Title
Austronesians in Papua: Diversification and Change in South-Halmahera-West New Guinea

Author
Kamholz, David

Publication Date
2014

Austronesians in Papua:
Diversification and change in South Halmahera–West New Guinea

by

David Christopher Kamholz

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Linguistics

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Andrew Garrett, Chair
Professor Larry Hyman
Professor Johanna Nichols

Fall 2014

Austronesians in Papua:
Diversification and change in South Halmahera–West New Guinea

Abstract

Austronesians in Papua:
Diversification and change in South Halmahera–West New Guinea

by

David Christopher Kamholz

Doctor of Philosophy in Linguistics

University of California, Berkeley

Professor Andrew Garrett, Chair

This dissertation presents a new subgrouping of South Halmahera–West New Guinea (SHWNG) languages. The 38 SHWNG languages form a small, poorly known branch of Austronesian. The Austronesian family originated in Taiwan and later spread into Indonesia, across New Guinea, and to the remote Pacific. In New Guinea, approximately 3500 years ago, Austronesian speakers first came into contact with so-called Papuan languages—the non-Austronesian languages indigenous to New Guinea, comprising more than 20 families. The Austronesian languages still extant from this initial spread into New Guinea fall into two branches: SHWNG and Oceanic. In great contrast to Oceanic, only a few SHWNG languages are well-described, and almost nothing has been reconstructed at the level of Proto-SHWNG. Contact with Papuan languages has given the SHWNG languages a typological profile quite different from their linguistic forebears.

Chapter 1 puts the SHWNG languages in context, describing their significance for Austronesian and their broader relevance to historical linguistics. It outlines the theoretical framework of the work, covering models of language diversification, diagnostic features for subgrouping, and language contact. A scale is proposed for ranking innovation types from most to least diagnostic for subgrouping. Morphological innovations are ranked above phonological innovations in this scale.

Chapter 2 gives an overview of the Austronesian family, focusing on the aspects most crucial to understanding the rest of the work: an outline of Proto-Austronesian phonology and the history of the branches ancestral to Proto-SHWNG.

Chapter 3 summarizes previous work on SHWNG languages, covering language membership, environmental and social characteristics, descriptive sources, shared innovations, subgrouping, reconstruction, and contact-induced change.

Chapters 4–6 are the main empirical contribution. Chapter 4 covers segmental sound change in 25 SHWNG languages and dialects. Chapter 5 covers tonogenesis in the Raja Ampat languages Maʲya and Magey Matbat and the Cenderawasih Bay languages Moor, Yaur, and Yerisiam. Chapter 6 covers subject agreement and inalienable possessive mor-

phology in 37 SHWNG languages and dialects. In these chapters, the goal is to identify shared innovations and determine their usefulness for establishing subgrouping relationships among SHWNG languages. Morphological innovations are found to be more diagnostic than phonological innovations, confirming the scale proposed in chapter 1.

Chapter 7 proposes a new subgrouping for SHWNG languages, synthesizing the results of chapters 4–6. The homelands of Proto-SHWNG and its branches are also discussed. The homeland of Proto-SHWNG is located in southern Cenderawasih Bay.

Chapter 8 concludes by considering the contributions of SHWNG languages to models of language diversification and change, and laying out questions for future research.

The Appendix contains the complete database of SHWNG cognate sets from which the analysis in chapters 4 and 5 is drawn.

To my parents, Barbara and John

Contents

List of Figures

List of Tables

Abbreviations

CB	Cenderawasih Bay
CMP	Central Malayo-Polynesian
Dus.	Dusner
Fia.	Fiawat
Gane (S.)	Gane (Saketa dialect)
Kur.	Kurudu
Lag.	Laganyan
M	Mamberamo
Mat.	Matbat
Maˈya (M.)	Maˈya (Misool dialect)
Maˈya (S.)	Maˈya (Salawati dialect)
Moor (A.)	Moor (Ayombai dialect)
Moor (H.)	Moor (Hirom dialect)
Mun.	Munggui
PAn	Proto-Austronesian
PCEMP	Proto-Central-Eastern Malayo-Polynesian
PEMP	Proto-Eastern Malayo-Polynesian
PMP	Proto-Malayo-Polynesian
RA	Raja Ampat
RASH	Raja Ampat–South Halmahera
SH	South Halmahera
SHWNG	South Halmahera-West New Guinea
SL	Serui-Laut
Wan.	Wandamen
Wau.	Wauyai
Wmb.	Warembori
Wrp.	Waropen
Yer.	Yerisiam

Transcriptional conventions

Transcription closely follows original source orthography. Remijsen (2001b) uses IPA transcription, with superscript numbers indicating tones. For other sources, the principal deviations from IPA are *’* = [ʔ], *g* = [g], *gh* = [ɣ], *gw* = /gʷ/, *j* = [dʒ], *ng* = /ŋ/, *v* = [β], *y* = [j]. See chapter 5 for the tonal transcription of Moor, Yerisiam, and Yaur.

I have modified original source orthography in two cases, in order to create consistency with other languages’ orthography. For Held (1942b), I have rewritten *w* as *v*. For van Hasselt and van Hasselt (1947), I have rewritten *j* as *y* and *ĕ* as *ə*, and removed the non-phonemic grave accent on vowels.

The PMP vowel normally written **e* is written **ə* throughout. This accurately reflects its phonetic value and additionally prevents confusion in comparison with PCEMP and PEMP, which contrast **ə* and **e*.

The Appendix precisely follows original source orthography.

Boundaries written with a hyphen (-) are present in the original sources or otherwise justifiable on synchronic grounds. Boundaries written with a slash (/) have no independent justification; their purpose is to separate a proposed reflex from other material.

Bracketing in reconstructed forms follows the conventions introduced by Ross (1988): *(x)* indicates that it cannot be determined whether *x* was present; *(x,y)* indicates that either *x* or *y* was present; and *[x]* indicates that the item is reconstructible in two forms, with and without *x*.

In tables of synchronic paradigms, *(x)* indicates that *x* is not present in all contexts; *[x]* indicates that *x* is optional in all contexts. Commas separate equivalent forms, with the selection of form determined by phonological context, inflection class, or dialect. Semicolons separate forms which belong to distinct subparadigms that the comparative table does not otherwise differentiate.

Acknowledgments

This dissertation would not have been possible without the support of numerous people and institutions.

First of all, I would like to thank my dissertation advisor, Andrew Garrett. During my time at Berkeley, he has had a substantial impact on my training as a historical linguist and the rigor of my scholarship. While writing the dissertation I have benefited many times from his comments, which always seemed to cut directly to the central issue I was facing. The end product would certainly have been much poorer without his impact.

My other committee members have also given me important direction, feedback, and encouragement. Larry Hyman was always available as I struggled through the analysis of tone systems and morphophonology. Johanna Nichols provided valuable perspective on the relevance of my work for larger areal and typological questions. In addition, Lev Michael and Alice Gaby gave important guidance during earlier stages of my research.

While on the subject of my intellectual development, it would be remiss not to also mention Sarah Thomason, who first taught me how to think like a historical linguist when I was an undergraduate at the University of Michigan, and also sparked an interest in language contact.

The germ for this dissertation was planted in 2005, when Mark Donohue suggested Indonesia as a possible field site. He later specifically proposed that I work on Moor, thus putting me on the path to documenting South Halmahera–West New Guinea languages and understanding their history. Mark has continued to provide practical and theoretical advice over the years.

I had the opportunity to take Malcolm Ross's 2009 LSA Summer Institute course on Austronesian and Papuan historical linguistics, greatly expanding my knowledge of those topics. Since then, he has continued to provide encouragement and research advice. His extensive comments on dissertation chapters were especially valuable.

Robert Blust generously helped me to identify many Austronesian etymologies in Moor, and also provided useful feedback on my ICAL presentations and several dissertation chapters. Bert Remijsen provided helpful comments on chapter 5.

In 2012, I visited the Nationaal Archief in The Hague, the KITLV in Leiden, and Het Utrechts Archief in Utrecht. The archive staffs were all very helpful in fulfilling my unusual requests. I am especially grateful to Huub Lems in Utrecht, who shared his knowledge of the Utrechtse Zendingsvereniging's mission to Cenderawasih Bay.

Regarding my field research, I must first thank the Endangered Languages Documentation Programme, a grant from which funded the majority of my trips to Indonesia. These trips were made much more pleasant and productive thanks to two stopover points along the way. David Gil, Uri Tadmor, John Bowden, and other staff at the Jakarta Field Station were always ready to lend a helping hand and discuss interesting data. Yusuf Sawaki of the Center for Endangered Language Documentation at Universitas Negeri Papua in Manokwari officially sponsored several of my trips. At CELD, Apriani Arilaha, Sutriani Narfafan, and Wiem Burung went out of their way to help with visa and other administrative issues.

I am grateful to my many friends in and around Nabire. The Aritahanu and Rumawi families kindly hosted me several times. Angela Hawar made sure that local administrative procedures ran smoothly. Among my language consultants, I would especially like to thank Moor speakers Zakeus, Yunus, Melsina, Asariat, Petrus, Alex, Markus, and Apner Manuaron, Derek and Selsius Aritahanu, Welem Singgamui, Efer and Salmon Samberi, Silas Samber, Dorkas Musendi, and Eva Sembor; Yerisiam speakers Herman Marariampi, Hengki Akubar, Yulianus and Enos Awujani, Frengki Numberi, Arkolaus Yarawobi, and Yermias Raifora; Yaur speakers Yunus and Berkus Abowi, Yakobus, Salonika, and Elisabet Aduari, Efraim Awandoi, Luki Ba'uromi, Selpi Raher, Dirk Rumawi, Melki Titama, Petrus Wojeri, Yohanis Waiwowi, Tomi Binur, Lukas Yamban, Yuliana Akubar, Utrek Inggeruhi, Yafet Maniburi, Yulian Nanor, Frengki Numberi, Beni and Arkolaus Yarawobi; and Umar speakers Yance, Marta, and Alfons Sadi, Jon Marani, Teo Masakeri, Marius Musu, Robertus and Yudas Kenenei, Nataniel, Agus, Amos, and Rio Banggo, and Nikanor Mareku.

I would also like to thank my fellow field linguists, Harald Hammarström, Antoinette Schapper, Niko Kobepa, Jason Jackson, Emily Gasser, Laura Arnold, and Paul van Velzen, for sharing their data, insights, and experiences with me.

I spent many congenial hours with fellow Berkeley graduate students, discussing matters both professional and personal. I would especially like to thank Alex Bratkievich, Roslyn Burns, Will Chang, Jessica Cleary-Kemp, Lindsey Newbold, and Elise Stickles.

Megan Williams has contributed to this project in many ways. She gave frequent, interesting, and original advice on my research; she kept me focused on the end goal; and she gave extensive feedback on written drafts, lending her unparalleled command of academic style.

My family, Barbara, John, and Rebecca Kamholz, believed in this project and my ability to carry it out even before I did. I am grateful to them in ways that cannot adequately be captured in words.

Chapter 1

Introduction

1.1 South Halmahera–West New Guinea in context

The South Halmahera–West New Guinea (SHWNG) languages form a small, poorly known branch of the vast Austronesian family. The largest of the 40-odd SHWNG languages is Biak, with 30,000 speakers; most languages have many fewer. And yet, the SHWNG languages play a significant role in the history of the Austronesian family, in the course of its spread from Taiwan into Indonesia, across New Guinea,[1] and into the Pacific. For it was in New Guinea, approximately 3500 years ago, that Austronesian speakers first came into contact with so-called Papuan languages—that is, the 800 non-Austronesian languages indigenous to New Guinea, comprising more than 20 families.

In New Guinea, Austronesian speakers encountered languages typologically quite unlike their own. The incoming Austronesian speakers would have spoken a language with VSO or SVO basic word order; perhaps a voice system distinguishing active and passive; no inflectional morphology; and no tonal contrasts. Assuming that they were similar to the present-day, the Papuan languages that Austronesian speakers encountered would have had SOV basic word order; clause chaining, but no voice distinctions; moderate to complex inflectional morphology; and tonal contrasts as often as not.

Today, the Austronesian languages still extant from this first incursion into New Guinea fall into two branches: SHWNG and Oceanic. The Oceanic languages, nearly 500 in number, have spread eastwards into the remote Pacific, reaching as far as New Zealand, Hawaii, and Easter Island. Some Oceanic languages remain in New Guinea as well.

The Oceanic subgroup is well-studied; many languages are well-described, and Proto-Oceanic speakers' grammar, lexicon, homeland, and culture have been well-reconstructed.[2] The contrast with SHWNG is stark. Only a few SHWNG languages are well-described, and

[1] In this work, 'New Guinea' refers to the island that is divided in half politically between Papua New Guinea in the east and two provinces of Indonesia (*Papua* and *Papua Barat*) in the west. Papua New Guinea is a former British and Australian colony; its lingua franca is Tok Pisin. The Indonesian side, until recently known as Irian Jaya, was part of the Dutch East Indies; its lingue franche are Indonesian and Papuan Malay.

[2] See, for example, Lynch et al. (2002); Ross et al. (1998).

almost nothing has been reconstructed at the level of Proto-SHWNG. We thus possess little knowledge about this group, one of only two independent witnesses to the eastward spread of Austronesian across New Guinea.

In the present work, I contribute to filling this gap by greatly elaborating our knowledge of the internal history of SHWNG. To do so, I employ the standard comparative method, focusing on phonology and morphology. These topics were selected because they are the most likely among the available data to shed light on internal history. For each phonological and morphological feature, I identify inherited Austronesian morphemes, comparing reconstructions with their SHWNG reflexes. This allows for the identification of shared innovations—new features shared by two or more SHWNG languages that are unlikely to have arisen independently or have been borrowed. Shared innovations form the basis of subgrouping arguments—hypotheses about the branching structure of the SHWNG family tree.

The state of available documentation on SHWNG languages makes this procedure a challenging task. Full-length grammars and comprehensive dictionaries are available for only a handful of SHWNG languages (§3.3). The rest are represented by brief sketches and short, often unreliable wordlists. In order to collect additional data, I undertook several field trips to Indonesia, during which I documented four SHWNG languages of southern Cenderawasih Bay: Moor, Umar, Yaur, and Yerisiam.[3]

I selected these four languages because existing documentation indicated that they were quite different both from each other and from other SHWNG languages. Most intriguingly, Moor was reported to be tonal (Laycock 1978). During the course of my fieldwork, I determined that Moor, Yaur, and Yerisiam were all tonal (see chapter 5). One of the major conclusions of my comparative work is that southern Cenderawasih Bay, where these languages are spoken, is the homeland of Proto-SHWNG (§7.7).

In addition to field data, I consulted many published and unpublished sources and archival materials. In order to fill in gaps in morphological paradigms, I found and contacted speakers on Facebook.[4]

Determining the internal history of SHWNG languages also poses significant analytical challenges. The breakup of Proto-SHWNG may have occurred as much as 3500 years ago (§2.5). In all likelihood, SHWNG languages were in contact with Papuan languages from the very beginning. This contact has caused the SHWNG languages to have a typological profile that is quite different from their linguistic forebears. In addition to the emergence of tone in some languages, all SHWNG languages have lost their inherited voice system (if indeed it was present: see §2.5), gained inflectional morphology, and undergone certain word order shifts (§3.10). They have also lost large amounts of their inherited Austrone-

[3]This fieldwork took place from 2008–13. It was partially supported by an Individual Graduate Scholarship from the Endangered Languages Documentation Programme ('Documentation of Moor, an Austronesian language of Cenderawasih Bay, Indonesia', 2010–13).

[4]These contributors were Hamim Al Fatih for Gane, Legaya Jumahir Jamulia for Patani, and Kalu Mata for Gebe.

sian vocabulary, to the extent that one author (Donohue 1999) classified two languages as non-Austronesian (§3.7).

The presence of strong areal pressure for millennia makes it no easy task to detect internal changes in SHWNG and distinguish them from other kinds of change. Well-articulated models of language diversification and change are required in order to accomplish this task. The history of SHWNG, in turn, is an important case study that can inform the further elaboration of such models.

I return to the question of the broader contribution of SHWNG to models of diversification and change in the conclusion (chapter 8). The rest of the introduction contains an overview of the theoretical framework employed in this work, covering models of language diversification, diagnostic features for subgrouping, and language contact.

1.2 Models of language diversification

Historical linguists have traditionally used two complementary models of language diversification: the *family tree model* and the *wave model* (François 2015). In the family tree model, diversification is viewed as a series of discrete splits of uniform proto-languages. Daughter languages can acquire their features in one of four ways: (1) retentions inherited from their ancestor; (2) innovations with respect to their ancestor; (3) borrowings from other languages or dialects; (4) universal tendencies (e.g., *mama* for 'mother'). Assuming chance can be ruled out, similarities among languages must have one of these four explanations.

In the wave model, by contrast, diversification occurs as individual innovations independently arise in specific locations and spread to other places. In this way, different speech communities acquire different combinations of criss-crossing innovations, forming a pattern that cannot neatly be captured with a family tree. This basic process of diffusion subsumes the family tree model's concepts of borrowing and inheritance. As François (2015: 168) puts it, "language-internal diffusion of innovations gives rise to the genealogical relations among languages … such a process is not fundamentally different from what is involved in language contact".

Neither the family tree model nor the wave model fully captures the complexity of language diversification. Ross (1997) is a modern, sophisticated attempt to synthesize these models with more recent variationist work, resulting in what he terms the *social network model*. The locus of change in Ross's model is the speech community, a socially linked network of individuals who communicate using mutually intelligible *lects* (dialects or languages). The social network constituting a speech community takes various forms; there might be a close-knit network within a village, a loose-knit network among villages in a larger region, and so on. Multilingual individuals can belong to multiple speech communities. In this way, Ross's model can capture a variety of modes of social interaction and differentiation.

Ross (1997: 210) terms language diversification events *speech-community events* (SCEs), "since a linguistic event often reflects a change in the life of the speech-community (e.g. division, growth, contact)". He recognizes several kinds of SCE, of which the most relevant for this work are *language fissure* and *lectal differentiation*. Language fissure "occurs when speakers of a lect become geographically or socially isolated from other speakers of the same or closely related lects, thereby forming a new speech community" (1997: 212). Lectal differentiation is described as follows (1997: 223):

> As a community grows, it establishes new settlements which remain in contact with each other, contact being naturally greatest with the geographically most accessible sister settlements. There is an increase in structural heterogeneity, but, unlike language fissure, it does not entail a sharp reduction in the density of links so that one unit becomes two but rather a gradual reduction in intensity and multiplexity which shades into a reduction in network density.[5]

These two kinds of SCEs produce different patterns of innovations. Language fissure results in a discrete, family-tree-like split, producing what Ross (1997: 220) terms an *innovation-defined subgroup*, "since its membership is defined by shared innovations relative to a proto-language". Lectal differentiation typically results in criss-crossing, wave-like innovations, producing what he terms an *innovation-linked subgroup* or *linkage* (1997: 224).

Ideally, different innovation patterns can be used to work backwards and infer a subgroup's complex history of SCEs. However, there are at least three situations in which this is challenging. If an innovation arises in one lect of a linkage and spreads to all other lects, it produces a pattern that is identical to what would result from language fissure (Ross 1997: 224). Likewise, if an innovation spreads only to some lects of a linkage, but those lacking the innovation are no longer extant, it appears to have been present in all lects. Finally, related lects may undergo parallel changes because of a common tendency inherited from their ancestor, a process known as *drift*.

In these three situations, the traditional practice has been to reconstruct the innovation to a common proto-language. Babel et al. (2013) argue for a more nuanced procedure which distinguishes inherited from diffused or parallel innovations. They define *clade* as "a group consisting of all the languages or dialects descended from a single ancestor", *taxon* as "a group of related languages or dialects sharing a significant set of features", and *apomorphic taxon* as a taxon whose defining features are innovations (2013: 446). The important distinction between clade and apomorphic taxon is conflated in Ross's concept of innovation-defined subgroup: clades reflect descent, whereas apomorphic taxa may also reflect diffusion or parallel change (Babel et al. 2013: 448). Attending to this distinction allows for a more accurate model of language diversification.

[5]Ross (1997: 217) defines *density* as "the number of relationships an individual has with other individuals", *intensity* as "the amount of time two people spend together and the intimacy of that relationship", and *multiplexity* as "the number of purposes for which two people relate to each other".

The primary goal of this work is to infer as accurately as possible the sequence of proto-languages that formed during the diversification of SHWNG languages. Only once this family-tree-like branching is worked out will it be possible to properly consider what other SCEs may have taken place. As Ringe and Eska (2013: 263) put it, "it is much easier to fit recalcitrant data into a network model; for exactly that reason a hypothesis of non-treelike diversification is less useful and should be preferred only when reasonable alternatives have proved untentable". I will therefore from now on exclusively use the term *subgroup* to mean a group of languages descended from a common proto-language (Babel et al.'s clade).

In order to increase the probability that my proposed subgroups are clades, I focus on innovations that have what Ross (1997: 220) terms *diagnostic substance*—that is, innovations that are unlikely to have arisen independently and unlikely to have diffused across lects. This crucial concept, not always explicitly discussed in subgrouping proposals, deserves a more in-depth presentation.

1.3 Diagnostic features for subgrouping

One must cite shared innovations in order to properly justify a subgroup. Ideally, these innovations should be exclusively shared, i.e., not present in any languages outside the subgroup. The most important criterion, however, is the likelihood that the innovations are the result of diffusion or parallel development. Lower likelihood of diffusion or parallel development means higher likelihood of inheritance from a common proto-language. Innovations that meet this criterion therefore carry more weight for subgrouping (in Ross's terms, they have greater diagnostic substance).

Various different kinds of innovations can be used to justify subgroups. Proto-SHWNG itself was established mainly on the basis of phonological innovations (see chapter 3). Two recent Austronesian subgrouping proposals are summarized here to further illustrate norms in the field.

Adelaar (1994) argues that the Tamanic languages of West Kalimantan (Borneo) form a subgroup together with the South Sulawesi languages. To justify this, he cites phonological innovations, lexical replacements, irregular phonological changes in particular words, and semantic changes. He also cites innovations in the pronominal system, including the development of ergative/absolutive marking, the specific forms of these markers, and their syntactic distribution.

Van den Berg (2003) argues for a subgrouping of the Muna-Buton languages of southeast Sulawesi that includes Tukang Besi but excludes other languages such as Wolio. Van den Berg's evidence includes phonological innovations, sporadic sound changes, irregular phonological developments, morphological innovations (e.g., in the pronominal system, derivational morphology, and demonstratives), and lexical replacements.

The above authors would presumably recognize that not all of their proposed innovations have equal diagnostic substance, but such evaluations are rarely made explicit in

the literature. Rather, it is the cumulative weight of innovations that implicitly renders a subgrouping argument convincing. However, in some cases, such as SHWNG, large numbers of innovations are not readily identifiable. It is therefore useful to have a more explicit model of diagnostic substance. I outline such a model here.

Phonological innovations have traditionally been widely used for subgrouping, but they are not always ideal for this purpose. Babel et al. (2013: 482) conclude that several shared regular sound changes in Western Numic (a subgroup of Uto-Aztecan) are best explained by diffusion, and so are not diagnostic for subgrouping. In their view, which I share, diffusion of phonological change is an under-recognized confounding factor in subgrouping.

Ringe et al. (2002: 66–68) make the important observation that parallel phonological changes are widely attested, including within the same family, so that they are not individually reliable for subgrouping. They conclude that, while this problem is substantially mitigated when multiple shared phonological innovations are cited, or when changes have unusual conditioning environments, "sound changes provide much less information for subgrouping than might be supposed".

Morphological change bears a different profile from phonological change. Commenting specifically on changes in inflectional morphology, Ringe et al. (2002: 68) note that parallel developments are rare, "apparently because inflectional systems are such tightly integrated constructs that conditions which would give rise to similar changes are unlikely to recur in different languages". Diffusion of inflectional change is also rare.[6]

The main disadvantage of morphological innovations, as Ringe et al. also observe, is that it can be difficult to distinguish innovations from retentions. Fortunately, in SHWNG this problem generally does not arise. Proto-Malayo-Polynesian (PMP), the most recent well-reconstructed ancestral stage to Proto-SHWNG, is known independently of SHWNG-derived evidence. PMP retentions can thus easily be recognized in SHWNG languages.

As with phonological changes, not all morphological changes are equally valuable for subgrouping. For example, some changes entail the remodeling of an entire inflectional paradigm—what I term a *paradigmatic innovation*. These are clearly more diagnostic than innovations that affect only a single paradigm cell.

I turn now to lexical innovations. These deserve a longer treatment than they are sometimes given, both because they are often cited in the Austronesian literature, and because they are crucial to many recent applications of computational phylogenetic methods to historical linguistics (e.g., Gray et al. (2009)).

There are at least three distinct phenomena that might be termed lexical innovations. The first is lexical replacement—the replacement of the etymon used to express a particular meaning with an unrelated (perhaps non-inherited) etymon. Lexical replacement can come about when a borrowed or newly derived word replaces an old word for a con-

[6]Derivational morphology is less clear-cut. It is not discussed here, because it is not relevant to my analysis of morphological innovations in SHWNG.

cept (presumably after a period of coexistence). It can also occur when a word changes meaning, filling the same "slot" as another word and eventually winning out.

The second phenomenon is semantic change, which is basically the flip side of the second kind of lexical replacement. For example, when PMP **waRəj* 'vine' came to mean 'rope' (probably prior to Proto-SHWNG), the form **waRəj* underwent semantic change, while the meaning 'rope' underwent lexical replacement.

The third phenomenon is irregular phonological change—a phonological development that unpredictably affects only a small number of etyma. An example is the change in quality of the first vowel of PMP **inum* 'drink' > Moor *anum-î*. Changes of this sort can only be identified once regular sound changes have been established.

Lexical replacement and semantic change have often been used in Austronesian subgrouping arguments (e.g., by Blust: see chapters 2–3). However, this procedure has serious pitfalls. It can be difficult to distinguish innovations from retentions, diffusion generally cannot be ruled out, and parallel cases of semantic change are common. For these reasons, I have not used these kinds of innovations in my SHWNG subgrouping proposals.

Irregular phonological changes have significantly greater diagnostic substance than other kinds of lexical innovation. Precisely because they are irregular, these changes are unlikely to arise in the same words independently. Innovations are sometimes difficult to distinguish from retentions, but fortunately, in SHWNG this is not the case (see above). Diffusion cannot always be ruled out, but its likelihood is reduced if the changes occur in basic vocabulary and so are unlikely to be borrowed. Marck (2000) is a well-known study that relies largely on irregular phonological changes to subgroup Polynesian languages.

A final kind of innovation that is sometimes used in subgrouping arguments is structural/typological change. Examples are changes in basic word order, changes in alignment (nominative/accusative vs. ergative/absolutive vs. split intransitive), development or loss of particular morphology (e.g., case markers, subject markers), development or loss of tone, and so on. Dunn et al. (2005) use typological features to classify the Papuan languages of Island Melanesia as a single family, and to subgroup these languages. However, as Donohue and Musgrave (2007) point out, typological features are likely to diffuse areally, and so are highly unreliable for classification and subgrouping. Additionally, typological features typically only have a small number of realizations (e.g., there are only so many basic word order types), so it can be difficult to rule out independent development (Ringe and Eska 2013: 262). For these reasons, typological features have limited diagnostic substance.

I have developed a scale of diagnostic substance in order to guide my SHWNG subgrouping decisions, shown in Figure 1.1. This scale is intended as a rule of thumb rather than an absolute. The specific details of any change must always be evaluated in order to determine its usefulness for subgrouping. However, I consider the final two members of the scale (lexical replacement/semantic change and typological change) to have sufficiently low diagnostic substance that I have not investigated them systematically in SHWNG.

Ranking from more to less diagnostic:
paradigmatic morphological change
single morphological change
irregular phonological change
regular phonological change
lexical replacement/semantic change
typological change

Figure 1.1: Proposed diagnostic substance scale.

1.4 Language contact

If diversification and change are the foregrounded subjects of this work, language contact is the background: always present, but rarely discussed explicitly.

Two basic kinds of contact-induced change are *borrowing* and *shift-induced interference* (Thomason and Kaufman 1988). In borrowing, a speaker bilingual (to some degree) in languages A and B takes a feature present in A and uses it in B. If other speakers of B adopt it and it becomes an established feature of B, borrowing has occurred. Thomason and Kaufman (1988: 74) propose a borrowing scale, going from casual contact with lexical borrowing only to very strong cultural pressure with heavy structural borrowing.

Shift-induced interference can occur when a speaker shifts his or her primary language from A to B. As a new learner of B, he or she may learn it imperfectly and unconsciously use features of A when speaking B (may have an "accent"). If there is a group of speakers shifting from A to B and they are numerous or influential enough, or isolated from other speakers of B, their imperfectly learned B may become the norm. In such a case, language B has undergone shift-induced interference. This is more likely to occur when the shift is abrupt (Thomason and Kaufman 1988: 41). Effects are typically apparent in the phonology and syntax of B, but not the morphology or lexicon.

One outcome of contact-induced change that does not neatly fit the above typology is *metatypy*, or 'change in type' (Ross 1996, 2007). Metatypy can occur when speakers of A and B communicate with each other in A. If speakers of B use A frequently, they may impose parallel structures on A and B in order to reduce cognitive load. Since speakers of A may not know B or use it frequently, whereas speakers of B use both languages, the tendency in this situation is for structures of B to be remodeled after A, rather than vice versa. Only structural features are affected; grammatical forms are not borrowed. Lexical and grammatical calquing typically precede metatypy, which is distinguished from them by the presence of changed morphosyntactic structure. Metatypy is clearly not shift-induced interference (Ross 2007: 131). Thomason and Kaufman treat it as a case of 'structural borrowing', but Ross (2007: 133) argues that this is not fully appropriate. In any case, metatypy does not conform to Thomason and Kaufman's borrowing scale, since it typically involves minimal lexical borrowing.

SHWNG languages have undergone various contact-induced changes over the course of their history (§1.1, §3.10). The presence of large amounts of non-Austronesian vocabulary suggests borrowing; the emergence of tone suggests shift-induced interference; and the structural features shared with Papuan languages suggest metatypy. However, it is generally not possible to infer the specific languages with which SHWNG speakers came into contact, or to reconstruct the sociolinguistic situation in which it occurred. The time depth of Proto-SHWNG is as great as 3500 years, and its speakers would have likely been in contact with Papuan languages from the beginning (§1.1). It is entirely possible that these languages belonged to families that are no longer extant, whether as a result of shift to Austronesian languages or historical accident. Furthermore, little is known even now about the ongoing contact situations of SHWNG languages.

Because it is generally not possible to say anything very precise about the effects of language contact in SHWNG, the focus of this work is on internal change. However, there is a good chance that future documentation of SHWNG languages and their Papuan neighbors, especially lexical documentation, will make it possible to better detect some of the effects of contact.

1.5 Outline

The plan of the rest of the work is as follows:

Chapter 2 provides a very basic overview of the Austronesian family, focusing on the aspects most crucial to understanding the rest of the work: an outline of Proto-Austronesian phonology and the history of the branches ancestral to Proto-SHWNG.

Chapter 3 summarizes previous work on SHWNG languages, covering language membership, environmental and social characteristics, descriptive sources, shared innovations, subgrouping, reconstruction, and contact-induced change.

Chapters 4–6 are the main empirical contribution. Chapter 4 covers segmental sound change in 25 SHWNG languages and dialects. Chapter 5 covers tonogenesis in the Raja Ampat languages Ma'ya and Magey Matbat and the Cenderawasih Bay languages Moor, Yaur, and Yerisiam. Chapter 6 covers subject agreement and inalienable possessive morphology in 37 SHWNG languages and dialects. In these chapters, the goal is to identify shared innovations and determine their usefulness for establishing subgrouping relationships among SHWNG languages.

Chapter 7 proposes a new subgrouping for SHWNG languages, synthesizing the results of chapters 4–6. The most likely homelands of Proto-SHWNG and its branches are also discussed.

Chapter 8 concludes by considering the contributions of SHWNG languages to models of language diversification and change, and laying out questions for future research.

The Appendix contains the complete database of SHWNG cognate sets from which the analysis in chapters 4 and 5 is drawn.

Chapter 2

The Austronesian family

2.1 Introduction

The Austronesian family contains over 1200 languages, most of which are spoken in insular Southeast Asia and Oceania (Lewis 2009). Figure 2.1 on the following page shows the geographic extent of the family and its major language groupings.

Linguistic evidence places the Austronesian homeland in Taiwan. The most persuasive argument for this hypothesis is the fact that Taiwan is home to nine of the ten primary branches of Proto-Austronesian, i.e., the 14 Formosan languages (Blust 1999).[1] Proto-Austronesian is generally correlated with the Neolithic in Taiwan around 5000–4000 BP (Bellwood 2007: 119; Pawley 2007: 23).[2]

Austronesian languages first spread southwards into the Philippines, then into the Indonesian islands of Borneo and Sulawesi. In Indonesia, the spread continued both westwards (towards Java, Sumatra, and the Malay peninsula) and eastwards (towards the Moluccas and New Guinea). Proto-Oceanic was spoken in the Bismarck Archipelago east of New Guinea 3400–3100 BP. Linguists and archaeologists generally equate it with the Lapita culture (Pawley 2007).

Figure 2.2 on page 12 shows the higher order subgroups of the Austronesian tree, according to Blust's generally accepted model. These branches are discussed further in §2.3–§2.5.

[1] Ross (2009) argues that several of these branches group together as Proto-Nuclear Austronesian. The result is largely compatible with Blust's analysis.

[2] For a recent opposing view, see Donohue and Denham (2010).

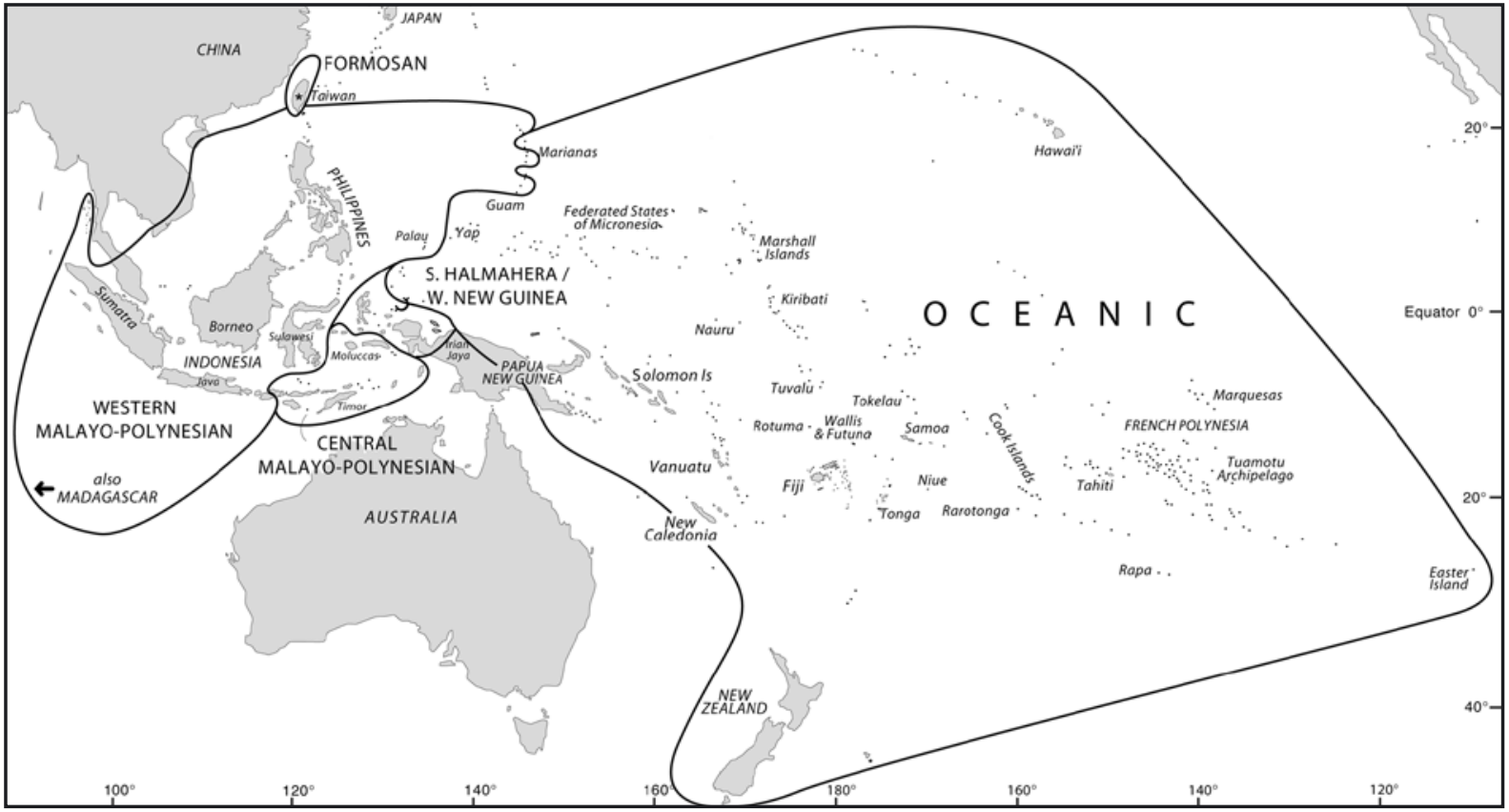

Figure 2.1: Map of the Austronesian family and major language groupings (Pawley 2007: 22, originally published as Ross et al. 1998: xx).

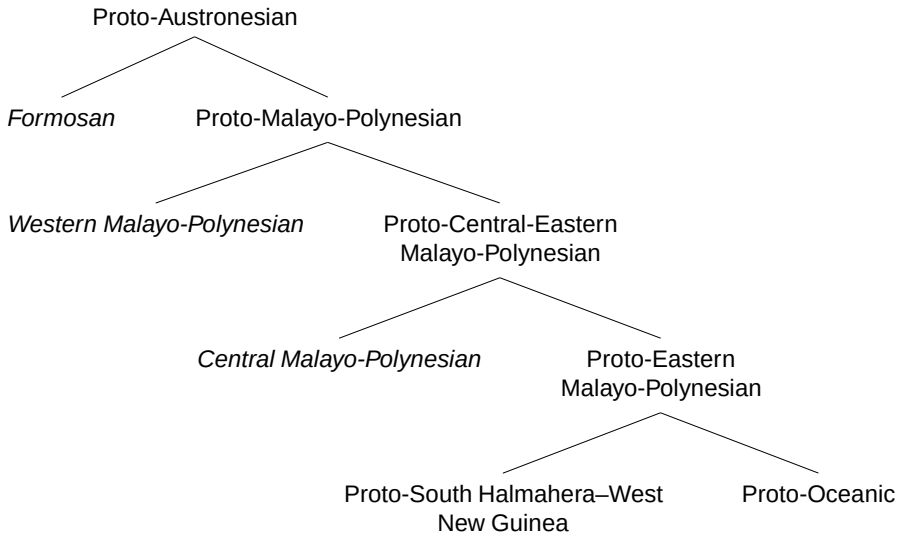

Figure 2.2: The higher branches of the Austronesian family tree, after Blust (2013: 729–743), originally appearing as Blust (1977). Nodes in italics are not proto-languages, but rather are cover terms for multiple primary branches.

2.2 Proto-Austronesian phonology

Tables 2.1 and 2.2 show the reconstructed vowel and consonant inventories of Proto-Austronesian, adapted from Blust (2013: 554).[3] The diphthongs in Table 2.1 were not separate phonemes. The proto-vowel **ə* is usually written **e* in the Austronesianist literature (with no implied difference in phonetic value). It is written **ə* throughout this work in order to avoid confusion with PCEMP and PEMP **e*, which is a mid front vowel and contrasts with **ə*. The phonetic values of the proto-consonants in Table 2.2 follow Blust (2013: 554). Not all scholars would agree with them.

There is disagreement over whether Proto-Austronesian had contrastive stress. Blust (2013: 554–558) examines the main proposals and concludes that there is not sufficient

monophthongs		diphthongs	
i	u	-iw	-uy
ə			
a		-ay, -aw	

Table 2.1: Proto-Austronesian vowels.

[3]Ross (1992) disputes the evidence for reconstructing **c*, **D*, **ñ*, and **r* to PAn. If this is correct, these consonants were PMP innovations.

p	t, C [tʃ]		c [cç]		k	q	
b	d	D [ɖ]	z [ʄʝ]	j [gʲ]	g		
m	n		ñ [ɲ]		ŋ		
	S [s]		s [ç]				h
	l		N [lʲ]				
	r [ɾ]					R [ʁ/r]	
w			y [j]				

Table 2.2: Proto-Austronesian consonants. Assumed phonetic values follow in IPA transcription, when different.

evidence to support the hypothesis. Stress has not been reconstructed at the levels of PMP, PCEMP, or PEMP. In §5.4, I propose that Proto-SHWNG had penultimate stress.

Most Proto-Austronesian roots were disyllabic, taking the form CVCVC (Blust 2013: 212). Medial clusters also occurred as a result of fossilized reduplication (e.g., **səpsəp* 'suck').

2.3 Proto-Malayo-Polynesian

Proto-Malayo-Polynesian is the ancestor of all Austronesian languages spoken outside of Taiwan (about 1200 languages). It was most likely spoken in the Batanes Islands and North Luzon, about 4000–3600 BP (Pawley 2007: 23). PMP divides into the Western Malayo-Polynesian languages, spoken mainly in the Philippines and Indonesia (about 500 languages), and Proto-Central Eastern Malayo-Polynesian. The evidence for the integrity of PMP is substantial (Blust 1977, 2001, 2013). PMP is characterized by an extensive set of phonological, morphological, and lexical innovations.

The principal PMP sound changes are PAn **t*, **C* > PMP **t*; PAn **n*, **N* > PMP **n*; and PAn **S* > PMP **h*, which apparently did not merge with PAn **h* (Adelaar 2005: 5; Blust 2013: 748). Additionally, there was sporadic prenasalization of medial obstruents (**b* > **mb*, **s* > **ns*, etc.). The phonological inventory of PMP was therefore the same as PAn, except that it lacked **C*, **S*, and **N*.

PMP's morphological and lexical innovations are not relevant to this work, so they are not summarized here.

More has been reconstructed at the level of PMP than at any other level ancestral to SHWNG.[4] There are reconstructions of pronominal paradigms (Ross 2006), verbal paradigms and clausal syntax (Ross 2002), derivational morphology (Blust 2013: 370), and more than 4000 individual forms (Blust 2014).

[4]PMP was, in fact, the first Austronesian proto-language to be reconstructed, in Dempwolff (1934–38)'s foundational work. Dempwolff did not have access to Formosan data. The modern terminological distinction between PAn and PMP dates to Blust (1977).

2.4 Proto-Central-Eastern Malayo-Polynesian

Proto-Central Eastern Malayo-Polynesian is the ancestor of the Central Malayo-Polynesian languages, spoken in southeastern Indonesia and East Timor (about 160 languages), and Proto-Eastern Malayo-Polynesian (Blust 1982, 1983–4, 1993). Blust's proposed innovations characterizing PCEMP are **c* > **s*; the reduction of medial consonant clusters (*C_1C_2 > *C_2 /V_V); 9 irregular phonological changes; 33 lexical innovations; and 6 semantic innovations. Blust also proposes that PCEMP innovated proclitic subject markers and an alienable/inalienable possessive distinction.

The most significant irregular phonological changes involve sporadic lowering of high vowels to mid vowels: PMP **uliq* > PCEMP **oliq/*uliq* 'return'; PMP **ma-qitəm* > PCEMP **ma-qetəm/*ma-qitəm* 'black'. Another important irregular change is PMP **maRi* > PCEMP **mai* 'come'. Some of the important lexical innovations are PMP **tawa* > PCEMP **malip* 'laugh'; PCEMP **kandoRa* 'cuscus, phalangerid'; PCEMP **mans(a,ə)r* 'bandicoot, peramelid'; PCEMP **kazupay* 'rat'; and PCEMP **keRa(n,ŋ)* 'hawksbill turtle, *Eretmochelys imbricata*'. As can be seen, two of these words also contain mid vowels. PCEMP thus possessed two new proto-vowels, **e* and **o*. Otherwise, the phonological inventory of PCEMP was the same as PMP, except that it lacked **c* and **D*.[5]

The PCEMP words for cuscus and bandicoot are particularly significant, since these marsupial mammals are only found east of the Wallace Line (Blust 1982). Since PMP was spoken west of the Wallace Line, **kandoRa* and **mans(a,ə)r* must be innovations (they also do not resemble any PMP faunal terms). Some WMP languages are located east of the Wallace Line, but they do not have reflexes of these forms. Since reflexes of **kandoRa* and **mans(a,ə)r* are found over a large geographical area and mostly show mostly regular sound correspondences, Blust argues that they must have been present in PCEMP.

According to Ross (1995: 81), of all the right-hand branches in Figure 2.2, PCEMP is "the least well supported by the comparative method". Adelaar (2005: 25) points out that Blust's morphological innovations are highly problematic, because it is not possible to reconstruct subject agreement and inalienable possession paradigms for PCEMP (as can be done, for example, for Proto-Oceanic). But by far the most serious challenge to the PCEMP hypothesis has come from Donohue and Grimes (2008). They examine the non-lexical innovations proposed by Blust and argue that most are not found consistently throughout the CMP area, and many are found in the WMP area as well. Their conclusion is that PCEMP did not exist: instead, PMP split into many primary branches, most of which are small subgroups that do not span more than one large island, with the only large subgroup being PEMP.

Blust (2009) is an extended rejoinder to Donohue and Grimes (2008). His most significant objection is that they do not give weight to the lexical innovations, which he considers to be among the strongest evidence for PCEMP, particularly **kandoRa*, **mans(a,ə)r*,

[5]Blust (1993) does not discuss the status of **D* in PCEMP. However, Blust (2013: 575) states that **D* only has distinct reflexes from **d* in WMP languages. I therefore assume that **D* > **d* in PCEMP.

and **keRa(n,ŋ)*. Donohue and Grimes (2008: 117) state that **kandoRa* and **mans(a,ə)r* "could be (and likely are) borrowed from an as yet unidentified non-Austronesian source. Once established in any trade vernacular, they would be spread through all and any subgroups in contact." As Blust (2009: 24) rightly points out, no known Papuan language can be cited as the source of these words, and there is no evidence for a prehistoric trade language of such wide extent.

Schapper (2011) further criticizes the PCEMP hypothesis, claiming that the linguistic evidence for **kandoRa* and **mans(a,ə)r* is weak. In her view,**kandoRa* cannot be reconstructed for PCEMP, and "it remains to be seen whether PCEMP **mans(aə)r* (and in turn the subgroup itself) will stand the test of time" (2011: 270). In his response, Blust (2012) argues that, like Donohue and Grimes, Schapper fails to provide a more convincing proposal than his original one.

Resolving the question of PCEMP's integrity is outside the scope of this work. Fortunately, it is also not crucially relevant, as for any given PCEMP reconstruction, there is generally sufficient evidence to reconstruct the same form at the level of PEMP or Proto-SHWNG. I am therefore justified in citing Blust's PCEMP reconstructions as evidence for sound change within SHWNG.

2.5 Proto-Eastern Malayo-Polynesian

Proto-Eastern Malayo-Polynesian divides into Proto-SHWNG and Proto-Oceanic (Blust 1974, 1978a, 1983–4). Most of the proposed evidence is in the form of 47 lexical innovations, 6 irregular phonological changes, and 4 semantic innovations.[6] According to Blust (2013: 732), the most important of these are PMP **anak* > PEMP **natu* 'child'; PMP **bahuq* > PEMP **boi/bui* 'smell, stench'; PMP **nunuk* > PEMP **qayawan* 'banyan, strangler fig'; PEMP **ka(d,R)a* 'cockatoo, parrot'; PEMP **sakaRu* 'reef'; and PMP **bəsuR* > PEMP **m(a,o)suR* 'satiated, full after eating'. While some of the proposed innovations may turn out to be retentions, they are numerous enough that the PEMP hypothesis deserves serious consideration.

Only one potentially significant phonological change characterizes PEMP: the change of penultimate **ə* to **o*. Remaining instances of **ə* would have then changed to **o* in Proto-Oceanic. As Blust (1978a: 211) and Ross (1995: 84) both point out, this is not a very convincing shared innovation. It is more likely that two changes occurred indepenently, conditioned in Proto-SHWNG and unconditioned in Proto-Oceanic.

PEMP also underwent two minor sound changes (Blust 2013: 748): **h* > ∅, and monophthongization of final diphthongs (**-ay* > **-e*; **-aw* > **-o*; **-uy*, **-iw* > **-i*). The phonological inventory of PEMP was therefore the same as PCEMP, except that it lacked **h*.

[6]These numbers were calculated by combining the innovations proposed in Blust (1978a, 1983–4) and subtracting those later assigned to PCEMP in Blust (1993).

Van den Berg and Boerger (2011) reconstruct a Proto-Oceanic passive formed from the inherited PMP infix **‹in›*. This morpheme would thus have been present in PEMP, possibly with a passive function as well.

Ross considers it most likely that PEMP was spoken on Halmahera, "on the principle that the location of the more conservative members of a language group is likely to be its homeland". The speakers who went in the first wave east were the ancestors of Proto-Oceanic. Later, after the formation of Proto-SHWNG, other groups went east and settled in Cenderawasih Bay (1995: 85). It is not obvious why Ross considers South Halmahera languages to be the most conservative. In any case, it is not clear why the rapidity of language change should depend on how far speakers have spread from their ancestors' point of origin. The location of the PEMP homeland is therefore best treated as an open question (see also chapter 8).

The time depth of PEMP is not known, but given the estimated time depths of Proto-Austronesian, PMP, and Proto-Oceanic (see above), a plausible figure is about 3500 BP. The time depth of Proto-SHWNG is less certain: it must be more recent than PEMP, but it is not known by how much.

Most Austronesianists have accepted the validity of PEMP, if they have considered the question at all. The principal objector is Dyen (1978), who cites a number of lexical items which are shared by Buli and Numfor with WMP and CMP languages, but are not found in Oceanic. Dyen argues on this basis that the SHWNG languages should not be grouped with Oceanic. The obvious problem with his argument is that the forms he cites could just as well be retentions as innovations, and he makes no attempt to distinguish the two.

Chapter 3

The South Halmahera–West New Guinea subgroup

3.1 Introduction

SHWNG languages are spoken in Indonesia on the southern half of Halmahera in the northern Moluccas, on the Raja Ampat islands to the east of Halmahera, and—continuing eastwards and skipping over the Bird's Head peninsula of New Guinea—along the coast and on the islands of Cenderawasih Bay,[1] ending at the mouth of the Mamberamo river.[2] Some putative SHWNG languages are also spoken on the Bomberai Peninsula south of the Bird's Head. Figures 3.1–3.3 show the locations of individual SHWNG languages.

SHWNG contains 42 languages (38 if the Bomberai languages are excluded), listed below according to geographic location (ISO 639-3 codes in brackets, alternative names and dialects in parentheses):[3]

- South Halmahera (6 languages): **Buli** [bzq] (dialect: Wayamli), **Gane** [gzn] (Gimán; dialect: Saketa), **Maba** [mqa] (Bicoli), **Patani** [ptn], **Sawai** [szw] (Weda), **Taba** [mky] (East Makian, Makian Dalam; dialects: Kayoa, Southeast Makian)

- Raja Ampat (8 languages): **Ambel** [wgo] (Amber, Waigeo), **As** [asz], **Bata**, **Biga** [bhc], **Gebe** [gei] (dialect: Minyaifuin), **Maden** [xmx] (Palamul; dialects: Banlol/Butleh/Fiawat, Kawit, Tepin/Tipin), **Matbat** [xmt] (dialects: Magey, Tomolol), **Ma'ya** [slz] (dialects: Kawe [kgb], Laganyan [lcc], Misool, Salawati, Wauyai [wuy])

[1] Also known by its former names of Geelvink Bay and Sarera Bay.

[2] The northern half of Halmahera and the Bird's Head are occupied by Papuan languages.

[3] Language names and status as language or dialect are drawn from recent fieldwork when possible: for Taba, Bowden (2001); for Raja Ampat, Remijsen (2001b) and van der Leeden (1993); for Bedoanas and Erokwanas, Harald Hammarström (p.c., 2010); for Irarutu and Kuri, Jason Jackson (p.c., 2010); for Moor, Umar, Yaur, and Yerisiam, my own fieldwork; for Roon, David Gil (p.c., 2010); for Warembori and Yoke, Donohue (1999). Otherwise, information is drawn from the Ethnologue (Lewis 2009). The Ethnologue considers Bata to be a dialect of Ma'ya, so it has no ISO 639-3 code.

- West New Guinea (28 languages):
  - Bomberai: **Bedoanas** [bed] (Kambran), **Erokwanas** [erw] (Yarik), **Irarutu** [irh], **Kuri** [nbn] (Nabi)
  - Cenderawasih Bay: **Biak** [bhw] (dialect: Numfor), **Dusner** [dsn], **Meoswar** [mvx], **Moor** [mhz] (Mor, dialects: Ayombai, Hirom, Kama), **Roon** [rnn] (Ron), **Tandia** [tni], **Umar** [gop] (Yeretuar), **Wandamen** [wad] (Wamesa, dialects: Windesi, Wondama), **Waropen** [wrp], **Yaur** [jau], **Yerisiam** [ire] (Iresim)
    - Yapen Island: **Ambai** [amk] (Wadapi-Laut), **Ansus** [and], **Busami** [bsm], **Kurudu** [kjr], **Marau** [mvr], **Munggui** [mth], **Papuma** [ppm], **Pom** [pmo], **Serui-Laut** [seu], **Wabo** [wbb] (Nusari), **Wooi** [wbw] (Woi)
  - Mamberamo: **Warembori** [wsa], **Yoke** [yki]

In this work I sometimes refer to the Magey dialect of Matbat simply as 'Matbat', since it is the only dialect for which data are available. Because the Waigeo dialects of Ma'ya are somewhat divergent, I refer to them simply as 'Kawe', 'Laganyan', and 'Wauyai', compared with 'Ma'ya (M.)' for the Misool dialect and 'Ma'ya (S.)' for the Salawati dialect.

Consensus is lacking for the inclusion of the Bomberai and Mamberamo languages in SHWNG. For the purposes of this work, the Bomberai languages are excluded and the Mamberamo languages are included (see §3.7).

3.2 Environmental and social characteristics

Speakers of SHWNG languages typically live on or near the coast. Their staple diet is fish and sago. Supplementary items include tubers, maize, beans, bananas, and coconuts, grown on small-scale garden plots, as well as wild forest products and game.

Languages are generally associated with ethnic groups. Settlement is in small villages of 100–500 people. Each village is headed by a non-hereditary 'big man'. The population is made up of various patriclans, some of which are spread across multiple villages.

Throughout recorded history, the most important political and trade influences on the SHWNG region were the sultanates of Ternate and Tidore. These two sultanates, located on neighboring volcanic islands in the North Moluccas just west of Halmahera, were already vying for control of the spice trade when the first Europeans arrived in the early 16th century.

When Dutch gained control of the Moluccan spide trade, they solidified an existing system whereby each sultanate had a recognized sphere of influence (Andaya 1993; Huizinga 1998). The sultans were expected to enforce Dutch regulations within their territories (e.g., on the cultivation and sale of cloves), and had the right to collect tribute. If tribute was not received from a locality, it could be taken by force with a so-called *hongi* raid.

Ternate's sphere of influence mainly extended to the west, but also included the islands of Makian and Kayoa (where Taba is spoken) and the region of Gane in southern

Figure 3.1: Map of the SHWNG region, with South Halmahera languages marked. The Raja Ampat language As, also marked, is spoken on the mainland just east of the Raja Ampat archipelago.

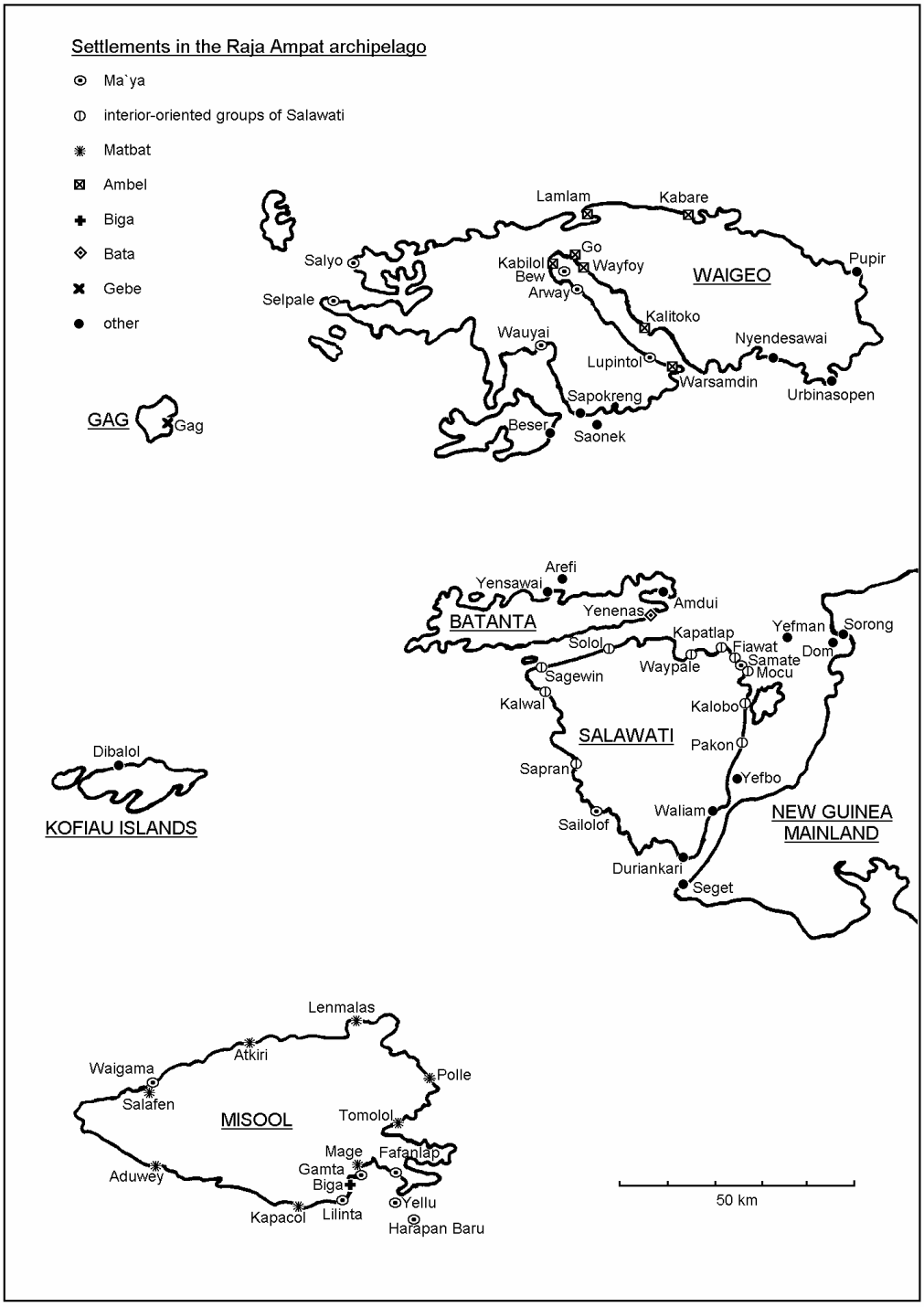

Figure 3.2: Map of Raja Ampat languages, from Remijsen (2001b: 16). Kawe is spoken on Waigeo in the villages of Selpale and Salyo. Laganyan is spoken on Waigeo in the villages of Lupintol, Arway, and possibly Bew (Remijsen 2001b: 15).

Figure 3.3: Map of Bomberai, Cenderawasih Bay, and Mamberamo languages, adapted from an unpublished SIL Papua map. Austronesian languages are shaded in gold.

Halmahera (where the language of the same name is spoken). Makian was an important source of cloves. Gane was a source of sago, areca nut, and slaves (Andaya 1993: 95).

Tidore's sphere extended to the east, including the east coast of Halmahera (where the remaining South Halmahera languages are spoken), the Raja Ampat archipelago, and western New Guinea. Tidore's influence in New Guinea theoretically extended as far as Cenderawasih Bay, but in practice decreased greatly with distance. These regions remained subjects of the sultanates of Ternate and Tidore until the Dutch put an end to this system in the early 20th century. The Halmahera territories were sources of ambergris, tortoiseshell, birds of paradise, slaves, and spices. The Raja Ampat islands were sources of slaves, sago, tortoiseshell, ambergris, and spices (Andaya 1993: 99).

Regarding religion, Ternate's territories Makian, Kayoa, and Gane were Muslim at the time of Dutch contact, and have remained so. Tidore's territories in Halmahera and Raja Ampat were approximately half Muslim at the time of Dutch contact. The other half of the population adhered to traditional beliefs, as did the entire population of Cenderawasih Bay. Missionaries from the Utrechtse Zendingsvereniging later converted these populations to Christianity in the early to mid-20th century (Kamma 1981–93).

In Tidore's Halmahera territories, the Maba, Patani, and some of the Buli and Sawai were Muslim at the time of contact, and have remained so. The remaining Buli and Sawai later converted to Christianity (Hueting 1929: 181ff).

The inhabitants of the Raja Ampat archipelago are divided by Remijsen (2001b: 163) into sea- and land-oriented groups. The Ma'ya, the sole sea-oriented group, are primarily Muslim;[4] practice fishing as their main economic activity; and engage in trade with the Moluccas. The remaining groups are land-oriented, and in contrast are Christian (since their conversion in the mid-20th century); produce sago, both for themselves and for the sea-oriented people, as their main economic activity; and had little contact outside Raja Ampat until the later 20th century. The Raja Ampat archipelago is also home to a sizable number of Biak migrants, known locally as Beser, who have maintained their language (Remijsen 2001b: 180).

From the beginning of recorded history in the 16th century until the Indonesian takeover in 1963, the territory of the Raja Ampat archipelago was formally divided among four *raja*s ('raja ampat' in Malay): East Misool, West Misool, Salawati, and Waigeo (Remijsen 2001b: 172). The *raja*s lived in Ma'ya villages and were vassals of the sultan of Tidore. The *raja*s in turn held sway over the local Raja Ampat big men, as well as some nearby coastal areas of New Guinea.

In Cenderawasih Bay, there were no significant political institutions larger than the village. The Biak were the primary direct recipients of trade and influence from Tidore, which they then passed on to the interior of the bay (Held 1957: 4). The Wandamen also exerted influence on southern Cenderawasih Bay. Cenderawasih Bay was a source of birds of paradise, *tripang* (sea cucumber), massoy (an aromatic bark), tortoiseshell, and

[4]The exceptions are the Kawe and Wauyai of Waigeo, who maintained traditional beliefs until they became Christian in the mid-20th century.

pearls (Swadling 1996: 122). In return for these items, locals received iron tools, textiles, beads, and china.

3.3 Descriptive sources

The major published descriptive materials for SHWNG languages, as well as some important unpublished and archival materials, are summarized here. Unless otherwise specified, I have examined all published, unpublished, and archival materials mentioned below, and make use of them where relevant in this work.

In South Halmahera, the best documented language is Buli, for which there is both a grammar (Maan 1951) and dictionary (Maan 1940). There is a good grammar of Taba (Bowden 2001), but only a limited lexicon (Collins 1982). For Sawai, there is a phonology (Whisler 1992), a study of pronominal prefixes (Thomas 1983), and a substantial lexicon and brief sketch in the Comparative Austronesian Dictionary (Whisler and Whisler 1995). The remaining South Halmahera languages are represented only by the wordlists of Teljeur (1982) and Stokhof (1980).

In Raja Ampat, the best documented language is Maʲya, for which there are several phonological studies (van der Leeden 1983, 1993, 1997; Remijsen 2001a, 2001b, 2002), and unpublished lexical and grammatical materials (van der Leeden, n.d.). For Matbat, there is a phonological description (Remijsen 2001b, 2007) and morphological sketch (Remijsen 2010). Remijsen (2001b) also contains short wordlists and paradigms for most Raja Ampat languages. Cowan (1953) and Grace (1955–6) contain brief notes on several languages.

In Cenderawasih Bay, the best documented language is Biak, for which there are two substantial recent grammars (van den Heuvel 2006; Mofu 2008) and two dictionaries (van Hasselt and van Hasselt 1947; Soeparno 1977). Wandamen is also well-represented, possessing a brief sketch (Cowan 1955), a dictionary (Henning 1991), an unpublished sketch and wordlist (Kamma, n.d.), another unpublished sketch (Saggers 1979), and a recent dissertation focused on morphophonology (Gasser 2014). For Waropen, there is a grammar (Held 1942a), dictionary (Held 1942b), and unpublished sketch (van Velzen, n.d.). For Dusner, there is a recent sketch (Dalrymple and Mofu 2012) and short lexicon (Dalrymple and Mofu 2011). David Gil has given several recent presentations on Roon, of which one is Gil (2008). Cowan (1953) and Grace (1955–6) contain brief notes on several languages.

In southern Cenderawasih Bay, the only substantial published work is Laycock (1978) on Moor. As a result of recent fieldwork, there are now fairly substantial published lexicons of Moor, Umar, Yaur, and Yerisiam (Kamholz 2013). Approximately 70 hours of recordings, including 9 hours of transcribed texts, are to be deposited at the Endangered Languages Archive (ELAR) in 2014.

Among the Yapen languages, the best described is Ambai, for which there is a grammar (Silzer 1983), a book of fish names (Silzer et al. 1986), a substantial unpublished

lexicon (Price, n.d.) (not available to me), and an unpublished prosodic analysis (Price and Donohue 2008). For Ansus, there is a recent lexicon (Price and Donohue 2009). For Serui-Laut, there is an unpublished sketch and wordlist (Slump 1924–38). There is an ongoing Wooi documentation project at the Center for Endangered Language Documentation at the Universitas Papua in Manokwari, but the materials are so far unpublished. I have examined only Sawaki (2009).

For the Mamberamo languages Warembori and Yoke, the only published description is Donohue (1999). There is a small amount of additional Yoke data in Clouse et al. (2002).

There are several wordlist collections, sometimes containing material not available elsewhere. Anceaux (1961a) contains short wordlists and paradigms for most Cenderawasih Bay languages. Smits and Voorhoeve (1992a, 1992b) is the complete dataset used in Anceaux (1961a), containing comparative wordlists for all Cenderawasih Bay and Raja Ampat languages; unfortunately, the data vary greatly in reliability. The Austronesian Basic Vocabulary Database (Greenhill et al. 2008) currently contains wordlists from 12 SHWNG languages, some of which are otherwise unpublished.

The Koninklijk Instituut voor Taal-, Land- en Volkenkunde (KITLV) in Leiden contains two important archival collections for SHWNG languages. The J. C. Anceaux collection (aanvraagnummer D Or. 615) contains several notebooks with short grammatical notes on many languages of Cenderawasih Bay. The I. S. Kijne collection (aanvraagnummer D Or. 421) contains notebooks with wordlists and transcribed texts in many languages of Cenderawasih Bay.

Finally, there are several early publications containing lexical data. Fabritius (1855) gives numerals for Maʹya and most Cenderawasih Bay languages. Wallace (1869) contains wordlists of Maʹya and Matbat. The reports of de Clercq (1888, 1889a, 1889b, 1889c) note various lexical items in Maʹya, Moor, Wandamen, Waropen, and Yaur. Peski (1914) contains a wordlist of Maʹya. Adriani and Kruyt (1914) contains lexical data and brief grammatical notes on all South Halmahera languages. Aside from the grammatical notes in Adriani and Kruyt (1914), these early sources have largely been supplanted by later sources.

There are no clearly evident structural differences between varieties described in earlier and later sources, and few lexical differences. The only substantial structural difference of which I am aware is Umar, which shows *s* in earlier sources for modern *h*.

3.4 Early classifications

Adriani and Kruyt (1914: 3:302–305) were the first to propose the subgroup that later became known as SHWNG.[5] They present a 101-item comparative wordlist from Buli, Gane, Sawai, and Taba, and state: “From this list it is entirely clear that [Taba] belongs with the languages of South Halmahera [= Buli, Gane, and Sawai], the region of the

[5]This summary of Adriani and Kruyt (1914) is partly based on Blust (1978a: 183).

Kalana Fat (Waigeo, Salawati, Misool), Numfor [a dialect of Biak], and its relatives."[6] In support of their claim, Adriani and Kruyt note four "typical features" shared by this group of languages:

1. final vowels are lost
2. many words show a syncopated form in which the syllable preceding the (new) stress is reduced, probably owing to stress shift
3. the third person plural pronoun *si* is postposed as a nominal plural marker
4. the "reverse genitive" (possessor–possessum order) is used

Adriani and Kruyt made no attempt to determine whether these four features were exclusively shared innovations (arguably none actually are). Nonetheless, their proposal was significant because it recognized previously unnoticed shared characteristics among languages that were geographically quite widely separated.

Esser (1938) was the first to use the label South Halmahera–West New Guinea for Adriani and Kruyt's unnamed subgroup. He included the South Halmahera languages, Biak, Wandamen, Kowiai (classified as CMP by Blust (1993)), and other unspecified languages (indicated by "etc."). The Sarmi coast languages (spoken east of Warembori and Yoke), later conclusively shown by Grace (1971) to be Oceanic, were placed in the Melanesian subgroup, not SHWNG. Esser did not provide any justification for his classification.

Dyen (1965) presented a lexicostatistical classification of about 250 Austronesian languages, among them 9 languages now considered to be SHWNG. These were classified into three groups: the Bigic Subfamily (As, Biga, Buli, Gebe); the Geelvink Hesion (Biak, Numfor, Wandamen, and Ambai[7]); and Waropen. The Bigic Subfamily was classified as a primary branch of Austronesian, while the Geelvink Hesion and Waropen were placed in the Moluccan Linkage. The Moluccan Linkage, which extended from Flores in the west to the Sarmi coast in the east, was a primary branch of the Malayo-Polynesian Linkage (not coextensive with what is now called Malayo-Polynesian). Dyen's classification has not been accepted by other Austronesianists.

3.5 SHWNG according to Blust

Blust (1978a) was the first attempt to put the SHWNG hypothesis on a sound empirical basis using the comparative method, that is, on the basis of exclusively shared innovations. It is the only previously published work to present a detailed argument for SHWNG and its subgroups. Blust (1978a) is an abridged version of a much longer, unpublished paper presented at the 2ICAL conference (Blust 1978b). A partial copy of the unpublished paper

[6] "Het is uit deze lijst geheel duidelijk, dat het Oost-Makiansch bij de talen van Z. Halmahera, het gebied der Kalana Fat (Waigeoe, Salawati, Misol), het Noefoorsch en zijne verwanten behoort."

[7] Dyen calls this language "Japen". Silzer (1983: 9) evidently was able to determine that it was Ambai.

has been made available to me, which I have used to supplement the published work when relevant.

Blust's starting point for investigating the subgrouping of SHWNG languages is a comparison of PMP reflexes and other phonological developments in Buli and Numfor (a dialect of Biak), which he summarizes in a rather hard-to-read table (1978a: 192). Given this table's significance for understanding Blust's arguments for SHWNG and the difficulty of reading the original, I have reproduced it in clearer form as Table 3.1 on the following page.[8] Numbered changes are those which are common to both languages. Blust groups sound changes so as to highlight what he treats as single changes for the purpose of subgrouping (e.g., the four rows that make up change 4). When Buli and Numfor show divergent reflexes, these are sometimes presented in separate rows (e.g., the outcome of PMP **-j*).

Blust cites Buli and Numfor forms to support the numbered sound changes in Table 3.1. His presentation of supporting forms, though generally persuasive, suffers from two drawbacks: paucity of forms, and irregularity of reflexes.[9] In several cases, only one or two supporting forms are given. Sometimes additional supporting forms can be found elsewhere in the paper.[10] The small number of forms is probably due both to the small percentage of inherited PMP words in Buli and Numfor (in fact, in all SHWNG languages) and to limitations of space in Blust (1978a), but without full access to Blust (1978b), it is not easy to know whether a given sound change has more supporting evidence.

Not all changes proposed by Blust are exceptionless. For example, the Buli reflex of PMP **a* is listed as *a* in change 9, but in change 10, *i* is listed as a "rare" Buli reflex for PMP **a* in the ultima (e.g., PMP **uRat* > Buli *uit* 'vein, tendon'). Another case is Numfor reflexes of **b*, which are sometimes *p* rather than *b* (1978a: 222, fn. 9). Some irregularities go unmentioned: PMP **ŋajan* > Numfor *nasan* 'name' instead of expected ***nasen*, and PMP **tazim* > Buli *dalim* 'sharp' instead of expected ***talim* (or "rare" ***calim*).[11]

In the unpublished version of the paper, Blust makes it clear that he views rare and irregular correspondences as expected: "the definition of regularity adopted here is that of recurrent (rather than exceptionless) correspondences" (1978b: 29), and "it is not uncommon for morphemes … to show some irregularity in their correspondences" (1978b: 28). He devises what he calls "the deficit system" as a way of rating the level of irregularity

[8]Most modifications are for clarity of presentation, but I have also made also one substantial change: reflexes are given from PMP rather than PAn, since changes from PAn to PMP are not relevant to the status of SHWNG. (At the time of Blust's paper, there was not yet consensus on the validity of PMP.) An error in change 10 has also been corrected: the original reads **u_2*, i.e., **u* in the penult, but it is clear from elsewhere that **u* in the ultima is intended. The orthography and reconstructed PMP phonology follow Blust (2013).

[9]These caveats also apply to the supporting forms from other SHWNG languages presented later in the paper.

[10]For example, although only one supporting form is given under change 1 (PMP **pitu* > Buli *fit*, Numfor *fik* 'seven'), one of the supporting forms for change 9 also illustrates change 1 (PMP **pa(n)pan* > Buli *fafan*, Numfor *am-bafen* 'plank').

[11]Blust (1978b: 29) notes the irregular correspondence in *dalim*, stating that it is the only case of **t* > *d* in Buli.

		PMP	Buli	Numfor
consonant shifts	1.	**p*	*f*	*f*
		**t*	*c* (rare)	*k*
		**b*	*p*	(*b*)
		**-d-*	*r* (rare)	[s.b.]
vowel shifts	2.	**ə* (in penult)	*o*	*o*
epenthesis	3.	**a-*	*ya*	*ya*
consonant mergers	4.	**t /_*i*	*s*	*s*
		**c*	*s*	*s?*
		**-j-*	*s*	*s*
		**s*	*s*	*s*
		**z*	[s.b.]	*s?*
	5.	**k*	∅	∅
		**q*	∅	∅
		**h*	∅	∅
		**-j*	[s.b.]	∅
		**R*	∅	*r*
		**-ŋ*	∅ (rare)	[s.b.]
	6.	**d, *D*	*l*	*r*
		**z*	*l*	*r?*
		**l*	*l*	*r*
		**r*	*l*	*r*
		**-j*	*l*	[s.a.]
	7.	**n*	*n*	*n*
		**ñ*	*n*	*n*
		**ŋ*	*ŋ*	*n*
		**-n*	*ŋ* (rare)	[s.a.]
	8.	cluster reduction (C merges with zero)	+	+
vowel and diphthong mergers	9.	**a*	*a*	*e*
		**ə* (in ultima)	*a*	*e*
	10.	**i*	*i*	*e*
		**u* (in ultima)	*i*	*e*
		**a* (in ultima)	*i* (rare)	*e*
	11.	apocope 1 (V merges with zero)	+	+
	12.	syncope (V merges with zero)	+	+
	13.	apocope 2 (original final vowels and final vowels from diphthongs merge with zero)	+	+
		contraction	–	+

Table 3.1: Phonological developments in Buli and Numfor (Blust 1978a: 192, adapted). (s.b./s.a = see below/above in table for reflex)

in a given word's correspondences, and only admits cases with zero or low irregularity as cognates. It should be kept in mind, then, that although there is good evidence for most of the sound changes that Blust proposes, the data are also fairly messy and may indicate a more complex historical scenario.

I turn now to Blust's analysis of the sound changes in Table 3.1 and their value in arguing for the SHWNG subgroup. In the course of his discussion, it becomes apparent that changes 4 and 5 should be separated into component changes, which I indicate as follows:

4a. PMP **t* became *s* before **i*

4b. PMP **c*, **s*, and **-j-* merged as *s*

5a. PMP **q* and **h* were lost

5b. PMP **-k-* was lost

5c. PMP **k-* and **-k* were lost

The special status of change 12, syncope, should also be mentioned. It falls somewhere between a regular sound change and a lexically specific change of form. Blust (1978a: 207) states that "syncope is to some extent lexically specific", but that the lexical items affected are mostly consistent across SHWNG languages.[12]

Blust presents evidence for the relative chronology of some of the changes in Table 3.1. He shows that change 3 (**a- > ya-*) must have come after 5a and before 5c in both Buli and Numfor, since forms derived from **q-* and **h-* undergo it, whereas forms derived from **k-* do not. Similarly, change 13 (final vowel loss) followed 5a, since forms derived from **-q* and **-h* undergo it in both languages. The relative chronology of changes 13 and 5c appears to vary: in Buli, words derived from **-k* preserve their final vowels (13 precedes 5c), whereas they are lost in Numfor (5c precedes 13). Blust attributes this ordering difference to wave-style diffusion: change 13 spread west-to-east and change 5b/5c spread east-to-west (1978a: 195).

Having made a good *prima facie* case for a subgroup that includes Buli and Numfor, Blust next examines nearby languages to see whether they also underwent the shared changes in Table 3.1. His conclusion is that all languages of South Halmahera, as well as "all of the languages of Misool for which information is available" (Ma'ya and Matbat: see Remijsen (2001b: 22)), underwent all changes in Table 3.1 except 4a (for which no evidence was available to decide), 5c, and the **a* part of change 10 (1978a: 198). The Cenderawasih Bay languages all underwent changes 2, 4, 5, 6, 9, and "apparently" 12, and the Bomberai language Irarutu underwent at least changes 2, 4, 6, and 9 (1978a: 206). On the basis of subgrouping assumptions (see §3.8), Blust presents supporting forms for

[12]Blust cites the following proto-forms as undergoing syncope in various SHWNG languages: PMP **banua* 'inhabited area', PMP **bulu* 'feather', PMP **mata* 'eye', PMP **paniki* 'fruit bat', PMP **t-ina* 'mother', PMP **tinaqi* 'intestines', PEMP **matu* 'dry coconut', PEMP **natu* 'child'.

a subset of languages only: Gane and Taba (South Halmahera); Dusner, Kurudu, Moor, Serui-Laut, Wandamen, and Waropen (Cenderawasih Bay); and Irarutu.

I infer from the above claims that Blust considers the following sound changes to be common to all SHWNG languages:[13]

2. PMP penultimate syllable **ə* became *o*

4b. PMP **c*, **s*, and **-j-* merged as *s*

5a. PMP **q* and **h* were lost

5b. PMP **-k-* was lost

6. PMP **d*, **D*, **z*, **l*, and **r* merged as *l* or *r*

9. PMP final syllable **ə* merged with **a* as *a* or *e*

12. lexically-specific syncope

Although he does not explicitly say so in all cases, Blust apparently holds that these changes had all occurred by the Proto-SHWNG stage. As he notes, some changes are of greater subgrouping value than others. The most distinctive changes from an Austronesian perspective, and therefore the most valuable as subgrouping evidence, are 2, 6, 9, and 12 (1978a: 194). Particularly distinctive is the outcome of PMP **ə* (changes 2 and 9), which "sets these languages off from all other members of the AN family, and could be taken by itself as subgrouping evidence to be reckoned with" (1978a: 208).

In addition to regular sound changes, Blust claims that SHWNG languages exclusively share a set of lexical innovations, semantic innovations, and irregular phonological changes. He cites "representative examples" of four irregular phonological changes and one semantic change (1978a: 208): **(ma-)Daləm* 'deep' undergoes consonant metathesis and the irregular change **l* > *n* (Buli *m-laman*, Numfor *ramen*); **pəñu* 'sea turtle' shows *e* for expected *o* (Buli *fen*, Waropen *eni*); **si iDa* 'they' shows irregular loss of **D* (Buli, Wandamen *si*); **t-ina* 'mother' shows sporadic palatalization (Buli *hñe*, Wandamen *siña*); and **qabara* 'shoulder' > 'carry on the shoulder'.

As a final argument, Blust gives what he considers "perhaps the most interesting and powerful piece of evidence for a SHWNG subgroup": the wave-style diffusion of changes 5c and 13, whose territories overlap in a "transition area". In the westmost languages (Gane and Taba), only change 13 is attested. As one progresses eastward, in Buli, change 13 occurred before 5c. Further east, in Numfor, change 5c occurred before 13. Finally, in the eastmost languages (e.g., Waropen), only change 5c is attested. This is claimed to be highly significant because "it is commonly believed that the diffusion of linguistic innovations is possible among dialects of the same language, but difficult or even impossible over distinct languages" (1978a: 209).

[13]Change 4a might be added to this list, since all languages investigated by Blust either undergo it or show no evidence against it. It was left out because Blust does not clearly state that he considers it to be a Proto-SHWNG innovation.

However, by admitting dialect differences in Proto-SHWNG, Blust is essentially admitting that some changes occurred after the breakup of the proto-language. In other words, they are not Proto-SHWNG innovations after all. These sort of spreading innovations, while obviously important for other reasons, should not be used as evidence for a subgroup if they clearly occurred after its breakup (§1.2).

In a later paper, Blust (1993: 272) states that the "most useful" innovations for showing that a language belongs to SHWNG and not CMP are changes 2 and 12, and the replacement of PMP **anak* 'child' with PEMP **natu*. It is not clear whether he is referring to the ease of verifying that a language has undergone these innovations, given the state of available documentation, or to their strength as subgrouping features.

Blust (1978a: 211) locates the Proto-SHWNG homeland in Cenderawasih Bay on the basis of its much greater linguistic diversity.

3.6 SHWNG according to Ross

Ross (1995) is an overview of the entire Austronesian family, within which is included is a brief evaluation and revision of Blust (1978a)'s SHWNG proposal. Ross (1995: 84) considers the subgroup to be very well supported ("the unity of Proto-SHWNG is remarkable"). Having made his own analysis of the lexical data in SHWNG languages, Ross (1995: 84) gives the following list of phonological innovations that in his view define Proto-SHWNG:[14]

1. PMP **p* became Proto-SHWNG **f*
2. PMP penultimate **ə* became Proto-SHWNG **o*
3. PMP initial **a-* became Proto-SHWNG **ya-*

4a. PMP **t* became Proto-SHWNG **s* before **i*

4b. PMP **-j-* merged with **s* as Proto-SHWNG **-s-*

5. PMP **k, *q, *h, *H* and **ʔ* were lost
6. PMP **d, *Z, *l* and **r* merged as Proto-SHWNG **l*
7. PMP **n* and **ñ* merged as Proto-SHWNG **n*
9. PMP final syllable **ə* merged with final syllable **a* as Proto-SHWNG **ə*

Ross (1995: 85) states that changes 2, 6, and 9 "are quite striking and their occurrence in combination proves the integrity of Proto-SHWNG as a language".

Ross (1995: 102, fn. 33) also notes that "these innovations differ in their formulation somewhat from Blust's not only because my reconstruction of PMP differs from his PAN, but also because I have checked data from a larger number of SHWNG languages and

[14] I have relabeled Ross's changes to be consistent with the numbering used throughout this chapter. Note that Ross's **Z* = Blust's **z*, and that Blust does not recognize PMP **H* or **ʔ*.

obtained somewhat different results". He does not mention which languages he checked (only that it was a greater number than Blust), and does not provide supporting forms for his sound changes.

I evaluate and compare Blust and Ross's proposals in §4.4 below.

3.7 Boundaries

Blust (1978a) does not fully delineate the boundaries of SHWNG. He explicitly includes all languages of South Halmahera, the Raja Ampat languages Ma'ya and Matbat, and all languages of Cenderawasih Bay classified by Anceaux (1961a).[15] He presents evidence that various other Austronesian languages close to Halmahera and New Guinea (Bacan, Ambon, Seram, Buru, Kei, and Sula) have clearly different phonological histories from SHWNG languages (1978a: 209). These languages were later classified as CMP (Blust 1983–4).

Van der Leeden (1993: 14), having examined materials from more Raja Ampat languages than Blust, concludes that "in view of the many obvious similarities between all languages about which I have more than superficial information, I do not doubt that all [Raja Ampat] languages … are to be classified either as SH languages, or as belonging to a separate subgroup of [SHWNG]". He presents no evidence for this claim. I show in chapter 4 that Raja Ampat languages undergo most sound changes proposed for Proto-SHWNG.

It is difficult to determine Blust (1978a)'s position on Irarutu. He claims to have determined whether or not Irarutu belongs in SHWNG (1978a: 206), but never mentions what the decision was. Since he claims that Irarutu underwent changes 2, 4, 6, and 9, one is led to the conclusion that he means to include it in SHWNG.[16] However, Blust (1993: 271) claims that in the earlier paper, "based on information from the late Professor J. C. Anceaux, Irarutu was excluded from SHWNG." This may have been a personal communication from Anceaux, since Anceaux (1961a) merely excluded Irarutu from his Cenderawasih Bay subgroup (see below) and did not address the question of SHWNG.

Blust (1993: 270) attempts to more precisely delimit the boundary between CMP and SHWNG. For Irarutu (and "by implication" its neighbor Kuri), he finds no conclusive evidence to classify it as CMP or SHWNG. Voorhoeve (1989: 114) and Ross (1995: 85) are two further attempts to classify Irarutu. Voorhoeve presents evidence that Irarutu underwent Blust's changes 2, 4b, and 6, but not 4a, and probably not 9. Ross presents supporting forms to show that Irarutu underwent his changes 1, 2, 5, and 6. Both authors argue, *contra* Blust (1993), that Irarutu belongs in SHWNG. I agree with Voorhoeve and Ross that there may be some kind of shared history between Irarutu and other SHWNG languages, but if so, Irarutu was probably the first language to branch off (Voorhoeve has

[15] Anceaux (1961a) includes all Cenderawasih Bay languages listed in §3.1 except Tandia, Umar, Yaur, and Yerisiam.

[16] Voorhoeve (1989: 114) also assumed that Blust included Irarutu in SHWNG.

a similar view). Due to its ambiguous status, Irarutu has been excluded from SHWNG for the purposes of this work. As for Kuri, its similarity to Irarutu should not be assumed until more data is available.[17] It has been excluded in this work due to lack of evidence.

Blust (1993) classifies Sekar, Onin, Uruangnirin, Arguni, and Kowiai (all spoken on the Bomberai peninsula or nearby islands) as CMP, on the basis of phonological and lexical innovations. Nearby Bedoanas and Erokwanas are not classified due to lack of data. I have excluded Bedoanas and Erokwanas in this work for the same reason.[18]

Donohue (1999) classifies Warembori and Yoke (spoken near the mouth of the Mamberamo river) as non-Austronesian. He now (p.c.) considers them to be Austronesian, and based on the published materials, I agree. Given their geographic location, and the fact that they are clearly not Oceanic, Warembori and Yoke are good candidates for membership in SHWNG. I show in chapter 4 that Warembori underwent most SHWNG-defining sound changes. The evidence from Yoke is not sufficient to be conclusive. Since Donohue (1999) states that the two languages are closely related, Warembori and Yoke are both included in SHWNG for the purposes of this work.

3.8 Previous internal subgrouping proposals

I now consider previous subgrouping proposals that have been made within SHWNG, starting with the South Halmahera languages.

Blust (1978a: 198) states that available descriptions of Buli, Maba, Patani, and Sawai suggest that they are "a dialect continuum in which even the extremes do not vary greatly". He terms these the Central-Eastern languages, which are distinguished from the other South Halmahera languages by "a major bundle of phonological and lexical isoglosses". The other two South Halmahera languages, Gane and Taba, are termed the Southern languages. The only evidence presented for either group is a list of lexical innovations in Gane and Taba to justify the Southern subgroup (1978a: 199). However, since the lexical divergence between these two groups is obvious on first inspection, this classification is a reasonable starting point.

To justify joining the Central-Eastern and Southern groups under a South Halmahera branch, Blust (1978a: 201) notes that Buli, Gane, and Taba share some innovations that set it apart from Numfor (and other Cenderawasih Bay languages): PMP $*b > p$ and PMP $*R > \emptyset$.[19] These sound changes are sufficiently distinctive to provide an initial justifi-

[17] Jason Jackson (p.c., 2010) informs me that Irarutu and Kuri have few similar vocabulary items on a basic wordlist, but that speakers of one language claim to understand the other without difficulty. This suggests pervasive bilingualism between Irarutu and Kuri speakers, complicating how to interpret reports of their similarity.

[18] Smits and Voorhoeve (1992a, 1992b), apparently published after Blust (1993) was written, contains lexical data from Bedoanas and Erokwanas. Unfortunately, the data are not sufficient, or sufficiently reliable, to be used for classification.

[19] Another feature that distinguishes the South Halmahera languages, although Blust does not mention it (perhaps because it is not highly diagnostic), is the outcome of the merger in change 6 as *l* rather than *r*.

cation for a subgroup. Ross (1995: 85) states that he has independently examined the evidence for a South Halmahera subgroup and accepts its validity, but does not mention on what basis.

Blust (1978a: 202) considers Maˈya to be a South Halmahera language on the basis of phonological and lexical innovations.[20] Only the lexical innovations are exemplified, in the form of a list of shared, non-inherited words between Buli and Maˈya, because they are "more specific".

Remijsen (2001b: 34) argues that all South Halmahera and Raja Ampat languages belong to one subgroup of SHWNG, which he proposes should be called RASH to reflect its geographic extent. His evidence, for which he provides supporting forms, is that they share the outcome of change 6 as *l* and the loss of **R*. Of these two changes, only the latter is sufficiently distinctive to be probative.[21]

Van der Leeden (1993: 15) considers it likely that the Raja Ampat languages constitute a subgroup of their own, since they innovated tone.[22] However, as Remijsen points out, some Raja Ampat languages, such as Ambel, are not tonal. Furthermore, the two Raja Ampat languages for which tone has been described have rather different tone systems (see §5.2), so it is far from clear that tonogenesis occurred only once. This is thus not convincing evidence for a subgroup.

Turning now to the West New Guinea languages, it is sometimes assumed that Blust (1978a) demonstrated the validity of Proto-WNG (e.g., by Ross (1995: 85)). In fact, he simply took over the proposal of Anceaux (1961a) that all Cenderawasih Bay languages belong to a single subgroup. However, Anceaux's subgroup was mainly based on lexicostatistics, and since the only other language in his sample was Irarutu, Anceaux's argument is quite weak: he does not consider what other languages might belong to the group, or what innovations define it. Blust never claims that there are any innovations exclusive to the Cenderawasih Bay languages or the West New Guinea (Cenderawasih Bay plus Irarutu) group. A possible phonological innovation is the outcome of change 6 as *r*, but this cannot be an innovation in both Proto-RASH and Proto-WNG (unless Proto-SHWNG started with neither **l* or **r*, which seems unlikely), and is of inconsequential subgrouping value in any case. Ross (1995: 85) claims to have independently verified the validity of Proto-WNG, but does not present any evidence. Thus, although Proto-WNG is sometimes assumed to exist, no evidence for it has ever been published.

I turn now to Anceaux (1961a)'s classification, shown in Figure 3.4 on the next page.[23] Anceaux describes Waropen as occupying a "central position" between Biakic and Yapen,

[20] For the identification of this language (called Misool by Blust) as Maˈya, cf. Remijsen (2001b: 17).

[21] Additionally, the outcome of change 6 is not a Proto-RASH innovation if Proto-SHWNG already had **l* (as, for example, Ross has claimed).

[22] He apparently excludes Gebe from this subgroup, considering it to be "an offshoot of the Patani language from southeastern Halmahera" (van der Leeden 1993: 10).

[23] The tree is copied from Blust (1978a: 205), who received clarifications from Anceaux of some unintended ambiguities in the original classification. The Biak Group has been renamed Biakic for clarity, and the group as a whole (not named by Anceaux) has been labeled Cenderawasih Bay.

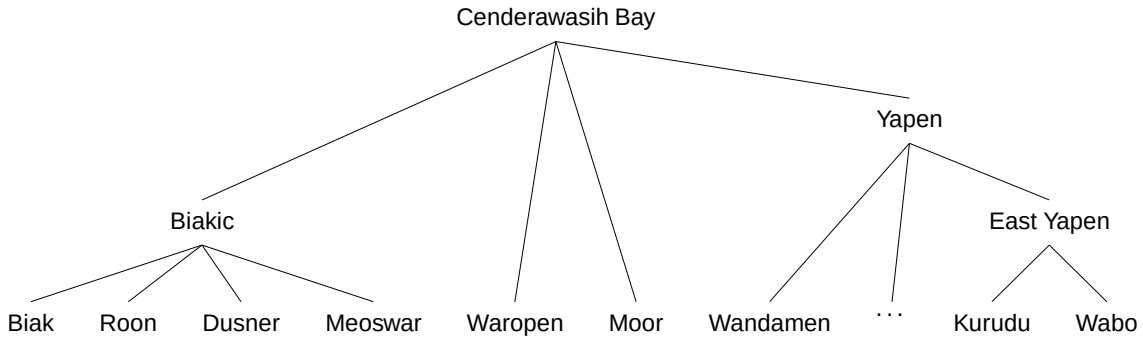

Figure 3.4: Anceaux (1961a)'s lexicostatistical classification of Cenderawasih Bay languages. The dots stand for the remaining Austronesian languages of Yapen Island.

with Moor "about half-way" between Waropen and Yapen (1961a: 146–7). As Blust points out, these statements are inconsistent with a tree model, so as a matter of convenience, he considers Waropen and Moor to be primary branches (1978a: 205).[24]

Since Anceaux's classification is not based on the comparative method, he does not propose any shared innovations to justify his subgroups. The only subgroup that is clearly justifiable on these grounds is Biakic. Roon (David Gil, p.c.) and Dusner (Dalrymple and Mofu 2012) clearly share numerous morphological innovations with Biak that could not have arisen by chance. There are few data available for Meoswar. Several Biak speakers have told me that Meoswar is partly mutually intelligible with Biak, so it is reasonable to include it on a preliminary basis.

Silzer (1983: 232–243) argues for a Western Yapen group on the basis of a striking series of shared morphological features in verbal subject prefixes. This group includes all of Anceaux's Yapen languages except for East Yapen. A few of Silzer's features are analyzable as retentions, but the rest are sufficiently numerous and specific that his argument is quite convincing. Silzer (1983: 15–19) internally subgroups the Western Yapen languages on the basis of shared sound changes (e.g., final consonant loss and $*s > \emptyset$). This subgrouping is much less convincing, as the cited sound changes are phonetically natural and could have easily diffused or occurred independently.

Van Velzen (1994) proposes a Sarera Bay subgroup containing all Cenderawasih Bay languages except Tandia, Umar, Yaur, and Yerisiam, which were excluded for lack of data. The Sarera Bay group splits into two primary branches: Biakic (containing the

[24]As mentioned above, Blust (1978a) uses Anceaux's classification in order to determine what evidence is sufficient to show that all Cenderawasih Bay languages underwent a sound change: it must be shared by Biakic, Waropen, Moor, and Yapen. This line of reasoning is somewhat obscure. Since the changes in question presumably occurred in Proto-SHWNG, and since Blust appears to accept Anceaux's Cenderawasih Bay group, finding evidence of SHWNG innovations in any individual Cenderawasih Bay language should be enough to make a good case for including the whole group in SHWNG. Perhaps Blust thought that there was better evidence for Anceaux's subgroups that for the group as a whole.

same languages as above) and West Sarera Bay (containing the remaining languages). The West Sarera Bay group splits into Wandamen-Yapen (similar to Silzer's Western Yapen) and Waropen-Moor. Van Velzen justifies these groups on the basis of shared phonological and morphological features, but he does not distinguish innovations, retentions, and areal features, and is not always explicit about how the subgrouping was produced.

Of the above proposed subgroups, I accept as already sufficiently demonstrated only Central-Eastern and Southern South Halmahera, Biakic, and Western Yapen. However, in chapters 4–6 I perform all comparisons at the level of individual languages. This is done in order to permit revisions to these subgrouping assumptions if compelling evidence is found.

3.9 Van den Berg's reconstruction of possessive marking

Van den Berg (2009) tentatively reconstructs Proto-SHWNG possessive marking on the basis of data from eleven languages: Buli, Sawai, Taba (South Halmahera); Irarutu (Bomberai); Ambai, Biak, Moor, Wandamen, Waropen (Cenderawasih Bay); and Warembori (Mamberamo).[25] He reconstructs two different possessive paradigms, alienable and inalienable, since the distinction is exhibited in almost all SHWNG languages.[26] Van den Berg first reconstructs possessive paradigms at the level of Proto-SH, Proto-RA, and Proto-WNG, and then reconstructs up to Proto-SHWNG.[27] He claims that Proto-SHWNG had nominal suffixes for inalienable possession, and two classifiers for alienable possession, **na* and **ri*, which also took suffixes. Van den Berg then compares the Proto-SHWNG inalienable paradigm to the Proto-Oceanic direct possession paradigm, and shows that there is substantial agreement.

Van den Berg's is the first serious attempt to reconstruct the morphology of Proto-SHWNG or any of its putative subgroups. I present an analysis of inalienable possessive marking aimed at subgrouping rather than reconstruction in §6.4.

3.10 Contact-induced change

Certain structural features of SHWNG languages have been attributed to contact-induced change from Papuan languages. The features most frequently mentioned in the litera-

[25]Van den Berg relies on Anceaux (1961a) and Laycock (1978) for Moor, which contain various inaccuracies, but better data would probably not significantly change his analysis.

[26]The only language in van den Berg's sample that does not make the distinction is Taba, which he argues has lost it.

[27]This procedure appears to be at variance with van den Berg's acceptance of Remijsen's Proto-RASH, and with his statement that "I will not be concerned with the details of subgrouping in this article" (2009: 218). His reconstruction presupposes a different subgrouping from Remijsen's, and moreover, one that not been proposed elsewhere to my knowledge.

ture are the alienable/inalienable possession contrast, possessor–possessum word order, clause-final negation, and lexical tone. Here I summarize the main proposals that have been made.

The most detailed argument regarding the appearance of the inalienable/alienable possession contrast in Austronesian comes from Donohue and Schapper (2008). They first observe that prefixal possessive marking and an alienable/inalienable contrast are common in Papuan languages. Austronesian languages usually have suffixal possessive marking, only showing the alienable/inalienable contrast in languages that are spoken near Papuan languages (or in their descendents, such as Oceanic languages). A few of these Austronesian languages have also developed prefixal possession. Donohue and Schapper proceed to argue that the appearance in Austronesian of the alienability contrast, prefixal possession, and the "indirect" possession construction for alienables (using a possessive classifier) are all attributable to Papuan contact. Although they are not fully explicit on this point, it appears they believe that this change happened many times independently as "a response to regional norms" (2008: 323), but that the construction had been fixed by the time of Proto-Oceanic and possibly PEMP.

Klamer et al. (2008) argue that shift-induced interference from Papuan to Austronesian is responsible for a number of features of CMP and SHWNG languages: the alienable/inalienable contrast, possessor–possessum order, clause-final negation, and possibly lexical tone. Their approach is more typologically-oriented than Donohue and Schapper's, but Klamer et al. also discuss in detail language-specific differences among Austronesian and Papuan languages in the expression of possession and negation. They argue that these changes probably occurred separately as different Papuan groups intermarried with more powerful Austronesians and shifted to their languages, but that at least the features of alienable/inalienable possession and clause-final negation had emerged by the time of Proto-Oceanic (2008: 138).

In the case of clause-final negation, Klamer et al. (2008: 133) note that there are striking resemblances in the form of the negator in CMP, SHWNG and some nearby Papuan languages: it is *βa* in Moor, Wandamen, and Biak; *wo(mo)* in one dialect of Waropen; *(u)wa* in North Halmahera; *bar* in Mansim and *big* in Hatam of the East Bird's Head family (apparently *-ar/-ig* is a regular correspondence in these languages); *waeid* in the CMP language Kei off the southwest coast of New Guinea; and even **b^{w}ali* with a shortened form **b^{w}a* in Proto-Oceanic. I have found similar negators in Yerisiam (*ve*) and the East Geelvink Bay language Tarunggare (*wawa*). It would indeed seem that there are too many similarities to be due to chance, although the mechanism that could produce such an outcome is unclear.

Donohue (2004) argues that split intransitivity in Taba is attributable to Papuan influence (e.g., from North Halmahera languages). Reesink (2005: 191–194) notes that an "experiential construction", with experiencers expressed as objects, is found throughout the Bird's Head and Cenderawasih Bay, in both Papuan and Austronesian languages. Donohue and Reesink's claims are suggestive, but in my opinion neither presents enough data to justify that the constructions in question are comparable across languages. Holton

(2008)'s description of split intransitivity in North Halmahera, on the other hand, bears a striking resemblance to the stative predicate split that I have observed in Moor (although Holton makes no claims about contact with SHWNG languages).

Remijsen (2001b: 11–13) suggests that some features of SHWNG languages may be attributable to Papuan contact, including lexical tone in Raja Ampat languages and Moor, lack of an *l*–*r* contrast, and a possible imperfective/perfective aspect contrast in Ambel. In the case of tone in Ma'ya and Matbat, the scenario is sketched out in more detail: tone arose under shift from a tonal Papuan language (2001b: 119). Remijsen claims that this hypothesis is able to account for otherwise hard to explain features of the Ma'ya tone system, such as a lack of preference for monosyllabic words. However, it is not obvious why contact should be the best explanation for lack of monosyllabism; the outcome of tonogenesis need not be so uniform.

Price and Donohue (2008) make a similar claim for the Austronesian languages of Yapen. They first describe the Ambai stress system, and concluding that there is "no known way of justifying" its complexity. They then note that other languages of Yapen also have complex stress systems (including Saweru, a Papuan language), and that tonal languages have been found around Cenderawasih Bay: the East Bird's Head languages have been described as pitch-accented, Moor is tonal, and the inland Papuan languages (Wissel Lakes and Lakes Plains) are tonal. Their conclusion is that the original (Papuan) languages of Yapen were tonal, and that with the arrival of Austronesian languages, there has been a process of language shift and tono-exodus. This is a very interesting claim, but it would be more convincing if Price and Donohue specifically stated why the Ambai stress system could not have arisen from internal change alone.

Chapter 4

SHWNG historical phonology I: Segmental phonology

4.1 Introduction

This chapter evaluates the historical segmental phonology of SHWNG languages, on the basis of current lexical data and PMP, PCEMP, and PEMP reconstructions.

Table 4.1 on the following page lists the sources consulted in compiling this chapter. Given the state of available documentation, language coverage is necessarily uneven. The diversity of SHWNG is nonetheless well represented, with the unavoidable exceptions of Kurudu and Wabo.

PMP, PCEMP, and PEMP reconstructions are drawn from Blust (1978a, 1993, 1999, 2014) and Ross (2006). Blust (1978a, 2014) and Greenhill et al. (2008) were consulted as starting points for cognacy judgments. Final cognacy decisions are my own. See the Appendix for the complete list of cognate sets from which the data in this chapter are drawn.

To make the presentation of data more manageable, reflexes are organized according to three geographic groupings: South Halmahera, Raja Ampat, and Cenderawasih Bay/Mamberamo. This is for convenience only, and does not represent a subgrouping claim.

Tables of PMP, PCEMP, and PEMP reflexes contain a representative sample of the available data, whenever possible illustrating reflexes in initial, medial, and final positions. Uncertain reflexes have generally been excluded from the tables.

A recurrent issue throughout the chapter is irregularity in sound change. The same proto-sound does not always produce the same reflex in a given language. Some potential ways to resolve discrepancies of this sort are (1) more precise specification of the conditioning environment; (2) appeal to dialect mixture; (3) categorization as something other than sound change; (4) rejection of the regularity hypothesis.

Strategy (1) is rarely possible in the case of SHWNG, since only a small number of

proto-form reflexes are typically attested in any given SHWNG language. For example, Moor reflects medial **p* only in PCEMP **kanzupay* > *arùha* 'rat'; PMP **qapuR* > *ára* 'lime'; and PMP **sa-puluq* > *tàura* 'ten'. The discrepancy between *h* and ∅ could conceivably be explained by phonological conditioning. However, it is difficult to make

	Language	Works consulted
SH	Buli	Blust (2014); Greenhill et al. (2008)
	Gane	Greenhill et al. (2008)
	Sawai	Whisler and Whisler (1995)
	Taba	Bowden (2001); Greenhill et al. (2008)
RA	Ambel	Remijsen (2001b)
	As	Greenhill et al. (2008)
	Biga	Greenhill et al. (2008); Remijsen (2001b)
	Fiawat	Remijsen (2001b)
	Gebe	Greenhill et al. (2008)
	Kawe	Remijsen (2001b)
	Laganyan	Remijsen (2001b)
	Matbat	Remijsen (2001b)
	Ma'ya	Blust (2014); Remijsen (2001b)
	Wauyai	Remijsen (2001b)
CB	Ambai	Blust (2014); Greenhill et al. (2008); Silzer (1983)
	Ansus	Blust (2014); Price and Donohue (2009)
	Biak	Blust (2014); Greenhill et al. (2008); van Hasselt and van Hasselt (1947)
	Dusner	Dalrymple and Mofu (2011)
	Kurudu	Blust (2014)
	Marau	Blust (2014)
	Moor	Kamholz (2013)
	Munggui	Blust (2014)
	Pom	Blust (2014)
	Roon	Blust (2014)
	Serui-Laut	Blust (2014); Slump (1924–38)
	Umar	Kamholz (2013)
	Wandamen	Blust (2014); Gasser (2013); Greenhill et al. (2008); Henning (1991)
	Waropen	Blust (2014); Greenhill et al. (2008); Held (1942b)
	Wooi	Blust (2014)
	Yaur	Kamholz (2013)
	Yerisiam	Kamholz (2013)
M	Warembori	Donohue (1999)
	Yoke	Donohue (1999)

Table 4.1: Sources of lexical data in this chapter.

solid generalizations on the basis of the small number of examples.

Strategy (2) is sometimes plausible, but often difficult to substantiate. To take another example from Moor, initial **k* is reflected in the Hirom dialect as PMP **kahiw* > *ka/'úata* 'wood' and PMP **kutu* > *kú'-a* 'louse'. In the Ayombai dialect, we find *ka/'úata* 'wood' and *ú'-a* 'louse'. We might therefore suppose that the original reflex was *k* in Hirom and ∅ in Ayombai, and that Ayombai has borrowed 'wood' from the Hirom dialect. This argument would be more convincing if we could show a systematic pattern of borrowing, and if 'wood' were a more likely word to be borrowed. As it stands, the argument is suggestive, but not conclusive.

Strategy (3) is applicable when there is reason to believe that a morphological process has altered the form of a word in some way. For example, Yaur reflects **a* in PMP **manuk* > *mà'-ré* 'bird' and PCEMP **matay* > *mèé'-rè* 'die'. It initially appears that there is a variable outcome of *a* or *e*. However, on closer inspection it turns out the citation form *mèé'-rè* is also the third person form, and shows the effect of a historical infix ‹*i*› (§6.3.2). The first person form *ì-màá'-rè* did not have an infix. Therefore, the regular outcome is *a*.

Strategy (4) is not really an explanation, but rather an admission that one cannot further account for irregular phonological developments. This is presumably what Blust (1978b: 29) means when he states, "the definition of regularity adopted here is that of recurrent (rather than exceptionless) correspondences". In practice, this is often the best one can do. Indeed, for many instances of irregularity noted in this chapter, none of the above strategies is convincing. In such cases, the irregularity is generally noted without comment; however, I hope that further research will be able to clarify some of them.

4.2 Comparative phonology

4.2.1 **q*

The regular outcome of **q* is ∅ in all SHWNG languages (see Tables 4.2–4.4). The change of **q* > ∅ is very common in Austronesian, so does not provide good subgrouping evidence.

PMP **daRaq* 'blood'	Buli *la*
PMP **ma-Ruqanay* 'man'	Buli *mān*, Gane *maón*, Sawai *mɔn*, Taba *mon*
PMP **qabu* 'ash'	Buli *gigi/ap*, Sawai *gɛ/yap*, Taba *yap-yap*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	Sawai *-yɛnɛf*
PMP **Rumaq* 'house'	Gane *um*, Sawai *um*
PMP **t‹in›aqi* 'intestines' > 'belly'	Buli *hñao*, Sawai *sno*

Table 4.2: Reflexes of **q* in South Halmahera.

PMP **daRaq* 'blood'	Gebe *la*
PMP **ma-Ruqanay* 'man'	Ambel *man*, As *-man*, Biga *wa/ˈman*, Gebe *man*, Kawe *ˈman[a]*, Lag. *ˈman[a]*, Mat. *wa^{3}y/ma^{21}n*, Maˈya *ˈma^{12}n*, Wau. *ˈman[a]*
PMP **qabu* 'ash'	As *yap-apin*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	Ambel *-ane*, Biga *-eˈnef*, Fia. *-ene*, Gebe *yenɛf*, Kawe *-eˈnef*, Lag. *-ˈenef*, Maˈya (S.) *-ˈene^{3}f*, Mat. *-e^{41}n*, Wau. *-ˈenef*
PMP **Rumaq* 'house'	Biga *um*, Gebe *um*, Kawe *um*, Maˈya *ˈu^{3}m*
PMP **t‹in›aqi* 'intestines' > 'belly'	Ambel *nyay*, Biga *nyao*, Fia. *na*, Gebe *hñao, hñainora*, Kawe *a-ˈnyay(o)*, Lag. *a-ˈnyay(o)*, Maˈya *ˈna(o)*, Wau. *ka-ˈnyay(o)*

Table 4.3: Reflexes of **q* in Raja Ampat.

PMP **daRaq* 'blood'	Moor *ràra*, Wrp. *rara*, Yer. *rárà* Wmb. *ke-ra-ro*
PMP **qabu* 'ash'	Umar *au*, SL *wabu*, Wrp. *avu*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	Ambai *ena*, Ansus *ena*, Biak *enəf*, Dus. *enep*, Moor *enâ*, SL *ena*, Wan. *ena*, Wrp. *ena-ko*, Yer. *éen/é*
PMP **Rumaq* 'house'	Biak *rum*, Dus. *rum*, Moor *rùma*, Umar *ron*, Wrp. *ruma*, Yaur *rúùg-ré* 'ceremonial house', Yer. *rúmà* 'ceremonial house'
PMP **t‹in›aqi* 'intestines' > 'belly'	Ambai *ene-*, Ansus *ane/u*, Biak *sne-*, Moor *siné*, SL *ane*, Umar *hna*, Wan. *sane*, Yaur *hnáa-rè*, Yer. *hìná*

Table 4.4: Reflexes of **q* in Cenderawasih Bay and Mamberamo.

4.2.2 **h*

The regular outcome of **h* is ∅ in all SHWNG languages (see Tables 4.5–4.7). The change of $h > \varnothing$ is very common cross-linguistically and in Austronesian, so does not provide good subgrouping evidence.

PMP **hapuy*, PCEMP **api* 'fire'	Buli *yap*
PMP **hikan*, PEMP **ikan* 'fish'	Buli *ian*, Gane *ian*, Sawai *in*
PMP **kahiw*, PCEMP **kayu* 'wood'	Buli *ai*, Sawai *ay*, Taba *ai*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	Buli *ma*
PMP **paRih*, PCEMP **paRi* 'sting'	Buli *fā* 'stingray', Sawai *fa* 'stingray'

Table 4.5: Reflexes of **h* in South Halmahera.

PMP **hapuy*, PCEMP **api* 'fire'	Ambel *lap*, As *yap*, Biga *lap*, Fia. *lap*, Gebe *yap*, Kawe *lap*, Lag. *lap*, Mat. *ya³p*, Maˈya ˈ*la¹²p*, Wau. *lap*
PMP **hikan*, PEMP **ikan* 'fish'	Gebe *in*, Kawe ˈ*in[i]*, Mat. *yi¹n*, Maˈya (M.) ˈ*i¹²n*
PMP **kahiw*, PCEMP **kayu* 'wood'	Ambel *ay*, As *a*, Biga *ay(o)*, Gebe *kai*, Kawe *w/ay(o)*, Maˈya ˈ*ai(o)*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	Gebe *moi*, Maˈya -ˈ*ma³*

Table 4.6: Reflexes of **h* in Raja Ampat.

PMP **hapuy*, PCEMP **api* 'fire'	Yer. *jáai*
PMP **hikan*, PEMP **ikan* 'fish'	Biak *in*, Dus. *in*, Moor (H.) *ìjana*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	Biak *ma*, Umar *mae*, SL *mamaya*, Wan. *mamaya*, Yer. *mái*
PMP **kahiw*, PCEMP **kayu* 'wood'	Ambai *ai*, Ansus *ai*, Biak *ai*, Dus. *ai*, Moor *ka/'úat-a*, SL *ai*, Umar *ae*, Wan. *ai*, Wrp. *ai*, Yaur *à-jé*, Yer. *áì* Wmb. *ayo-ro*, Yoke *a*
PMP **təbuh* 'sugarcane'	Ambai *tovu*, Ansus *towu*, Biak *kob*, SL *tovu*, Umar *to*, Wrp. *kovu*, Yaur *òo-jé*, Yer. *kóou*

Table 4.7: Reflexes of **h* in Cenderawasih Bay and Mamberamo.

4.2.3 **p*

The regular outcome of **p* is *f* in most South Halmahera and Raja Ampat languages (see Tables 4.8 and 4.9). Exceptions are Taba, where the outcome is *h* (presumably via *f*), and Ambel, where the outcome is *f* ~ *ɸ* ~ *h*.[1] Apparent reflexes of PCEMP **api* 'fire' show the irregular outcome *p* in all attested examples.

Outcomes of **p* in Cenderawasih Bay and Mamberamo are more varied (see Table 4.10). In Dusner, it remains *p*, whereas it becomes *f* in closely related Biak. In Yerisiam, the outcome is ∅ ~ *p*. In Moor, the outcome is ∅ ~ *h*. (There are no obvious conditioning factors in either case.) In the remaining languages, **p* > ∅.

I assume, on the basis of phonetic plausibility, that languages reflecting **p* as *h* or ∅ first underwent the change **p* > **f*. However, this is such a cross-linguistically common change that it cannot persuasively be used as subgrouping evidence. Furthermore, the fact that Biak and Dusner, both members of the small Biakic subgroup, have divergent outcomes shows that this change must have happened independently at least twice.

PMP **əpat*, PEMP **pat* 'four'	Buli *fat*, Gane *-fot*, Sawai *-fɔt*, Taba *-hot*
PMP **hapuy*, PCEMP **api* 'fire'	Buli *yap*
PMP **ma-nipis* 'thin (materials)'	Buli *m-lifis*, Gane *manifis*, Sawai *-mɛnifɛs*, Taba *mnihis*
PCEMP **marip* 'laugh'	Buli *a-mlif*, Gane *mlif*, Sawai *-mlif*, Taba *-(ha)mlih*
PMP **paniki* 'fruit bat'	Buli *fni*, Gane *fnik*, Sawai *fni*
PMP **paRih*, PCEMP **paRi* 'sting'	Buli *fā* 'stingray'
PMP **qatəp* 'roof'	Buli *yataf*, Gane *yotaf*, Sawai *yɔtɛf*

Table 4.8: Reflexes of **p* in South Halmahera.

PMP **əpat*, PEMP **pat* 'four'	Ambel *ɸat*, As *fat*, Biga *fat*, Gebe *pi-fat*, Lag. *fat*, Maˈya ˈ*fa*^{12}*t*
PMP **hapuy*, PCEMP **api* 'fire'	Ambel *lap*, As *yap*, Biga *lap*, Fia. *lap*, Gebe *yap*, Kawe *lap*, Lag. *lap*, Mat. *ya*^{3}*p*, Maˈya ˈ*la*^{12}*p*, Wau. *lap*
PCEMP **kazupay* 'rat'	Biga *kalof*, Maˈya *keluf*
PMP **ma-pənuq* 'full'	Ambel *an/hon*, Biga *fon*, Fia. *fon*, Kawe *fon*, Lag. *fon*, Mat. *fo*^{3}*n*, Maˈya ˈ*fo*^{12}*n*
PCEMP **marip* 'laugh'	As *-meli/s*, Biga *-mlef*, Gebe *-mnif*
PMP **qatəp* 'roof'	Gebe *yataf*

Table 4.9: Reflexes of **p* in Raja Ampat.

[1] Arnold (2014) shows that Ambel *f*, *ɸ*, and *h* are variants of a single phoneme /f/.

PMP **əpat*, PCEMP **pat-i*, PEMP **pat* 'four'	Ambai *-a*, Biak *fiak*, Dus. *pati*, Marau *ati*, Moor á'-ó, SL *-a*, Umar *eat*, Wan. *at*, Wrp. *ak/o*, Yaur *r-ía-hè*, Yer. *áak/à*
PCEMP **kazupay* 'rat'	Ambai *karu*, Moor *arùha*, SL *karu*
PMP **ma-nipis* 'thin (materials)'	Umar *mnieh*, Wan. *minis*, Yaur *né-mníhè*, Yer. *mánĺijáhé*
PCEMP **marip* 'laugh'	Ambai *miri*, Ansus *mari*, Biak *mbrif*, Moor *marí/'-a*, SL *mari*, Umar *mari*, Wan. *mari*
PMP **paRih*, PCEMP **paRi* 'sting'	Yer. *pár/éèmà* 'stingray', *ari máanáà* 'ray sp.'
PMP **punti* 'banana'	Moor *hút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *pĺití* Wmb. *uti-ro*, Yoke *si*
PMP **qapuR* 'lime, calcium'	Biak *afər*, Dus. *aper*, Moor (A.) *áua*, Moor (H.) *ár-a*, Umar *au*, Yer. *áau*
PMP **qatəp* 'roof'	Moor *r/à'a*, Wrp. *aka*, Yer. *áká-ráaníà*
PMP **sa-puluq* 'ten'	Ambai *sura*, Ansus *ura*, Biak *sa-m-fur*, Dus. *sa-m-pur*, Moor *tàura*, SL *sura*, Wrp. *sauro*

Table 4.10: Reflexes of **p* in Cenderawasih Bay and Mamberamo.

4.2.4 **b*[2]

The regular outcome of **b* is *p* in South Halmahera (see Table 4.11).

Raja Ampat languages show considerable variation between *p* and *b* (see Table 4.12). The variation is partly predictable by word, partly by language. In the available data, As and Gebe consistently show *p*, and Matbat consistently shows *b*. The remaining languages all show some variation.[3] Variation by word is evident when we compare reflexes of PMP **batu* 'stone' and PMP **buaq* 'fruit', which are consistently *p*; reflexes of PMP **bəRay* 'give', which are consistently *b*; and reflexes of PMP **ba-b‹in›ahi* 'woman', which are evenly divided.

In Cenderawasih Bay and Mamberamo, the regular outcome of **b* is *b* in Biak, Munggui, and Warembori;[4] *β* in Dusner, Moor, Yaur, and Yoke; and, on the basis of a single word, *w* in Kurudu (see Table 4.13). The remaining languages show word by word variation, as in Raja Ampat: Ambai shows $b \sim \beta \sim w$; Ansus shows $b \sim w$; Serui-Laut shows $\beta \sim w$; Wandamen and Waropen show $b \sim \beta$; Umar shows $\beta \sim \varnothing$; and Yerisiam shows $b \sim \varnothing$.

There is no obvious phonological conditioning accounting for the observed variation, and it would be difficult in any case to generalize on the basis of the small number of examples. It is clear that there was a change $*b > p$ in South Halmahera, and possibly some Raja Ampat languages. This change is distinctive enough to be of moderate subgrouping

[2]See §4.2.21 for **mb* clusters.

[3]More data might well produce evidence of variation in As, Gebe, or Matbat as well.

[4]Warembori has a single phoneme /b/ which is pronounced *b* word-initially and *β* intervocalically. These allophones are spelled *b* and *v*, respectively.

value. However, the irregularity of reflexes in Raja Ampat significantly weakens the case for a shared innovation with South Halmahera. It is unclear precisely what happened without further evidence.

In Cenderawasih Bay, there was evidently a progression of changes from $*b > \beta > w > \varnothing$. These changes are less distinctive than the devoicing change, and the fact that closely related languages (Biak and Dusner; Ambai and Serui-Laut) show divergent outcomes weighs against using them as subgrouping evidence.

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Buli *ma-piŋ*, Gane *mapín*, Sawai *mɛpin*, Taba *mapin*
PMP **batu* 'stone'	Buli *pāt*
PMP **buaq* 'fruit'	Buli *pio*, Taba *sa/po*
PMP **bunuq* 'kill'	Buli *pun*, Gane *pun*, Sawai *-pun*, Taba *-pun*
PMP **Rəbək* 'to fly'	Buli *opa*, Gane *opa*, Sawai *-opɛ*, Taba *-opa*

Table 4.11: Reflexes of **b* in South Halmahera.

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Ambel *bin*, Biga *wa/ˈbin*, Fia. *bin*, Gebe *mapin*, Kawe *pin*, Lag. *pin*, Maˈya *ˈpi³n*, Wau. *pin*
PMP **batu* 'stone'	As *pa*, Biga *ka-ˈpat*, Gebe *ka-pat*, Kawe *a-ˈpat*, Lag. *a-ˈpat*, Mat. *pa¹²t*, Maˈya *ka-ˈpa¹²t*, Wau. *ka-ˈpat*
PMP **bəRay* 'give'	Ambel *-bi*, Fia. *bi*, Lag. *ˈbi(o)*, Mat. *be²¹*, Maˈya *ˈbi(o)*, Wau. *bi(o)*
PMP **buaq* 'fruit'	As *nu/pu-*, Biga *puɔ*, Gebe *ka-pio*
PMP **bunuq* 'kill'	Ambel *buni*, As *-bun*, Biga *bun*, Fia. *bun*, Gebe *-pun*, Kawe *bun*, Lag. *ˈbu³n*, Mat. *bu³n*, Maˈya *ˈbu³n*, Wau. *bun, fal/ˈpun*
PMP **Rəbək* 'to fly'	Ambel *-apo*, As *n/apɔ*, Biga *-oˈbo*, Fia. *-op*, Gebe *-opo*, Kawe *-ˈop[o]*, Lag. *-ˈop[o]*, Maˈya (S.) *-ˈopo³*, Wau. *-ˈop[o]*

Table 4.12: Reflexes of **b* in Raja Ampat.

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Ambai *vivin*, Ansus *wawing*, Biak *bin*, Moor *vavín-a*, Umar *ing/go*, SL *vavin*, Wan. *vavi*, Wrp. *bino*, Yer. *îînà* Wmb. *bin-do*
PMP **baRa* 'arm'	Ambai *wara-*, Ansus *wara/u*, Biak *bra*, Dus. *vra*, Moor *veréa*, Mun. *bara*, SL *wara*, Wan. *vara*, Wrp. *va(ha)-*, Yaur *vrá-'ùgwájè*, Yer. *bà-kí* Wmb. *ke-vera-ro*, Yoke *βura-*
PMP **baqəru* 'new'	Ambai *wa/woru*, Ansus *wa/woru*, Biak *ba/bo*, Kur. *woru*, SL *va-voru*, Wan. *va/voru*, Wrp. *voa, boa*
PMP **batu* 'stone'	Moor *vá'-a*, Umar *atu*, Yer. *áakú*
PMP **bəRay* 'give'	Dus. *ve*, Umar *ve*, Yaur *vè-né*
PMP **bəRsay* 'canoe paddle'	Ambai *bo, wo*, Ansus *bo, wo*, Biak *-borəs*, Dus. *vors*, Moor *vór-a*, SL *bo*, Wan. *bo, vo*
PMP **buaq* 'fruit'	Ambai *bon*, Ansus *ai/bong*, Biak *ai/bon*, Moor *vó*, SL *bo*, Wan. *buo*, Wrp. *vo*, Yer. *ú* Wmb. *bua*, Yoke *βua*
PMP **buku* 'knot'	Moor *vú'-a*, Umar *vu*, Yaur *vúu-jè*, Yer. *bú-gùa*
PMP **bulu* 'feather, body hair'	Ambai *na-wa/vuru*, Moor *vùru*, Umar *uru*, Wrp. *vuro*, Yer. *úurú-gùa* Wmb. *ke-vun-do*, Yoke *bo*
PMP **qabu* 'ash'	Ansus *w/awu*, SL *w/abu*, Umar *au*, Wan. *w/abu*, Wrp. *avu* Wmb. *aivu-ro*
PMP **Rəbək* 'to fly'	Biak *rob*, Wrp. *ro/ko* (?) Wmb. *dove*
PMP **təbuh* 'sugarcane'	Ambai *tovu*, Ansus *towu*, Biak *kob*, SL *tovu*, Umar *to*, Wrp. *kovu*, Yaur *òo-jé*, Yer. *kóou*

Table 4.13: Reflexes of **b* in Cenderawasih Bay and Mamberamo.

4.2.5 **t*[5]

The regular outcome of **t* in South Halmahera and Raja Ampat is *t* (see Tables 4.14 and 4.15). In Buli, a few words irregularly reflect **t* as *c*, and in one case as *d* (*m-dalim* 'sharp'). In Raja Ampat, the reflex of PCEMP **todan* 'sit' irregularly shows *s* in Ma'ya and *h* in Matbat.

In Cenderawasih Bay and Mamberamo, there is evidence in several languages for a progression of the form **t* > *k* > *ʔ* > ∅. Biak, Roon (not shown here), Warembori, Waropen, and Yerisiam consistently reflect **t* as *k*. In Moor, there is variation between *k* and *ʔ*.[6] In Yaur, **t* becomes *ʔ* word-initially and ∅ elsewhere. In Ambai, Ansus, and

[5]See §4.2.6 for palatalization of **t* before **i*. See §4.2.21 for **nt* clusters.

[6]In several words, the outcome is *k* in the Hirom dialect and *ʔ* in the Ayombai dialect. Examples are Hirom *mukáʔ-a*, Ayombai *muʔáʔ-a* 'afraid'; Hirom *kúʔ-a*, Ayombai *úʔ-a* 'louse'. (Moor has no word-initial contrast between *ʔ* and ∅ on nouns.)

Serui-Laut, **t* is lost finally, otherwise it is preserved as *t*. In the other languages, **t* remains unchanged.

We might suppose that all languages that underwent the change **t* > *k*, before possibly progressing further, share an innovation—i.e., Biak, Moor, Roon, Warembori, Waropen, Yaur, and Yerisiam. However, there are three convincing arguments against this claim. First, this putative grouping would cross-cut the well-established Biakic subgroup, including Biak and excluding Dusner. Second, there are no other known innovations subgrouping this particular set of languages. Finally, Blust (2004) has shown that the change *t* > *k* has occurred independently numerous times in the history of Austronesian. On this basis, I conclude that the change **t* > *k* most likely occurred independently several times, and so does not provide good subgrouping evidence.

PMP **batu* 'stone'	Buli *pāt*
PMP **əpat*, PEMP **pat* 'four'	Buli *fat*, Gane *-fot*, Sawai *-fɔt*, Taba *-hot*
PMP **kita* 'we (incl.)'	Buli *ite*, Gane *kit*, Sawai *it*, Taba *tit*
PMP **kulit* 'skin'	Gane *kulit*, Taba *kulit*
PMP **kutu* 'louse'	Buli *ut*, Gane *kut*, Sawai *kit*, Taba *kut*
PMP **laŋit* 'sky'	Buli *laŋit*, Gane *laŋgit*, Taba *laŋgit*
PMP **mata* 'eye'	Buli *mta*, Gane *mto*, Sawai *mtɔ*, Taba *mto*
PMP **ma-takut* 'afraid'	Buli *am-cait*
PMP **ma-taʐim* 'sharp'	Buli *m-dalim*
PMP **tanəm* 'to plant'	Gane *tonam*, Sawai *tɔnɛm*
PMP **taŋis* 'to cry'	Buli *taŋis*, Gane *taŋgis*
PMP **təlu* 'three'	Sawai *-tel*, Taba *-tol*
PMP **tuʐuq* 'indicate'	Buli *culi*

Table 4.14: Reflexes of **t* in South Halmahera.

PMP *batu* ‘stone’	As *pa*, Biga *ka-ˈpat*, Gebe *ka-pat*, Kawe *a-ˈpat*, Lag. *a-ˈpat*, Mat. *pa^{12}t*, Maˈya *ka-ˈpa^{12}t*, Wau. *ka-ˈpat*
PMP **əpat*, PCEMP **pat-i*, PEMP **pat* ‘four’	Ambel *ɸat*, As *fat*, Biga *fat*, Gebe *pi-fat*, Lag. *fat*, Maˈya *ˈfa^{12}t*
PMP **kutu* ‘louse’	Ambel *ut*, Biga *wut*, Fia. *wut*, Gebe *ut*, Kawe *wut*, Lag. *wut*, Mat. *wu^{3}t*, Maˈya (S.) *ˈu^{3}t*, Wau. *wut*
PMP **laŋit* ‘sky’	As *lanit*
PMP **qataɣ* ‘liver’	Ambel *latey*, Gebe *atai*, Kawe *laˈte(y)*, Lag. *ˈlati*, Mat. *ta^{21}y*, Maˈya (S.) *ˈlati^{3}*
PMP **taliŋa* ‘ear’	As *tana*, Fia. *tena*, Maˈya *taˈna(o)*, Wau. *taˈna(o)*
PMP **taŋis* ‘to cry’	As *-tanis*, Biga *-tinis*, Gebe *-tenis*
PMP **tu(n)daŋ*, PCEMP **todan* ‘sit’	Gebe *tɔlɔn*, Kawe *toˈlon*, Lag. *toˈlon*, Mat. *ho^{121}l*, Maˈya (S.) *ˈsolo^{3}n*, Wau. *toˈlon*

Table 4.15: Reflexes of **t* in Raja Ampat.

PMP **batu* ‘stone’	Moor *vá’-a*, Umar *atu*, Yer. *áakú*
PMP **əpat*, PCEMP **pat-i*, PEMP **pat* ‘four’	Ambai *-a*, Biak *fiak*, Dus. *pati*, Marau *ati*, Moor á’-ó, SL *-a*, Umar *eat*, Wan. *at*, Wrp. *ak/o*, Yaur *r-ía-hè*, Yer. *áak/à*
PMP **kutu* ‘louse’	Ansus *utu*, Biak *uk*, Moor (H.) *kú’-a*, SL *itu*, Umar *utu*, Wrp. *ghui, vui*, Yaur *óò-jé*
PMP **ma-takut* ‘afraid’	Ambai *matai*, Ansus *matai*, Biak *mkāk*, Dus. *mtat*, Moor (A.) *mu’á’-a*, Moor (H.) *muká’-a*, SL *maitai*, Umar *mtat*, Wan. *matai(t)*, Wrp. *akak/o*, Yer. *ngkák/é*
PMP **qataɣ* ‘liver’	Biak *ke/n*, Kur. *ate*, Moor *à’a*, Wan. *ate/ni*, Yer. *ákéè/nà*
PMP **t-ama* ‘father’	Ambai *tama-*, Biak *kəma*, Dus. *tma*, Moor *kamá* ‘grandparent’, Wan. *tama*
PMP **tanəm* ‘to plant’	Ambai *tana(m)*, Ansus *tanam/i*, Moor *’anam-î*, SL *tana*, Umar *tnam*, Wan. *tanam*, Wrp. *ana/ko*, Yaur *ì-’àm-né* ‘I plant’, Yer. *káamán/é*
PMP **tunu* ‘roast food over a fire’	Biak *kun*, Dus. *un*, Moor *’un-î*, SL *tunu*, Yaur *’ún-dè*, Yer. *kúun-á* Wmb. *kuni*

Table 4.16: Reflexes of **t* in Cenderawasih Bay and Mamberamo.

4.2.6 Palatalization of **t* before **i*

There is evidence for palatalization of **t* to **s* preceding **i* in most SHWNG languages for which evidence is available (see Table 4.17).

The Raja Ampat evidence is hard to interpret, because there is only a single attested candidate word in each language, the reflex of PMP **t‹in›aqi* ‘belly’. However, the devel-

opment of syncopated **tin- > hñ-* in Gebe, as well as in the South Halmahera language Buli, suggests that palatalization of some sort did take place in these languages.[7] Raja Ampat languages other than Gebe evidently underwent the same development in this word, after which the *h* was lost.

In Cenderawasih Bay, the palatalized **t* merged with **s* and became *s*, *h*, or ∅, in line with the regular developments in the particular language. However, in Moor, **s* resulting from palatalization does not feed **s > t*. That is, PMP **t‹in›aqi > siné* 'belly', not ***tiné*. This can be explained if we assume that original **s > *ts* (or a similar intermediate stage) prior to palatalization, after which **ts > t*.[8]

In the Mamberamo language Warembori, it is not possible to determine if **t > *s > t*, following the regular development of **s*, or if palatalization never happened in the first place. The outcome would be identical in both scenarios.

The lack of palatalization in some reflexes of PMP **punti* 'banana' is due to the medial nasal cluster (see §4.2.21). Lack of palatalization in the Biak and Dusner reflexes of PMP **qatimun* 'cucumber' most likely indicates that the word was borrowed from another Austronesian language.

PMP **bitil* 'hungry'	Ambai *wa/wisi*, Ansus *wawi*, Biak *bisər*, Dus. *m/buser*, Wan. *va/wisi*
PMP **ma-putiq* 'white'	Sawai *-mfus*
PMP **punti* 'banana'	Moor *húút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *píití* Wmb. *uti-ro*, Yoke *si*
PMP **qatimun* 'cucumber'	Buli *ti-timin* Dus. *tinem*
PMP **qutin* 'penis'	Sawai *fsi* Ambai *i-*, Moor *ùsi*
PMP **timuR* 'south or east wind'	Buli *simi* 'south (wind)'
PMP **t‹in›aqi* 'intestines' > 'belly'	Buli *hñao*, Sawai *sno* Ambel *nyay*, Biga *nyao*, Fia. *na*, Gebe *hñao, hñainora*, Kawe *a-ˈnyay(o)*, Lag. *a-ˈnyay(o)*, Maˈya *ˈna(o)*, Wau. *ka-ˈnyay(o)* Ambai *ene-*, Ansus *ane/u*, Biak *sne-*, Moor *siné*, SL *ane*, Umar *hna*, Wan. *sane*, Wrp. *n/ina*, Yaur *hnáa-rè*, Yer. *hìná*
PMP **utik* 'marine fish with thorny skin' > 'pufferfish'	Biak *us*, Yaur *bàb/ùh-ré*

Table 4.17: Palatalization of **t* before **i* in SHWNG.

[7] Whatever the intermediate stage between **t* and *h*, it could not have been identical to the reflex of **s*, which remains *s* in most Raja Ampat languages (§4.2.10).

[8] Ambai *wa/wisi* 'hungry' apparently shows an analogous development. However, palatalized **t* otherwise apparently merged with **s* in Ambai, as in PMP **qutin > *usi > *si > i-* 'penis'.

4.2.7 *c

There are no attested reflexes of *c in SHWNG languages.

4.2.8 *k[9]

In South Halmahera, the outcome of *k is regular only in Buli, where it is ∅ (see Table 4.18). In Gane and Taba, there are cases of *k preserved as k in all positions, but it is lost in reflexes of PMP *hikan 'fish' (in Gane), PMP *kahiw 'wood', PMP *kami 'we (excl.)', and PMP *Rəbək 'to fly'. In Sawai, *k is generally lost, but it is exceptionally preserved in the reflex of PMP *kutu 'louse'.

In Raja Ampat, the change *k > ∅ is attested in all languages (see Table 4.19). *k is exceptionally preserved in Gebe *kai* 'wood' and Matbat *ya^{21}k* 'I'.

In Cenderawasih Bay and Mamberamo, the change of *k > ∅ is attested in all languages except Moor. In Moor, the outcome is k ~ ʔ, with a tendency towards k in the Hirom dialect and ʔ in the Ayombai dialect.[10] In Warembori and Yaur, *k is unexpectedly not lost in reflexes of PMP *kita 'we (incl.)': it is reflected as k in Warembori, and ʔ in Yaur.[11] In Wandamen, *k is irregularly preserved in *kruya* 'thunder', most likely due to onomatopoeia.

The loss of *k appears to have occurred independently many times throughout SHWNG languages; it is difficult to account for the occasional intact k without assuming this. However, the evidence is at least consistent with the change having been completed by the time of Proto-Biakic and Proto-Western Yapen.

PMP *hikan, PEMP *ikan 'fish'	Buli *ian*, Gane *ian*, Sawai *in*
PMP *i-aku 'I'	Buli *ya*, Gane *yak*, Taba *yak*, Sawai *ya*
PMP *kahiw, PCEMP *kayu 'wood'	Buli *ai*, Sawai *ay*, Taba *ai*
PMP *kami 'we (excl.)'	Buli *ame*, Gane *ame*, Sawai *am*, Taba *am*
PMP *kulit 'skin'	Gane *kulit*, Taba *kulit*
PMP *kutu 'louse'	Buli *ut*, Gane *kut*, Sawai *kit*, Taba *kut*
PMP *manuk 'bird'	Buli *mani*, Gane *manik*, Sawai *manɛ*, Taba *manik* 'chicken'
PMP *ma-takut 'afraid'	Buli *am-cait*
PMP *Rəbək 'to fly'	Buli *opa*, Gane *opa*, Sawai *-opɛ*, Taba *-opa*
PMP *wakaR 'root'	Buli *wā*

Table 4.18: Reflexes of *k in South Halmahera.

[9] See §4.2.21 for *ŋk clusters.

[10] There is no word-initial contrast between ʔ and ∅ on Moor nouns. Ayombai *ú'-a* 'louse' is thus consistent with *k > ʔ.

[11] The Yaur reflex may in fact be regular for initial position. In the other attested examples, it is not possible to distinguish initial ʔ from ∅.

PMP **hikan*, PEMP **ikan* 'fish'	Gebe *in*, Kawe ˈ*in[i]*, Mat. *yi¹n*, Maˈya (M.) ˈ*i¹²n*
PMP **i-aku* 'I'	Mat. *ya²¹k*
PMP **kahiw*, PCEMP **kayu* 'wood'	Ambel *ay*, As *a*, Biga *ay(o)*, Gebe *kai*, Kawe *w/ay(o)*, Maˈya ˈ*ai(o)*
PMP **kutu* 'louse'	Ambel *ut*, Biga *wut*, Fia. *wut*, Gebe *ut*, Kawe *wut*, Lag. *wut*, Mat. *wu³t*, Maˈya (S.) ˈ*u³t*, Wau. *wut*
PMP **manuk* 'bird'	Ambel *mani*, As *mani*, Biga *miˈni*, Fia. *min*, Gebe *mani*, Lag. ˈ*min[i]*, Maˈya (S.) ˈ*mini¹²*, Wau. ˈ*min[i]*
PMP **ma-takut* 'afraid'	Biga *-mtat*, Gebe *-mtait*
PMP **Rəbək* 'to fly'	Ambel *-apo*, As *n/apɔ*, Biga *-oˈbo*, Fia. *-op*, Gebe *-opo*, Kawe *-ˈop[o]*, Lag. *-ˈop[o]*, Maˈya (S.) *-ˈopo³*, Wau. *-ˈop[o]*
PMP **wakaR* 'root'	Mat. *wa²¹/po*

Table 4.19: Reflexes of **k* in Raja Ampat.

PMP **buku* 'knot'	Moor *vú'-a*, Umar *vu*, Yaur *vúu-jè*, Yer. *bú-gùa*
PMP **hikan*, PEMP **ikan* 'fish'	Biak *in*, Dus. *in*, Moor (H.) *ìjana*
PMP **i-aku* 'I'	Ambai *yau*, Ansus *yau*, Biak *ya*, Dus. *ya*, SL *yau*, Wan. *yau*, Wrp. *ya*
PMP **kahiw*, PCEMP **kayu* 'wood'	Ambai *ai*, Ansus *ai*, Biak *ai*, Dus. *ai*, Moor *ka/'úat-a*, SL *ai*, Umar *ae*, Wan. *ai*, Wrp. *ai*, Yaur *à-jé*, Yer. *áì* Wmb. *ayo-ro*, Yoke *a*
PMP **kudug* 'thunder'	Moor *kururú'-a*, Wan. *kru/ya*
PMP **kutu* 'louse'	Ansus *utu*, Biak *uk*, Moor (A.) *ú'-a*, Moor (H.) *kú'-a*, SL *itu*, Umar *utu*, Wrp. *ghui, vui*, Yaur *óò-jé* Wmb. *ki-ro*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **ma-takut* 'afraid'	Ambai *matai*, Ansus *matai*, Biak *mkāk*, Dus. *mtat*, Moor (A.) *mu'á'-a*, Moor (H.) *muká'-a*, SL *maitai*, Umar *mtat*, Wan. *matai(t)*, Wrp. *akak/o*, Yer. *ngkák/é*
PMP **Rəbək* 'to fly'	Biak *rob*, Wrp. *ro/ko* Wmb. *dove*
PMP **wakaR* 'root'	Ambai *ne-wa(sa)*, Pom *wa-wari*, Wan. *war*, Wrp. *ghai, vai*, Wooi *wari*

Table 4.20: Reflexes of **k* in Cenderawasih Bay and Mamberamo.

4.2.9 **g*

There are only four known possible reflexes of **g* in SHWNG (see Table 4.21). PMP **gəkgək* is rather dubious, owing to its onomatopoeic nature and the irregular preservation of **k* in its putative reflexes. The other three cases consistently show **g* > ∅.

This change is of no SHWNG-internal subgrouping value, because there is not enough evidence to establish which languages participate in the change. If it proves to be shared by all SHWNG languages, it may be of some value as a Proto-SHWNG innovation.

PMP **əŋgəm* 'hold in the mouth'	Yer. *óom/à*
PMP **gəkgək* 'animal sound'	Buli *gokgok* 'crow', Sawai *gok?gok* 'crow'
PMP **kudug* 'thunder'	Moor *kururú'-a*, Wan. *kru/ya*
PMP **ma-gatəl* 'to itch'	Ambai *maitata* (?), Ansus *matata* (?), Biak *maker*

Table 4.21: Reflexes of **g* in SHWNG.

4.2.10 **s* and **j*

These two proto-consonants are treated together, because they merge in all SHWNG languages.

The regular outcome is *s* in most South Halmahera and Raja Ampat languages (see Tables 4.22 and 4.23). The exceptions are Fiawat and Laganyan, where **s*, **j* > *h*.

The reflex of PMP **ŋajan* 'name' is irregular in the Raja Ampat languages Biga, Kawe, and Matbat, showing ∅ instead of the expected *s*. Since there are no other known reflexes of **j* in these languages, it is not possible to determine if this is due to the presence of **j* as opposed to **s* or is simply a lexical irregularity.

In Cenderawasih Bay and Mamberamo, the most widespread outcome is *s* (see Table 4.24). The change of **s*, **j* > *h* occurs in Umar, Yaur, and Yerisiam.[12] In Ambai and Ansus, the reflex is ∅ (presumably via *h*).[13] In Moor and Warembori, the reflex is *t*.

Since the changes *s* > *h* > ∅ and *s* > *t* are quite common cross-linguistically, the reflexes of **s* and **j* are of little subgrouping value.

[12]Older sources for Umar often write *s* instead of *h*. During my fieldwork, speakers claimed that *h* was the correct sound, but occasionally produced forms with *s*. The change was evidently quite recent, and may not have run to completion.

[13]Ambai *sura* 'ten' may be a borrowing from a neighboring language.

PMP **asa, *isa, *əsa* ‘one’	Buli *asa, isa*, Gane *p/so*, Sawai *-sɔ*, Taba *-so*
PMP **bisik* ‘sick’	Buli *pisi*, Sawai *-pisɛ*
PMP **hajək* ‘sniff, kiss’	Buli *yās*
PMP **ma-nipis* ‘thin (materials)’	Buli *m-lifis*, Gane *manifis*, Sawai *-mɛnifɛs*, Taba *mnihis*
PMP **ŋajan* ‘name’	Buli *ŋasan*, Sawai *ŋɔsɛŋ*
PMP **p-ijan* ‘when?’	Buli *ma-fis*, Gane *ha/fis/ak*
PMP **si-ida* ‘they’	Buli *sil(e)*, Gane *si*, Sawai *si*, Taba *si*
PMP **susu* ‘female breast’	Buli *sus*, Gane *susu*, Sawai *sus*, Taba *susu*

Table 4.22: Reflexes of **s* and **j* in South Halmahera.

PMP **asa, *isa, *əsa* ‘one’	As *sa*, Gebe *-sa*, Maˈya (S.) ˈ*sa*
PMP **ŋajan* ‘name’	As *gasɛn*, Biga *nan*, Fia. *nahan*, Gebe *ŋasn/ɔ-*, Kawe *nan*, Lag. *naˈhan*, Mat. *na^{21}n*, Maˈya (S.) ˈ*nasa^{3}n*, Wau. *nan*
PMP **si-ida* ‘they’	As *sia, sire*, Gebe *sia*, Lag. ˈ*hia*, Maˈya ˈ*sia*
PMP **susu* ‘female breast’	Ambel *su*, As *sus*, Biga *sus*, Gebe *sus*, Kawe *su*, Lag. ˈ*tut[u]*, Mat. *su^{3}*, Maˈya ˈ*su^{3}s*, Wau. *su*
PMP **taŋis* ‘cry’	As *-tanis*, Biga *-tinis*, Gebe *-tenis*

Table 4.23: Reflexes of **s* and **j* in Raja Ampat.

PMP **asa, *isa, *əsa* 'one'	Biak *sai*, Moor *ta-tá*, Wan. *esa*
PMP **ma-nipis* 'thin (materials)'	Wan. *minis*, Yaur *né-mníhè*, Yer. *mánúijáhé*
PMP **nusa* 'island'	Ambai *nu*, Ansus *nu*, Biak *nus*, Moor *nút-a*, SL *nu*, Umar *nuh/man*, Wan. *nu*, Wrp. *nusa*, Yaur *nùh-ré*, Yer. *núùhà*
PMP **ŋajan* 'name'	Biak *nasan* 'title', Moor *nàtan-a*, Umar *han*, Wan. *san/o*, Wrp. *nasan/o*, Yaur *áhg-rè*, Yer. *áahán/à* Wmb. *nan-do*, Yoke *nand*
PMP **sa-puluq* 'ten'	Ambai *sura*, Ansus *ura*, Biak *sa-m-fur*, Dus. *sa-m-pur*, Moor *tàura*, SL *sura*, Wrp. *sauro*
PMP **si-ida* 'they'	Ambai *ea*, Biak *si*, Dus. *si*, Moor *ti-'ó*, Umar *i-hi*, Wrp. *ki* (?), Yaur *ó-hè*, Yer. *ínúi-hí* Wmb. *ti*
PMP **susu* 'female breast'	Ambai *ui*, Ansus *u*, Biak *sus*, Moor *tút-a*, Umar *huhu*, SL *su*, Wan. *susu*, Wrp. *susu*, Yaur *húhì-e*, Yer. *húuhú-gùa* Wmb. *ke-tutu-ro*
PMP **taŋis* 'cry'	Biak *kanəs*, Moor *'ànit-a*, Wrp. *anis/a*, Yaur *'àáh-rè*, Yer. *káh/é*

Table 4.24: Reflexes of **s* and **j* in Cenderawasih Bay and Mamberamo.

4.2.11 **d*[14]

The regular outcome of **d* in South Halmahera is *l* (see Table 4.25).

In Raja Ampat, the outcome is also *l* in several attested cases (see Table 4.26). However, the picture is complicated by reflexes of PMP **dəŋəR* 'hear', showing *d* in several languages and *n* in Matbat, and reflexes of PMP **ma-diŋdiŋ* 'cold', showing *r* in all cases. There is no obvious phonological explanation for these discrepancies.

The case of **ma-diŋdiŋ* is quite striking, because Raja Ampat languages generally do not have *r* in native words. Cenderawasih Bay languages are a possible source for borrowing, as they show **d* > *r* (see §4.2.11). However, the only Cenderawasih Bay language currently in contact with Raja Ampat languages is Biak, which has the unrelated word *prim* 'cold'.

In Cenderawasih Bay and Mamberamo, the outcome of **d* is generally *r*.[15] However, it apparently survives intact as *d* in PMP **duha* 'two' > Umar *e-dih*, Yaur *re-du*. Umar also shows preservation of **d* in PMP **ma-diŋdiŋ* > *drin* and apparent word-final devoicing in PCEMP **todan* > *tot*.

The shared outcome **d* > *l* in South Halmahera and Raja Ampat is not convincing for subgrouping, because the merger of **d*, **l*, and **z* is shared among all SHWNG languages

[14] See §4.2.21 for **nd* clusters.

[15] Warembori has a single phoneme /d/ which is pronounced *d* word-initially and *r* intervocalically. These allophones are reflected in the orthography.

(see chapter 3). The most likely explanation for an outcome of *l* versus *r* is areal: laterals are atypical in New Guinea languages, but common in the islands to the west.

PMP **dəŋəR* 'hear'	Buli *loŋa*, Gane *longa*, Sawai *-loŋɛ*, Taba *-ma/longo*
PMP **dəpa* 'span, fathom'	Buli *lof*, Sawai *lof*
PMP **di* 'at'	Buli *li*, Gane *li*, Taba *li*
PMP **duha* 'two'	Buli *lu*, Gane *p/lu*, Sawai *-lu*, Taba *-lu*
PMP **qudaŋ* 'shrimp'	Buli *ulaŋ*
PMP **tiduR*, **tuduR* 'sleep'	Buli *tuli*
PMP **tu(n)daŋ*, PCEMP **todan* 'sit'	Buli *-tolaŋ*, Sawai *-tolɛn*, Taba *bat/talón*

Table 4.25: Reflexes of **d* in South Halmahera.

PMP **daRaq* 'blood'	Gebe *la*
PMP **dəŋəR* 'hear'	Biga *do*ˈ*no*, Gebe *lɔŋɔ*, Kawe ˈ*don[o]*, Lag. ˈ*don[o]*, Mat. *no*^{41}*ŋ*, Maˈya ˈ*do*^{12}*n*, Wau. ˈ*don[o]*
PMP **duha* 'two'	Ambel *low*, As *lu*, Biga *lu*, Gebe *-lu*, Lag. ˈ*lu*^{3}, Mat. *lu*^{3}, Maˈya ˈ*lu*^{3}, Wau. *lu*
PMP **ma-diŋdiŋ* 'cold'	Kawe *mari*ˈ*rin*, Lag. *mari*ˈ*rin*, Wau. *mari*ˈ*rin*
PMP **tu(n)daŋ*, PCEMP **todan* 'sit'	Gebe *tɔlɔn*, Kawe *to*ˈ*lon*, Lag. *to*ˈ*lon*, Mat. *ho*^{121}*l*, Maˈya (S.) ˈ*solo*^{3}*n*, Wau. *to*ˈ*lon*

Table 4.26: Reflexes of **d* in Raja Ampat.

PMP **dahun* 'leaf'	Ambai *re/raun*, Moor *ràn*u, SL *re-rau*, Wan. *rau*, Wrp. *rana* Wmb. *an/dan-do*, Yoke *tan/du* (?)
PMP **daləm* 'inside'	Ambai *roron*, Ansus *rarong*, Wan. *raro*
PMP **danum* 'fresh water'	Moor *ràrum-a*, Umar *i/ran*, Wrp. *rauno*, Yer. *ráarám/à* Wmb. *dan-do*
PMP **daRaq* 'blood'	Moor *ràra*, Wrp. *rara*, Yer. *rárà* Wmb. *ke-ra-ro*
PMP **duha* 'two'	Ambai *-ru*, Biak *su/ru*, Dus. *nu/ru*, Moor *rú-ró*, Umar *e-dih*, Wan. *muan/du*, Wrp. *vo/ru*, Yaur *ré-dú-hè*, Yer. *rúu-hí*
PMP **duyuŋ* 'dugong'	Biak *rowin*, Moor *rún-a*, Wrp. *rui*, Yaur *rì'-ré*
PMP **ma-diŋdiŋ* 'cold'	Umar *drin*
PMP **tu(n)daŋ*, PCEMP **todan* 'sit'	Umar *tot*

Table 4.27: Reflexes of **d* in Cenderawasih Bay and Mamberamo.

4.2.12 **D*

The Cenderawasih Bay language Biak is the only SHWNG language with attested reflexes of **D*. The outcome is *r* in both cases (see Table 4.28).

PMP **hateD* 'accompany, escort'	Biak *yakər*
PMP **siDsiD* 'sail along the coast'	Biak *sisər* 'coast'

Table 4.28: Reflexes of **D* in Biak.

4.2.13 **l*

The regular outcome of **l* is *l* in South Halmahera and Raja Ampat (see Tables 4.29 and 4.30). There is an idiosyncratic change of **l* > *n* in the Gebe reflex of PCEMP **malip* 'laugh'.

In Cenderawasih Bay and Mamberamo, the regular outcome is *r* (see Tabke 4.31).[16] In Warembori, the outcome is *n* in *ke-vun-do* 'body hair'. This apparently reflects a regular change of *r* > *n* in syllable-final position: another example is PMP **niuR* > *nuan-do*. In Yoke, *r* > ∅ word-finally.

The same arguments against using the outcome of **d* for subgrouping apply to **l* (see §4.2.11).

PMP **bulan* 'moon'	Taba *bulan*
PMP **bulu* 'feather, body hair'	Buli *plu*, Sawai *plu*
PMP **laŋit* 'sky'	Buli *laŋit*, Gane *laŋgit*, Sawai *laŋɛt*, Taba *laŋgit*
PMP **lima* 'five'	Buli *lim*, Sawai *-lim*, Taba *-lim*
PCEMP **malip* 'laugh'	Buli *-mlif*, Gane *mlif*, Sawai *-mlif*, Taba *-(ha)mlih*
PMP **qitəluR* 'egg'	Buli *tolo*, Gane *toli*, Taba *tolo*
PMP **zalan* 'road'	Buli *laliŋ*, Gane *lolan*, Taba *lolan*

Table 4.29: Reflexes of **l* in South Halmahera.

[16] Warembori (and, apparently, Yoke) have a single phoneme /d/ which is pronounced *d* word-initially and *r* intervocalically. These allophones are reflected in the orthography. It is unclear why the word for 'five' was transcribed with initial *r* in Warembori.

PMP **laŋit* ‘sky’	As *lanit*
PMP **lima* ‘five’	Ambel *lim*, Biga *lim*, Kawe *lim*, Lag. *ˈli³m*, Mat. *li³m*, Maˈya *ˈli³m*, Wau. *lim*
PMP **lipən* ‘tooth’	Biga *lifo-*, Kawe *a-ˈlif(o)*, Lag. *a-ˈlif(o)*, Maˈya (S.) *ka-ˈlif(o)*, Wau. *la-ˈlif*
PCEMP **malip* ‘laugh’	As *-meli/s*, Biga *-mlef*, Gebe *-mnif*
PMP **qitəluR* ‘egg’	Ambel *talo*, As *talɔ*, Biga *toˈlo*, Fia. *tol*, Kawe *ˈtol[o]*, Lag. *ˈtol[o]*, Mat. *to²¹l*, Maˈya (S.) *ˈto¹²l*, Wau. *ˈtol[o]*
PMP **ʒalan* ‘road’	As *alin*, Biga *liˈlin*, Kawe *liˈlin*, Lag. *liˈlin*, Maˈya (S.) *ˈlili³n*

Table 4.30: Reflexes of **l* in Raja Ampat.

PMP **bulu* ‘feather, body hair’	Ambai *na-wa/vuru*, Moor *vùru*, Umar *uru*, Wrp. *vuro*, Yer. *úurú-gùa* Wmb. *ke-vun-do*, Yoke *bo*
PMP **lahud* ‘seawards’ > ‘sea’	Ambai *ai-rau*, Ansus *raw/anang*, Moor *rú*, Wan. *rau*, Wrp. *rau*
PMP **lakaj*, **lakaw* ‘go, walk’	Ambai *ra*, Ansus *ra*, Biak *rā*, Moor *rá*, SL *ra*, Umar *ra*, Wan. *ra*, Wrp. *ra*, Yaur *rèé-rè* ‘come’, Yer. *rá* Wmb. *da*, Yoke *da*
PMP **lima* ‘five’	Ambai *rin*, Ansus *ring*, Biak *rim*, Dus. *rim/bi*, Moor *rím-ó*, Mun. *-rim*, SL *ri*, Wan. *rime*, Wrp. *rim/o*, Yer. *rîmà* Wmb. *rin/ti*, Yoke *-rim/si*
PMP **ma-kapal* ‘thick’	Biak *kpor* (?)
PCEMP **malip* ‘laugh’	Ambai *miri*, Ansus *mari*, Biak *mbrif*, Moor *marí/’-a*, SL *mari*, Umar *mari*, Wan. *mari*
PMP **sa-puluq* ‘ten’	Ambai *sura*, Ansus *ura*, Biak *sa-m-fur*, Dus. *sa-m-pur*, Moor *tàura*, SL *sura*, Wrp. *sauro*
PMP **təlu* ‘three’	Ambai *-toru*, Ansus *toru*, Dus. *tori*, Moor *ór-ó*, Umar *e-tro*, Wan. *toru*, Wrp. *or-o*, Yer. *kóorí-hé*

Table 4.31: Reflexes of **l* in Cenderawasih Bay and Mamberamo.

4.2.14 **ʒ*

There are few attested reflexes of **ʒ* in SHWNG. In South Halmahera and Raja Ampat, the regular outcome is *l* (see Tables 4.32 and 4.33).

In Cenderawasih Bay, the general outcome is *r* (see Table 4.34). The small amount of available evidence suggests **ʒ* > ∅ in Umar, Yaur, and Yerisiam. The initial *j* in the reflex of PMP **ʒalan* ‘road’ in Umar and Yerisiam is due to later glide insertion (see §4.2.27). There is no available evidence for the Mamberamo languages.

The arguments against using the outcomes of **d* and **l* for subgrouping generally apply to **z* as well (see §4.2.11). However, the divergent outcome shared by Umar, Yaur, and Yerisiam is sufficiently distinctive that it may indicate a more closely shared history among these languages. By itself this evidence is too scant to be conclusive, but is significant in light of other innovations shared by these three languages (see §4.2.19 and §4.2.25 below).

PMP **haRəzan* 'notched log ladder'	Buli *olan* 'ladder'
PCEMP **kazupay* 'rat'	Buli *luf*, Gane *luf*, Sawai *luf*
PMP **quzan* 'rain'	Buli *ulan*, Gane *ulan*, Taba *ulan*
PMP **zalan* 'road'	Buli *laliŋ*, Gane *lolan*, Taba *lolan*
PMP **zauq* 'far'	Buli *lau*, Gane *lou*, Sawai *lɔw*, Taba *na/lou*

Table 4.32: Reflexes of **z* in South Halmahera.

PCEMP **kazupay* 'rat'	Biga *kalof*, Maˈya *keluf*
PMP **zalan* 'road'	As *alin*, Biga *liˈlin*, Kawe *liˈlin*, Lag. *liˈlin*, Maˈya (S.) *ˈlili³n*
PMP **zauq* 'far'	As *i/lao*, Gebe *lau*, Kawe *lau*

Table 4.33: Reflexes of **z* in Raja Ampat.

PMP **haRəzan* 'notched log ladder'	Yaur *ròg-ré*
PCEMP **kazupay* 'rat'	Ambai *karu*, Moor *arùha*
PMP **ma-tazim*, **ma-tazəm* 'sharp'	Umar *mtan*
PMP **zalan* 'road'	Ambai *ran*, Ansus *rang*, Dus. *ran*, Moor *ràrin-a*, SL *ran*, Umar *jar*, Wrp. *rara/do*, Yer. *jáàrà*

Table 4.34: Reflexes of **z* in Cenderawasih Bay and Mamberamo.

4.2.15 **r*

There are only six known possible reflexes of **r* in SHWNG (see Table 4.35). In Buli, Biak, and Moor, the outcome is apparently *r*. In Ambai and Serui-Laut, the outcome is apparently ∅ (at least in word-final position). This evidence is clearly too meager to be used for subgrouping.

PCEMP **madar* 'ripe, overripe'	Buli *mara*, Moor *marar/ù* 'withered', SL *marai*
PMP **pa(n)tar* 'bed frame of wooden or bamboo laths'	Ambai *fata* 'bed', Biak *fakər* 'foundation of stones, wood, etc.', Wan. *patar*

Table 4.35: Reflexes of **r* in SHWNG.

4.2.16 **R*

The regular outcome of **R* is ∅ in South Halmahera and Raja Ampat (see Tables 4.36 and 4.37).

In Cenderawasih Bay and Mamberamo, the regular outcome is *r* (see Table 4.38). In Ambai, Kurudu, Umar, Waropen, and Yerisiam, there is a tendency for **R* > ∅ word-finally. In Warembori and Yoke, the developments in word-final position parallel **l* (see §4.2.13).

The change of **R* > ∅ found in South Halmahera and Raja Ampat languages is distinctive; this change is not particularly common within Austronesian. It is more likely to be a shared rather than independent innovation. It provides more convincing evidence for Proto-South Halmahera-Raja Ampat than the outcome of the **d, *l, *z* merger.

The change of **R* > *r* in Cenderawasih Bay and Mamberamo is less unusual, and does not provide convincing evidence for subgrouping.

PMP **baqəRu* 'new'	Buli *po*, Gane *pou*, Taba *powo*
PMP **buRuk* 'rotten'	Gane *puík*
PMP **busuR* 'hunting bow'	Buli *pusi*
PMP **daRaq* 'blood'	Buli *la*
PMP **dəŋəR* 'hear'	Buli *loŋa*, Gane *longa*, Sawai *-loŋɛ*, Taba *-ma/longo*
PMP **habaRat* 'south'	Buli *pāt* 'west'
PMP **ma-Raŋaw* 'dry'	Buli *māŋ*, Sawai *-maŋ*
PMP **niuR* 'coconut'	Sawai *niwɛ*, Taba *niwi*
PMP **Rəbək* 'to fly'	Buli *opa*, Gane *opa*, Sawai *-opɛ*, Taba *-opa*
PMP **Rumaq* 'house'	Gane *um*, Sawai *um*
PMP **wahiR* 'fresh water'	Buli *waya*, Gane *waya*, Sawai *wɔɛ*, Taba *woya*
PMP **zaRum* 'needle'	Gane *laim*

Table 4.36: Reflexes of **R* in South Halmahera.

PMP **bəRək* 'domesticated pig'	Fia. *bu*, Lag. *bo*, Maˈya ˈ*bo*^{3}, Wau. *bo*
PMP **dəŋəR* 'hear'	Biga *do*ˈ*no*, Gebe *lɔŋɔ*, Kawe ˈ*don[o]*, Lag. ˈ*don[o]*, Mat. *no*^{41}*ŋ*, Maˈya ˈ*do*^{12}*n*, Wau. ˈ*don[o]*
PMP **maqiRaq*, PCEMP **meRaq* 'red'	Biga *ma/*ˈ*me*, Fia. *me/me*, Kawe *me*, Maˈya (S.) *ma/*ˈ*me*^{3}, Wau. *me*
PMP **ma-Raŋaw* 'dry'	Gebe *maŋ*
PMP **niuR* 'coconut'	Biga *ni*, Kawe *nu*, Lag. *nu*, Mat. *nu*^{1}, Maˈya ˈ*nu*^{12}
PMP **Rəbək* 'to fly'	Ambel *-apo*, As *n/apɔ*, Biga *-o*ˈ*bo*, Fia. *-op*, Gebe *-opo*, Kawe *-*ˈ*op[o]*, Lag. *-*ˈ*op[o]*, Maˈya (S.) *-*ˈ*opo*^{3}, Wau. *-*ˈ*op[o]*
PMP **Rumaq* 'house'	Biga *um*, Gebe *um*, Kawe *um*, Maˈya ˈ*u*^{3}*m*
PMP **wahiR* 'fresh water'	Ambel *we*, As *we?*, Biga *wey*, Fia. *wey*, Gebe *wa*, Kawe ˈ*way[a]*, Lag. ˈ*way[a]*, Maˈya (S.) ˈ*waya*^{3}, Wau. ˈ*way[a]*
PMP **wakaR* 'root'	Mat. *wa*^{21}*/po*

Table 4.37: Reflexes of **R* in Raja Ampat.

PMP **buRbuR* 'rice porridge' > 'sago porridge'	Moor *vùvur-a*, Wrp. *vivir/o* Wmb. *boro-ro*
PMP **daRaq* 'blood'	Moor *ràra*, Wrp. *rara*, Yer. *rárà* Wmb. *ke-ra-ro*
PMP **niuR* 'coconut'	Moor *nér-a*, Wrp. *nivar/o*, Yer. *núì* Wmb. *nuan-do*, Yoke *ɲia*
PMP **qabaRa* 'carry on shoulder'	Moor *ovar-î*, Wrp. *avaro*, Yer. *áar/í*
PMP **qapuR* 'lime, calcium'	Biak *afər*, Dus. *aper*, Moor (A.) *áua*, Moor (H.) *ár-a*, Umar *au*, Yer. *áau*
PMP **Rəbək* 'to fly'	Biak *rob*, Wrp. *ro/ko* (?) Wmb. *dove*
PMP **Rumaq* 'house'	Biak *rum*, Dus. *rum*, Moor *rùma*, Umar *ron*, Wrp. *ruma*, Yaur *rúùg-ré* 'ceremonial house', Yer. *rúmà* 'ceremonial house'
PMP **wahiR* 'fresh water'	Ambai *waya* 'river', Biak *wār*, Dus. *war*, Kur. *way* 'river', Moor *gwàjar-a* 'river', SL *waya* 'river', Wrp. *ghai* Wmb. *war/en-do* 'river'
PMP **wakaR* 'root'	Ambai *-wa(sa)*, Pom *wa-wari*, Wan. *war*, Wooi *wari*, Wrp. *ghai, vai*

Table 4.38: Reflexes of **R* in Cenderawasih Bay and Mamberamo.

4.2.17 **m*

The usual outcome of **m* is *m* in all SHWNG languages (see Tables 4.39–4.41). There are divergent outcomes in several languages of Cenderawasih Bay. In Ambai and Umar, **m* > *n* word-finally. In Ansus, **m* > *ŋ* word-finally.[17] In Serui-Laut, Wandamen, and Waropen, **m* > ∅ word-finally.[18] In Yaur, **m* > *g* ~ *n* word-finally on nouns (see §4.2.20 for more details).

The sound changes attested in the outcomes of **m* are not sufficiently distinctive to be used in subgrouping arguments.[19] Word-final **m* is lost in several Western Yapen languages, but it is also present in a number of words, so the change could not have been complete in Proto-Western Yapen.

PMP **ənəm* 'six'	Buli *wonam*, Sawai *wonɛm*, Taba *-wonam*
PMP **kami* 'we (incl.)'	Buli *ame*, Gane *ame*, Sawai *am*, Taba *am*
PMP **lima* 'five'	Buli *lim*, Sawai *-lim*, Taba *-lim*
PCEMP **malip* 'laugh'	Buli *-mlif*, Gane *mlif*, Sawai *-mlif*, Taba *-(ha)mlih*
PMP **manuk* 'bird'	Buli *mani*, Gane *manik*, Sawai *manɛ*, Taba *manik* 'chicken'
PMP **ma-Ruqanay* 'man'	Buli *mān*, Gane *maón*, Sawai *mɔn*, Taba *mon*
PMP **m-atay* 'die'	Buli *mat*, Gane *mot*, Taba *-mot*
PMP **Rumaq* 'house'	Gane *um*, Sawai *um*
PMP **tanəm* 'to plant'	Gane *tonam*, Sawai *tɔnɛm*

Table 4.39: Reflexes of **m* in South Halmahera.

[17] Ansus shows irregular loss of **m* word-finally in PMP **qayam* > *aya* 'bird'.

[18] Ambai, Ansus, Umar, and Wandamen show irregular preservation of word-final **m* in their reflexes of PMP **tanəm* 'to plant'.

[19] The Yaur development is quite unusual, but it occurs in only one language.

PMP **ənəm* ‘six’	Ambel *wanom*, Biga *woˈnom*, Fia. *wonom*, Kawe *woˈnom*, Lag. *woˈnom*, Mat. *no^{12}m*, Maˈya (S.) *ˈwono^{3}m*, Wau. *woˈnom*
PMP **kami* ‘we (incl.)’	Ambel *am/ne*, As *am/ne*, Biga *am/on*, Gebe *am/ne*
PMP **lima* ‘five’	Ambel *lim*, Biga *lim*, Kawe *lim*, Lag. *ˈli^{3}m*, Mat. *li^{3}m*, Maˈya *ˈli^{3}m*, Wau. *lim*
PCEMP **malip* ‘laugh’	As *-meli/s*, Biga *-mlef*, Gebe *-mnif*
PMP **manuk* ‘bird’	Ambel *mani*, As *mani*, Biga *miˈni*, Fia. *min*, Gebe *mani*, Kawe *mani*, Lag. *ˈmin[i]*, Maˈya (S.) *ˈmini^{12}*, Wau. *ˈmin[i]*
PMP **ma-Ruqanay* ‘man’	Ambel *man*, As *-man*, Biga *wa/ˈman*, Gebe *man*, Kawe *ˈman[a]*, Lag. *ˈman[a]*, Mat. *wa^{3}y/ma^{21}n*, Maˈya *ˈma^{12}n*, Wau. *ˈman[a]*
PMP **m-atay* ‘die’	Ambel *-mat*, As *ma-ʔ*, Biga *mat*, Gebe *-mat*, Kawe *mat*, Mat. *ma^{12}t*, Maˈya *ˈma^{12}t*, Wau. *mat*
PMP **Rumaq* ‘house’	Biga *um*, Gebe *um*, Kawe *um*, Maˈya *ˈu^{3}m*
PMP **tanəm* ‘to plant’	Gebe *fa/tanam*

Table 4.40: Reflexes of **m* in Raja Ampat.

PMP **daləm* 'inside'	Ambai *roron*, Ansus *rarong*, Wan. *raro*
PMP **ənəm* 'six'	Ambai *wonan*, Ansus *wonang*, Biak *wonəm*, Wrp. *ghon/o*
PMP **kami* 'we (incl.)'	Ambai *amea*, Moor *ám-a*, SL *ama*, Umar *emi*, Wan. *ama(te)*, Wrp. *ami*, Yaur *ómí-'è*, Yer. *n/éemé* Wmb. *ami*
PMP **lima* 'five'	Ambai *rin*, Ansus *ring*, Biak *rim*, Dus. *rim/bi*, Moor *rím-ó*, Mun. *-rim*, SL *ri*, Wan. *rime*, Wrp. *rim/o*, Yer. *rîmà* Wmb. *rin/ti*, Yoke *-rim/si*
PCEMP **malip* 'laugh'	Ambai *miri*, Ansus *mari*, Biak *mbrif*, Moor *marí/'-a*, SL *mari*, Umar *mari*, Wan. *mari*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **ma-Ruqanay* 'man'	Ambai *man*, Ansus *muang*, Biak *man*, Dus. *sno/man*, SL *man*, Umar *no/man*, Wan. *mua[n]*, Wrp. *mano*, Yaur *jò/màg-ré*, Yer. *máànà* Wmb. *man-do*, Yoke *mamb-*
PMP **ma-tazəm* 'sharp'	Umar *mtan*
PMP **qayam* 'bird'	Ansus *aya*, SL *aya*, Wan. *aya*
PMP **Rumaq* 'house'	Biak *rum*, Dus. *rum*, Moor *rùma*, Umar *ron*, Wrp. *ruma*, Yaur *rúùg-ré* 'ceremonial house', Yer. *rúmà* 'ceremonial house'
PMP **tanəm* 'to plant'	Ambai *tana(m)*, Ansus *tanam/i*, Moor *'anam-î*, SL *tana*, Umar *tnam*, Wan. *tanam*, Wrp. *ana/ko*, Yaur *ì-'àm-né* 'I plant', Yer. *káamán/é*

Table 4.41: Reflexes of **m* in Cenderawasih Bay and Mamberamo.

4.2.18 **n* and **ñ*

These two proto-consonants are treated together, because they merge in all SHWNG languages. The regular outcome is *n* in all languages (see Tables 4.42–4.44).

In South Halmahera, there are two instances of irregular **n* > *ŋ* word-finally: Buli *ma-píŋ* 'woman' and Sawai *ŋɔsɛŋ* 'name'.

In the Raja Ampat language Gebe, **ñ* is irregularly preserved as *ñ* in the reflex of PMP **ma-ñawa* 'breathe'. There is also unexpected palatalization of **n* in the reflexes of PEMP **natu* 'child'.

In the Cenderawasih Bay language Ansus, **n* > *ŋ* word-finally.[20] In Wandamen and Yerisiam, there is a tendency towards word-final loss of **n*, similar to that observed for **m* above. In Yaur, **n* > *g* ~ *n* word-finally on nouns; there is also one case of **n* > *ʔ* (see §4.2.20 for more details).

[20]Ansus *tawan* 'a tree: *Pometia pinnata*' may be mistranscribed. It is derived from Blust (2014), while most other Ansus data are derived from Price and Donohue (2009).

As with **m*, these changes are not sufficiently distinctive to be used in subgrouping arguments.

PMP **añam* 'weave, plait'	Buli *yanam*, Sawai *-yɔnɛm*
PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Buli *ma-piŋ*, Gane *mapín*, Sawai *mɛpin*, Taba *mapin*
PMP **bulan* 'moon'	Taba *bulan*
PMP **bunuq* 'kill'	Buli *pun*, Gane *pun*, Sawai *-pun*, Taba *-pun*
PMP **ma-ñawa* 'breathe'	Gane *manow*, Taba *-manowo*
PMP **məñak* 'fat, grease'	Buli *mna*
PMP **ŋajan* 'name'	Buli *ŋasan*, Sawai *ŋɔsɛŋ*
PMP **tanəm* 'to plant'	Gane *tonam*, Sawai *tɔnɛm*
PMP **utaña* 'ask'	Buli *utan*

Table 4.42: Reflexes of **n* in South Halmahera.

PMP **banua* 'inhabited land' > 'village'	Biga *pnu*, Kawe *nu*, Lag. *nu*, Mat. *nu³*, Maˈya ˈ*pnu³*
PMP **bunuq* 'kill'	Ambel *buni*, As *-bun*, Biga *bun*, Fia. *bun*, Gebe *-pun*, Kawe *bun*, Lag. ˈ*bu³n*, Mat. *bu³n*, Maˈya ˈ*bu³n*, Wau. *bun, fal/*ˈ*pun*
PMP **ma-ñawa* 'breathe'	Gebe *-fa/ñawa/ya*
PMP **məñak* 'fat, grease'	Biga *maˈna(o)*, Fia. *mena*, Kawe *maˈna*, Lag. *maˈna*, Mat. *mna¹²*, Maˈya (S.) *maˈna³*, Wau. *maˈna*
PEMP **natu* 'child' > 'person'	Gebe *ñat*
PMP **niuR* 'coconut'	Biga *ni*, Kawe *nu*, Lag. *nu*, Mat. *nu¹*, Maˈya ˈ*nu¹²*
PMP **ŋajan* 'name'	As *gasɛn*, Biga *nan*, Fia. *nahan*, Gebe *ŋasn/ɔ-*, Kawe *nan*, Lag. *naˈhan*, Mat. *na²¹n*, Maˈya (S.) ˈ*nasa³n*, Wau. *nan*
PMP **pəñu* 'the green turtle, *Chelonia mydas*'	Biga *fin*, Kawe *fin*, Lag. *fin*, Mat. *fe³¹n*, Maˈya ˈ*fe³n*
PMP **tanəm* 'to plant'	Gebe *fa/tanam*
PMP **zalan* 'road'	As *alin*, Biga *liˈlin*, Kawe *liˈlin*, Lag. *liˈlin*, Maˈya (S.) ˈ*lili³n*

Table 4.43: Reflexes of **n* in Raja Ampat.

PMP **banua* 'inhabited land' > 'village'	Ansus *nu* 'world', Biak *mənu*, Dus. *munu/ai*, Moor *manù* 'forest', SL *nu* 'world', Umar *nu/ae*, Wrp. *nu*, Yaur *núù-ré*, Yer. *nú* Wmb. *bunu/pune* (?)
PMP **bulan* 'moon'	Moor *vùrin-a*, Yer. *úùrà*
PMP **bulaw-an* 'gold'	Biak *brawən*, Roon *barawan*, SL *barawan*
PMP **bunuq* 'kill'	Ambai *mun*, Ansus *muŋ*, Biak *mun*, Dus. *mun*, Moor *mun/â*, SL *mun*, Wan. *mun*, Wrp. *mun/a* Wmb. *muni-ro*, Yoke *mu*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **ma-ñawa* 'breathe'	Biak *mnasu*
PMP **məñak* 'fat, grease'	Ambai *ne-main*, Moor *mananá*, Umar *mnai*, Wan. *mai[n]*, Wrp. *mana*, Yaur *mnáa-rè*, Yer. *mì/mná*
PMP **niuR* 'coconut'	Moor *nér-a*, Wrp. *nivar/o*, Yer. *núì* Wmb. *nuan-do*, Yoke *ɲia*
PMP **nusa* 'island'	Ambai *nu*, Ansus *nu*, Biak *nus*, Moor *nút-a*, SL *nu*, Umar *nuh/man*, Wan. *nu*, Wrp. *nusa*, Yaur *nùh-ré*, Yer. *núùhà*
PMP **ŋajan* 'name'	Biak *nasan* 'title', Moor *nàtan-a*, Umar *han*, Wan. *san/o*, Wrp. *nasan/o*, Yaur *áhg-rè*, Yer. *áahán/à* Wmb. *nan-do*, Yoke *nand*
PMP **pəñu* 'the green turtle, *Chelonia mydas*'	Umar *ono*, Yer. *éenú*
PMP **tawan* 'a tree: *Pometia pinnata*'	Ambai *tawan*, Ansus *tawan*, Moor *kagwán-a*, Wan. *tawa*, Wrp. *kavan/o*
PMP **utaña* 'ask'	Ambai *utan*, Biak *f-ukən*, Dus. *p/utna*, Moor *u'unú*, SL *utana*, Wan. *uta*

Table 4.44: Reflexes of **n* in Cenderawasih Bay and Mamberamo.

4.2.19 **ŋ*

The regular outcome of **ŋ* is *ŋ* in South Halmahera (see Table 4.45).

In Raja Ampat languages, the outcome is generally *n*, but with two unexplained complications (see Table 4.46). In Gebe and Matbat, there is variation between *ŋ* and *n*. In As, there is one apparent case of **ŋ* > *g*: PMP **ŋajan* > *gasɛn* 'name'.

In Cenderawasih Bay and Mamberamo, the outcome is also generally *n* (see Table 4.47). The exceptions are Yaur and Yerisiam, where **ŋ* > ∅. In Yaur, there is also one case of **ŋ* > *ʔ* (see §4.2.20).

The change of **ŋ* > *n* is not distinctive enough to be used for subgrouping. However, the change of **ŋ* > ∅ is rather striking. This change provides additional support for

grouping Yaur and Yerisiam together in a single low-level subgroup (see §4.2.14).[21] This change must have preceded Yaur's final nasal changes (see §4.2.20).

PMP **bataŋ* 'fallen tree'	Buli *patŋ-o*
PMP **biŋaq* 'kind of volute shell'	Buli *piŋ*
PMP **buŋ* 'deep resounding sound' > 'heart'	Buli *puŋ*, Sawai *puŋ*
PMP **buŋa* 'flower'	Gane *bungan*, Taba *bungan*
PMP **dəŋəR* 'hear'	Buli *loŋa*, Gane *longa*, Sawai *-loŋɛ*, Taba *-ma/longo*
PMP **laŋit* 'sky'	Buli *laŋit*, Gane *laŋgit*, Sawai *laŋɛt*, Taba *langit*
PMP **ŋajan* 'name'	Buli *ŋasan*, Sawai *ŋɔsɛŋ*

Table 4.45: Reflexes of **ŋ* in South Halmahera.

PMP **bataŋ* 'fallen tree'	Fia. *batan* 'tree'
PMP **dəŋəR* 'hear'	Biga *doˈno*, Gebe *lɔŋɔ*, Kawe ˈ*don[o]*, Lag. ˈ*don[o]*, Mat. *no^{41}ŋ*, Maˈya ˈ*do^{12}n*, Wau. ˈ*don[o]*
PMP **laŋit* 'sky'	As *lanit*
PMP **ma-Raŋaw* 'dry'	Gebe *maŋ*
PMP **ŋajan* 'name'	As *gasɛn*, Biga *nan*, Fia. *nahan*, Gebe *ŋasn/ɔ-*, Kawe *nan*, Lag. *naˈhan*, Mat. *na^{21}n*, Maˈya (S.) ˈ*nasa^{3}n*, Wau. *nan*
PMP **taliŋa* 'ear'	As *tana*, Fia. *tena*, Maˈya *taˈna(o)*, Wau. *taˈna(o)*
PMP **taŋis* 'to cry'	As *-tanis*, Biga *-tinis*, Gebe *-tenis*

Table 4.46: Reflexes of **ŋ* in Raja Ampat.

[21] Umar, which shares common developments of **z* with Yaur and Yerisiam, apparently did not participate in this change.

PMP **duyuŋ* 'dugong'	Biak *rowin*, Moor *rún-a*, Wrp. *rui*, Yaur *rì'-ré*
PMP **hasaŋ* 'gills'	Biak *asən*
PMP **laŋaw* 'housefly'	Biak *ran*
PMP **laŋit* 'sky'	Biak *nanək*, Yer. *ráak/átè*
PMP **ma-diŋdiŋ* 'cold'	Umar *drin*
PMP **ŋajan* 'name'	Biak *nasan* 'title', Moor *nàtan-a*, Umar *han*, Wan. *san/o*, Wrp. *nasan/o*, Yaur *áhg-rè*, Yer. *áahán/à* Wmb. *nan-do*, Yoke *nand*
PMP **taliŋa* 'ear'	Ambai *tara-*, Biak *kna*, Moor *ìna*
PMP **taŋis* 'cry'	Biak *kanəs*, Moor *'ànit-a*, Wrp. *anis/a*, Yaur *'àáh-rè*, Yer. *káh/é*

Table 4.47: Reflexes of **ŋ* in Cenderawasih Bay and Mamberamo.

4.2.20 Final nasals in Yaur

Final nasal developments in Yaur are complex and require further discussion (see Table 4.48). I noted in §4.2.17 and §4.2.18 that **m* and **n* are reflected word-finally in Yaur as *g* ~ *n*. This variable outcome is part of a synchronic root alternation on nouns: the form with *g* occurs before the suffix *-re* (present in citation form among other contexts), while the form with *n* occurs when the noun is unsuffixed: thus, for example, *ròg-ré* 'ladder' versus *rón méhà* 'which ladder?'.

It is noteworthy that the *g* outcome is only attested on nouns. The most likely trigger of the sound change that led to this alternation is the *r* of the nominal suffix *-re*, which would have created a cluster with the root-final nasal.[22] Following **ŋ* > ∅ (§4.2.19), evidently the remaining nasals **m*, **n* > **ŋ* /_**r* (where **r* represents the outcome of the merger of PMP **d*, **l*, **R*). This change also must have followed final vowel loss (§4.2.32): thus, PMP **Rumaq* 'house' > **rum*, then **rum-re* > **ruŋ-re*. The conditioning environment is needed to explain why verb roots did not undergo the same change preceding nasals (*ì-'àm-né* 'I plant') or finally (*ì-'àm ìdí-e* 'I plant a banana tree').[23]

This nasal place change would have created a root alternation between suffixed and unsuffixed nouns (i.e., **ruŋ-re* versus **rum*). The suffixed alternant was extended to the unsuffixed environment, after which final **ŋ* > *n*: thus, **rum* → **ruŋ* > *rún* (the shafted arrow indicates an analogical change).

Meanwhile, the medial cluster in the suffixed form would have undergone stop epenthesis (**ruŋ-re* > **ruŋg-re*), followed by nasal cluster simplification (**ruŋg-re* > *rúùg-ré*).[24] The end result was the unusual *g* ~ *n* root alternation, which was not leveled.

[22]There are no *r*-initial verbal suffixes in Yaur.

[23]The conditioning would be more phonetically natural if **r* was a uvular fricative or trill, similar to PMP **R*. This is possible, but there is no independent evidence for it.

[24]See §5.3.3 for a discussion of vowel length and tonal developments.

Two words show exceptional developments: PMP **manuk* > *mà'-ré* 'bird' and PMP **duyuŋ* > *rì'-ré* 'dugong'. Apparently, final **n*, **ŋ* > *ʔ* in these words, which must have occurred prior to **ŋ* > ∅. There is no known explanation for this unusual development.

PMP **duyuŋ* 'dugong'	Yaur *rì'-ré*
PMP **haRəzan* 'ladder'	Yaur *ròg-ré*
PMP **mamaq* 'chew'	Yaur *í-jó'-màm-né* 'I chew'
PMP **manuk* 'bird'	Yaur *mà'-ré*
PMP **ma-Ruqanay* 'man'	Yaur *jò/màg-ré*
PMP **ŋajan* 'name'	Yaur *áhg-rè*
PMP **Rumaq* 'house'	Yaur *rúùg-ré* 'ceremonial house'
PMP **tanəm* 'to plant'	Yaur *ì-'àm-né* 'I plant'
–	Yaur *àág-rè* 'driftwood', cf. Umar *an*
–	Yaur *dràag-ré* 'leaf used to relieve pain', cf. Umar *dran*
–	Yaur *hìbòog-ré* 'cockroach', cf. Umar *hibom/brer*
–	Yaur *jáag-rè* 'year', cf. Yer. *jámà*
–	Yaur *rìg-ré* 'centipede', cf. Umar *rien*
–	Yaur *rîg-ré* 'language', cf. Moor *rían-a*, Yer. *árínà*
–	Yaur *tràg-ré* 'harpoon', cf. Moor *tarán-a*, Yer. *táráànà*

Table 4.48: Final nasal developments in Yaur.

4.2.21 Nasal–stop clusters

The medial clusters **mb*, **nt*, **nd*, and **ŋk* have distinct reflexes in some SHWNG languages (see Table 4.49).

In South Halmahera and Raja Ampat, the nasal serves to "protect" the following stop from undergoing sound changes it would otherwise be subject to (**b* > *p*, **d* > *l*, etc.). The nasal is subsequently deleted, leaving just the medial stop. Thus, for example, PCEMP **tumbuq* > Buli *tub*, not ***tup*.

In the Cenderawasih Bay languages Umar, Yaur, and Yerisiam, the effect is similar, at least for bilabial and alveolar clusters. The stop does not undergo sound changes it would otherwise be subject to (**t* > *k*, **d* > *r*, etc.). The nasal is subsequently deleted, leaving just the medial stop. In Yerisiam, the resulting stop is regularly voiceless; in Umar and Yaur, it is voiced. Thus, for example, PCEMP **kandoRa* > Yerisiam *átóòrà*, not ***áróòrà*. There is a parallel development in a single Moor word: *t* is preserved in **punti* > *hút-a*, instead of ***hú'-a*.

In the remaining Cenderawasih Bay and Mamberamo languages, the outcome of medial nasal clusters is apparently the same as the stop alone. For example, in Waropen, PMP **punti* 'banana' appears to have developed as follows: **punti* > **unti* > **unsi* > **usi* > **uhi* > *ui*.

Although many SHWNG languages share changes for medial nasal clusters, these changes are quite common cross-linguistically, and so cannot reliably be used for subgrouping.

PMP **Rambia* ‘sago palm’	Ambel *bey*, Biga *bi*, Maˈya ˈ*bi*^{3}
	Umar *abi*, Wrp. *fi*, Yer. *pí*
PMP **tu(m)buq*, PCEMP **tumbuq* ‘grow’	Buli *tub*, Gane *tub* ‘to live’, Sawai *-tub*, Taba *-an/tub* ‘to live’
	Gebe *-tub* ‘to live’
	Moor *ùvu* ‘branch’ (?)
PMP **bantun* ‘pull up, as out of a pit’	Biak *bakən*
PMP **punti* ‘banana’	Moor *hút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *pítí*
	Wmb. *uti-ro*, Yoke *si*
PCEMP **kandoRa* ‘cuscus, phalangerid’	Buli *do*
	Yer. *átóòrà*
PMP **buŋkul* ‘lump’	Buli *puk*
PEMP **beŋker* ‘defecate’	Buli *péke*
PCEMP **waŋka* ‘canoe’	Maˈya ˈ*wa*^{12}*k*
	Ambai *wa*, Ansus *wa*, Biak *wa(i)*, Dus. *wak*, Moor *gwá’-a*, Wrp. *gha*, Yer. *gwáà*
	Wmb. *wa-ro*, Yoke *wa/pi*

Table 4.49: Reflexes of nasal–stop clusters in SHWNG.

4.2.22 **y*

There is little evidence for the outcome of **y* in SHWNG. The available data suggests that it was generally preserved (see Tables 4.50–4.52). The diphthong **ay* tends to monophthongize to *e* or *i* in word-final position.

PMP **kahiw*, PCEMP **kayu* ‘wood’	Buli *ai*, Sawai *ay*, Taba *ai*
PMP **ma-hiaq*, PCEMP **mayaq* ‘ashamed’	Buli *ma*
PMP **qatay* ‘liver’	Buli *yatay*, Gane *yocu* (?), Sawai *yɔtɛy*, Taba *yoco* ‘heart’ (?)
PMP **waqay* ‘foot, leg’	Gane *we*, Taba *we*

Table 4.50: Reflexes of **y* in South Halmahera.

PMP **kahiw*, PCEMP **kayu* 'wood'	Ambel *ay*, As *a*, Biga *ay(o)*, Gebe *kai*, Kawe *w/ay(o)*, Maˈya *ˈai(o)*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	Gebe *moi*, Maˈya -ˈ*ma*^{3}
PMP **qatay* 'liver'	Ambel *latey*, Gebe *atai*, Kawe *laˈte(y)*, Lag. ˈ*lati*, Mat. *ta*^{21}*y*, Maˈya (S.) ˈ*lati*^{3}

Table 4.51: Reflexes of **y* in Raja Ampat.

PMP **duyuŋ* 'dugong'	Biak *rowin*, Moor *rún-a*, Wrp. *rui*, Yaur *rì'-ré*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	Biak *ma*, Umar *mae*, SL *mamaya*, Wan. *mamaya*, Yer. *mái*
PMP **qatay* 'liver'	Biak *ke/n*, Kur. *ate*, Moor *à'a*, Wan. *ate/ni*, Yer. *ákéè/nà*
PMP **qayam* 'bird'	Ansus *aya*, SL *aya*, Wan. *aya*
PMP **waqay* 'foot, leg'	Ambai *we*, Biak *we*, Dus. *we*, SL *aen*, Wan. *ai*, Wrp. *e*

Table 4.52: Reflexes of **y* in Cenderawasih Bay and Mamberamo.

4.2.23 **w*

The regular outcome of **w* is *w* in South Halmahera and Raja Ampat (see Tables 4.53 and 4.54). The only exception is PMP **siwa* > Taba *-sio* 'nine', where it is lost. Frequency may have played a factor here, or the intervocalic position of *w* preceding a rounded vowel.

In Cenderawasih Bay and Mamberamo, the outcome is also generally *w* (see Table 4.55). In Moor, Yaur, and Yerisiam, **w* is hardened to g^{w}.[25] In Waropen, the outcome is *ɣ* ~ *β* in the Waropen Kai dialect, and consistently *β* in the Napan dialect.

PMP **lawaq* 'spider'	Buli *kopo/law*, Gane *tapi/lou*, Sawai *lawalawa* 'spiderweb'
PEMP **qayawan* 'banyan'	Buli *yawan*
PMP **siwa* 'nine'	Taba *-sio*
PMP **wahiR* 'fresh water'	Buli *waya*, Gane *waya*, Sawai *wɔɛ*, Taba *woya*
PMP **wakaR* 'root'	Buli *wā*
PMP **waqay* 'foot, leg'	Gane *we*, Taba *we*
PMP **walu* 'eight'	Sawai *-wal*, Taba *-wal*
PCEMP **waRəj* 'vine, creeper' > 'rope'	Buli *wala*, Sawai *wɔlɛ*, Taba *wola*

Table 4.53: Reflexes of **w* in South Halmahera.

[25]The unrounding in PMP **wiRi* > Yerisiam *bá-giru* 'left (side)' is regular. Yerisiam does not permit /g^{w}/ before a high vowel, changing it to /g/.

PMP **lawaq* 'spider'	Gebe *p/law*
PMP **ma-ñawa* 'breathe'	Gebe *-fa/ñawa/ya*
PMP **wakaR* 'root'	Mat. *wa^{21}/po*
PMP **wahiR* 'fresh water'	Ambel *we*, As *we?*, Biga *wey*, Fia. *wey*, Gebe *wa*, Kawe ˈ*way[a]*, Lag. ˈ*way[a]*, Maˈya (S.) ˈ*waya^{3}*, Wau. ˈ*way[a]*
PCEMP **waRəj* 'vine, creeper' > 'rope'	As *wali?*, Biga *wili*, Gebe *wala*, Kawe *wala*

Table 4.54: Reflexes of **w* in Raja Ampat.

PMP **bulaw-an* 'gold'	Biak *brawən*, Roon *barawan*, SL *barawan*
PMP **qasawa* 'spouse'	Ansus *awa/ni*, Biak *swa-*, Wan. *sawa* 'husband'
PMP **siwa* 'nine'	Wrp. *sigh/iro*
PMP **tawan* 'a tree: *Pometia pinnata*'	Ambai *tawan*, Ansus *tawan*, Moor *kagwán-a*, Wan. *tawa*, Wrp. *kavan/o*
PMP **wahiR* 'fresh water'	Ambai *waya* 'river', Biak *wār*, Dus. *war*, Kur. *way* 'river', Moor *gwàjar-a* 'river', SL *waya* 'river', Wrp. *ghai* Wmb. *war/en-do* 'river'
PMP **wakaR* 'root'	Ambai *-wa(sa)*, Pom *wa-wari*, Wan. *war*, Wooi *wari*, Wrp. *ghai, vai*
PMP **walu* 'eight'	Biak *war*
PCEMP **waŋka* 'canoe'	Ambai *wa*, Ansus *wa*, Biak *wa(i)*, Dus. *wak*, Moor *gwá'-a*, SL *wa*, Wrp. *gha* Wmb. *wa-ro*, Yoke *wa/pi*
PMP **waqay* 'foot, leg'	Ambai *we*, Biak *we*, Dus. *we*, SL *aen*, Wan. *ai*, Wrp. *e*
PCEMP **waRəj* 'vine, creeper' > 'rope'	Ambai *wai*, Moor *gwàri/'-a*, SL *wai*, Umar *wari*, Yaur *gwàrí-e*, Yer. *gwáarí*
PMP **wiRi* 'left (side)'	Moor *sa/gwìri*, Yaur *vráa-gwìrì-e*, Yer. *bá-gírú*

Table 4.55: Reflexes of **w* in Cenderawasih Bay and Mamberamo.

4.2.24 **i*

The regular outcome of **i* is *i* in most SHWNG languages (see Tables 4.56–4.58).

In the South Halmahera language Sawai, **i* > *ɛ* in final unstressed syllables of polysyllabic words.[26]

The Raja Ampat language Biga shows irregular **i* > *e* in *-mlef* 'laugh'.

[26]Sawai stress is regularly penultimate, unless the penult contains *ɛ*, in which case it is final (Whisler and Whisler 1995: 1:661). *mɛpin* 'woman' thus has final stress.

In the Cenderawasih Bay languages Biak and Dusner, **i* is lowered in final closed syllables of polysyllabic words. The outcome is *ə* ~ *e* in Biak and *e* in Dusner.[27]

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Buli *ma-piŋ*, Gane *mapín*, Sawai *mɛpin*, Taba *mapin*
PMP **bisik* 'sick'	Buli *pisi*, Sawai *-pisɛ*
PMP **hikan*, PEMP **ikan* 'fish'	Buli *ian*, Gane *ian*, Sawai *in*
PMP **laŋit* 'sky'	Buli *laŋit*, Gane *langit*, Sawai *laŋɛt*, Taba *langit*
PMP **lima* 'five'	Buli *lim*, Sawai *-lim*, Taba *-lim*
PCEMP **malip* 'laugh'	Buli *-mlif*, Gane *mlif*, Sawai *-mlif*, Taba *-(ha)mlih*
PMP **ma-nipis* 'thin (materials)'	Buli *m-lifis*, Gane *manifis*, Sawai *-mɛnifɛs*, Taba *mnihis*
PMP **ma-pia* 'good'	Buli *ma-fia*, Gane *fia*, Taba *hia*
PMP **taŋis* 'to cry'	Buli *taŋis*, Gane *tangis*

Table 4.56: Reflexes of **i* in South Halmahera.

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Ambel *bin*, Biga *wa/ˈbin*, Fia. *bin*, Gebe *mapin*, Kawe *pin*, Lag. *pin*, Maˈya *ˈpi³n*, Wau. *pin*
PMP **hikan*, PEMP **ikan* 'fish'	Gebe *in*, Kawe *ˈin[i]*, Mat. *yi¹n*, Maˈya (M.) *ˈi¹²n*
PMP **laŋit* 'sky'	As *lanit*
PMP **lima* 'five'	Ambel *lim*, Biga *lim*, Kawe *lim*, Lag. *ˈli³m*, Mat. *li³m*, Maˈya *ˈli³m*, Wau. *lim*
PCEMP **malip* 'laugh'	As *-meli/s*, Biga *-mlef*, Gebe *-mnif*
PMP **ma-pia* 'good'	As *fi*, Biga *fi*, Fia. *fiy*, Kawe *fi*, Lag. *fi*, Mat. *fi³*, Maˈya *ˈfi³*, Wau. *fi*
PMP **taŋis* 'cry'	As *-tanis*, Biga *-tinis*, Gebe *-tenis*

Table 4.57: Reflexes of **i* in Raja Ampat.

[27]The variation in Biak is prosodically conditioned. The vowel is realized as *ə* (or ∅) unless the word falls at the end of an intonational phrase, in which case the final syllable is stressed and the vowel is realized as *e* (van den Heuvel 2006: 27).

PMP **ba-b‹in›ahi*, PCEMP **b‹in›ai* 'woman'	Ambai *vivin*, Biak *bin*, Moor *vavín-a*, Umar *ing/go*, SL *vavin*, Wan. *vavi*, Wrp. *bino*, Yer. *îînà* Wmb. *bin-do*
PMP **bitil* 'hungry'	Ambai *wa/wisi*, Ansus *wawi*, Biak *bisər*, Dus. *m/buser*, Wan. *va/wisi*
PMP **hikan*, PEMP **ikan* 'fish'	Biak *in*, Dus. *in*, Moor (H.) *ìjana*
PMP **laŋit* 'sky'	Biak *nanək*, Yer. *ráak/átè*
PMP **lima* 'five'	Ambai *rin*, Ansus *ring*, Biak *rim*, Dus. *rim/bi*, Moor *rím-ó*, Mun. *-rim*, SL *ri*, Wan. *rime*, Wrp. *rim/o*, Yer. *rîîmà* Wmb. *rin/ti*, Yoke *-rim/si*
PCEMP **malip* 'laugh'	Ambai *miri*, Ansus *mari*, Biak *mbrif*, Moor *marí/'-a*, SL *mari*, Umar *mari*, Wan. *mari*
PMP **punti* 'banana'	Moor *hút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *pítí* Wmb. *uti-ro*, Yoke *si*
PMP **qasin* 'saltiness' > 'salt'	Ambai *ai*, Ansus *ai*, Biak *m/asən*, Dus. *m/asen*, Wan. *s/asi*
PMP **qubi* 'yam, *Dioscorea*'	Ambai *uvi*, Wan. *uwi*, Wrp. *uvi*
PMP **taŋis* 'cry'	Biak *kanəs*, Moor *'ànit-a*, Wrp. *anis/a*, Yaur *'àáh-rè*, Yer. *káh/é*

Table 4.58: Reflexes of **i* in Cenderawasih Bay and Mamberamo.

4.2.25 **u*

The usual outcome of **u* in SHWNG is *u* in originally non-final syllables, and *u* ~ *i* in final syllables (see Tables 4.59–4.61). There are no attested cases of the *i* outcome in Fiawat, Matbat, Moor, Umar, and Yoke; this may simply reflect an artifact of the available data.

In the South Halmahera language Sawai, **u* > **i* > *ɛ* in final syllables, according to the same rule described in §4.2.24 above.

The Raja Ampat language Biga shows irregular **u* > *o* in *kalof* 'rat', paralleling the irregular change mentioned in §4.2.24 above. There is similar sporadic lowering in Raja Ampat reflexes of PMP **qitəluR* 'egg'; Umar *e-tro* 'three'; and Yaur *óò-jé* 'louse'.

In the Cenderawasih Bay languages Biak and Dusner, **u* is lowered and fronted in final closed syllables of polysyllabic words. The outcome is *ə* ~ *e* in Biak[28] and *e* in Dusner. Lowering does not occur, apparently irregularly, in PMP **duyuŋ* > Biak *rowin* 'dugong'.

Umar, Yaur, and Yerisiam share an irregular change of **u* > *i* in the first syllable of PMP **punti* 'banana'. This provides additional evidence that these languages belong to the same low-level subgroup (see §4.2.14 and §4.2.19). However, the argument is weakened somewhat when we consider that the three languages are geographically proximate and in contact, making it difficult to rule out borrowing.

[28]See footnote 27 on the previous page for the conditioning of the two Biak outcomes.

It is noteworthy that there is some agreement in which words undergo the irregular **u* > *i* change: it occurs in reflexes of PMP **manuk* 'bird' and PMP **bunuq* 'kill' in widely separated SHWNG languages. This cannot be used as evidence for a SHWNG subgroup, but it provides good evidence for the unity of SHWNG.

Another shared irregularity is found in Sawai, Serui-Laut, and Warembori, which all show unexpected penultimate **u* > *i* in reflexes of PMP **kutu* 'louse'. It is not clear whether this happened independently. In any case, a subgroup of these three languages is not defensible on such a slim basis, especially given the much stronger evidence for deriving Serui-Laut from Proto-Western Yapen.

PMP **bulu* 'feather, body hair'	Buli *plu*, Sawai *plu*
PMP **bunuq* 'kill'	Buli *pun*, Gane *pun*, Sawai *-pun*, Taba *-pun*
PMP **duha* 'two'	Buli *lu*, Gane *p/lu*, Sawai *-lu*, Taba *-lu*
PCEMP **kazupay* 'rat'	Buli *luf*, Gane *luf*, Sawai *luf*
PMP **kutu* 'louse'	Buli *ut*, Gane *kut*, Sawai *kit*, Taba *kut*
PMP **manuk* 'bird'	Buli *mani*, Gane *manik*, Sawai *manɛ*, Taba *manik* 'chicken'
PMP **Rumaq* 'house'	Gane *um*, Sawai *um*
PMP **susu* 'female breast'	Buli *sus*, Gane *susu*, Sawai *sus*, Taba *susu*

Table 4.59: Reflexes of **u* in South Halmahera.

PMP **bunuq* 'kill'	Ambel *buni*, As *-bun*, Biga *bun*, Fia. *bun*, Gebe *-pun*, Kawe *bun*, Lag. *ˈbu³n*, Mat. *bu³n*, Maˈya *ˈbu³n*, Wau. *bun, fal/ˈpun*
PMP **duha* 'two'	Ambel *low*, As *lu*, Biga *lu*, Gebe *-lu*, Lag. *ˈlu³*, Mat. *lu³*, Maˈya *ˈlu³*, Wau. *lu*
PCEMP **kazupay* 'rat'	Biga *kalof*, Maˈya *keluf*
PMP **kutu* 'louse'	Ambel *ut*, Biga *wut*, Fia. *wut*, Gebe *ut*, Kawe *wut*, Lag. *wut*, Mat. *wu³t*, Maˈya (S.) *ˈu³t*, Wau. *wut*
PMP **manuk* 'bird'	Ambel *mani*, As *mani*, Biga *miˈni*, Fia. *min*, Gebe *mani*, Kawe *mani*, Lag. *ˈmin[i]*, Maˈya (S.) *ˈmini¹²*, Wau. *ˈmin[i]*
PMP **qitəluR* 'egg'	Ambel *talo*, As *talɔ*, Biga *toˈlo*, Fia. *tol*, Kawe *ˈtol[o]*, Lag. *ˈtol[o]*, Mat. *to²¹l*, Maˈya (S.) *ˈto¹²l*, Wau. *ˈtol[o]*
PMP **Rumaq* 'house'	Biga *um*, Gebe *um*, Kawe *um*, Maˈya *ˈu³m*
PMP **susu* 'female breast'	Ambel *su*, As *sus*, Biga *sus*, Gebe *sus*, Kawe *su*, Lag. *ˈtut[u]*, Mat. *su³*, Maˈya *ˈsu³s*, Wau. *su*

Table 4.60: Reflexes of **u* in Raja Ampat.

PMP **bantun* 'pull up, as out of a pit'	Biak *bakən*
PMP **bulu* 'feather, body hair'	Ambai *na-wa/vuru*, Moor *vùru*, Umar *uru*, Wrp. *vuro*, Yer. *úurú-gùa* Wmb. *ke-vun-do*, Yoke *bo*
PMP **bunuq* 'kill'	Ambai *mun*, Ansus *mung*, Biak *mun*, Dus. *mun*, Moor *mun/â*, SL *mun*, Wan. *mun*, Wrp. *mun/a* Wmb. *muni-ro*, Yoke *mu*
PMP **duha* 'two'	Ambai *-ru*, Biak *su/ru*, Dus. *nu/ru*, Moor *rú-ró*, Umar *e-dih*, Wan. *muan/du*, Wrp. *vo/ru*, Yaur *ré-dú-hè*, Yer. *rúu-hí*
PMP **duyuŋ* 'dugong'	Biak *rowin*, Moor *rún-a*, Wrp. *rui*, Yaur *rì'-ré*
PMP **kutu* 'louse'	Ansus *utu*, Biak *uk*, Moor (A.) *ú'-a*, Moor (H.) *kú'-a*, SL *itu*, Umar *utu*, Wrp. *ghui, vui*, Yaur *óò-jé* Wmb. *ki-ro*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **ma-takut* 'afraid'	Ambai *matai*, Ansus *matai*, Biak *mkāk*, Dus. *mtat*, Moor (A.) *mu'á'-a*, Moor (H.) *muká'-a*, SL *maitai*, Umar *mtat*, Wan. *matai(t)*, Wrp. *akak/o*, Yer. *ngkák/é*
PMP **punti* 'banana'	Moor *hút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *píití* Wmb. *uti-ro*, Yoke *si*
PMP **qapuR* 'lime, calcium'	Biak *afər*, Dus. *aper*, Moor (A.) *áua*, Moor (H.) *ár-a*, Umar *au*, Yer. *áau*
PMP **Rumaq* 'house'	Biak *rum*, Dus. *rum*, Moor *rùma*, Umar *ron*, Wrp. *ruma*, Yaur *rúùg-ré* 'ceremonial house', Yer. *rúmà* 'ceremonial house'
PMP **susu* 'female breast'	Ambai *ui*, Ansus *u*, Biak *sus*, Moor *tút-a*, Umar *huhu*, SL *su*, Wan. *susu*, Wrp. *susu*, Yaur *húhì-e*, Yer. *húuhú-gùa* Wmb. *ke-tutu-ro*
PMP **təlu* 'three'	Ambai *-toru*, Ansus *toru*, Dus. *tori*, Moor *ór-ó*, Umar *e-tro*, Wan. *toru*, Wrp. *or-o*, Yer. *kóorí-hé*
PMP **tunu* 'roast food over a fire'	Biak *kun*, Dus. *un*, Moor *'un-î*, SL *tunu*, Yaur *'ún-dè*, Yer. *kúun-á* Wmb. *kuni*

Table 4.61: Reflexes of **u* in Cenderawasih Bay and Mamberamo.

4.2.26 **a*

The regular outcome of **a* is *a* in the South Halmahera language Buli (see Table 4.62). In Gane, Taba, and Sawai, there is a tendency to raise **a*, with an outcome of *o* in Gane and Taba and *ɔ* ~ *ɛ* in Sawai. Gane, Taba, and Sawai generally show agreement regarding which words undergo the change, though the conditioning factors are unclear.

In Raja Ampat, the outcome is generally *a* (see Table 4.63). There is a tendency to monophthongize **ai* > *e* in reflexes of PMP **wahiR* 'fresh water'. The reflexes of PMP **manuk* 'bird' show irregular **a* > *i* in several languages. As *gasɛn* 'name' shows irregular **a* > *ɛ*.

In Cenderawasih Bay and Mamberamo, the outcome is also generally *a* (see Table 4.64). In Biak (and probably Dusner, but evidence is lacking), **a* > *ə* ~ *e* in final closed syllables of polysyllabic words.[29] Additional examples include PMP **bulaw-an* > *brawən* 'gold', PMP **habaRat* 'south' > *barək* 'west', PMP **hasaŋ* > *asən* 'gills', PMP **uRat* 'root' > *urək* 'vein, vessel', and PMP **laman* > *ramən* 'deep'. The only known exception is PMP **ŋajan* 'name' > *nasan* 'title'.

The raising change in Gane, Sawai, and Taba could plausibly be used to support a subgroup. It is unusual in the context of SHWNG, and the agreement among affected lexical items lends considerable weight to its status as a shared innovation, especially given the lack of clear conditioning. The geographical distribution of the **a* > *o* change is in fact both wider and narrower than it would appear from Table 4.62. Adriani and Kruyt (1914: 3:335) note that it is found in Maba and Patani, apparently in the same words as the other languages. Inspection of Teljeur (1982) shows that it is *not* found in the Southeast Makian dialect of Taba, spoken in the villages of Samsuma, Peleri, Tahane, and Soma.

A putative subgroup containing the languages undergoing the raising change would be incompatible with Blust (1978a)'s subgroups Central-Eastern (including Buli, Patani, Maba, and Sawai) and Southern (including Gane and Taba). The fact that a single language, Taba, shows different outcomes among its dialects suggests that the change may have spread via diffusion rather than common inheritance.

Two considerations support this analysis. First, the affected languages are found in a geographically contiguous area, with Taba and Buli at each extreme. Second, there is evidence that the Southeast Makian dialect of Taba has a different history than the rest of Taba. Andaya (1993: 95) states that many of the original inhabitants of Gane were deported to repopulate Makian after the Spanish conquest of Ternate in 1606; Bowden (2001: 8) claims that they settled in Tahane. This dialect may therefore represent a relic area, preserving original features that were lost elsewhere.

I therefore assume that the raising change spread via diffusion, and does not define a subgroup. Based on tentative historical evidence, it most likely reached Gane after 1606.

[29] See footnote 27 on page 72 for the conditioning of the two Biak outcomes.

PMP **añam* ‘weave, plait’	Buli *yanam*, Sawai *-yɔnɛm*
PMP **asa*, **isa*, **əsa* ‘one’	Buli *asa, isa*, Gane *p/so*, Sawai *-sɔ*, Taba *-so*
PMP **daRaq* ‘blood’	Buli *la*, Sawai *lɛlɔ*, Taba *llo*
PMP **əpat*, PEMP **pat* ‘four’	Buli *fat*, Gane *-fot*, Sawai *-fɔt*, Taba *-hot*
PMP **haRəzan* ‘notched log ladder’	Buli *olan* ‘ladder’, Sawai *lon*
PMP **kahiw*, PCEMP **kayu* ‘wood’	Buli *ai*, Sawai *ay*, Taba *ai*
PMP **laŋit* ‘sky’	Buli *laŋit*, Gane *laŋgit*, Sawai *laŋɛt*, Taba *laŋgit*
PMP **manuk* ‘bird’	Buli *mani*, Gane *manik*, Sawai *manɛ*, Taba *manik* ‘chicken’
PMP **ma-Ruqanay* ‘man’	Buli *mān*, Gane *maón*, Sawai *mɔn*, Taba *mon*
PMP **mata* ‘eye’	Buli *mta*, Gane *mto*, Sawai *mtɔ*, Taba *mto*
PMP **m-atay* ‘die’	Buli *mat*, Gane *mot*, Taba *-mot*
PMP **ŋajan* ‘name’	Buli *ŋasan*, Sawai *ŋɔsɛŋ*
PMP **qatəp* ‘roof’	Buli *yataf*, Gane *yotaf*, Sawai *yɔtɛf*
PMP **quzan* ‘rain’	Buli *ulan*, Gane *ulan*, Taba *ulan*
PMP **siwa* ‘nine’	Taba *-sio*
PMP **wahiR* ‘fresh water’	Buli *waya*, Gane *waya*, Sawai *wɔɛ*, Taba *woya*
PMP **walu* ‘eight’	Sawai *-wal*, Taba *-wal*

Table 4.62: Reflexes of **a* in South Halmahera.

PMP **asa*, **isa*, **əsa* ‘one’	As *sa*, Gebe *-sa*, Maˈya (S.) *ˈsa*
PMP **əpat*, PCEMP **pat-i*, PEMP **pat* ‘four’	Ambel *ɸat*, As *fat*, Biga *fat*, Gebe *pi-fat*, Lag. *fat*, Maˈya *ˈfa^{12}t*
PMP **kahiw*, PCEMP **kayu* ‘wood’	Ambel *ay*, As *a*, Biga *ay(o)*, Gebe *kai*, Kawe *w/ay(o)*, Maˈya *ˈai(o)*
PMP **manuk* ‘bird’	Ambel *mani*, As *mani*, Biga *miˈni*, Fia. *min*, Gebe *mani*, Kawe *mani*, Lag. *ˈmin[i]*, Maˈya (S.) *ˈmini^{12}*, Wau. *ˈmin[i]*
PMP **ma-Ruqanay* ‘man’	Ambel *man*, As *-man*, Biga *wa/ˈman*, Gebe *man*, Kawe *ˈman[a]*, Lag. *ˈman[a]*, Mat. *wa^{3}y/ma^{21}n*, Maˈya *ˈma^{12}n*, Wau. *ˈman[a]*
PMP **m-atay* ‘die’	Ambel *-mat*, As *ma-ʔ*, Biga *mat*, Gebe *-mat*, Kawe *mat*, Mat. *ma^{12}t*, Maˈya *ˈma^{12}t*, Wau. *mat*
PMP **ŋajan* ‘name’	As *gasɛn*, Biga *nan*, Fia. *nahan*, Gebe *ŋasn/ɔ-*, Kawe *nan*, Lag. *naˈhan*, Mat. *na^{21}n*, Maˈya (S.) *ˈnasa^{3}n*, Wau. *nan*
PMP **qatəp* ‘roof’	Gebe *yataf*
PMP **wahiR* ‘fresh water’	Ambel *we*, As *weʔ*, Biga *wey*, Fia. *wey*, Gebe *wa*, Kawe *ˈway[a]*, Lag. *ˈway[a]*, Maˈya (S.) *ˈwaya^{3}*, Wau. *ˈway[a]*

Table 4.63: Reflexes of **a* in Raja Ampat.

PMP **añam* 'weave, plait'	Biak *yanəm*, Yer. *áamán/é*
PMP **asa*, **isa*, **əsa* 'one'	Biak *sai*, Moor *ta-tá*, Wan. *esa*
PMP **daRaq* 'blood'	Moor *ràra*, Wrp. *rara*, Yer. *rárà* Wmb. *ke-ra-ro*
PMP **əpat*, PCEMP **pat-i*, PEMP **pat* 'four'	Ambai *-a*, Biak *fiak*, Dus. *pati*, Marau *ati*, Moor á'-ó, SL *-a*, Umar *eat*, Wan. *at*, Wrp. *ak/o*, Yaur *r-ía-hè*, Yer. *áak/à*
PMP **hapən* 'fishing line'	Biak *yafən* 'harpoon'
PMP **kahiw*, PCEMP **kayu* 'wood'	Ambai *ai*, Ansus *ai*, Biak *ai*, Dus. *ai*, Moor *ka/'úat-a*, SL *ai*, Umar *ae*, Wan. *ai*, Wrp. *ai*, Yaur *à-jé*, Yer. *âì* Wmb. *ayo-ro*, Yoke *a*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **ŋajan* 'name'	Biak *nasan* 'title', Moor *nàtan-a*, Umar *han*, Wan. *san/o*, Wrp. *nasan/o*, Yaur *áhg-rè*, Yer. *áahán/à* Wmb. *nan-do*, Yoke *nand*
PMP **qatəp* 'roof'	Moor *r/à'a*, Wrp. *aka*, Yer. *áká-ráaníà*
PMP **wahiR* 'fresh water'	Ambai *waya* 'river', Biak *wār*, Dus. *war*, Kur. *way* 'river', Moor *gwàjar-a* 'river', SL *waya* 'river', Wrp. *ghai* Wmb. *war/en-do* 'river'

Table 4.64: Reflexes of **a* in Cenderawasih Bay and Mamberamo.

4.2.27 Insertion of *y* before initial **a*

The glide *y* is sporadically inserted before initial **a* in a number of SHWNG languages (see Table 4.65). Blust (1978a) has observed that glide insertion must have occurred after the loss of **q* and **h*, since words with initial **q* and **h* are also affected. Likewise, it must have occurred after the loss of **z* in Umar and Yerisiam (see §4.2.14). In Moor, Umar, Yaur, and Yerisiam, the inserted initial **y* was later strengthened to *ʤ*. In Raja Ampat languages other than As, Gebe, and Matbat, this initial **y* was strengthened to *l*.

Glide insertion is a puzzling change. The conditioning environment is unexpected, making it a sufficiently unusual change to be plausibly used for subgrouping. However, the distribution of glide insertion bears no apparent relationship to subgroups established by other means. Its emergence may be the result of an areal tendenacy, as it is also found in the CMP languages Arguni and Sekar, spoken on the Bomberai peninsula on the west coast of New Guinea.[30]

The glide strengthening changes are of somewhat less plausible subgrouping value. Each is found in a small set of geographically contiguous languages, raising the possibility of diffusion rather than shared inheritance. Of the two changes, **y* > *l* is more distinctive,

[30]Examples are PMP **asu* > Sekar *yasi* 'dog', and PMP **hapuy* > Arguni *yaf*, Sekar *yafi* 'fire'.

and provides some support for grouping Ambel, Biga, Fiawat, and the various dialects of Ma'ya.

PMP **añam* 'weave, plait'	Buli *yanam*, Sawai *-yɔnɛM* Biak *yanəm*
PMP **hapuy*, PCEMP **api* 'fire'	Buli *yap* Ambel *lap*, As *yap*, Biga *lap*, Fia. *lap*, Gebe *yap*, Kawe *lap*, Lag. *lap*, Mat. *ya³p*, Ma'ya *'la¹²p*, Wau. *lap* Yer. *jáai*
PMP **hasaq* 'whet, sharpen'	Ansus *asa/sumi*, Biak *yās*, SL *aa*, Yer. *áhà*
PMP **(q)aRuhu* 'a shore tree: *Casuarina equisetifolia*'	Ambai *-yaru*, Biak *yār*, Moor *jàru/r-a*, Umar *jaru*, Wan. *yaru*, Yaur *jàr-murí-e*
PMP **qasu* 'smoke'	Buli *mama/yás*, Gane *n/yas*, Sawai *mɛ/yas*, Taba *yas/o* As *kap/yas*, Biga *ka'p/las*, Gebe *ma/yas*, Ma'ya *'la¹²s* Biak *ās* 'to smoke (of a fire)', Wrp. *asi*, Yer. *ógw/áahú-gùa*
PMP **qatay* 'liver'	Buli *yatay*, Gane *yocu* (?), Sawai *yɔtɛy*, Taba *yoco* 'heart' (?) Ambel *latey*, Gebe *atai*, Kawe *la'te(y)*, Lag. *'lati*, Mat. *ta²¹y*, Ma'ya (S.) *'lati³* Biak *ke/n*, Kur. *ate*, Moor *à'a*, Wan. *ate/ni*, Yer. *ákéè/nà*

Table 4.65: Initial glide insertion in SHWNG.

4.2.28 **ə*

The outcome of **ə* depends on whether it was originally in the penultimate or final syllable. This is most likely because of a stress difference in Proto-SHWNG: the penultimate syllable was stressed, the final unstressed (§5.4).

In South Halmahera, the regular outcome is *o* in the penult (see Table 4.66). In Buli, Gane, and Taba, the regular outcome is *a* in the final; in Sawai, it is *ɛ*.

The situation in Raja Ampat is more complex (see Table 4.67). The outcome of **ə* harmonizes with the other vowel in the word if one is present.[31] Otherwise, the outcome is penultimate syllable *a* and final syllable *o/ɔ* in Ambel and As, and general *o* in the other Raja Ampat languages.[32]

In Cenderawasih Bay and Mamberamo, outcomes are similar to South Halmahera. Penultimate syllable **ə* > *o* in all languages.[33] Final syllable **ə* is reflected as *ə* ~ *e*

[31]Examples are reflexes of PMP **məñak* 'fat, grease'; PMP **qatəp* 'roof'; PCEMP **qenəp* 'lie down to sleep'; PMP **qitəluR* 'egg'; and PMP **tanəm* 'to plant'. The only exception is PMP **lipən* 'tooth', perhaps because the other vowel is *i*. There is no evidence for harmony in Matbat, due to its tendency towards monosyllabicity.

[32]The discrepancy betwen Gebe *ɔ* and *o* is due to a transcriptional difference in the two sources consulted.

[33]Reflexes of **pəñu* 'the green turtle, *Chelonia mydas*' generally have *e* or *i* instead, as first noted by Blust (1978a).

in Biak;[34] *e* in Dusner; *e* ~ *a* in Warembori (on the basis of two words, neither very conclusive); and *a* in the remaining languages.

The development of **ə* in Raja Ampat sets these languages apart from other SHWNG languages. This phonological innovation could be used as a starting point in arguing for Proto-Raja Ampat, with the possible exclusion of Ambel and As.

The developments shared by Biak and Dusner in the final syllable outcomes of **u*, **i*, and **ə* are striking, and provide good additional support for the Biakic subgroup.

PMP **ənəm* 'six'	Buli *wonam*, Sawai *wonɛm*, Taba *-wonam*
PMP **hapən* 'fishing line'	Buli *yafan* 'harpoon'
PMP **haRəzan* 'notched log ladder'	Buli *olan* 'ladder'
PMP **qatəp* 'roof'	Buli *yataf*, Gane *yotaf*, Sawai *yɔtɛf*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	Sawai *-yɛnɛf*
PMP **Rəbək* 'to fly'	Buli *opa*, Gane *opa*, Sawai *-opɛ*, Taba *-opa*
PMP **tanəm* 'to plant'	Gane *tonam*, Sawai *tɔnɛm*
PMP **təbuh* 'sugarcane'	Buli *top*, Sawai *tep*
PMP **təlu* 'three'	Sawai *-tel*, Taba *-tol*

Table 4.66: Reflexes of **ə* in South Halmahera.

[34] See footnote 27 on page 72 for the conditioning of the two Biak outcomes.

PMP **dəŋəR* ‘hear’	Biga *do^{l}no*, Gebe *lɔŋɔ*, Kawe ^{l}*don[o]*, Lag. ^{l}*don[o]*, Mat. *no^{41}ŋ*, Ma^{l}ya ^{l}*do^{12}n*, Wau. ^{l}*don[o]*
PMP **ənəm* ‘six’	Ambel *wanom*, Biga *wo^{l}nom*, Fia. *wonom*, Kawe *wo^{l}nom*, Lag. *wo^{l}nom*, Mat. *no^{12}m*, Ma^{l}ya (S.) ^{l}*wono^{3}m*, Wau. *wo^{l}nom*
PMP **lipən* ‘tooth’	Biga *lifo-*, Kawe *a-^{l}lif(o)*, Lag. *a-^{l}lif(o)*, Ma^{l}ya (S.) *ka-^{l}lif(o)*, Wau. *la-^{l}lif*
PMP **ma-pənuq* ‘full’	Ambel *an/hon*, Biga *fon*, Fia. *fon*, Kawe *fon*, Lag. *fon*, Mat. *fo^{3}n*, Ma^{l}ya ^{l}*fo^{12}n*
PMP **məñak* ‘fat, grease’	Biga *ma^{l}na(o)*, Fia. *mena*, Kawe *ma^{l}na*, Lag. *ma^{l}na*, Mat. *mna^{12}*, Ma^{l}ya (S.) *ma^{l}na^{3}*, Wau. *ma^{l}na*
PMP **qatəp* ‘roof’	Gebe *yataf*
PMP **qinəp*, PCEMP **qenəp* ‘lie down to sleep’	Ambel *-ane*, Biga *-e^{l}nef*, Fia. *-ene*, Gebe *yenɛf*, Kawe *-e^{l}nef*, Lag. *-^{l}enef*, Ma^{l}ya (S.) *-^{l}ene^{3}f*, Mat. *-e^{41}n*, Wau. *-^{l}enef*
PMP **qitəluR* ‘egg’	Ambel *talo*, As *talɔ*, Biga *to^{l}lo*, Fia. *tol*, Kawe ^{l}*tol[o]*, Lag. ^{l}*tol[o]*, Mat. *to^{21}l*, Ma^{l}ya (S.) ^{l}*to^{12}l*, Wau. ^{l}*tol[o]*
PMP **Rəbək* ‘to fly’	Ambel *-apo*, As *n/apɔ*, Biga *-o^{l}bo*, Fia. *-op*, Gebe *-opo*, Kawe *-^{l}op[o]*, Lag. *-^{l}op[o]*, Ma^{l}ya (S.) *-^{l}opo^{3}*, Wau. *-^{l}op[o]*
PMP **tanəm* ‘to plant’	Gebe *fa/tanam*

Table 4.67: Reflexes of **ə* in Raja Ampat.

PMP **bəRsay* ‘canoe paddle’	Ambai *bo, wo*, Ansus *bo, wo*, Biak *-borəs*, Dus. *vors*, Moor *vór-a*, SL *bo*, Wan. *bo, vo*
PMP **ənəm* ‘six’	Ambai *wonan*, Ansus *wonang*, Biak *wonəm*, Wrp. *ghon/o*
PMP **hapən* ‘fishing line’	Biak *yafən* ‘harpoon’
PMP **qinəp*, PCEMP **qenəp* ‘lie down to sleep’	Ambai *ena*, Ansus *ena*, Biak *enəf*, Dus. *enep*, Moor *enâ*, SL *ena*, Wan. *ena*, Wrp. *ena-ko*, Yer. *éen/é* Wmb. *na/n-do*
PMP **qitəluR* ‘egg’	Umar *tor*, Yaur *òó’-rè* (?), Yer. *á/kóor/é*
PMP **Rəbək* ‘to fly’	Biak *rob*, Wrp. *ro/ko* Wmb. *dove*
PMP **tanəm* ‘to plant’	Ambai *tana(m)*, Ansus *tanam/i*, Moor *’anam-î*, SL *tana*, Umar *tnam*, Wan. *tanam*, Wrp. *ana/ko*, Yaur *ì-’àm-né* ‘I plant’, Yer. *káamán/é*
PMP **tələn* ‘to swallow’	Ambai *ton*, Biak *orən*, Moor *’oran-î*, Umar *dor*, Yer. *kóor/í*
PMP **təlu* ‘three’	Ambai *-toru*, Ansus *toru*, Dus. *tori*, Moor *ór-ó*, Umar *e-tro*, Wan. *toru*, Wrp. *or-o*, Yer. *kóorí-hé*

Table 4.68: Reflexes of **ə* in Cenderawasih Bay and Mamberamo.

4.2.29 **e*

The outcome of PCEMP **e* is generally *e* in the small number of attested examples in SHWNG (see Table 4.69). In Sawai, the outcome is *ɛ*. In Ambel, the reflex is apparently *a* in *-ane* 'sleep'.

PCEMP **keRa(nŋ)* 'hawksbill turtle, *Eretmochelys imbricata*'	Moor *èran-a*
PMP **maqiRaq*, PCEMP **meRaq* 'red'	Biga *ma/ˈme*, Fia. *me/me*, Kawe *me*, Maˈya (S.) *ma/ˈme*^{3}, Wau. *me*
	Ansus *merai*, SL *merai*, Umar *miar*, Wan. *mirai*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	Sawai *-yɛnɛf*
	Ambel *-ane*, Biga *-eˈnef*, Fia. *-ene*, Gebe *yenɛf*, Kawe *-eˈnef*, Lag. *-ˈenef*, Maˈya (S.) *-ˈene*^{3}*f*, Mat. *-e*^{41}*n*, Wau. *-ˈenef*
	Ambai *ena*, Ansus *ena*, Biak *enəf*, Dus. *enep*, Moor *enâ*, SL *ena*, Wan. *ena*, Wrp. *ena-ko*, Yer. *éen/é*

Table 4.69: Reflexes of **e* in SHWNG.

4.2.30 **o*

The outcome of PCEMP/PEMP **o* is generally *o* in the small number of attested examples in SHWNG (see Table 4.70). In Biga, Gebe, and Kawe, the outcome is *ɔ*. Taba *bat/talón* 'sit' and Warembori *vavo* 'above' show unexpected *a*.

PMP **bawbaw*, PCEMP **bobo* 'above'	Buli *popó*
	Biga *pa/pɔwɔ*
	Biak *bo*, Wan. *vavo*, Wrp. *bo*
PCEMP **kandoRa* 'cuscus, phalangerid'	Buli *do*
	Yer. *átóòrà*
PEMP **molaŋ* 'true'	Buli *molaŋ*
PCEMP **tobV* 'fishnet float'	Biak *kob*
PMP **tu(n)daŋ*, PCEMP **todan* 'sit'	Buli *-tolaŋ*, Sawai *-tolɛn*, Taba *bat/talón*
	Gebe *tɔlɔn*, Kawe *toˈlon*, Lag. *toˈlon*, Mat. *ho*^{121}*l*, Maˈya (S.) *ˈsolo*^{3}*n*, Wau. *toˈlon*
	Dus. *ton*, Moor *'ò*, Umar *tot*, Yer. *kó*

Table 4.70: Reflexes of **o* in SHWNG.

4.2.31 Syncope

Syncope in SHWNG takes the form of the loss of an originally penultimate vowel, resulting in the creation of a new consonant cluster. In some cases, the initial consonant of this new cluster is later lost, as in PMP **banua* > **pnu* > Kawe *nu* 'village'. Syncope is lexically conditioned, applying only to certain proto-forms (§3.5).

Syncope is attested in at least one word in all South Halmahera and Raja Ampat languges (see Table 4.71).[35]

In Cenderawasih Bay and Mamberamo, syncope is clearly attested in Biak, Dusner, Umar, Waropen, Yaur, and Yerisiam (see Table 4.72). The altered penultimate vowel of Ansus *ane/u*, Serui-Laut *ane*, and Wandamen *sane* 'belly' is probably also a result of syncope, as are the Ambai and Wandamen reflexes of PEMP **natu* 'child'.

In Umar, syncope has gone a step further than in other SHWNG languages, applying to many words that do not show syncope elsewhere (see Table 4.73).

There is no evidence for syncope in Moor. The original vowel is preserved in all attested examples, as in PMP **t-ama* > *kamá* 'grandparent' versus PMP **t‹in›aqi* > *siné* 'belly'.

The idiosyncratic nature of syncope suggests that it is very unlikely to have occurred independently. It is therefore good evidence for the shared history of the languages that undergo the change. The lack of syncope in Moor could be used to argue that syncope was not a Proto-SHWNG innovation, but rather occurred at the level of a large subgroup—call it Proto-Nuclear SHWNG—containing all SHWNG languages but Moor. However, given that syncope is by nature lexically sporadic, it is difficult to prove that it did not happen in Moor. The Proto-Nuclear SHWNG hypothesis is rather weak without being substantiated by other shared innovations.

[35] As *-meli/s* 'laugh' and Fiawat *mena* 'fat' should probably be counted as examples of syncope. The vowel *e* may be due either to reduction of the penultimate syllable without loss, or restoration following loss.

PMP **banua* 'inhabited land' > 'village'	Biga *pnu*, Kawe *nu*, Lag. *nu*, Mat. *nu³*, Maˈya ˈ*pnu³*
PMP **bulu* 'feather, body hair'	Buli *plu*, Sawai *plu*
PCEMP **malip* 'laugh'	Buli *-mlif*, Gane *mlif*, Sawai *-mlif*, Taba *-(ha)mlih* As *-meli/s*, Biga *-mlef*, Gebe *-mnif*
PMP **mata* 'eye'	Buli *mta*, Gane *mto*, Sawai *mtɔ*, Taba *mto* Gebe *nta*
PMP **məñak* 'fat, grease'	Buli *mna* Biga *maˈna(o)*, Fia. *mena*, Kawe *maˈna*, Lag. *maˈna*, Mat. *mna¹²*, Maˈya (S.) *maˈna³*, Wau. *maˈna*
PEMP **natu* 'child'	Buli *ntu*, Gane *tu*, Taba *mtu* Gebe *ñat* 'person'
PMP **paniki* 'fruit bat'	Buli *fni*, Gane *fnik*, Sawai *fni*
PMP **t-ama* 'father'	Buli *hmā*
PMP **t-ina* 'mother'	Buli *hñē*
PMP **t‹in›aqi* 'intestines' > 'belly'	Buli *hñao*, Sawai *sno* Ambel *nyay*, Biga *nyao*, Fia. *na*, Gebe *hñao, hñainora*, Kawe *a-ˈnyay(o)*, Lag. *a-ˈnyay(o)*, Maˈya ˈ*na(o)*, Wau. *ka-ˈnyay(o)*

Table 4.71: Syncope in South Halmahera and Raja Ampat.

PMP **banua* 'inhabited land' > 'village'	Ansus *nu* 'world', Biak *mənu*, Dus. *munu/ai*, Moor *manù* 'forest', SL *nu* 'world', Umar *nu/ae*, Wrp. *nu*, Yaur *núù-ré*, Yer. *nú* Wmb. *bunu/pune* (?)
PCEMP **malip* 'laugh'	Ambai *miri*, Ansus *mari*, Biak *mbrif*, Moor *marí/'-a*, SL *mari*, Umar *mari*, Wan. *mari*
PMP **mata* 'eye'	Biak *mga*, Moor *masina'ú* (?), Umar *mta*
PMP **məñak* 'fat, grease'	Ambai *ne-main*, Moor *mananá*, Umar *mnai*, Wan. *mai[n]*, Wrp. *mana*, Yaur *mnáa-rè*, Yer. *mì/mná*
PEMP **natu* 'child'	Ambai *antu/n*, Dus. *mtu*, Moor *na'ú* 'person', Wan. *a[n]tu*, Wrp. *ku*
PMP **t-ama* 'father'	Ambai *tama-*, Biak *kəma*, Dus. *tma*, Moor *kamá* 'grandparent', Wan. *tama*
PMP **t-ina* 'mother'	Biak *sna-*, Wan. *sinia*
PMP **t‹in›aqi* 'intestines' > 'belly'	Ambai *ene-*, Ansus *ane/u*, Biak *sne-*, Moor *siné*, SL *ane*, Umar *hna*, Wan. *sane*, Yaur *hnáa-rè*, Yer. *hìná*

Table 4.72: Syncope in Cenderawasih Bay and Mamberamo.

PMP **kaRaw* ‘to scratch’	Umar *krar*, cf. Wan. *kara*
PMP **kuRita* ‘octopus’	Umar *kte*, cf. Moor *arí’-a*
–	Umar *kbae* ‘neck’, cf. Wau. *kaˈlu ˈbay(o)*
–	Umar *kro* ‘snake’, cf. Wan. *koro*
PMP **manuk* ‘bird’	Umar *mna*, cf. Biak *man*
PMP **Ramәs* ‘squeeze’	Umar *rma/n*, cf. Biak *ramәs*
PMP **tanәm* ‘to plant’	Umar *tnam*, cf. Wan. *tanam*
PMP **tәlu* ‘three’	Umar *e-tro*, cf. Wan. *toru*
PMP **tunu* ‘roast food over a fire’	Umar *tnu*, cf. SL *tunu*
–	Umar *tpe* ‘lightning’, cf. Fia. *tepyep*

Table 4.73: Syncope in Umar.

4.2.32 Final vowel loss

Final vowel loss is regular in South Halmahera and Raja Ampat (see Table 4.74), except in words that have undergone syncope (see §4.2.31 above). Blust (1978a) notes that change applies to words with original final **q*, but not original final **k*; therefore, vowel loss must have occurred after the loss of **q*, but prior to the loss of **k*. Final vowel loss does not apply to the small number of words that have lost final **R*, so must have preceded **R* loss (see §4.2.16).

In Cenderawasih Bay and Mamberamo, final vowel loss is variable (see Table 4.75). It is completely regular only in Biak and Dusner, though at least one case of final vowel loss is attested in all languages. Instances of final vowel loss following final **k* loss are attested at least once in Ambai, Biak, Wandamen, and Yaur.

Final vowel loss is not a cross-linguistically distinctive change, and so does not form a good basis for subgrouping.

PMP **batu* ‘stone’	Buli *pāt*
	As *pa*, Biga *ka-ˈpat*, Gebe *ka-pat*, Kawe *a-ˈpat*, Lag. *a-ˈpat*, Maˈya *ka-ˈpa¹²t*, Wau. *ka-ˈpat*
PMP **bunuq* ‘kill’	Buli *pun*, Gane *pun*, Sawai *-pun*, Taba *-pun*
	Ambel *buni*, As *-bun*, Biga *bun*, Fia. *bun*, Gebe *-pun*, Kawe *bun*, Lag. *bun*, Mat. *bu³n*, Maˈya *ˈbu³n*, Wau. *bun, fal/ˈpun*
PMP **dəŋəR* ‘hear’	Buli *loŋa*, Gane *longa*, Sawai *-loŋɛ*, Taba *-ma/longo*
	Biga *doˈno*, Gebe *lɔŋɔ*, Kawe *ˈdon[o]*, Lag. *ˈdon[o]*, Mat. *no⁴¹ŋ*, Maˈya *ˈdo¹²n*, Wau. *ˈdon[o]*
PMP **dəpa* ‘span, fathom’	Buli *lof*, Sawai *lof*
PMP **kutu* ‘louse’	Buli *ut*, Gane *kut*, Sawai *kit*, Taba *kut*
	Ambel *ut*, Biga *wut*, Fia. *wut*, Gebe *ut*, Kawe *wut*, Lag. *wut*, Mat. *wu³t*, Maˈya (S.) *ˈu³t*, Wau. *wut*
PMP **lima* ‘five’	Buli *lim*, Sawai *-lim*, Taba *-lim*
	Ambel *lim*, Biga *lim*, Kawe *lim*, Lag. *ˈli³m*, Mat. *li³m*, Maˈya *ˈli³m*, Wau. *lim*
PMP **manuk* ‘bird’	Buli *mani*, Gane *manik*, Sawai *manɛ*, Taba *manik* ‘chicken’
	Ambel *mani*, As *mani*, Biga *miˈni*, Fia. *min*, Gebe *mani*, Kawe *mani*, Lag. *ˈmin[i]*, Maˈya (S.) *ˈmini¹²*, Wau. *ˈmin[i]*
PMP **məñak* ‘fat, grease’	Buli *mna*
	Biga *maˈna(o)*, Fia. *mena*, Kawe *maˈna*, Lag. *maˈna*, Mat. *mna¹²*, Maˈya (S.) *maˈna³*, Wau. *maˈna*
PMP **qitəluR* ‘egg’	Buli *tolo*, Gane *toli*
	Ambel *talo*, As *talɔ*, Biga *toˈlo*, Fia. *tol*, Kawe *ˈtol[o]*, Lag. *ˈtol[o]*, Mat. *to²¹l*, Maˈya (S.) *ˈto¹²l*, Wau. *ˈtol[o]*
PMP **qubi* ‘yam, *Dioscorea*’	Buli *up* ‘kind of tuber’

Table 4.74: Final vowel loss in South Halmahera and Raja Ampat.

PMP **batu* 'stone'	Moor *vá'-a*, Umar *atu*, Yer. *áakú*
PMP **bulu* 'feather, body hair'	Ambai *na-wa/vuru*, Moor *vùru*, Umar *uru*, Wrp. *vuro*, Yer. *úurú-gùa* Wmb. *ke-vun-do*, Yoke *bo*
PMP **bunuq* 'kill'	Ambai *mun*, Ansus *mung*, Biak *mun*, Dus. *mun*, Moor *mun/â*, SL *mun*, Wan. *mun*, Wrp. *mun/a* Wmb. *muni-ro*, Yoke *mu*
PMP **daRaq* 'blood'	Moor *ràra*, Wrp. *rara*, Yer. *rárà* Wmb. *ke-ra-ro*
PMP **kutu* 'louse'	Ansus *utu*, Biak *uk*, Moor (A.) *ú'-a*, Moor (H.) *kú'-a*, SL *itu*, Umar *utu*, Wrp. *ghui, vui*, Yaur *óò-jé* Wmb. *ki-ro*
PMP **lima* 'five'	Ambai *rin*, Ansus *ring*, Biak *rim*, Dus. *rim/bi*, Moor *rím-ó*, Mun. *-rim*, SL *ri*, Wan. *rime*, Wrp. *rim/o*, Yer. *rîmà* Wmb. *rin/ti*, Yoke *-rim/si*
PMP **manuk* 'bird'	Ambai *man-*, Biak *man*, Moor *mànu*, Umar *mna*, Wrp. *mani*, Yaur *mà'-ré* Wmb. *mani-ro*, Yoke *mani*
PMP **məñak* 'fat, grease'	Ambai *ne-main*, Moor *mananá*, Umar *mnai*, Wan. *mai[n]*, Wrp. *mana*, Yaur *mnáa-rè*, Yer. *mì/mná*
PMP **nanaq* 'pus'	Ambai *nana*, Yer. *náanáà*
PMP **punti* 'banana'	Moor *hút-a*, Umar *idi*, Wrp. *ui*, Yaur *ìdí-e*, Yer. *píití* Wmb. *uti-ro*, Yoke *si*
PMP **qubi* 'yam, *Dioscorea*'	Ambai *uvi*, Wan. *uwi*, Wrp. *uvi*
PMP **Rumaq* 'house'	Biak *rum*, Dus. *rum*, Moor *rùma*, Umar *ron*, Wrp. *ruma*, Yaur *rúùg-ré* 'ceremonial house', Yer. *rúmà* 'ceremonial house'
PMP **susu* 'female breast'	Ambai *ui*, Ansus *u*, Biak *sus*, Moor *tút-a*, Umar *huhu*, SL *su*, Wan. *susu*, Wrp. *susu*, Yaur *húhì-e*, Yer. *húuhú-gùa* Wmb. *ke-tutu-ro*
PMP **tasik* 'saltwater'	Moor *àti*, Umar *tah* 'salt', Yaur *àah-ré* 'salt', Yer. *káhì/a* 'salt'
PMP **tunu* 'roast food over a fire'	Biak *kun*, Dus. *un*, Moor *'un-î*, SL *tunu*, Yaur *'ún-dè*, Yer. *kúun-á* Wmb. *kuni*

Table 4.75: Final vowel loss in Cenerawasih Bay and Mamberamo.

4.3 Summary of reflexes and sound changes

Tables 4.76 and 4.77 summarize the reflexes presented in this chatper.

		*q	*h	*p	*b	*t	*k	*s, *j	*t /_i	*d	*l	*z	*R	*m	*n, *ñ	*ŋ
SH	Buli	∅	∅	f	p	t/(c)	∅	s	s	l	l	l	∅	m	n	ŋ
	Gane	∅	∅	f	p	t	k/∅	s		l	l	l	∅	m	n	ŋ
	Sawai	∅	∅	f	p	t	∅	s	s	l	l	l	∅	m	n	ŋ
	Taba	∅	∅	h	p	t	k/∅	s		l	l	l	∅	m	n	ŋ
RA	Ambel	∅	∅	f/ɸ/h	b/p	t	∅	s	∅?	l	l	l	∅	m	n	n
	As	∅	∅	f	p	t	∅	s		l	l	l	∅	m	n	n
	Biga	∅	∅	f	b/p	t	∅	s	∅?	l	l	l	∅	m	n	n
	Fiawat	∅	∅	f	b/p	t	∅	h	∅?	l	l	l	∅	m	n	n
	Gebe	∅	∅	f	p	t	∅	s	h?	l	l	l	∅	m	n	n
	Kawe	∅	∅	f	p/b	t	∅	s	∅?	l	l	l	∅	m	n	n
	Laganyan	∅	∅	f	p/b	t	∅	h	∅?	l	l	l	∅	m	n	n
	Matbat	∅	∅	f	b	t	∅	s		l	l	l	∅	m	n	n
	Maˈya	∅	∅	f	p/b	t	∅	s	∅?	l	l	l	∅	m	n	n
	Wauyai	∅	∅	f	p/b	t	∅	s	∅?	l	l	l	∅	m	n	n
CB	Ambai	∅	∅	∅	b/β/w	t/∅	∅	∅	∅/s	r	r	r	r	m	n	
	Ansus	∅	∅	∅	b/w	t/∅	∅	∅	∅	r	r	r	r	m/ŋ	m/ŋ	
	Biak	∅	∅	f	b	k	∅	s	s	r	r		r	m	n	n
	Dusner	∅	∅	p	β	t	∅	s	s	r	r		r	m	n	
	Moor (H.)	∅	∅	∅/h	β	ʔ/k	k/ʔ	t	s	r	r	r	r	m	n	n
	Serui-Laut	∅	∅	∅	β/w	t	∅	s	∅	r	r		r	m	n	
	Umar	∅	∅	∅	∅/β	t	k/∅	h	h	r/(d)	r	∅	r	m	n	n
	Wandamen	∅	∅	∅	b/β	t	∅	s	s	r	r		r	m	n	n
	Waropen	∅	∅	∅	β/b	k	∅	s	∅?	r	r	r	r	m	n	n
	Yaur	∅	∅	∅	β	∅/ʔ	∅/(ʔ)	h	h	r/(d)	r	∅	r	m/n/g	n/g/(ʔ)	∅/(ʔ)
	Yerisiam	∅	∅	∅/p	∅/b	k	∅	h	h	r	r	∅	r	m	n	∅
M	Warembori	∅	∅	∅	b	k	∅	t	t	d	d/(n)		r	m	n	n

Table 4.76: Summary of PMP, PCEMP, and PEMP proto-consonant reflexes in SHWNG languages.

		*i	*u (penult)	*u (final)	*a (penult)	*a (final)	*ə (penult)	*ə (final)	*e	*o
SH	Buli	i	u	u	a	a	o	a	e	o
	Gane	i	u	u/i	a/o	a/o	o	a	e	o
	Sawai	i/ɛ	u/(i)	u/ɛ	a/ɔ/ɛ	a/ɔ/ɛ	o	ɛ	ɛ	o
	Taba	i	u	u/i	a/o	a/o	o	e	e	o
RA	Ambel	i	u	u/i	a	a	a/V	o/V	a?	o?
	As	i	u	u/i	a	a	a/V	ɔ/V	e?	o?
	Biga	i	u	u/i	a	a	o/V	o/V	e	ɔ
	Fiawat	i	u	u/i?	a	a	o/V	o/V	e	o?
	Kawe	i	u	u/i	a	a	o/V	o/V	e?	ɔ
	Laganyan	i	u	u/i	a	a	o/V	o/V	e?	o
	Matbat	i	u	u/i?	a	a	o		e	o
	Maˈya	i	u	u/i	a	a	o/V	o/V	e	o
	Wauyai	i	u	u/i	a	a	o/V	o/V	e	o?
CB	Ambai	i	u	u/i	a	a	o	a	e	o?
	Ansus	i	u	u/i	a	a	o	a	e	o?
	Biak	i/e/ə	u	u/i/e/ə	a	a/e/ə	o	e/ə	e	o
	Dusner	i/e	u	u/i/e	a	a	o	e	e	o
	Moor (H.)	i	u	u/i?	a	a	o	a	e	o
	Serui-Laut	i	u/(i)	u/i	a	a	o	a	e	o?
	Umar	i	u/(i)	u/i?	a	a	o	a	e?	o
	Wandamen	i	u	u/i	a	a	o	a	e	o
	Waropen	i	u	u/i	a	a	o	a	e	o
	Yaur	i	u/(i)	u/i	a	a	o		e?	o?
	Yerisiam	i	u/(i)	u/i	a	a	o	a	e	o
M	Warembori	i	u/(i)	u/i	a	a	o	e?/a?	e?	o?

Table 4.77: Summary of PMP, PCEMP, and PEMP proto-vowel reflexes in SHWNG languages.

Various individual sound changes are responsible for these reflexes. Most of these changes are summarized below, with relative chronology specified where relevant.[36] Irregular changes are presented as if they are regular. For example, it is stated below that **k* > (**ʔ* >) ∅ in Moor; in fact, some Moor words undergo the complete change, while others reflect *k* or *ʔ*.

The following sound changes occurred in all SHWNG languages at an early stage (Proto-SHWNG or shortly thereafter):

- **q* > ∅
- **h* > ∅
- **j* > **s*
- **ñ* > **n*
- **d*, **D* > **l* unless following **n*
- **z* > **l* (except in Umar, Yaur, Yerisiam)
- **k* > (**ʔ* >) ∅ unless following **ŋ*
- **g* > ∅ (in all languages for which there are data)
- **t* > **ts* preceding **i* (unless following **n*, in Moor)

These changes preceded other changes in all cases for which there is evidence.

The following sound changes occurred involving **l*, **z*, and **R*:

- **l* > *r* in Cenderawasih Bay, Mamberamo
- **z* > ∅ Umar, Yaur, Yerisiam (precedes **a* > **ya* below)
- **R* > ∅ in South Halmahera, Raja Ampat
- **R* > *r* in Cenderawasih Bay, Mamberamo

The following sound changes occurred involving labial stops:

1. **p* > **f* in all SHWNG languages except Dusner, after which:
   - **f* > *h* in Taba, Ambel
   - **f* (> **h*) > ∅ in Cenderawasih Bay, Mamberamo, except Biak
2. **b* > *p* unless following **m*, in South Halmahera, Raja Ampat, except Matbat
2. **b* > *β* in Dusner, Moor, Umar, Wandamen, Waropen, Yaur, Yerisiam, all Yapen languages, Yoke, after which:

[36] Lower numbered changes precede higher numbered changes. Unless otherwise specified, there is no evidence for sequencing among unnumbered changes or changes with the same number.

- $\beta > w$ in Ambai, Ansus, Kurudu, Serui-Laut
- $\beta > \emptyset$ in Umar, Yerisiam

The following sound changes occurred involving **t*:

- $*t > \emptyset$ finally in Ambai, Ansus, Serui-Laut

1. $*t > *k$ in Biak, Moor, Roon, Warembori, Waropen, Yaur, Yerisiam
2. $*k > *ʔ$ in Moor, Yaur
3. $*ʔ > \emptyset$ non-initially in Yaur

The following sound changes occurred involving **s*, after the above **t* changes:

1. $*s > t$ in Moor
2. $*ts > s$ in all SHWNG languages
3. $*s > t$ in Warembori
3. $*s > h$ in Fiawat, Laganyan, Ambai, Ansus, Umar, Yaur, Yerisiam
4. $h > \emptyset$ in Ambai, Ansus

The following sound changes occurred involving nasals:

- $*m, *n > ŋ$ finally in Ansus
- $*m > n$ finally in Ambai, Umar
- $*m > \emptyset$ finally in Serui-Laut, Wandamen, Waropen
- $*n > \emptyset$ finally in Wandamen and Yerisiam
- $*ŋ > n$ in Raja Ampat, Cenderawasih Bay, Mamberamo except Yaur, Yerisiam
- $*ŋ > \emptyset$ in Yaur, Yerisiam

The following nasal sound changes occured in Yaur, after the above nasal changes:

1. $*m, *n > *ŋ$ preceding $*r$
2. $*ŋ > n$ finally
2. $*ŋr > *ŋgr > gr$

The following sound changes occurred involving nasal–stop clusters:

- $*NC > C$ in South Halmahera, Raja Ampat, Moor (follows stop changes above)
- $*NC >$ voiceless *C* in Yerisiam, voiced *C* in Umar, Yaur (follows stop changes above)
- $*NC > C$ in Cenderawasih Bay, Mamberamo, except Moor, Umar, Yaur (precedes stop changes above)

The following sound changes occurred involving glides:

- **w* > *g*^{w} in Moor, Yaur, Yerisiam
- **w* > *β*, *ɣ* in Waropen

The following sound changes occurred involving vowels:

1. **a* > **ya* initially in South Halmahera, Raja Ampat, sporadically in Cenderawasih Bay (follows **z* > ∅ above), after which:
    - **y* > *dʒ* initially in Moor, Umar, Yaur, Yerisiam
    - **y* > *l* initially in Raja Ampat except As, Gebe, Matbat
2. **u* > **i* in final syllables, in Sawai
2. **a* > *o* in Gane, Taba, *ɔ* in Sawai (conditioning unclear)
2. **ə* > *o* in penultimate syllables, *a* in final syllables, in South Halmahera, Cenderawasih Bay except Biak, Dusner
2. **ə* > preceding or following vowel, in Raja Ampat
2. **i*, **u*, **a*, **ə* > *e* in final closed syllables of polysyllabic words, in Biak, Dusner
3. **i* > *ɛ* in final unstressed syllables of polysyllabic words, in Sawai
3. **a* > *ɛ* in Sawai
3. **ə* > *o* in Raja Ampat

See §4.2.31 for syncope and §4.2.32 for final vowel loss.

4.4 Reassessment of Proto-SHWNG sound changes

At this point, it is worth briefly taking stock of the status of proposed Proto-SHWNG innovations, in light of the data presented in this chapter. I will use the same change numbering as in chapter 3.

Change 1 (**p* > **f*) is posited by Ross. I showed in §4.2.3 that it is not attested in Dusner, and not regularly attested in Yerisiam.

Changes 2 (merger of **ə* with **o* in penultimate syllables) and 9 (merger of **ə* with **a* in final syllables) are posited by Blust and Ross as highly distinctive SHWNG innovations. I showed in §4.2.28 that they are problematic in Raja Ampat languages.

Change 3 (**a-* > **ya-*) is posited by Ross. I showed in §4.2.27 that it is not regularly found in all SHWNG languages.

Change 4a (**t* > **s /_*i*) is posited by Ross. I showed in §4.2.6 that it is found in all SHWNG languages, with the possible exception of Warembori.

Change 4b (**s, *j, *c > *s*) is posited by Blust and Ross. I showed in §4.2.10 that **s* and **j* merge in all SHWNG languages. There is no evidence for **c* (§4.2.7).

Change 5a (**q, *h > ∅*) is posited by Blust and Ross. I showed in §4.2.1 and §4.2.2 that it is found in all SHWNG languages.

Change 5b (**-k- > ∅*) is posited by Blust and Ross. I showed in §4.2.8 that it is found in all SHWNG languages, with a small number of lexical exceptions.

Change 5c (**k-, *-k > ∅*) is posited by Ross. I showed in §4.2.8 that it is not regularly found in all SHWNG languages.

Change 6 (merger of **d*, **D*, **l*, **r*, and **z*) is posited by Blust and Ross as one of the more persuasive arguments for SHWNG. However, the irregularities noted in §4.2.11 and §4.2.14 cast some doubt on this merger's validity. It is difficult to explain these irregularities if we assume that the merger was complete by the time of Proto-SHWNG.

Change 7 (merger of **n* and **ñ* as **n*) is posited by Ross. I showed in §4.2.18 that it is found in all SHWNG languages.

Change 12 (syncope) is posited by Blust. I showed in §4.2.31 that it is found in all SHWNG languages except Moor.

It is clear from the preceding evaluation that Blust's version of Proto-SHWNG is better supported than Ross's. Changes 1, 3, and 5c, included in Proto-SHWNG by Ross but not Blust, are not shared by all SHWNG languages. Change 12, included by Blust but not Ross, is problematic in Moor, but otherwise well-attested.

I have shown that there may be significant problems with three changes that Blust and Ross hold to be essential to the integrity of Proto-SHWNG: changes 2, 6, and 9. For now, this evidence is not strong enough to overturn the the validity of Proto-SHWNG. It may still be possible to resolve the discrepancies by reinterpreting either the Proto-SHWNG sound changes or the problematic data from the daughter languages. A full re-evaluation of the status of Proto-SHWNG is, in any case, beyond the scope of this work.

Nonetheless, it is clear from the evidence presented here that the time for such a re-evaluation has come. The logical next step is to do a fine-grained phonological comparison of SHWNG languages with their closest Austronesian neighbors to the west: the languages of the Bomberai peninsula and the Southern Moluccas. This could bring significant clarification to the status of SHWNG and its boundaries.

4.5 Implications for subgrouping

I have shown that, in the main, phonological innovations are not probative for subgrouping within SHWNG. Several shared innovations were identified that possess subgrouping value:

1. **a > *ya > la* initially in Ambel, Biga, Fiawat, and Ma'ya
2. **ŋ > ∅* in Yaur and Yerisiam
3. **z > ∅* in Umar, Yaur, and Yerisiam

4. irregular **u* > *i* in PMP **punti* 'banana' in Umar, Yaur, and Yerisiam
5. **u*, **i*, **ə* > *e* ~ *ə* in final closed syllables of polysyllabic words, in Biak and Dusner
6. **ə* assimilates to vowel of preceding or following syllable, in Raja Ampat
7. **R* > ∅ in South Halmahera and Raja Ampat
8. lexically conditioned syncope (Blust's change 12) in all SHWNG languages but Moor

As noted in §4.2.26, **a* > *o* in Gane, Maba, Patani, Sawai, and Taba was most likely spread by diffusion, and is therefore not included here.

Innovation 1 supports the establishment of what I will (somewhat arbitrarily) term Proto-Maˈyaic, containing Ambel, Biga, Fiawat (and perhaps other dialects of Maden), and Maˈya.

Innovation 2 supports the establishment of Proto-Yaur-Yerisiam, containing Yaur and Yerisiam.

Innovations 3 and 4 support the establishment of Proto-Southwest Cenderawasih Bay, containing Umar and Proto-Yaur-Yerisiam.

Innovation 5 most likely occurred at the stage of Proto-Biakic, and therefore provides additional support for it. With data from Meoswar and Roon, it would be possible to determine if all Biakic languages share the change.

Innovation 6 supports the establishment of Proto-Raja Ampat, containing Proto-Maˈyaic and the other Raja Ampat languages.

Innovation 7 supports Proto-RASH, containing Proto-Central-Eastern South Halmahera, Proto-Southern South Halmahera, and Proto-Raja Ampat.

Innovation 8 supports the establishment Proto-Nuclear SHWNG, containing all SHWNG languages except Moor.

None of the proto-languages newly established on the basis of these innovations is fully convincing. The most plausible, because of its wide geographic extent, is Proto-RASH. For the others, it is difficult to rule out diffusion as a possibility. Proto-Nuclear SHWNG is particularly weakly founded due to the sporadic nature of the syncope change.

I combine these subgroups with those proposed in other chapters in chapter 7.

Chapter 5

SHWNG historical phonology II: Tonal phonology

5.1 Introduction

This chapter summarizes what is known about tonal systems and tonogenesis in the five SHWNG languages that are known to have lexical tone and whose tone systems have been described: Maˈya, Magey Matbat, Moor, Yerisiam, and Yaur.[1] The Moor, Yerisiam, and Yaur tone systems are analyzed here for the first time.

Tone is rare in Austronesian languages, and has not been reconstructed for any high-level branches.[2] Most tonal Austronesian languages are found in the SHWNG and Oceanic subgroups. Within SHWNG, tone is found in the Raja Ampat languages Maˈya and Matbat and the Cenderawasih Bay languages Moor, Yerisiam, and Yaur. Within Oceanic, tone is found in five languages of New Caledonia (Rivierre 1993, 2001); the North Huon Gulf languages Yabem and Bukawa (Ross 1993); Awad Bing (Cahill 2003); and Kara, Barok, and Patpatar of New Ireland (Hajek 1995).

Outside of SHWNG and Oceanic, tone is found only in the Chamic languages Eastern Cham (Edmondson and Gregerson 1993b) and Tsat (Maddieson and Pang 1993). Its presence there has been attributed to the influence of neighboring Chinese languages.

[1]Waropen and Roon are two additional SHWNG languages that may have some kind of tonal contrast, but for which data are currently insufficient to resolve the question. Van Velzen (1994) claims in passing, with no examples or analysis, that Waropen has three distinctive tones (high, mid, and low). Anceaux (n.d.)'s transcription of Roon [βaˈɾaːna] 'my arm' versus [βaˈɾana] 'his/her arm' may be a misinterpretation of a tonal contrast as a length contrast.

[2]This summary is partly based on Remijsen (2007: 27).

5.2 Raja Ampat languages

5.2.1 Maˈya

There are five dialects of Maˈya, of which the Salawati, Misool, and Laganyan dialects are tonal, while the Kawe and Wauyai dialects are not (Remijsen 2001b: 71). This section covers the Salawati and Misool dialects, since they are the tonal dialects for which adequate lexical data are available. All Maˈya data are from Remijsen (2001b).

Remijsen (2001b: 50, 70) analyzes Maˈya as having three tonemes: Rise/Low (/^{12}/), Fall (/^{21}/), and High (/^{3}/). Tones are restricted to word-final syllables. In addition to tone, Maˈya has contrastive lexical stress (/ˈ/), which is restricted to penultimate and final syllables.

Stress placement correlates with both tone and vowel quality (Remijsen 2001b: 105ff). With very few exceptions, penultimately stressed words are restricted to a single toneme on the final syllable: the High toneme in the Salawati dialect (e.g., ˈ*tala*^{3} ‘banana’), and the Low toneme in the Misool dialect (e.g., ˈ*tala*^{12} ‘banana’). Both dialects also permit toneless final syllables on penultimately stressed words (e.g., ˈ*siri(o)* ‘juice’). Most penultimately stressed words have matching vowels in their penultimate and final syllables (see preceding examples). Finally stressed polysyllabic words always have the vowel *a* in the penultimate syllable (e.g., *gaˈni*^{3} ‘sago (food)’, *saˈpo*^{12} ‘no’, *kaˈlun(o)* ‘leaf, feather’). In some cases, loan words violate these constraints; in others, they are adapted to conform to them.

The primary acoustic correlate of stress is length. However, there is an important relationship between the Fall toneme and stress (Remijsen 2001b: 70):

> The Fall plays a pivotal role in the word prosodic system of Maˈya, because it is involved in both the lexical stress and the lexical tone contrasts. On the one hand, the Fall can be interpreted as lexical stress without High or Rise toneme …, and therefore it will be transcribed as lexical stress. On the other hand, however, the Fall is a toneme in the sense that it contrasts with the Rise and the High in minimal sets. The Fall also stands out from the other two tonemes in that words carrying the Fall get an epenthetic final vowel /o/ when they occur sentence-finally.

As an illustration, the minimal triplet ˈ*sa*^{12} ‘to sweep’, ˈ*sa*^{3} ‘to climb’, and ˈ*sa* ‘one’ contains the tonemes Rise, High, and Fall, respectively. Remijsen analyzes ˈ*sa* ‘one’ as underlyingly toneless. All three words are stressed.

There are some acoustic differences in the realization of tones between the Salawati and Misool dialects (Remijsen 2001b: 80). The Rise toneme in the Salawati dialect (realized as low rising sentence-medially and low level sentence-finally) corresponds to the Low toneme in the Misool dialect (realized as low level in all contexts). Both are transcribed as /^{12}/ by Remijsen. The Fall toneme in the Misool dialect starts and ends at a higher pitch than in the Salawati dialect. Remijsen (2001b: 84) hypothesizes that proto-

Ma^{l}ya had a tone system like the Salawati dialect, with the Misool system the result of a push chain, whereby the change from Rise to Low triggered a higher-pitch Fall toneme.

I have identified Austronesian etymologies for 53 of the 237 Salawati Ma^{l}ya words found in Remijsen (2001b). These are listed in Tables 5.1–5.3, arranged according to the resulting tone. There are 32 words with high tone, 15 with rising tone, and 6 with falling tone.

In most cases, stress falls on the penultimate syllable of the proto-root; stress was evidently penultimate in proto-Ma^{l}ya. The sole apparent exception[3] is PMP **məñak* 'fat, grease' > *ma^{l}na^{3}*. Most penultimately stressed words have high tone. The sole exception is PMP **i-kahu* 'you (sg.)' > *^{l}aw/a*, which also has an unexplained final *a*. However, it is not very surprising that a pronoun should show irregular developments such as this.

There are no very convincing segmental predictors of tone. The strongest candidates I have found are uvular consonants in the proto-form. Onset **q* correlates with Rise (four examples, one exception, which is **t‹in›aqi* 'intestines' > *^{l}na(o)* 'belly'). As first noted by Remijsen (2001b: 120), word-final **R* (most likely a voiced uvular trill) correlates with Rise (three examples, no exceptions, although **niuR* 'coconut' > *^{l}nu^{12}* has a variant *^{l}nu^{3}*). The phonetic motivation for these putative correlations is not obvious.

The Misool dialect shows only minor differences in comparison to the Salawati dialect. As expected, most penultimately stressed words have low tone instead of high tone. There is one exception: *-^{l}ini^{3}m* 'drink'. Two finally stressed words have low tone where Salawati has high tone: *^{l}i^{12}n* 'fish' and *ma^{l}na^{12}* 'fat, grease'.

The prosodic innovations of Ma^{l}ya can be summarized as follows: (1) a single tonal pattern on the final syllable of penultimately stressed words; (2) the tendency of onset **q* and word-final **R* to produce rising tone; (3) epenthetic final *o* on words with falling tone sentence-finally.[4]

[3]There are not enough data to determine if this word is really exceptional, or regular according to some other change.

[4]There is some ambiguity about the precise environment in which epenthetic final *o* appears: Remijsen (2001b: 70) claims sentence-finally, while Remijsen (2007: 25) claims utterance-finally. In either case, it is a significant innovation.

PMP **ba-b‹in›ahi* ‘woman’	*ˈpi³n*
PMP **banua* ‘inhabited area’	*ˈpnu³* ‘village’
PMP **bəRək* ‘pig’	*ˈbo³*
PMP **bunuq* ‘kill’	*ˈbu³n*
PMP **duha* ‘two’	*ˈlu³*
PMP **ənəm* ‘six’	*ˈwono³m*
PMP **hikan* ‘fish’	*ˈd/o³n*
PMP **inum* ‘drink’	*-ˈini³m*
PMP **kutu* ‘head louse’	*ˈu³t*
PMP **lima* ‘five’	*ˈli³m*
PMP **ma-hiaq*, PCEMP **mayaq* ‘ashamed’	*-ˈma³*
PMP **manuk* ‘bird’	*ˈmini³*
PCEMP **ma-pia* ‘good’	*ˈfi³*
PMP **ma-qitəm*, PCEMP **ma-qetəm* ‘black’	*mat/ˈmete³m*
PMP **məñak* ‘fat, grease’	*maˈna³*
PMP **miqmiq* ‘urine’	*ta/ˈmi³*
PMP **niuR* ‘coconut’	*ˈnu³*
PMP **ŋajan* ‘name’	*ˈnasa³n*
PMP **paRih* ‘sting’	*ˈfa³* ‘stingray’
PMP **pəñu* ‘turtle’	*ˈfe³n*
PMP **qatay* ‘liver’	*ˈlati³*
PMP **qinəp*, PCEMP **qenəp* ‘lie down to sleep’	*-ˈene³f*
PMP **Rambia* ‘sago’	*ˈbi³*
PMP **Rəbək* ‘to fly’	*-ˈopo³*
PMP **Rumaq* ‘house’	*ˈu³m*
PMP **sakat* ‘to rise’	*ˈsa³*
PMP **salaq* ‘wrong’	*ˈsa³l*
PMP **susu* ‘female breast’	*su³s*
PMP **təlu* ‘three’	*ˈto³l*
PCEMP **todan* ‘sit’	*ˈsolo³n*
PMP **wahiR* ‘fresh water’	*ˈwaya³*
PMP **zalan* ‘path’	*ˈlili³n*

Table 5.1: Sources of Maˈya (S.) high tone.

PMP **babaq* 'low'	*ˈpa¹²p*
PMP **batu* 'stone'	*ka-ˈpa¹²t*
PMP **dəŋəR* 'hear'	*ˈdo¹²n*
PMP **əpat* 'four'	*ˈfa¹²t*
PMP **hapuy*, PEMP **api* 'fire'	*ˈla¹²p*
PMP **ma-pənuq* 'full'	*ˈfo¹²n*
PMP **ma-Ruqanay* 'man'	*ˈma¹²n*
PMP **matay* 'die'	*ˈma¹²t*
PMP **niuR* 'coconut'	*ˈnu¹²*
PMP **pajəy* 'rice plant'	*ˈfa¹²s* 'rice'
PMP **panaq* 'to shoot'	*ˈfa¹²n*
PMP **qabu* 'ashes'	*ga/ˈla¹²p*
PMP **qasu* 'smoke'	*ˈla¹²s*
PMP **qitəluR* 'egg'	*ˈtol¹²*
PCEMP **saŋan* 'branch'	*ka-ˈʃa¹²n*

Table 5.2: Sources of Maˈya (S.) rising tone.

PMP **bəRay* 'give'	*ˈbe(o)*
PMP **dahun* 'leaf'	*ka-ˈlun(o)* 'leaf, feather'
PMP **i-kahu* 'you (sg.)'	*ˈaw/a*
PMP **kahiw*, PCEMP **kayu* 'wood'	*ˈai(o)*
PMP **lipən* 'tooth'	*ka-ˈlif(o)*
PMP **t‹in›aqi* 'intestines'	*ˈna(o)* 'belly'

Table 5.3: Sources of Maˈya (S.) falling tone (stress with no underlying toneme).

5.2.2 Magey Matbat

There are two dialects of Matbat, Magey and Tomolol, both of which are tonal (Remijsen 2007). Only the Magey dialect's tonal system has been described.

Remijsen (2007: 13) analyzes Magey Matbat as having six tonemes: High Level (/^{3}/), Low Fall (/^{21}/), Low Rise (/^{12}/), Low Level (/^{1}/), Extra High Fall (/^{41}/), and Rise-Fall (/^{121}/). Tones are associated with syllables, as in Maˈya. Much of the Magey Matbat lexicon consists of monosyllabic words, but monomorphemic words of up to three syllables are attested. All monosyllabic words have tone. All polysyllabic words contain at least one tonal syllable, with the presence and location of the toneless syllables unpredictable.

Remijsen (2007: 14) observes that "words with the Low Fall toneme on the final syllable often have an epenthetic final /o/ in phrase-final context". This is very similar to Maˈya, where words with the Fall toneme always have epenthetic final *o* in sentence-final position (§5.2.1). Magey Matbat Low Fall and Maˈya Fall are acoustically identical

(Remijsen 2007: 25). I discuss the implications of epenthetic final *o* for subgrouping in §5.4.

I have identified Austronesian etymologies for 33 of the 182 Magey Matbat words found in Remijsen (2001b). These are listed in Tables 5.4–5.6, arranged according to the resulting tone. The most common tonal outcomes are high level (12 words) and low falling (11 words). Aside from this general bias, I have found only one consistent predictor: words with onset **p* acquire high level tone (five examples, no exceptions). This is consistent with the widely observed pattern in tonogenesis of voiceless stop onsets producing high tone (Hombert et al. 1979). However, no other onset shows a consistent outcome, and the small number of examples may not be enough to be significant.

Overall, the most striking fact about Magey Matbat tonogenesis is the lack of predictability of tonal outcomes. The development of onset **p* and the epenthetic *o* on low falling phrase-final syllables are the only clearly identifiable innovations.

PMP **banua* 'inhabited area'	*nu³* 'village'
PMP **bunuq* 'kill'	*bu³n*
PMP **duha* 'two'	*lu³*
PMP **əpat* 'four'	*fa³t*
PMP **hapuy*, PEMP **api* 'fire'	*ya³p*
PMP **kutu* 'head louse'	*wu³t*
PMP **lima* 'five'	*li³m*
PCEMP **ma-pia* 'good'	*fi³*
PMP **ma-pənuq* 'full'	*fo³n*
PMP **pəñu* 'turtle'	*fe³n*
PMP **susu* 'female breast'	*su³*
PMP **təlu* 'three'	*to³l*

Table 5.4: Sources of Magey Matbat high level tone.

PMP **bəRay* 'give'	*be²¹*
PMP **bulu* 'feather'	*na/po²¹l*
PMP **dahun* 'leaf'	*da²¹n*
PMP **i-aku* 'I'	*ya²¹k*
PMP **i-kahu* 'you (sg.)'	*ya²¹w(a)*
PMP **inum* 'drink'	*-ani²¹m*
PMP **ma-Ruqanay* 'man'	*wa³y/ma²¹n*
PMP **ŋajan* 'name'	*na²¹n*
PMP **qatay* 'liver'	*ta²¹y*
PMP **qitəluR* 'egg'	*to²¹l*
PMP **wakaR* 'root'	*wa²¹/po*

Table 5.5: Sources of Magey Matbat low falling tone.

PMP **batu* 'stone'	*pa^{12}t*
PMP **ənəm* 'six'	*no^{12}m*
PMP **mataɣ* 'die'	*ma^{12}t*
PMP **məñak* 'fat, grease'	*mna^{12}*
PMP **hikan* 'fish'	*yi^{1}n*
PMP **niuR* 'coconut'	*nu^{1}*
PMP **ʒaRum* 'needle'	*la^{1}m*
PMP **dəŋəR* 'hear'	*no^{41}ŋ*
PMP **qinəp*, PCEMP **qenəp* 'lie down to sleep'	*-e^{41}n*
PCEMP **todan* 'sit'	*ho^{121}l*

Table 5.6: Sources Magey Matbat low rising, low level, extra high falling, and rising falling tones.

5.3 Cenderawasih Bay languages

5.3.1 Moor

Moor exhibits a word-tone system, with four basic tonal patterns.[5] Since these patterns' realization is somewhat complex and variable, I refer to them here simply as tones 1 to 4. Variation arises from context, word length, and whether a word is underlyingly vowel- or consonant-final. Consonant-final words receive an optional epenthetic final *a* (obligatory if the consonant is *j* or *gw*).[6] Epenthetic final *a* is low in pitch. Table 5.7 summarizes the basic Moor tonal patterns.[7]

Tone 1, transcribed with an acute accent on the first vowel of the final syllable, is realized as high pitch on initial syllables, with a fall on the final syllable (H*F). The fall co-occurs with lengthening of the vowel on which it is realized. On consonant-final words, the fall may be shortened, being realized as high pitch with only a slight fall, if any.

Tone 2, transcribed with a grave accent on the first vowel of the final syllable, is realized as low pitch on initial syllables, with a rise on the final syllable (L*R). The rise co-occurs with lengthening of the vowel on which it is realized. Tone 2 is not found on consonant-final words. It mostly appears on verbs and adjectives and is rare on nouns.

[5]Laycock (1978) first observed that Moor was tonal. He cited a few minimal pairs but gave no analysis. This section covers the Hirom dialect, the Moor dialect with which I am most familiar. Impressionistically, tonal differences among dialects are limited to the phonetic realization of tones. The Ayombai dialect shows the greatest difference compared to the system described here.

[6]In the description below, epenthetic final *a* is disregarded when counting syllables. For example, "final syllable" refers to the final underlying syllable.

[7]Phonetic transcription follows IPA: [á] = high pitch, [ā] = mid pitch, [à] = low pitch. In the tone pattern schemas used here and in following sections, H = high, M = mid, L = low, F = falling, R = rising, * = zero or more of the preceding tone/pitch.

	vowel-final	consonant-final	main word classes
Tone 1 (H*F)	*iná* [íná:à] 'mother'	*núta* [nú(ù)t(à)] 'island'	all
Tone 2 (L*R)	*inà* [ìnà:á] 'pour'	–	verbs, adjectives
Tone 3 (L*RM)	*ìna* [ìínā] 'ear'	*vùrina* [βùúɾīn(à)] 'moon'	nouns
Tone 4 (H*LH)	*munâ* [múùná] 'kill'	–	verbs, adjectives

Table 5.7: Summary of the four basic Moor tonal patterns.

	noun in isolation	with suffixed article
Tone 1 (H*F)	*u'áu* [úʔáù] 'taro sp.'	*u'áu-ró* [úʔáu-ɾō]
Tone 2 (L*R)	*manù* [mànùú] 'forest'	*manù-ó* [mànù-ō]
Tone 3 (L*RM)	*àju* [àádʒū] 'wing'	*àju-ró* [àádʒū-ɾō]
Tone 4 (H*LH)	*rousû* [ɾóùsú] 'k.o. arrow'	*rousû-ró* [ɾóusù-ɾó]

Table 5.8: Moor tonal developments with suffixed nominal article.

Tone 3, transcribed with a grave accent on the first vowel of the penultimate syllable, is realized as low pitch on initial syllables, with a rise on the penultimate syllable and mid pitch on the final syllable (L*RM). It mostly appears on nouns and is rare on verbs and adjectives.

Tone 4, transcribed with a circumflex on the first vowel of the final syllable, is realized as high pitch on initial syllables, with low pitch on the penultimate syllable and high pitch on the final syllable (H*LH). On disyllables, the pattern is compressed so that the first syllable contains a fall on a lengthened vowel (FH). On monosyllables, the pattern is truncated so that only the high pitch is realized (H).[8] Tone 4 is not found on consonant-final words. It mostly appears on verbs and adjectives and is rare on nouns.

It is evident from the above descriptions that the primary locus of contrast among tones 1–4 is the final two syllables. In fact, the contrast is even more restricted than this: tones are realized only on phrase-final words. As a result, the functional load of tone is quite low in discourse.

The neutralization of tone in all contexts but phrase-final position limits the domain of possible tonal interactions. Most affixes and clitics have no effect on tone. For example, the 1SG proclitic *i=* receives high pitch in *i=verá* 'I go' and low pitch in *i=vorà* 'I split'. The only clear case of a morphological form bearing tone is the suffixed article *-ó/-ró/-jó*, which is generally realized with a mid level pitch. Examples are shown in Table 5.8. The phonological analysis of this phenomenon is not clear.

In addition to contrastive tone, Moor contains a marginal vowel length contrast. Long vowels (transcribed by repeating the vowel letter) are restricted to a handful of pronom-

[8]The only attested monosyllable with tone 4 is *î* 'he, she'.

inal forms. A minimal pair is *arú* [árúù] 'small white crab' versus *aarú* [áarúù] 'we (du. incl.)'.

I have identified clear Austronesian etymologies for 92 of the 1680 words found in my Moor lexicon (disregarding cases with evidence of borrowing). These are listed in Tables 5.9–5.12, arranged according to the resulting tone. There are 39 words with tone 1, 9 with tone 2, 28 with tone 3, and 16 with tone 4.

The most robust generalization that emerges from these data is that words that become (or remain) monosyllablic receive tone 1. Among the many examples are **kutu* 'louse' > *kú'-a* and **niuR* 'coconut' > *nér-a*.[9] The sole exceptions are **todan* 'sit' > *'ò* and **ia* 'he, she' > *î*.

There is a related (but weaker) generalization between tone 3 and words that become (or remain) disyllabic. Among the various examples are **bulan* 'moon' > *vùrin-a*, **taŋis* 'cry' > *'ànit-a*, and **tasik* 'saltwater' > *àti*. Among the counterexamples are two kinship terms that receive tone 1 instead (**ina* 'mother' > *iná*, **t-ama* 'father' > *kamá* 'grandparent'); **banua* 'inhabited area' > *manù* 'forest'; and **qenəp* 'lie down to sleep' > *enâ*.

The various verbs and adjectives that have acquired the *-i* intransitivizing suffix regularly have tone 4. These are counterexamples to the above generalizations in some cases (e.g., **tunu* 'roast over a fire' > *'un-î*).

I have not been able to identify any generalization for words that receive tone 2.

It is not straightforward to employ the above generalizations to derive phonological innovations that would give rise to the Moor tonal system. There is some evidence to support the hypothesis that tone 3 is the reflex of a formerly regular penultimate stress system. The rising pitch of tone 3 falls on the historically penultimate syllable in most cases. Tone 3 is the most common outcome if some other process (reduction to a monosyllable, affixation of *-i*, etc.) does not interfere. Finally, recent borrowings, most of which come from penultimately stressed words in local Malay, generally receive tone 3 (e.g., *bìsa* 'to be able' from *bisa*, *udàra* 'airplane' from *udara* 'air').

The penultimate stress hypothesis deserves further consideration, but it only partially explains the development of tone in Moor. The phonetic conditioning of tones 2 and 4, in particular, is rather mysterious. It is striking that so little can be said about the historical processes that produced such a system.

[9] As noted above, the epenthetic final *a* is not counted.

PMP **bab‹in›ahi* ‘woman’	*vavín-a*
PMP **baRa* ‘arm’	*veréa*
PMP **batu* ‘stone’	*vá’-a*
PMP **bəRsay* ‘paddle’	*vór-a*
PMP **buaq* ‘fruit’	*vó*
PMP **buku* ‘node, knot’	*vú’-a*
PMP **danaw* ‘lake’	*rán-a*
PMP **duyuŋ* ‘dugong’	*rún-a*
PMP **duha* ‘two’	*rú-ró*
PMP **əpat* ‘four’	*á’-ó*
PMP **əsa* ‘one’	*ta-tá*
PMP **ina* ‘mother’	*iná*
PMP **kahiw*, PCEMP **kayu* ‘wood’	*ka/’úat-a*
PMP **kami* ‘we (excl.)’	*ám-a*
PMP **kasuaRi* ‘cassowary’	*atúar-a*
PMP **kita* ‘we (incl.)’	*í’-a*
PMP **kuRita* ‘octopus’	*arí’-a*
PMP **kutu* ‘head louse’	*kú’-a*
PMP **lahud* ‘sea’	*rú*
PMP **lakaw* ‘go’	*rá*
PMP **lima* ‘five’	*rím-ó*
PCEMP **malip* ‘laugh’	*marí/’-a*
PMP **məñak* ‘fat, grease’	*mana/ná*
PCEMP **mipi* ‘to dream’	*ena-mí/’-a*
PCEMP **mutaq* ‘to vomit’	*ma/múa’-a*
PEMP **natu* ‘child’	*na’ú* ‘person’
PMP **niuR* ‘coconut’	*nér-a*
PMP **nusa* ‘island’	*nút-a*
PMP **punti* ‘banana’	*hút-a*
PMP **qapuR* ‘lime, calcium’	*ár-a*
PMP **qənay* ‘sand’	*áen-a*
PCEMP **sei* ‘who?’	*na’u-sé*
PMP **susu* ‘female breast’	*tút-a*
PMP **t-ama* ‘father’	*kamá* ‘grandparent’
PMP **təbuh* ‘sugarcane’	*kóh-a*
PMP **təlu* ‘three’	*ó-ró*
PMP **t‹in›aqi* ‘intestines’	*siné* ‘belly’
PMP **utaña* ‘ask’	*u’unú*
PCEMP **waŋka* ‘canoe’	*gwá’-a*

Table 5.9: Sources of Moor tone 1.

PMP **banua* ‘inhabited area’	*manù* ‘forest’
PMP **barəq* ‘swollen’	*va/varà*
PMP **bəlaq* ‘split’	*vorà*
PMP **buruk* ‘rotten’	*va/varù*
PMP **kamu* ‘you (pl.)’	*amù*
PCEMP **madar* ‘overripe’	*marar/ù* ‘withered’
PMP **ma-tuqah*, PEMP **matu* ‘dry (coconut)’	*ma’ù*
PMP **Ramәs* ‘squeeze’	*amat-à*
PCEMP **todan* ‘sit’	*’ò*

Table 5.10: Sources of Moor tone 2.

PMP **bulan* ‘moon’	*vùrin-a*
PMP **bulu* ‘body hair’	*vùru*
PMP **buRbuR* ‘rice porridge’	*vùvur-a* ‘sago porridge’
PMP **dahun* ‘leaf’	*rànu*
PMP **danum* ‘fresh water’	*ràrum-a*
PMP **daRaq* ‘blood’	*ràra*
PMP **hikan* ‘fish’	*ìjan-a*
PMP **ka-wiri* ‘left side’	*sa/gwìri*
PCEMP **kazupay* ‘rat’	*arùha*
PCEMP **kera(nŋ)* ‘hawksbill turtle’	*èran-a*
PMP **manuk* ‘bird’	*mànu*
PEMP **(n)iwi* ‘nest’	*nìgwi*
PMP **ŋajan* ‘name’	*nàtan-a*
PMP **qaninu* ‘shadow’	*anìno*
PMP **qatay* ‘liver’	*à’a*
PMP **qutin* ‘penis’	*ùsi*
PMP **Rumaq* ‘house’	*rùma*
PMP **sa-puluq* ‘ten’	*tàura*
PMP **tabuRi* ‘conch shell’	*avùr/a*
PMP **taliŋa* ‘ear’	*ìna*
PMP **taŋis* ‘cry’	*’ànit-a*
PMP **tasik* ‘saltwater’	*àti*
PMP **tawan* ‘*Pometia pinnata*’	*kàgwan-a*
PMP **tubuq* ‘branch’	*ùvu*
PMP **tuqәlaŋ* ‘bone’	*òro*
PMP **wahiR* ‘river’	*gwàjar-a*
PMP **zalan* ‘path’	*ràrin-a*
PCEMP **waRәj* ‘vine, creeper’	*gwàri/’-a*

Table 5.11: Sources of Moor tone 3.

PMP **babaq* 'short, low'	*ku/vava/'-î* 'short'
PMP **bunuq* 'kill'	*munâ*
PMP **dəŋəR* 'hear'	*oran-î*
PMP **ia* 'he, she'	*î*
PMP **inum* 'drink'	*anum-î*
PMP **lawaq* 'spider'	*ragwa/'î*
PMP **ma-iRaq* 'red'	*mara/r-î*
PMP **mataq* 'green, raw'	*ma'-î* 'raw', *ma'a-ma'-î* 'green'
PMP **ma-panas* 'hot'	*na/nat-î*
PMP **qabaRa* 'carry on shoulder'	*ovar-î*
PCEMP **qenəp* 'lie down to sleep'	*enâ*
PMP **tanəm* 'to plant'	*'anam-î*
PMP **tələn* 'swallow'	*'oran-î*
PMP **tunu* 'roast over a fire'	*'un-î*

Table 5.12: Sources of Moor tone 4.

5.3.2 Yerisiam

Yerisiam has both contrastive tone and vowel length.[10] The tone-bearing unit is the mora, with short vowels counted as a single mora, long vowels counted as two moras, and diphthongs variably counted as one or two moras (see below). Two underlying tones may be associated with moras: high (H) and low (L). It follows that contour tones may be realized only as the sequences HL and LH on long vowels and bimoraic diphthongs. Table 5.13 summarizes the most common Yerisiam tonal patterns in words of up to three syllables. H is transcribed with an acute accent, L with a grave accent.

Three groups of common tonal patterns can be identified. Pattern 1 consists of high tone throughout the word (H). Pattern 2 consists of initial high tone followed by a shift to low on some mora (HL). Pattern 3 consists of initial low tone, with a shift to high on the final syllable (L*H). Synchronic alternations show that monomoraic words with high tone belong to pattern 3, not pattern 1. For example, pronominal prefixes typically receive the same tone as the first root syllable, but combining 1SG *ne-* with *pú* 'go home' produces *nè-pú* 'I go home', not ***né-pú*.

These three patterns are by far the most frequent in the Yerisiam lexicon. As an illustration, my Yerisiam lexicon contains 526 disyllables (out of 1802 total items). Of these, pattern 1 accounts for 200 words, pattern 2 for 230, and pattern 3 for 75. All other patterns are represented by only 21 words, about 4%.

Patterns 1–3 are not the only possible tone patterns, and there is diversity within pattern 2 with respect to the mora on which the shift to low tone occurs. I therefore assume that surface tone assignment on roots generally reflects underlying tone assignment in Ye-

[10]Anceaux (1961b) first observed that Yerisiam was tonal. He cited a few minimal pairs but gave no analysis.

risiam (but see below for my analysis of pattern 3). Table 5.14 shows the other attested tonal patterns in words of up to three syllables. It contains a significant proportion of the available examples.

σ	(1)	H	$\mu\mu$	*áau* 'betel lime', *róoi* 'night'
	(2)	HL	$\mu\mu$	*gwáà* 'canoe', *áì* 'tree'
	(3)	H	μ	*bú* 'blister', *gwái* 'duck sp.', *rói* 'song'
$\sigma\sigma$	(1)	H-H	μ-μ	*róhé* 'nit', *óría* 'broth', *báohé* 'turtle flipper'
			$\mu\mu$-μ	*háarú* 'coral', *péeréi* 'bed'
	(2)	H-L	μ-μ	*búnè* 'bamboo stem', *krádìa* 'flesh'
			$\mu\mu$-μ	*áakà* 'four', *búumbùi* 'bottle'
		H-HL	μ-$\mu\mu$	*dáîì* 'father', *bábráù* 'land', *káoníà* 'small sago midrib'
			$\mu\mu$-$\mu\mu$	*máanáà* 'bird', *ráaníà* 'sheet (of paper)'
		HL-L	$\mu\mu$-μ	*áàkà* 'sago midrib', *káèpà* 'sago chopsticks', *ráànìa* 'leaf'
	(3)	L-H	μ-μ	*àká* 'ball sago', *dìorí* 'top shell', *dìarúa* 'sago stirrer'
$\sigma\sigma\sigma$	(1)	H-H-H	μ-μ-μ	*kájáké* 'bad', *húmbíái* 'loose'
			μ-μ-$\mu\mu$	*híróráai* 'tree sp.', *kákíkóoi* 'multicolored'
			μ-$\mu\mu$-μ	*báróopé* 'finger', *níaméené* 'tongue', *bárúaahí* 'share'
			$\mu\mu$-μ-μ	*kóoríhé* 'three', *míeetáré* 'light (n.)'
	(2)	H-H-L	μ-μ-μ	*jávútù* 'flint', *bábúgùa* 'elbow', *ádíakà* 'shellfish sp.'
			μ-$\mu\mu$-μ	*háráakvè* 'book', *pémáanùa* 'slow'
			$\mu\mu$-μ-μ	*díijánà* 'fish', *húuhúgùa* 'breast'
		H-L-L	μ-μ-μ	*hábàkù* 'cigarette', *tónùrè* 'ant nest'
			μ-$\mu\mu$-μ	*nájòorè* 'horn', *úbìikì* 'lift'
			$\mu\mu$-μ-μ	*bóokànì* 'axe', *híaamàtù* 'fish sp.', *róodìatè* 'tonight'
		H-H-HL	μ-μ-$\mu\mu$	*káuríeráà* 'k.o. arrow', *kábágwéà* 'squash sp.'
			μ-$\mu\mu$-$\mu\mu$	*róníijáà* 'gecko sp.', *áráadíà* 'smoking platform'
		H-HL-L	μ-$\mu\mu$-μ	*hánéèrà* 'mosquito', *kárúàrà* 'friend', *áráàhìa* 'day'
			$\mu\mu$-$\mu\mu$-μ	*gwáapíàtè* 'freshwater eel'
	(3)	L-L-H	μ-μ-μ	*bàhàbé* 'fast', *nàkùnía* 'knife', *hìbìabí* 'bent'

Table 5.13: Common Yerisiam tonal patterns in words of up to three syllables.

Several constraints restrict the distribution of long vowels: (i) there may be no more than one long vowel per word, except on the final two syllables when their tone pattern is H-HL (thus, *róníijáà* 'gecko sp.' but not, for example, **róonîjà*); (ii) long vowels do not occur in diphthongs, except in VVG diphthongs (long vowel with an off-glide *i* or *u*) in final level syllables (thus, *róoi* 'night' but not **róoimé* or **áaì*); (iii) long vowels are not permitted on final level syllables unless they are part of a VVG diphthong (there is no word of the form **róo*)[11]; (iv) long vowels do not occur in words with tone pattern 3

[11]There is some evidence that underlyingly long vowels are permitted more generally on final level syllables. The word *nó* 'hear' becomes *nóo* when followed by the negator *vè*, whereas *pú* 'go home' remains

σ	L	μ	*bà* ‘still’, *pò* ‘in order to’
$\sigma\sigma$	L-L	μ-μ	*dòrò* ‘also’, *dìhì* ‘from’
	H-LH	μ-$\mu\mu$	*mígwàí* ‘duck sp.’
	L-LH	μ-$\mu\mu$	*kànàó* ‘talk freely’
	HL-H	$\mu\mu$-μ	*áìhá* ‘above’, *áòró* ‘catfish sp.’
	LH-L	$\mu\mu$-μ	*nùúsì* ‘great-grandparent’, *gwòókà* ‘crow sp.’
$\sigma\sigma\sigma$	H-L-H	μ-μ-μ	*mónìhá* ‘all’, *rúmùhúa* ‘house post’
	L-L-L	μ-μ-μ	*kàpùhè* ‘ancestor’, *jàrìmòi* ‘agarwood tree’
	H-L-HL	μ-μ-$\mu\mu$	*móhàdáà* ‘oven’, *óvàéè* ‘duck sp.’
	H-L-LH	μ-μ-$\mu\mu$	*móhòràú* ‘colored sky’
	L-L-LH	μ-μ-$\mu\mu$	*mèmìmùá* ‘feature’, *kàimìàú* ‘swan sp.’
	H-HL-H	μ-$\mu\mu$-μ	*máhéèbá* ‘firefly cluster’, *távéèhé* ‘that’s right’
	H-LH-L	μ-$\mu\mu$-μ	*ímbàérì* ‘tree sp.’
	LH-L-L	$\mu\mu$-μ-μ	*kàágwàtè* ‘wire’
	HL-H-L	$\mu\mu$-$\mu\mu$-μ	*îdíoodì* ‘bird sp.’

Table 5.14: Uncommon Yerisiam tonal patterns in words of up to three syllables.

(thus, *àká* ‘ball sago’ but not **àaká* or **àkóoi*).

As noted above, diphthongs can count for one or two moras. They are bimoraic if they contain a contour tone or occur in a VVG diphthong (e.g., *áì* ‘wood’, *róoi* ‘night’); otherwise they are monomoraic (e.g., *dìarúa* ‘sago stirrer’).[12] This analysis is based on the impressionistic length of diphthongs in these contexts. An analysis that did not stipulate variable moraicity would be preferable, but I have not found a viable alternative. One obvious option would be to treat the contrast between *róoi* ‘night’ and *rói* ‘song’ as one between a disyllable and a monosyllable (/rói/ versus /rój/). However, this analysis is actually less parsimonious: glides are insufficient to capture the full range of attested diphthongs (e.g., *báohé* ‘turtle flipper’, in which the initial syllable is as short as *rói*), and there is no corresponding explanatory benefit that would shed light on the restricted distrbution of long vowels.

Tone pattern 3 is exceptional. Unlike other patterns, words with pattern 3 undergo an alternation when the enclitic demonstrative *=tà* is added, receiving high tone throughout. Thus, *hùpé* ‘bottom’ becomes *húpéà=tà*, whereas *áakú* ‘stone’ (pattern 1) becomes *áakúà=tà* and *búubù* ‘water’ (pattern 2) becomes *búubùa=tà*.[13] I interpret this to mean that pattern 3 is the default tonal melody, and such words are underlyingly toneless.

the same. This suggests an underlying length contrast that is neutralized in final position. This question has not yet been systematically investigated.

[12]Monosyllables with VVG diphthongs have tone pattern 1, as becomes clear when a pronominal prefix is added (see above): *né-róoi* ‘my night’. Monosyllables with monomoraic diphthongs have pattern 3: *nè-rói* ‘my song’.

[13]The final *à* before the enclitic is inserted by a regular phonological rule.

The demonstrative *=tà* then imposes its own tonal melody if no underlying melody is present. This analysis does not, however, straightforwardly account for the prohibition on long vowels in pattern 3 words noted above. An additional stipulation is required that long vowels are only permitted on underlyingly tonal syllables.

I have identified clear Austronesian etymologies for 85 of the 1802 words found in my Yerisiam lexicon (disregarding cases with evidence of borrowing). These are listed in Tables 5.16–5.18, arranged according to the resulting tone pattern. There are 31 words with pattern 1, 39 with pattern 2, and 15 with pattern 3. No other tonal patterns are attested in these data.

The origin of vowel length is relatively straightforward. Of the 70 words with patterns 1 and 2, 46 have a long vowel on the historically penultimate syllable.[14] The most plausible explanation for this is that Yerisiam descends from a proto-language that had penultimate stress, with former stress surviving as vowel length. Though 24 words do not conform, not all are truly exceptions. Two do not allow long vowels for phonotactic reasons (*áì* 'wood', *núì* 'coconut'; see constraint (ii) above). Seven are likely candidates for contamination: kinship terms (*gwápúù* 'grandmother', *bábà* 'older sibling'); *ûnà* 'woman' (cf. *máànà* 'man'); pronouns (*néemé* 'we (excl.)', *néeké* 'we (incl.)', *ínúihí* 'they'); and a numeral (*áakà* 'four'). This leaves a residue of 15 words which lack the expected long vowels, or contain them where not expected. I have considered various predictors (e.g., the presence of final **q* and the loss of intervocalic consonants) but have not found any convincing correlations.

Turning now to the origin of tone, inspection of Tables 5.16–5.18 shows that there is a striking correlation between a Yerisiam word's tone pattern and the presence or absence of final *a*. In pattern 1, 2 of 31 words end in *a* (6%); in pattern 2, 35 of 39 (90%); and in pattern 3, 5 of 15 (33%). This correlation also holds for the Yerisiam lexicon at large. Table 5.15 shows the prevelance of final *a* among attested disyllables and trisyllables in patterns 1, 2, and 3. Final *a* is rare in pattern 1, very common in pattern 2, and quite common in pattern 3.

This leads straightforwardly to the inference that final *a* triggered a tonal change. The default tonal outcome was evidently pattern 1. If a word came to end in *a*, whether as a result of sound change or suffixation, the outcome was pattern 2. The origin of pattern 3 is unclear, except that in several cases it derives from monosyllables that would have had pattern 1 but are too short (e.g., *nú* 'village', *ú* 'fruit').

The unexplained residue in these data is relatively minor (leaving aside pattern 3, which as mentioned is not well understood): two words in Table 5.16 end in *a* and four words in Table 5.17 do not end in *a*. Of these cases, the only one for which there is a ready explanation is *gwápúù* 'grandmother', which may have been contaminated by other kinship terms such as *áîì* 'mother' and *áúù* 'father's younger brother'.[15]

[14]Pattern 3 does not permit long vowels, as noted above.

[15]This leaves open the question of how *áîì* and *áúù* acquired their falling tone in the first place. These words do not have clear Austronesian etymologies. One possibility is that they are loanwords, and their

The mora on which the change from H to L falls in pattern 2 words is largely predictable. There were apparently two separate stages in which changes occurred. During the first stage, all words had tone pattern 1, with a lengthened vowel in the penultimate syllable in most cases (but not all, as discussed above). Possibly tone was not yet contrastive at this stage. Then, if the word ended in *a*, the tone shifted from H to L on the second mora of the penult if it was long (*HH-H > HL-L), otherwise on the final syllable (*H-H > H-L). Examples are **úurá* 'moon' > *úùrà* and **rúmá* 'ceremonial house' > *rúmà*. During the second stage, some words that were not *a*-final in the first stage acquired low-tone *a*-final suffixes. This introduced a shift to L on the final syllable (*HH-H > HH-H-L). Examples are **dǐijáǹ* 'fish' > *dǐijáǹ-à* and **úurú* 'body hair' > *úurú-gùa*.[16]

The phonetic basis on which final *a* triggers low tone is of significant interest for the theory of tonogensis. There is a well-established cross-linguistic universal that high vowels have an intrinsically higher F_0 by about 10–15 Hz (Whalen and Levitt 1995). A low vowel such as *a* has a lower F_0, and may plausibly be the phonetic precursor of a phonologized change to low tone.

The effect of vowel height on tone is discussed sparingly in the tonogenesis literature, and not all proposed cases have been accepted. Maddieson (1978: 354) and Hombert et al. (1979: 52) reject it for Lahu and Foochow, the most plausible examples known at the time. Hombert et al. (1979: 52) conclude that these cases "can [rather] be interpreted as an effect of tones on vowels. It would seem that the interaction between tones and vowel height works only in one direction: tone can affect vowel height but not vice-versa."

Since Hombert et al.'s landmark paper, several more persuasive examples of vowel height affecting tone have been observed. Svantesson (1989, 1991) describes two independent cases in two Mon-Khmer languages. In Hu, "the high vowels *i* and *u* always have high tone, except before *ʁ* or in open syllables, where both [high and low] tones occur" (Svantesson 1991: 72). In U, "in open syllables…, the high level tone split in two, depending on vowel height, so that high vowels retained the high tone and nonhigh vowels got low tone" (Svantesson 1989: 72). Svantesson cites intrinsic F_0 differences as the most likely explanation for both cases.

Rivierre (2001) describes a phenomenon in Cèmuhî, an Oceanic language of New Caledonia, which is strikingly similar to Yerisiam tonogenesis. Cèmuhî has three different word-level tones: high, mid, and low. High tone derives straightforwardly from aspirated initial consonants (*C^hV > $C\acute{V}$), mid tone from unaspirated initial consonants (*CV > $C\bar{V}$). The significant case is low tone. The proto-sequences **aqa*, **ao*, and **oa* are all reflected as *à*.[17] The result is that most low tone words contain *a*.[18]

---

tone is preserved from the donor language. However, it is difficult to trace the origin of most of the non-Austronesian vocabulary in Yerisiam (and other SHWNG languages).

[16]There is no synchronic evidence that *-à* is analyzable as a suffix, but there are enough historical examples that it must have been previously. Its function is unkown.

[17]The three sequences presumably merged prior to the development of low tone, though Rivierre does not explicitly address this question.

[18]Proto-Oceanic **a* is reflected as *ɛ* in Cèmuhî, and had no effect on tone.

There is one important difference between tonogesis in Cèmuhî and Yerisiam. Cèmuhî undergoes typical tonogenesis changes involving secondary split: the loss of contrastive aspiration elevates what was formerly a predictable pitch difference to a tonal contrast. Similarly, when the reflexes of **aqa*, **ao*, and **oa* merged, their formerly predictable low pitch became phonologized as low tone. In Yerisiam, however, the conditioning environment for the tone change, namely the final *a*, was never lost. This makes Yerisiam somewhat unusual compared with more well-known cases of tonogenesis.

Taken together, the Hu, U, Cèmuhî, and Yerisiam cases provide convincing evidence that, contra Hombert et al. (1979: 52), vowel height can affect tone. The fact that only these cases are known suggests that this phenomenon is quite rare.

	tones	# words	# with final *a*	
(1)	H-H	200	26	(13%)
(2)	H-L	81	57	(70.4%)
	H-HL	67	39	(58.2%)
	HL-L	82	59	(72%)
(3)	L-H	75	36	(48%)
(1)	H-H-H	175	11	(6.3%)
(2)	H-H-L	164	105	(64%)
	H-L-L	17	0	(0%)
	H-H-HL	27	21	(77.8%)
	H-HL-L	108	81	(75%)
(3)	L-L-H	35	21	(60%)

Table 5.15: Distribution of final *a* across tone patterns in Yerisiam.

PMP **añam* ‘weave’	*áamán/é*
PMP **batu* ‘stone’	*áakú*
PMP **duha* ‘two’	*rúu-hí*
PMP **hapuy*, PEMP **api* ‘fire’	*jáai*
PMP **inum* ‘drink’	*íimán/é*
PMP **kaən* ‘eat’	*áan-í* ‘eat (intr.)’
PMP **kami* ‘we (excl.)’	*née/mé*
PMP **kaRaw* ‘to scratch’	*ráa/rí*
PMP **kita* ‘we (incl.)’	*née/ké*
PMP **kutu* ‘head louse’	*úukú*
PMP **laRiw* ‘run’	*ráarú*
PMP **ləsəq* ‘nit’	*róh/é*
PMP **ma-bəRəqat* ‘heavy’	*máak/í*
PMP **ma-nipis* ‘thin’	*mánii/jáhé*
PMP **ma-Raqan* ‘light’	*márán/é*
PMP **ma-takut* ‘afraid’	*ngkák/é*
PMP **mataq* ‘raw, green’	*máaká* ‘raw’, *mák-máaká* ‘blue’
PMP **pəñu* ‘turtle’	*éenú*
PMP **punti* ‘banana’	*píití*
PMP **qabaRa* ‘carry on shoulder’	*áar-í*
PMP **qapuR* ‘lime, calcium’	*áau*
PCEMP **qenəp* ‘lie down to sleep’	*éen/é*
PMP **qitəluR* ‘egg’	*á/kóor/é*
PMP **sida* ‘they’	*íníi-hí*
PMP **tanəm* ‘to plant’	*káamán/é*
PMP **taŋis* ‘cry’	*káh/é*
PMP **təbuh* ‘sugarcane’	*kóou*
PMP **tələn* ‘swallow’	*kóor-í*
PMP **təlu* ‘three’	*kóorí-hé*
PMP **tunu* ‘roast over a fire’	*kúun/á*
PMP **waRəj* ‘vine, creeper’	*gwáarí* ‘rope’

Table 5.16: Sources of Yerisiam tone pattern 1.

PMP **apu* ‘grandparent’	*gw/ápúù* ‘grandmother’
PMP **baba* ‘father’	*bábà* ‘older sibling’
PMP **bab‹in›ahi* ‘woman’	*îînà*
PMP **bulan* ‘moon’	*úùrà*
PMP **buku* ‘knot’	*bú-gùa*
PMP **bulu* ‘body hair’	*úurú-gùa*
PMP **dahun* ‘leaf’	*ráàn/ìa*
PMP **danum* ‘fresh water’	*ráarám/à*
PMP **daRaq* ‘blood’	*rárà*
PMP **əŋgəm* ‘hold in mouth’	*óom/à*
PMP **əpat* ‘four’	*áak/à*
PMP **hasaq* ‘sharpen’	*áhà*
PMP **hikan* ‘fish’	*d/íijáin/à*
PMP **kahiw*, PCEMP **kayu* ‘wood’	*áì*
PCEMP **kandoRa* ‘cuscus’	*átóòrà*
PMP **laŋit* ‘sky’	*ráak/átè*
PMP **lawaq* ‘spider’	*rá-ráà/rùmà*
PMP **lima* ‘five’	*rîmà*
PMP **mamaq* ‘chew’	*námà*
PMP **manuk* ‘bird’	*máan/áà*
PMP **ma-Ruqanay* ‘man’	*máànà*
PMP **m-atay* ‘die’	*máàkà*
PMP **nanaq* ‘pus’	*náanáà*
PMP **niuR* ‘coconut’	*núì*
PMP **nusa* ‘island’	*núùhà*
PMP **ŋajan* ‘name’	*áahán/à*
PMP **paRih* ‘sting’	*pár/éèmà* ‘stingray’
PMP **qaləjaw* ‘sun’	*óòrà*
PMP **qaninu* ‘shadow’	*ánúunú-gùa*
PMP **qasu* ‘smoke’	*ógw/áahú-gùa*
PMP **qatay* ‘liver’	*ákéè/nà*
PMP **qudaŋ* ‘shrimp’	*úuráà*
PMP **Rumaq* ‘house’	*rúmà* ‘ceremonial house’
PMP **susu* ‘female breast’	*húuhú-gùa*
PMP **tasik* ‘salt’	*káhì/a*
PMP **taki, *taqi* ‘feces’	*káà*
PMP **tuqəla(nŋ)* ‘bone’	*kóo/vá/rà*
PCEMP **waŋka* ‘canoe’	*gwáà*
PMP **zalan* ‘path’	*jáàrà*

Table 5.17: Sources of Yerisiam tone pattern 2.

PMP **banua* 'inhabited area'	*nú* 'village'
PMP **baRa* 'arm'	*bà-kí*
PMP **buaq* 'fruit'	*ú*
PMP **ia* 'he, she'	*ì/ní*
PMP **i-kahu* 'you (sg.)'	*à/né*
PMP **kaən* 'eat'	*àn/á* 'eat (tr.)'
PMP **lakaw* 'go'	*rá*
PMP **ma-hiaq*, PCEMP **mayaq* 'ashamed'	*mái*
PMP **ma-tuqah*, PEMP **matu* 'dry (coconut)'	*màkú/i*
PMP **məñak* 'fat, grease'	*mì/mná*
PCEMP **mipi* 'to dream'	*mí*
PMP **quma* 'to work'	*ùmá*
PMP **Rambia* 'sago'	*pí*
PMP **t‹in›aqi* 'intestines'	*hìná* 'belly'
PCEMP **todan* 'sit'	*kó*

Table 5.18: Sources of Yerisiam tone pattern 3.

5.3.3 Yaur

Yaur has both contrastive tone and vowel length.[19] There is rarely more than one long vowel in a word. The tone-bearing unit is the mora, with short vowels counted as a single mora, and long vowels and diphthongs counted as two moras. Two underlying tones may be associated with moras: high (H) and low (L). It follows that contour tones may be realized only as the sequences HL and LH on long vowels and diphthongs.

Most of my Yaur lexicon of 1342 words consists of disyllables and trisyllables. Although various tone patterns are attested, there are only four common patterns on disyllables and six on trisyllables. Table 5.19 shows these patterns and their distribution. H is transcribed with an acute accent, L with a grave accent. An example of a near-minimal disyllabic quadruplet is *hníoojè* 'body hair', *òojé* 'sugarcane', *óòjé* 'head louse', and *'òórè* 'bone'. To this set may be added *òjé* 'bamboo', illustrating the vowel length contrast.

I have identified clear Austronesian etymologies for only 37 of the words found in my Yaur lexicon (disregarding cases with evidence of borrowing). These are listed in Tables 5.20–5.22, arranged according to the resulting tone pattern. There are 14 words with L-H (or equivalent), 14 with H-L (or equivalent), 4 with HL-H, and 5 with LH-L.

It is difficult to make robust generalizations about such a small number of words. The most convincing patterns I have noted are that pronouns, numerals, and inalienably possessed nouns typically have H-L, and words with LH-L tend to be verbs. The paucity of data means that the origins of tone in Yaur must remain mysterious for now.

[19] Yaur was not known to be tonal prior to my fieldwork.

pattern	# words
H-L	202
L-H	176
HL-H	42
LH-L	36
others	18
total $\sigma\sigma$	474
H-H-L	167
L-L-H	119
H-L-L	65
H-L-H	52
H-HL-H	41
L-LH-L	26
others	20
total $\sigma\sigma\sigma$	490

Table 5.19: Distribution of attested Yaur tone patterns in disyllables and trisyllables.

PMP **bəRay* 'give'	*vè-né*
PMP **duyuŋ* 'dugong'	*rì'-ré*
PMP **haRəzan* 'ladder'	*ròg-ré*
PMP **kahiw*, PCEMP **kayu* 'wood'	*à-jé*
PCEMP **mamaq* 'chew'	*í-jó'-màm-né* 'I chew'
PMP **manuk* 'bird'	*mà'-ré*
PMP **ma-Ruqanay* 'man'	*jò/màg-ré*
PMP **punti* 'banana'	*ìdí-e*
PMP **tanəm* 'to plant'	*ì-'àm-né* 'I plant'
PMP **tasik* 'salt, saltwater'	*àah-ré* 'salt'
PMP **təbuh* 'sugarcane'	*òo-jé*
PMP **utik* 'marine fish with thorny skin'	*bàb/ùh-ré* 'pufferfish'
PMP **wai* 'mango'	*gwài/h-ré*
PMP **waRəj* 'vine, creeper'	*gwàrí-e* 'rope'

Table 5.20: Sources of Yaur L-H tone.

PMP **buku* 'node, knot'	*vúu-jè*
PMP **duha* 'two'	*ré-dú-hè*
PMP **əpat* 'four'	*ría-hè*
PMP **ia* 'he, she'	*í-'è*
PMP **i-kahu* 'you (sg.)	*á-'è*
PMP **kamiu* 'you (pl.)'	*ámú-'è*
PCEMP **madar* 'ripe'	*mád-rè*
PMP **mataq* 'green'	*máa'/rùrìe*
PMP **məñak* 'fat, grease'	*mnáa-rè*
PMP **ŋajan* 'name'	*áhg-rè*
PMP **qaninu* 'shadow'	*núndì-e*
PMP **susu* 'female breast'	*húhì-e*
PMP **t‹in›aqi* 'intestines'	*hnáa-rè*
PMP **tunu* 'roast over a fire'	*'ún-dè*

Table 5.21: Sources of Yaur H-L tone.

PMP **banua* 'inhabited area'	*núù-ré* 'village'
PMP **kutu* 'head louse'	*óò-jé*
PMP **lawaq* 'spider'	*ráà-jé*
PMP **Rumaq* 'house'	*rúùg-ré* 'ceremonial house'
PMP **lakaw* 'go'	*ì-ràá-rè* 'I come'
PMP **mataɣ* 'die'	*ì-màá'-rè* 'I die'
PMP **taŋis* 'cry'	*ì-'àáh-rè* 'I cry'
PMP **tasik* 'salt, saltwater'	*àáh-rè* 'sea water'
PMP **tuqəla(nŋ)* 'bone'	*'òó-rè*

Table 5.22: Sources of Yaur HL-H and LH-L tone.

5.4 Implications for subgrouping

Of the five languages covered in this chapter, it is possible to place the origins of tone on a relatively sound basis only in one case: Yerisiam. The innovations that are found in Yerisiam are not, however, found in the other four languages. The only identifiable shared tonal innovation is the epenthetic final *o* found after the (acoustically identical) Fall in Ma'ya and Low Fall in Matbat.[20] The origin of this innovation is obscure; there

[20]Biga also has epenthetic final *o* in prepausal position in various words (Remijsen 2001b: 158). Biga is not known with certainty to be tonal, and Remijsen does not transcribe tone in his wordlist. It therefore cannot be determined whether epenthetic final *o* in Biga has the same origin as in Ma'ya and Matbat, though it seems likely that there is some relationship.

are no known synchronic or historical facts explaining why the *o* is restricted to a words with (low) falling tone, or why the vowel is *o*.

The epenthetic final *o* innovation provides support for Proto-Ma'ya-Matbat. Since Ma'ya and Matbat are in contact, the innovation could also have diffused, rather than being inherited from a common proto-language. Remijsen (2007: 25) takes this view:

> The Matbat Low Fall and the Ma'ya Fall are acoustically identical, so it is likely that one of them has influenced the other. It is more probable that Ma'ya influenced Matbat rather than the [other] way around, since Matbat is only used on Misol, and could not have exerted an influence on the Waigeo and Salawati variants of Ma'ya, which also feature the epenthetic final /o/.

Remijsen apparently does not consider inheritance as an alternative explanation for the common feature.

The fact that tonal developments provide such little support for subgrouping, leading to the conclusion that tone has arisen independently four or five times in SHWNG, is in itself striking. It is implausible that so many languages in a relatively small region should become tonal by chance. It is more likely that the presence of nearby tonal Papuan languages has played a role at some point in the history of SHWNG.[21] However, of the five tonal SHWNG languages, only Yerisiam is currently in contact with a Papuan language, namely, the Yamor dialect of Kamoro. This dialect is largely undescribed, and it is not known whether it is tonal.[22] It is therefore not possible at present to identify the tonal Papuan language(s) that may have had an influence on tonal SHWNG languages.

Traces of former penultimate stress were found in Ma'ya, Moor, and Yerisiam. Penultimate stress is cited as the regular or default pattern in most other SHWNG languages for which descriptions are available: the South Halmahera languages Buli (Maan 1951: 16), Sawai (Whisler and Whisler 1995: 660), and Taba (Bowden 2001: 62); the Cenderawasih Bay languages Ambai (Silzer 1983: 40), Wandamen (Henning 1991: xviii), and Waropen (Held 1942b: 28); and the Mamberamo language Warembori (Donohue 1999: 7). The most likely explanation for such a widespread pattern is that stress was penultimate in Proto-SHWNG. The fact that traces of penultimate stress are still readily apparent in Ma'ya, Moor, and Yerisiam further suggests that SHWNG tonogenesis is not particularly ancient.

[21] See Donohue (1997) for a general survey of tone in New Guinea.

[22] Drabbe (1953), a grammar of the coastal varieties of Kamoro, makes no mention of tone. Donohue (2005: 35) claims that (coastal) Kamoro is tonal, but I have not been able to trace the source of this claim.

Chapter 6

SHWNG historical morphology

6.1 Introduction

This chapter evaluates the historical morphology of all SHWNG languages for which data are available. SHWNG languages consistently exhibit morphological paradigms in two areas: subject marking and inalienable possessive marking. The focus in this chapter is therefore on these two paradigms. Other topics which are not relevant or well-described for all languages, but might be discussed in a fuller treatment, include object marking, alienable possessive marking, and demonstratives.

Table 6.1 on the following page lists the sources consulted in compiling this chapter. Sources vary considerably in depth and quality (see §3.3).

6.2 Pronouns

The most readily identifiable sources of SHWNG subject markers are phonologically reduced independent pronouns. This is a well-known grammaticalization pathway, and synchronic comparison of subject markers with independent pronouns in SHWNG languages shows significant overlap. I therefore summarize reconstructed PMP pronouns and current SHWNG pronouns before turning to subject marking.

Ross (2006) tentatively reconstructs six series of personal pronouns for PMP (see Table 6.2). Pronominal series are defined by case, i.e., the morphosyntactic context in which they appear. PAn and PMP reconstructed morphosyntax is complex; see Ross (2002) and Ross (2006) for more details.

SHWNG personal pronouns are generally derived from the PMP NOM1 series (see Tables 6.3 and 6.4). The 1SG pronouns containing *ya-*, *(y)e-*, and *i-* derive from NEUT **i-aku*.

There are only a few candidates for shared innovations within the pronominal system. The 1SG and 1PL contain innovative *ne* (or similar) in various languages, but this does not seem to follow any clear subgrouping pattern. This is a candidate for a Proto-SHWNG

	Language	Works consulted
SH	Buli	Maan (1951); van den Berg (2009)
	Gane	Hamim Al Fatih (p.c., 2013); Greenhill et al. (2008)
	Maba	Adriani and Kruyt (1914)
	Patani	Legaya Jumahir Jamulia (p.c., 2013)
	Sawai	Whisler and Whisler (1995); van den Berg (2009)
	Taba	Bowden (2001)
RA	Ambel	Remijsen (2001b); Arnold (2014)
	As	Grace (1955–6); Greenhill et al. (2008)
	Biga	Remijsen (2001b); Grace (1955–6)
	Fiawat	Remijsen (2001b)
	Gebe	Grace (1955–6); Greenhill et al. (2008); Kalu Mata (p.c., 2014)
	Kawe	Remijsen (2001b); Grace (1955–6)
	Matbat	Remijsen (2010); van den Berg (2009)
	Ma'ya (S.)	Remijsen (2001b); van der Leeden (n.d.)
CB	Ambai	Silzer (1983); van den Berg (2009)
	Ansus	Silzer (1983); Price and Donohue (2009); Anceaux (1961a)
	Biak	van den Heuvel (2006); van den Berg (2009)
	Busami	Silzer (1983)
	Dusner	Dalrymple and Mofu (2011); Kijne (n.d.[b])
	Kurudu	Silzer (1983); Anceaux (1961a)
	Meoswar	Anceaux (n.d.); Smits and Voorhoeve (1992b)
	Moor	own field notes
	Munggui	Silzer (1983); Anceaux (1961a)
	Papuma	Silzer (1983); Anceaux (1961a)
	Pom	Silzer (1983); Anceaux (1961a)
	Roon	Gil (2008); Anceaux (n.d.)
	Serui-Laut	Slump (1924–38)
	Tandia	Kijne (n.d.[a])
	Umar	own field notes
	Wabo	Silzer (1983); Anceaux (1961a)
	Wandamen	Henning (1991); Silzer (1983); Kamma (n.d.); Gasser (2013)
	Waropen	Held (1942a); van den Berg (2009)
	Wooi	Sawaki (2009); Silzer (1983); Anceaux (1961a)
	Yaur	own field notes
	Yerisiam	own field notes
M	Warembori	Donohue (1999)
	Yoke	Donohue (1999); Clouse et al. (2002)

Table 6.1: Sources of morphological data in this chapter.

innovation. It may conceivably derive from PMP **-ni* '1PL deixis and spatio-temporal reference: this; here; now'. If so, it is significant that the vowel is consistently lowered.

The Biakic languages (Biak, Dusner, Meoswar, and Roon) contain pronouns deriving from 1PL.IN **to*, 1PL.EX **nto*, and 2PL **mto*. This is clearly a shared innovation: none derive directly from PMP forms, and there is close agreement among the four languages. I therefore assume it occurred at the stage of Proto-Biakic.

In several cases, plural pronouns clearly derive from historical trial and quadral forms. Moor pronouns ending in *-'ó* and Papuma and Pom pronouns ending in *-(t)oru* derive from trials (cf. Moor *ó-ró*, Papuma, Pom *toru* 'three').[1] Kawe and Wauyai pronouns ending in *-ˈfat(a)*, and possibly Matbat *hafɔ*^{12} as well, evidently derive from quadrals (cf. Kawe, Wauyai *fat*, Matbat *fa*^{3}*t* 'four').

As an example of another possible development of the inherited pronouns following the breakup of PEMP, the Proto-Oceanic pronouns are shown in Table 6.5. There are some obvious differences with SHWNG languages. For example, Proto-Oceanic has no reflexes of the first syllable of 3SG NOM1 **sida*, whereas these are common in SHWNG. There are also various divergent developments in subject marking (see below).

	1SG	2SG	3SG	1PL.IN	1PL.EX	2PL	3PL
NEUT	i-aku	ikahu	siya	i-kita, ita	i-kami	i-kamu, i-ka-ihu, kamu-ihu	—
NOM1	aku	(i)kahu	iya	kita, i-ta	kami	kamu, ka-ihu	sida
NOM2	=(h)aku	=ka(hu)	=∅, =ya	=ta	=kami	=kamu, =ka-ihu, =kamu-ihu	=da
GEN1	=ku	=mu	=ya	=ta	=mi	=ihu, -mu-ihu	=da
GEN2	=n(a)ku	=nihu	=niya	—	=mami, =nami	=nihu	=nida
PSR	[y]akən	imu, ihu	—	[y]atən	[y]amən	ihu, ini-hu, imu-ihu	—

Table 6.2: PMP pronouns reconstructed by Ross (2006).

[1] Moor *a'ó* and *ma'ó* are synchronically paucal, further supporting derivation from a historical trial. Oddly, however, *mu'ó* and *ti'ó* are not paucal.

	1SG	2SG	3SG	1PL.IN	1PL.EX	2PL	3PL
Buli	ya	awe, au	i	ite	ame(k)	meu	si, sil(e)
Gane	yak	au	i	kit	am(e)	meu	si
Maba	ya	au	i	ite	amek	meu	si(d)
Patani	ay(a)	aw(a)	i	it(i)	am(a)	mew(e)	si
Sawai	ya	aw(e)	i	it(e)	am(e)	méw(e)	si
Taba	yak, lak	au	i	tit	am	meu	si
Ambel	yene	awa	iya	isne	amne	mewa	si
As	anɛ	awa, aure	ia	ti(re)	amne(re)	mɔu(re)	sire, sia(fere)
Biga	in	ˈawa	num	itbaˈna	ambaˈna	mimbana	abaˈna
Fiawat	in(e)	aw(a)	ia	atne	ame	mihya	hane
Gebe	ane	auya	ia	itne	amne	mevia	sia
Kawe	ˈyene	ˈwawa	ˈia	ˈtit(n)e, taˈfat(a)	ˈam(n)e amˈfat(a)	ˈmia	ˈsi(a), haˈfat(a)
Laganyan	ˈyene	ˈawa	?	ˈitne	ˈamne	?	ˈhia
Matbat	ya^{21}ka	ya^{21}wa	i^{21}	ya^{21}ta	ya^{21}ma	mi^{21}na	hafɔ^{12}
Maˈya (S.)	ˈene	ˈawa	ˈia	ˈakne	ˈamne	ˈmia	ˈsia
Wauyai	ˈyene	ˈawa	?	ˈtitne	ˈam(n)e, amˈfat(a)	?	?

Table 6.3: Personal pronouns in South Halmahera and Raja Ampat.

	1SG	2SG	3SG	1PL.IN	1PL.EX	2PL	3PL
Ambai	yau	wau	i	tata	amea	mea	ea
Ansus	yau	au	i	tata	ama	mia	ya
Biak	aya	aw	i	ko	inko	mko	si; na
Dusner	ya	au, wa	i	to(en)	ndoen	mto(en)	si; na
Kurudu	aya	awa(wa)	i	net(a)	nami, name	ame, amia	isi(a)
Meoswar	aya	au	i	kon	inggon	mkon	skon
Munggui	yau	au	i	?	antoru	mintori	?
Moor	ígwa	ágwa	î	í'a; a'ó	áma; ma'ó	amù, mu'ó	ti'ó
Papuma	iau	au	i	tantoru	antoru	mintoru	soru
Pom	iau	au	i	tatoru	antoru	mintoru	tioru
Roon	ya	aw	(t)i	kon	nggon	mokon	si; na
Serui-Laut	yau	wau	i	tata	ama	ma	sa
Tandia	yane	auna	i(no)ya	itaya	amiya	mu	sia
Umar	ene	ate	ije	ete	emi	amu	ihi
Wabo	ayae	awawi	i	nente	?	amiti	isi
Wandamen	ya(u)	au	i	tata	ama(te)	mia(te)	sia(te); si
Waropen	ya, ra	auo	i	iko	ako, amo	mu	ki
Wooi	ya(u)	au	i	tata	ama	mia	hnia
Yaur	jú'è	á'è	náràvè	ó'í'è	ómí'è	ámú'è	óhè
Yerisiam	né	àné	ìní	néeké	néemé	ánéemé	íníihí
Warembori	iwi	awi	yi	ki	ami	mi	ti
Yoke	eβu	aβu	iβu	kiβu	?	miβu	siβu

Table 6.4: Personal pronouns in Cenderawasih Bay and Mamberamo.

	1SG	2SG	3SG	1PL.IN	1PL.EX	2PL	3PL
independent	[i]au	[i]ko[e]	ia	kita	ka[m]i, kamami	ka[m]u, kamiu	(k)ira
subject	ku=, au=	mu=, ko=	(y)a=, ña=, i=	∅, ta=	∅	∅	∅, ra=
object	=au	=ko	=a	∅	∅	∅	=ra
possessor	-gu	-mu	-ña	-da	-ma[m]i	-m[i]u	-dra

Table 6.5: Proto-Oceanic pronouns reconstructed by Lynch et al. (2002).

6.3 Subject marking

6.3.1 Introduction

This section compares subject marking in 37 SHWNG languages and dialects, evaluating its usefulness as a subgrouping diagnostic.

All SHWNG languages possess verbal subject morphology. Individual languages show differences in its phonological form (prefix, infix, or proclitic) and syntactic status (agreement or pronominal argument). For example, Yerisiam has prefixes and infixes, as in *nè-rá* 'I go', *à-r‹ú›a* 'you go', *ì-r‹í›a* '(s)he goes'. The prefix is a pronominal argument, as evidenced by its absence in sentences with a full subject: *máànà r‹í›a* 'the man goes'. The preceding example also shows the infix to be an agreement marker.

Subject markers often vary depending on whether the verb stem begins with a vowel or a consonant. I refer to these as 'vocalic' and 'consonantal' conjugations. For example, in Yaur, the 1SG prefix is *igw-* on vowel-initial stems (e.g., *ígw-éhrè* 'I stand'), and *i-* on consonant-initial stems (e.g., *í-ráavúrè* 'I go').

Subject marking paradigms have not been reconstructed for PCEMP, PEMP, or Proto-SHWNG. The diversity of attested paradigms in their descendants suggests that these proto-languages did not actually have an established subject marking paradigm. Rather, their descendents independently innovated such paradigms many times, as a result of an existing tendency, contact with nearby Papuan languages, or both.

Infixal subject marking is one of these significant tendencies: it is common in CMP and SHWNG languages, though it cannot be reconstructed for PCEMP. Dyen (1978: 248) notes that it is found in the CMP languages 'Kabhubhaka' (apparently Wejewa, spoken on Sumba), Leti (spoken on Leti, just east of Timor), Fordata, Selaru, and Yamdena (all spoken in the Tanimbar islands). It also occurs in Arguni, spoken on Arguni island off the Bomberai peninsula (Grace 1955–6). According to Dyen, infixation arose when "the originally last vowel of some preverbal pronouns was metathesised to a position after the initial consonant of a following verb". Dyen gives a few non-verbal examples to justify the claim that metathesis was a regular sound change. However, there are only a few such attested examples, and the only CMP or SHWNG language for which there is synchronic evidence of regular metathesis is Leti (Blevins and Garrett 1998; Hume 1997, 1998). I therefore follow a bottom-up approach in evaluating infixal subject marking, assuming each case to be independent unless there is extensive coincidence in form.

6.3.2 Comparative morphology

In summarizing subject marking, some abstractions have been made in order to facilitate comparison. The tables show affixes and clitics only, ignoring stem allomorphy. For example, in Patani *y-an* 'I eat', *n-on* '(s)he eats', only the prefixes are analyzed. This is because Patani's stem allomorphy is difficult to generalize and compare with other languages.

In cases where stem allomorphy clearly derives from historical infixation, the inferred earlier infix stage is given in the tables. For example, when compared with related languages, it is clear that Yaur *rèérè* '(s)he comes' descends from a form with the 3SG infix *‹i›* (cf. *ì-ràárè* 'I come', which lacks the infix). I therefore give Yaur's 3SG subject marker as *‹i›*, glossing over the change to an ablauting system. Likewise, I interpret consonant alternations in certain Raja Ampat languages as derived from an earlier infix *‹y›*. For example, Kawe *cen* 'I give' derives from *t‹y›en*, as comparisons with *ten* 'they give' and *m‹y›at* 'I die' make clear (Remijsen 2001b: 160).

Another abstraction is that markers that occur only on certain common stems are listed as if they are regular. For example, in Umar, 2SG *‹u›* and 3SG *‹i›* occur only on a small number of (presumably) common verbs: compare *i-r‹i›a* '(s)he goes' with *i-mah* '(s)he dances'. Following standard models of morphological change, I infer that infixation formerly occurred more widely and was lost on all but the most common verbs. In this case as well, it makes most sense to compare the historically earlier stage.

I divide the analysis of subject markers into singular and plural forms.[2] Tables 6.6 and 6.7 show the attested singular forms, divided by geographical region.

The 1SG marker is *k-*, *y-*, or similar in most SHWNG languages. Since both variants are easily derived from PMP NEUT **i-aku* or GEN1 **=ku*, neither is of convincing subgrouping value.

The 2SG marker is *m-* or *w-* in most SHWNG languages, deriving from GEN1 **=mu*. The marker *a-* may derive either from synchronic pronouns or directly from one of the other PMP 2SG pronouns. Since all of these forms could have arisen independently, none is of convincing subgrouping value.

The 1SG and 2SG infix *‹y›* appears in Patani and all Raja Ampat languages except Matbat.[3] In Kawe and Ma'ya (S.), it occurs in the 3SG as well. It is sufficiently different in form and distribution from the Cenderawasih Bay infixes (see below) that it should be considered historically distinct. The historical origin of this infix is somewhat obscure, making it quite unlikely to have arisen independently. This innovation therefore supports a subgroup containing the languages that show the 1SG and 2SG infixation pattern. The 3SG infix is an independent innovation that supports a narrower subgroup.

The 2SG consonantal conjugation prefix *wa-* is found in the Biakic languages Biak, Dusner, and Roon. Data from Meoswar are minimal, but it may well occur there as well. This innovation lends support to the Biakic subgroup. Warembori *(w)a-* is presumably an independent innovation.

The 2SG vocalic conjugation prefix *b(u)-* is found in the Yapen languages Ambai, Ansus, Kurudu, Wabo, Wandamen, and Wooi. This prefix is not easily derived from any PMP

[2]Some SHWNG languages also distinguish dual and trial forms. These are generally synchronically transparent, and so are not covered here.

[3]Biga lacks conclusive evidence. Grace (1955–6) indicates that Biga's consonantal conjugation is similar to Ma'ya (S.). Since Grace's data are partially inconsistent with the vocalic conjugation in Remijsen (2001b), they are not included in the tables. However, I assume on a preliminary basis that Biga undergoes infixation, since Remijsen does not give the consonantal conjugation.

pronoun. It is therefore a distinctive innovation and supports a subgroup containing all languages in which it is found.

The 3SG vocalic conjugation prefix *d-* and similar (*di-*, *dy-*, *t-*, *ty-*, etc.) is found in all Cenderawasih Bay languages except Moor, Umar, Waropen, and Yaur; data are lacking for Tandia.[4] This prefix is not easily derived from any PMP pronoun. It is therefore a distinctive innovation and supports a subgroup containing all languages in which it is found.

The 2SG infix *‹u›* and 3SG infix *‹i›* are found in all Cenderawasih Bay languages except Moor, Tandia, and Waropen. These infixes are clearly derived from PMP pronouns, the most likely sources being GEN1 *=*mu* and *=*ya*. However, whatever their exact source, the particular form and distribution of the infixes is distinctive, and unlikely to have an independent origin in these languages. This innovation therefore supports a subgroup containing all languages in which it is found.

	1SG		2SG		3SG	
	V	C	V	C	V	C
Buli	ik-	i-	m-	m-	n-	n-
Gane	[ek-]k-	ek-	[em-]m-	em-	[en-]n-	en-
Maba	k-	k-	m-	m-	n-	n-
Patani	y-, k-	‹i›, y(i)-, ki-	m(y)-	m-(‹i›)	n-	n-
Sawai	k-	k-	m-	m-	∅	∅
Taba	k=	k=	m=	m=	n=	n=
Ambel	y-	‹y›	ny-	n-‹y›	n-	n-
As	‹y›	(i-)‹y›	m-‹y›	m-‹y›	n-	n-
Biga	y-	ya-	m-	ma-	n-	na-
Fiawat	y-	ye-‹y›	m-	?	n-	?
Gebe	y-	‹y›	my-	m-‹y›	n-	n-
Kawe	y-	‹y›	my-	m-‹y›	ny-	n-‹y›
Matbat	k-	k-	m-	m-	n-	n-
Ma'ya (S.)	y-	‹y›, ya-	my-	m-‹y›, ma-	ny-	n-(‹y›), na-

Table 6.6: South Halmahera and Raja Ampat singular subject markers, divided into vocalic and consonantal conjugations.

[4] I analyze Busami *s-* as deriving from earlier **ty-*. I analyze Moor and Umar *j-* as deriving from earlier **y-*, and therefore being unrelated (see §4.2.22).

	1SG		2SG		3SG	
	V	C	V	C	V	C
Ambai	i-	i-	bu-	‹u›	di-	‹i›
Ansus	ya-	e-	bu-	‹u›	d-	‹i›
Biak	y-	ya-	w-	wa-, ‹w›	d-	i-, ‹y›
Busami	ya-	ya-	w-	?	s-	‹i›
Dusner	y-	ya-, ∅	w-	wa-, ‹w›	nd-, ndi-	i-, ‹i›
Kurudu	ay-	a(y)-	b-	‹u›	d-	‹i›
Meoswar	y-	a-	w-	‹u›	d-	‹i›
Moor	i=gw-	i=	a=(gw-)	a=	j-	∅
Munggui	y-	e-	w-	‹u›	ty-	‹y›
Papuma	y-	e-	w-	‹u›	t-	‹i›
Pom	y-	i-	w-	‹u›	dy-	‹i›
Roon	y-	ya-, i-	w-	wa-	t-	i-
Serui-Laut	ya-	y-	w-	‹u›	d-	‹i›
Tandia	?	ya-	?	a(m)-	?	i-
Umar	e-	e-	a(w)-	a-‹u›	j-	i-‹i›
Wabo	ai-	a-	b-	o-	d-	‹i›
Wandamen	y-	i-	bu-	‹u›	di-	‹i›
Waropen	r-, y-	ra-, ya-	agh-, a(u)-	a-	i(y)-	∅, i-
Wooi	y-	∅, i-	bu-	‹u›	ty-	‹y›
Yaur	igw-	i-	agw-‹u›	a-‹u›	‹i›	‹i›
Yerisiam	ne-j-	ne-	a-gu-	a-‹u›	i-di-	i-‹i›
Warembori	∅	i-, e-, ya-	w-	(w)a-	y-	i-, ya-, ∅

Table 6.7: Cenderawasih Bay and Mamberamo singular subject markers, divided into vocalic and consonantal conjugations.

I turn now to the plural forms (see Tables 6.8 and 6.9).

The 2PL prefix derives from **f-* in the South Halmahera languages and Gebe. This prefix is not easily derived from any PMP pronoun. It is therefore a distinctive innovation and supports a subgroup containing all languages in which it is found.

The 3PL marker derives from NOM1 **sida* or GEN1 **=da* in most SHWNG languages. The precise form varies extensively, but can generally be attributed to regular sound changes. The prefix *d-* or *r-*, found in some South Halmahera languages and Gebe, is anomalous but nonetheless probably derives from **d*.

The innovative 3PL prefix *w-* is found in Kawe and Ma'ya (S.). This supports a subgroup containing these two dialects.

The Biakic languages (Biak, Dusner, Meoswar, and Roon) contain prefixes deriving from 1PL.IN **to-*, 1PL.EX **nto-*, 2PL **mto-*, 3PL **si-*, and 3PL.NHUM **na-*. Except for the 3PL,

all of these forms show distinctive changes from the PMP pronouns. This paradigmatic innovation is related to the innovation in the pronominal paradigm (see §6.2). It lends additional support to Proto-Biakic.

The vocalic conjugation contains a linking consonant *-t-* in all plural forms in Ambai, Serui-Laut, Wandamen, and Wooi. Vocalic conjugations are not available for Papuma and Pom, so its absence in Table 6.9 should not be taken as signifcant. The historical origin of this consonant is obscure. Its presence is an innovation that supports a subgroup containing all languages in which it is found.

Other prefixes are in most cases clearly derived from PMP pronouns, with subsequent reduction and regular sound change. For example, the 1PL.IN prefix generally derives from PMP NEUT or NOM1 **ita*. Other than the cases discussed above, there are no good candidates for shared innovations.

	1PL.IN	1PL.EX	2PL	3PL
Buli	t-	k-	f-	d-
Gane	et-	am-	ef-	i-
Maba	t-	k-	f-	d-
Patani	t-	k-	f-	r-
Sawai	t-	k-	f-	r-
Taba	t=	a=	h=	l=
Ambel	t- | ∅	am-	m- | mim-	l- | la-
As	t-	am-	m-	l- | si-
Biga	t-	m-	m-	l-
Gebe	t-	k-	f-	d-
Fiawat	t-	l-	m-	l- | ∅
Kawe	t-	w-	m-	w- | ∅
Matbat	t-	n-	m-	n-
Maˈya (S.)	t-, ta-	m-, ma-	m-, ma-	w- | ∅; wa-

Table 6.8: South Halmahera and Raja Ampat plural subject markers. Markers differing in vocalic and consonantal conjugations are listed as *vocalic* | *consonantal*.

	1PL.IN	1PL.EX	2PL	3PL	3PL.NHUM
Ambai	tat- | ta-	amet- | ame-	met- | me-	et- | e-	
Biak	kw- | ko-	nkw- | nko-	mkw- | mko-	s- | s(i)-	n- | n(a)-
Dusner	t- | to-	nd- | ndo-	mt- | mto-	s(i)- | s(i)-, so-	n- | na-
Kurudu	t-	nam-	mi- | min-	si-	
Meoswar	k- | ko-	ingg- | inggo-	mk- | mko-	s- | sko-	
Moor	∅	n- | ∅	n- | ∅	ti=n-, ti=j- | ti=	ti=j- | ti=
Papuma	ta(N)-	anta(N)-	minta(N)-	e(N)-	
Pom	ta(N)-	anta(N)-	minta(N)-	ti(N)-	
Roon	k- | ko-	ngg- | nggo-	mak- | moko-	s- | si-, se-	n- | na-, ne-
Serui-Laut	tat- | ta-	amet- | ame-	met- | me-	et- | e-	
Tandia	ite-	ami-	mu(m)-	si-	
Umar	t-	em-	am-‹u›	ih-‹i›	
Wandamen	tat- | ta(N)-	amat- | ama(N)-	met- | me(N)-	set- | se(N)-	si-
Waropen	(i)k- | ∅, i-	angg- | a-	m[ingg]- | mi-	ki-	
Wooi	tat- | ta(N)-	mat- | ma(N)-	met- | me(N)-	het- | he(N)-	
Yaur	o'-	om-	am-‹u›	oh-‹i›	h-‹i›
Yerisiam	ne-k-	ne-m-	a-mu- | a-m-‹u›	i-hi-	hi-
Warembori	k- | kV-	am- | amV-	m- | mV-	t- | tV-	

Table 6.9: Cenderawasih Bay and Mamberamo plural subject markers. Markers differing in vocalic and consonantal conjugations are listed as *vocalic* | *consonantal*.

6.4 Inalienable possessive marking

6.4.1 Introduction

This section compares inalienable possessive marking in 28 SHWNG languages and dialects, evaluating its usefulness as a subgrouping diagnostic.

All SHWNG languages except Taba and Gane clearly distinguish the categories of alienable and inalienable possession.[5] Van den Berg (2009: 230) notes that there are remnants of inalienable possessive marking in the Southeast Makian dialect of Taba. Therefore, he convincingly argues, Taba (and Gane)'s lack of this contrast is an innovation, not a retention.

The distinction between alienable and inalienable nouns in SHWNG is lexically determined, and does not depend on usage context. The inalienable category may include body parts, kinship terms, locative nouns, and the word for 'name'. The inalienable possessor is expressed with a prefix, suffix, or circumfix. The alienable possessor is expressed with a prefix, possessive pronoun, or suffixed possessive ligature (van den Berg 2009).

[5]For the lack of these categories in Taba, see Bowden (2001). Hamim Al Fatih (p.c., 2013) confirms that Gane is identical to Taba in this respect.

Alienable possessive markers typically are transparently related to synchronic pronominal forms, while inalienable possessive markers may not be. For example, Moor *áun iigwó* 'my dog' contains the first singular possessive pronoun *iigwó*, clearly related to the first singular subject pronoun *ígwa*. Inalienably possessed *ìna-'a* 'my ear' contains the suffix *-'a*, which is not related to other synchronic forms.

Since inalienable possessive marking represents a potentially independent witness from the pronominal system, it is more likely than alienable possessive marking to provide evidence of morphological innovations, and is therefore more likely to be probative for subgrouping. For these reasons, I have not systematically investigated alienable possessive marking.

The focus in this section is on individual morphological forms and their distribution within paradigms. The semantic boundary between the inalienable and alienable categories is not addressed, for two reasons. First, in many languages this boundary is not adequately known. Second, semantic shifts are less informative than changes in form: there are only a few relevant semantic categories, and shifts could easily occur independently.

For the purposes of this section, I do not make reference to van den Berg (2009)'s reconstruction of Proto-SHWNG possessive marking. The reason is that he assumes an unorthodox SHWNG subgrouping without attempting to justify it. The resulting reconstructions are therefore questionable, because (for example) all languages of Cenderawasih Bay are collapsed into a single witness. It is a better procedure to first argue carefully for a specific subgrouping, as I do here, before attempting reconstruction.

6.4.2 Comparative morphology

I divide the analysis of inalienable possessive markers into singular and plural forms.[6] First, however, I draw some general conclusions. Inspection of the forms in Tables 6.10–6.13 below shows that suffixation is the most common marking strategy in the singular, while circumfixation is most common in the plural. Suffixes and the suffixal part of circumfixes are generally derived from the corresponding PMP GEN1 or GEN2 series enclitic pronoun (see Table 6.2). Prefixes and the prefixal part of circumfixes are generally derived from synchronic free pronouns (see Tables 6.3–6.4). For example, in Buli 1SG *ya-…-k*, the suffix *-k* clearly derives from PMP GEN1 *=*ku*, while the prefix *ya-* is transparently related to the Buli free pronoun *ya*.

I turn now to examine the singular forms in more detail. Tables 6.10 and 6.11 show the attested forms, divided by geographical region. It is immediately apparently that the Central-Eastern South Halmahera languages (Buli, Maba, Patani, and Sawai) share a common system: they are the only languages with circumfixes in the singular, and the forms match almost exactly across languages. Although the arrangement of the morphemes is

[6]Some SHWNG languages also distinguish dual and trial forms. These are generally synchronically transparent, and so are not covered here.

distinctive, they are not innovative in form, except for the voicing of historical **-k* to *-g* in Maba, Patani, and Sawai. This is a minor change, and the fact that is also occurs in the otherwise not particularly similar Biga and Kawe suggests that it should not be used as a subgrouping feature. There is therefore only the main, paradigmatic innovation.

In Raja Ampat, there are no good candidates for shared innovations. The As prefixal forms and Matbat 1SG *-ŋ* are distinctive, but neither is shared with other SHWNG languages. Languages sharing 3SG ∅ cannot be assumed to share an innovation without a better reconstruction of the Proto-SHWNG paradigm.

The Biakic languages (Biak, Dusner, Meoswar, and Roon) clearly reflect the a single innovative morphological paradigm. For example, they all show 1SG *-ri*, 2SG *-mri*, *-mi*, and 3SG *-ri*, none of which have clear PMP derivations. This paradigmatic innovation offers strong support for the Biakic subgroup. The alternative suffixes within each person/number combination reflect different subcategories of inalienable possession. For example, in the 2SG Biak distinguishes non-paired body parts (*-m-ri*), paired body parts (*-m-si*), and kinship terms (*-mi*). Data from other Biakic languages are not sufficient to be conclusive, but they appear to distinguish the same subcategories.

Among the remaining Cenderawasih Bay and Mamberamo languages, the clearest innovation is 3SG *-mpai* and similar suffixes in Ansus, Papuma, Serui-Laut, and Wandamen. There are also common 3SG elements *-na* and *-ni* which permit the inclusion of Ambai and Pom in this group, though this is slightly less convincing given the resemblance to PMP GEN2 **=niya*. These innovations offer support for the Western Yapen subgroup.

Prefixation has emerged as a strategy in As, Kurudu, Waropen, Yaur, Yerisiam, and Warembori. In As and Kurudu, the 2SG and 3SG prefixes ultimately derive from PMP GEN1 **=mu* and GEN2 **=niya*, respectively. This suggests that they were formerly suffixes and have shifted position. In the other languages, prefixes transparently derive from synchronic pronouns. In no case is there evidence for any shared innovation other than the development of prefixation. The lack of shared innovations in form makes this unconvincing as a subgrouping argument: it is a typological shift, likely contact-induced, and so probably happened multiple times independently.

	1SG	2SG	3SG
Buli	ya-…-k	a-…-m	i-
Maba	a-…-g	a-…-m	i-
Patani	a-…-g	a-…-m	i-
Sawai	[a-]…-g, [ya-]…-g	[a-]…-m	[i-]
Ambel	-k	-m	∅
As	an-	am-	ni-
Biga	-g	-m	-o
Gebe	-k	-m	∅
Kawe	-k, -g | -Vk, -Vg	-m | -Vm	∅ | -V
Matbat	-ŋ	-m	∅
Ma'ya (S.)	-k | -Vk	-m | -Vm	∅

Table 6.10: South Halmahera and Raja Ampat inalienable possessive marking (singular forms). If there is a difference with vowel- and consonant-initial or final roots, the markers are listed as *vocalic* | *consonantal*.

	1SG	2SG	3SG
Ambai	-ku	-mu	-n, -na
Ansus	-u	-mpi	ne-…-mpai
Biak	-ri; -si	-m-ri; -m-si; -mi	-ri; -si
Dusner	?	-meria; -mi	-ri
Kurudu	ai-	me-	ne-
Meoswar	-ri; -na	-mri; -mna; -mi	-ri; -na
Moor	-'a	-ma	-ra
Papuma	-u	-mu	-[ne]mpae
Pom	-ni	-mu	-nani
Roon	-ri; -na; -etia	-meri; -mena; -mi	-ri; -na
Serui-Laut	-u	-mu	∅, ne-, -ne[mpoi]
Umar	-vie	-vua	-vre
Wandamen	-ne[i]	-mu[i]	-pai; -ni
Waropen	ra-	a-	∅
Yaur	igw- | i-	agw- | a-	∅
Yerisiam	ne-ni- | ne-	a-ni- | a-	i-ni- | i-
Warembori	e-	a-	i-

Table 6.11: Cenderawasih Bay and Mamberamo inalienable possessive marking (singular forms). If there is a difference with vowel- and consonant-initial or final roots, the markers are listed as *vocalic* | *consonantal*.

	1PL.IN	1PL.EX	2PL	3PL
Buli	ite-…-r	ame-…-mam	meu-…-meu	si[le]-…-ri
Maba	ite-…-r	a-…-am	meu-…-meu	si-…-ri
Patani	ite-…-r	ama-…-mam	me-…-me	si-…-re
Sawai	[ite-]…-r	[a-]…-mam	[me-]…-mi	[si-]…-ri
Ambel	-n	am-…-n	mim-…-n	-n
As	ti(N)-	ami(N)-	mi(N)-	si(N)-
Biga	-no	-no	-no	-no
Gebe	-d	-man	-mo	-ri
Kawe	-n | -Vn	-m | -Vm	-m | -Vm	-n | -Vn
Matbat	-n	-m	-m	∅
Ma'ya (S.)	-n | -Vn	-m | -Vm	-m | -Vm	-n | -Vn

Table 6.12: South Halmahera and Raja Ampat inalienable possessive marking (plural forms). If there is a difference with vowel- and consonant-initial or final roots, the markers are listed as *vocalic* | *consonantal*.

I turn now to the plural forms (see Tables 6.12 and 6.13). In the Central-Eastern South Halmahera languages, the suffixal part of the 1PL.IN marker contains the innovative form *-r*. The same suffix evidently appears as Gebe *-d*. This suffix possibly derives from the GEN1 pronoun *=*ta*, but if so, it has undergone irregular phonological developments.[7] In fact, no known regular sound change produces South Halmahera *r* or Gebe *d* (see chapter 4). The Gebe 1PL.EX and 2PL suffixes also show some resemblance to the suffixal part of the South Halmahera markers. The distinctiveness of these innovations argues for a subgroup containing Central-Eastern South Halmahera and Gebe.

In Raja Ampat, the best candidate for a shared innovation is 1PL.IN *-n*, found in Kawe, Matbat, and Ma'ya (S.).[8] This innovation provides support for grouping these three together in a subgroup. Ambel *-n*, in contrast, appears in all plural forms, thus most likely has a different history. It may derive from a reduction of GEN2 2PL *=*nihu* and 3PL *=*nida*, which would then have been extended to other plural forms.[9] Biga *-no* appears to share the same history, with an unexplained mutation in form. There is therefore evidence for subgrouping Ambel and Biga on this basis.

The Biakic languages (Biak, Dusner, Meoswar, and Roon) show a clear paradigmatic innovation in the plural, as in the singular. Most convincingly, the suffixes *-sna* and *-sesia*,

[7] Ross (2006) does not reconstruct a PMP GEN2 pronoun for 1PL.IN, presumably because the evidence is not conclusive. Blust (1977: 11) tentatively reconstructs PMP 1PL.IN **ni-ta* for the equivalent of Ross's GEN2. Blust's **ni-ta*, if correct, could explain the origin of these suffixes, which perhaps show the outcome of **ni-ta* > **nta*. (A similar change is thought to have produced Proto-Oceanic **-da* (Ross, p.c., 2014).) The evidently irregular outcome of **nta* would still qualify as a distinctive innovation in this case.

[8] An alternative explanation is that these forms derive from **ni-ta* (see footnote 7).

[9] Kawe and Ma'ya (S.) 3PL *-n* most likely also derive from GEN2 *=*nida*. However, it is unlikely that this *-n* is responsible for 1PL.IN *-n*, as extension from 3PL to 1PL.IN alone is implausible.

-etia are each found in multiple languages and lack clear PMP derivations. This innovation provides additional strong support for the Biakic subgroup.

The Cenderawasih Bay languages Ambai, Ansus, Papuma, Pom, and Wandamen all contain a plural suffix *-mi* or *-mu*. This most plausibly derives from GEN1 1PL.EX *=*mi* or 2PL **-mu-ihu*, which would then have been extended to other plural forms. This innovation provides additional support for the Western Yapen subgroup.

The remaining languages have mainly developed prefixal markers that transparently derive from synchronic pronouns, and so are not probative for subgrouping.

	1PL.IN	1PL.EX	2PL	3PL
Ambai	ta-…-mi	ame-…-mi	me-…-mi	e-…-mi
Ansus	ta(N)-…-minekuira	ama-…-mine	me(N)-…-mipakuira	e(N)-…-miwanekuira
Biak	ko-…-s-na	nko-…-s-na	mko-…-s-na	si-…-s-na
Dusner	to-…-sesia	?	mto-…-sesia	si-…-sesia
Kurudu	ta-	na-	mi-	si-
Meoswar	ko-…-sna; ko-…-sri	inggo-…-sna; inggo-…-sri	mko-…-sna; mko-…-sri	sko-…-sna; sko-…-sri
Moor	-ta	-ma	-mu, -ma	-ta
Papuma	tas-…-mu	antas-…-mu	mintas-…-mu	es-…-mu
Pom	ta(N)-…-mi	-n	minda(N)-…-mi	ti(N)-…-mi
Roon	ko-…-sena; -kesia	nggo-…-sena; -nggetia	moko-…-sena; -meketia	si-…-sena; -setia
Serui-Laut	ta-…-mi	ame-…-mi	me-…-mi	e-…-mi
Umar	-vte	-viemi	-vuamu	-hien
Wandamen	ta(N)-…-mi	ama(N)-…-mi	me(N)-…-mi	se(N)-…-mi
Waropen	∅	a(N)-	mi(N)-	ki-
Yaur	o'-	om-	am-	oh-
Yerisiam	nek-	nem-	am-	ih-
Warembori	ki-, ke-	ami √	mi-, me-	ti-, te-

Table 6.13: Cenderawasih Bay and Mamberamo inalienable possessive marking (plural forms).

6.5 Implications for subgrouping

I have shown that there is evidence for the following innovations (S = subject marker, I = inalienable possessive marker):

1. S: 2PL prefix *f-* in all South Halmahera languages and Gebe
2. I: 1PL.IN *-r/-d* in the Central-Eastern South Halmahera languages and Gebe

3. I: paradigmatic innovation in the Central-Eastern South Halmahera languages
4. I: loss of inalienable possessive marking in Gane and Taba
5. S: 1SG and 2SG infix *‹y›* in Patani and all Raja Ampat languages except Matbat
6. S: 3SG infix *‹y›* and 3PL prefix *w-* in Kawe and Maˈya (S.)
7. I: plural *-n/-no* in Ambel and Biga
8. I: 1PL.IN *-n* in Kawe, Matbat, and Maˈya (S.)
9. S: 2SG infix *‹u›* and 3SG infix *‹i›* in all Cenderawasih Bay languages except Moor, Tandia, and Waropen
10. S: 3SG vocalic conjugation prefix *d-* and similiar in all Cenderawasih Bay languages except Moor, Umar, Waropen, and Yaur (no data for Tandia)
11. S and I: paradigmatic innovations in the Biakic languages (Biak, Dusner, Meoswar, and Roon)
12. S: 2SG vocalic conjugation prefix *b(u)-* in Ambai, Ansus, Kurudu, Wabo, Wandamen, and Wooi
13. I: 3SG *-mpai*, 3SG *-na/-ni*, and plural *-mi/-mu* in the Western Yapen languages
14. S: plural vocalic conjugation linking consonant *-t-* in Ambai, Serui-Laut, Wandamen, and Wooi

Innovations 3, 4, 6, 11, and 13 provide further support for established subgroups. (Kawe and Maˈya (S.) are dialects of a single language.)

Innovation 1 supports the establishment of Proto-South Halmahera, containing the languages spoken on South Halmahera proper and Gebe.

Innovation 2 narrowly supports a subgroup containing Gebe and the Central-Eastern South Halmahera languages. It is also consistent with Proto-South Halmahera. Since Gebe does not undergo other Central-Eastern South Halmahera shared innovations (such as innovation 3), it cannot simply be included in Central-Eastern South Halmahera.

Innovation 5 narrowly supports a subgroup containing Patani and all Raja Ampat languages except Matbat. However, this subgroup conflicts with Patani and Gebe's descent from Proto-South Halmahera (newly established by innovation 1) and Patani's descent from Proto-Central-Eastern South Halmahera. The best way to reconcile this conflict is to posit innovation 5 at the level of Proto-RASH. The infix would then have been lost in most South Halmahera languages and Matbat. One alternative to this proposal would be to reassign innovation 1 to Proto-RASH. However, this would entail loss of 2PL *f-* in most Raja Ampat languages, and its replacement with a prefix straighforwardly derived from synchronic or PMP pronouns. While such a history is possible, there is no evidence for it.

Innovation 7 supports the establishment of Proto-Ambel-Biga, containing Ambel and Biga.

Innovation 8 can be used to establish Proto-Maˈya-Matbat, containing at least Maˈya and Matbat. It may also contain other languages for which inalienable possessive data are

lacking. If there were other innovations to support it, one could include Proto-Ambel-Biga as well: its innovation 7 would have eliminated the evidence for innovation 8.

Innovations 9 and 10 have almost the same distrbution. Only Umar and Yaur undergo one innovation and not the other. Given this, it makes most sense to posit a single proto-language for innovations 9 and 10. The only strong counter-argument would be if there were evidence that the other Cenderawasih Bay languages share distinctive innovations lacking in Umar and Yaur; however, I am not aware of any such innovations. I therefore posit Proto-Cenderawasih Bay, containing all Cenderawasih Bay languages except Moor, Waropen, and (barring future data) Tandia. This entails that Umar and Yaur formerly had the 3SG vocalic *d-* prefix, then lost it.

Innovation 12 supports the establishment of Proto-Yapen, containing all Yapen languages. Any other proposal would conflict with the well-established Western Yapen subgroup. The Proto-Yapen 2SG vocalic prefix was most likely **bu-*, as it is much easier to explain a change from **bu-* to *b-* than the reverse. Kurudu and Wabo thus changed **bu-* to *b-*. This minor innovation justifies the tentative establishment of Proto-East Yapen.

Meanwhile, five Yapen languages do not show innovation 12: Busami, Munggui, Papuma, Pom, and Serui-Laut, which show *w-* instead of expected *bu-*. This entails positing that these five languages, in turn, descend from Proto-Central Yapen, a daughter of Proto-Western Yapen, in which inherited **bu-* became **w-*. Otherwise, it would be necessary to suppose that **bu-* became *w-* five times independently, which is very implausible.

Innovation 14 narrowly supports a subgroup containing Ambai, Serui-Laut, Wandamen, and Wooi. However, there are no data for other Western Yapen languages, so it is more likely to be a Proto-Western Yapen innovation.

I combine these subgroups with those proposed in other chapters in chapter 7.

Chapter 7

SHWNG subgrouping: A new proposal

7.1 Introduction

This chapter combines the different subgrouping proposals in chapters 4–6 into a single proposal that accounts for the entire range of data. The sections below are organized according to the primary branches of Proto-SHWNG. For each subgroup, I summarize the shared innovations that define it and its primary branches. I also list subgroups that were rejected in the final subgrouping and explain why they were not included.

The chapter concludes with a discussion of the most likely homelands of Proto-SHWNG and its subgroups (§7.7).

7.2 Proto-RASH

Proto-RASH is defined by two innovations: (1) *R > ∅ (§4.5, 7), (2) the 1SG and 2SG subject infix *‹*y*› (§6.5, 5). The second innovation is particularly distinctive and places the subgroup on a solid foundation.

The primary branches of Proto-RASH are Proto-South Halmahera, Proto-Ambel-Biga, Proto-Ma'ya-Matbat, As, and Fiawat.[1] The infix *‹*y*› was lost in Proto-Southern South Halmahera, all descendants of Proto-Central-Eastern South Halmahera except Patani, and Matbat.

7.2.1 Proto-South Halmahera

Proto-South Halmahera is defined by two innovations: (1) the 2PL subject prefix *_f_- (§6.5, 1), (2) the 1PL.IN inalienable possessive suffix *-_d_ (§6.5, 2). The first innovation is very distinctive, and the second is not found elsewhere in SHWNG (the change that produced

[1] Fiawat is a dialect of Maden, but data are lacking from other Maden dialects, so only Fiawat is mentioned here. See §7.2.5 for more on the classification of Maden. Bata is presumably to be included under Proto-RASH as well, but no data are available.

the Proto-Oceanic 1PL.IN possessive *-*da* may be an independent example). Taken together, these innovations place the subgroup on a solid foundation.

The primary branches of Proto-South Halmahera are Proto-Central-Eastern South Halmahera, Proto-Southern South Halmahera, and Gebe. The 1PL.IN inalienable suffix became *-*r* in Proto-Central Eastern South Halmahera.

7.2.2 Proto-Central-Eastern South Halmahera

Proto-Central-Eastern South Halmahera is defined by a paradigmatic innovation in inalienable possessive marking (§6.5, 3), placing it on a firm basis. Blust (1978a), who originally proposed this subgroup, noted other distinctive phonological and lexical innovations that define it (see §3.8).

The primary branches of Proto-Central-Eastern South Halmahera are Buli, Maba, Patani, and Sawai.

7.2.3 Proto-Southern South Halmahera

Proto-Southern South Halmahera is defined by the loss of inalienable possessive marking (§6.5, 4). There are no positive morphological features that define it. Blust (1978a), who originally proposed this subgroup, noted other distinctive phonological and lexical innovations that define it (see §3.8).

The primary branches of Proto-Southern South Halmahera are Gane and Taba.

7.2.4 Proto-Ambel-Biga

Proto-Ambel-Biga is defined by the innovation of the inalienable possessive plural suffix *-n/-no* (§6.5, 7). The unexplained variation in form (*-n* in Ambel, *-no* in Biga) makes this subgroup less convincing than some of the others proposed here. Nonetheless, it is more plausible to assume that this specific innovation happened once rather than twice independently.

The primary branches of Proto-Ambel-Biga are Ambel and Biga. See §7.7 for more on the social and linguistic history of Biga.

7.2.5 Proto-Maˈya-Matbat

Proto-Maˈya-Matbat is defined by two innovations: (1) epenthetic final *o* on words with Fall or Low Fall tone (§5.4), (2) the 1PL.IN inalienable possessive suffix *-n* (§6.5, 8). Together, these innovations place it on a relatively solid foundation.

The primary branches of Proto-Maˈya-Matbat are Maˈya and Matbat. Fiawat and other dialects of Maden are reportedly similar to Maˈya, but no data are available on their tonal system or inalienable possessive paradigms, so it is not possible to determine if they share the above two innovations.

7.3 Proto-Cenderawasih Bay

Proto-Cenderawasih Bay is defined by two innovations: (1) the 2SG subject infix *‹u› and 3SG subject infix *‹i› (§6.5, 9), and (2) the 3SG vocalic conjugation subject prefix *dy- (§6.5, 10). These innovations provide a very convincing subgrouping argument.[2]

The primary branches of Proto-Cenderawasih Bay are Proto-Biakic, Proto-Yapen, and Proto-Southwest Cenderawasih Bay. The 3SG prefix *dy- was lost in Umar and Yaur, and underwent minor changes in various other languages (see §6.3.2).[3]

7.3.1 Proto-Biakic

Proto-Biakic is defined by three innovations: (1) *u, *i, *ə > e ~ ə in final closed syllables of polysyllabic words (§4.5, 5), (2) a paradigmatic innovation in subject marking (§6.5, 11), (3) a paradigmatic innovation in inalienable possessive marking (§6.5, 11). These innovations provide a very convincing subgrouping argument.

The primary branches of Proto-Biakic are Biak, Dusner, Meoswar, and Roon.

7.3.2 Proto-Yapen

Proto-Yapen is defined by the innovation of the 2SG vocalic conjugation subject prefix *bu- (§6.5, 12). Though only a single innovation, it is quite distinctive, leaving little doubt about the validity of the subgroup.

The primary branches of Proto-Yapen are Proto-Western Yapen and Proto-Eastern Yapen. The 2SG prefix *bu- became *w- in Proto-Central Yapen and *b- in Proto-Eastern Yapen.

7.3.3 Proto-Western Yapen

Proto-Western Yapen is defined by several innovations in inalienable possessive marking (3SG *-mpai*, 3SG *-na/-ni*, plural *-mi/-mu*: §6.5, 13) and the innovation of the plural vocalic conjugation linking consonant *-t- (§6.5, 14). Silzer (1983: 232–243), who first proposed this subgroup, enumerates several additional morphological innovations shared between Ambai and Wandamen (detailed data are lacking for the other languages).

The primary branches of Proto-Western Yapen are Proto-Central Yapen, Ambai, Ansus, Marau, Wandamen, and Wooi.

[2]During the course of my research, Gasser (2014) independently proposed Proto-Biak-Yapen on the basis of the first innovation. Proto-Biak-Yapen is essentially my Proto-Cenderawasih Bay under a different name.

[3]The case of Umar is in fact ambiguous. Its 3SG prefix *j-* is most straightforwardly derived from *y-. This could either be a reduction of *dy- or an unrelated innovation.

7.3.4 Proto-Central Yapen

Proto-Central Yapen is defined by the change of the Proto-Western Yapen 2SG vocalic conjugation subject prefix **bu-* to **w-* (§6.5). Although a relatively minor change, it is more parsimonous to suppose that the change happened once rather than several times independently. Since the affected languages are found in a geographically contiguous area, diffusion of the change (rather than inheritance) is another possibility. However, other evidence for diffusion is lacking—for example, the reflexes of 3SG **dy-* are quite varied, which one would not expect under such a scenario. It is therefore more likely that **w-* was inherited.

The primary branches of Proto-Central Yapen are Busami, Munggui, Papuma, Pom, and Serui-Laut.

7.3.5 Proto-Eastern Yapen

Proto-Eastern Yapen is defined by the change of the Proto-Yapen 2SG vocalic conjugation subject prefix **bu-* to **b-* (§6.5). This is a relatively minor change, and could have occurred independently or spread via diffusion. Sufficient data are not available to settle the question. The validity of this subgroup should be considered tentative until more data are collected.

The primary branches of Proto-Eastern Yapen are Kurudu, Wabo.

7.3.6 Proto-Southwest Cenderawasih Bay

Proto-Southwest Cenderawasih Bay is defined by two phonological innovations: (1) **z* > ∅ (§4.5, 3), (2) irregular **u* > *i* in PMP **punti* 'banana' (§4.5, 4). These innovations, though fairly distinctive, are not especially convincing given the possibility of diffusion. The validity of this subgroup should be considered tentative barring further evidence.

The primary branches of Proto-Southwest Cenderawasih Bay are Proto-Yaur-Yerisiam and Umar.

7.3.7 Proto-Yaur-Yerisiam

Proto-Yaur-Yerisiam is defined by a single innovation, **ŋ* > ∅ (§4.5, 2). The loss of a nasal in all positions is rather unusual. However, a single phonological innovation, no matter how distinctive, is not sufficient to incontrovertibly establish a subgroup. The validity of this subgroup should therefore be considered tentative for now.

The primary branches of Proto-Yaur-Yerisiam are Yaur and Yerisiam.

7.4 Other primary branches of Proto-SHWNG

Five languages share no known innovations with each other or other SHWNG languages, and therefore must be posited as primary branches of Proto-SHWNG. These are the Cenderawasih Bay languages Moor, Tandia, and Waropen, and the Mamberamo languages Warembori and Yoke. Future evidence may show that some of them subgroup together or belong in one of the above subgroups.

7.5 Rejected subgroups

7.5.1 Proto-Raja Ampat

This subgroup would be defined by a single innovation: **ə* assimilates to the vowel of the preceding or following syllable (§4.5, 6). It would contain the primary branches Proto-Ambel-Biga, Proto-Maˈya-Matbat, As, Fiawat, and Gebe. The inclusion of Gebe under Proto-Raja Ampat would conflict with its inclusion in Proto-South Halmahera on the basis of a very convincing morphological innovation. I therefore reject Proto-Raja Ampat, and assume that this sound change spread by diffusion.

An additional reason for rejecting Proto-Raja Ampat is that the sound change that would define it, though fairly distinctive, is posited on the basis of only a small number of words. More data from Raja Ampat languages would make it possible to better understand the nature of the change, and whether the evidence best supports inheritance or diffusion.

7.5.2 Proto-Maˈyaic

This subgroup would be defined by a single innovation: **a* > **ya* > *la* initially (§4.5, 1). It would contain the primary branches Proto-Ambel-Biga, Fiawat, and Maˈya. The absence of Matbat would conflict with the establishment of Proto-Maˈya-Matbat, which is justified by more distinctive innovations. I therefore reject Proto-Maˈyaic, and assume that this sound change spread by diffusion.

7.5.3 Proto-Nuclear SHWNG

This subgroup would be defined by a single innovation: lexically conditioned syncope (§4.5, 8). It would contain all SHWNG languages except Moor. Although it does not conflict with other proposed subgroups, I nonetheless reject it. The inherently sporadic nature of syncope in SHWNG languages makes it very difficult to definitively show that syncope did not occur in a given language. The sporadic distribution of syncope, in turn, is more easily explained by diffusion rather than inheritance.

7.6 Summary

Figure 7.1 contains a family tree summarizing the subgroups proposed in this chapter.

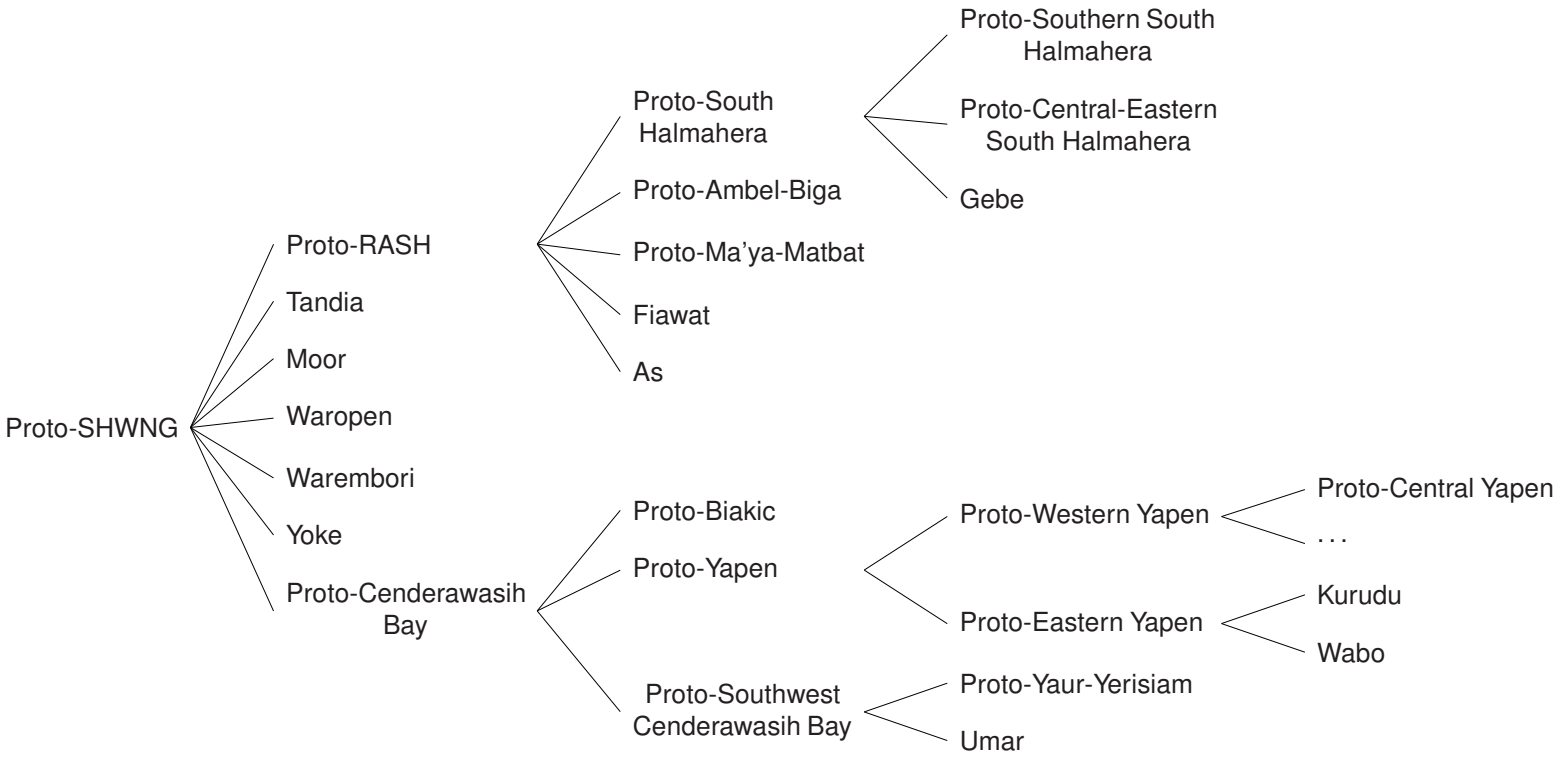

Figure 7.1: New proposed subgrouping of SHWNG languages.

7.7 The homelands of Proto-SHWNG and its subgroups

The new subgrouping of SHWNG languages presented above makes it possible to more carefully consider the location of the homelands of Proto-SHWNG and its subgroups. This leads to plausible hypotheses about how speakers of SHWNG languages may have spread geographically.

The most widely applicable criterion for locating the homeland of a proto-language is that speakers tend not to move very far, all else being equal. Therefore, the homeland typically contains representatives of more primary branches than other areas, and these languages have had more time to differentiate. I rely mainly on this criterion here. Other criteria require detailed knowledge of the proto-environment and proto-culture (derived from archaeology, reconstructed vocabulary, etc.), which is currently lacking for Proto-SHWNG.

Blust (1978a: 211) places the Proto-SHWNG homeland in Cenderawasih Bay on the basis of its greater general linguistic diversity (§3.5). He does not explicitly address the important question of whether this diversity is found among the primary branches of Proto-SHWNG or at some lower level.

Examination of Figure 7.1 shows that, indeed, four of the seven primary branches of Proto-SHWNG contain languages spoken only in Cenderawasih Bay (Moor, Tandia, Waropen, and Proto-Cenderawasih Bay). This strongly suggests that the Proto-SHWNG homeland was located in Cenderawasih Bay, confirming Blust's hypothesis. More specifically, the most plausible location is southern Cenderawasih Bay, the location of three primary branches of Proto-SHWNG (Moor, Tandia, and some Waropen villages) and one of the primary branches of Proto-Cenderawasih Bay (Proto-Southwest Cenderawasih Bay).

Locating the Proto-SHWNG homeland in southern Cenderawasih Bay neatly accounts for the spread of the three primary branches of Proto-SHWNG that are not found in Cenderawasih Bay. Speakers of two branches (Warembori and Yoke) went eastward along the coast, leaving Cenderawasih Bay and settling near the mouth of the Mamberamo river. Speakers of the third branch (Proto-RASH) went westward along the coast, leaving Cenderawasih Bay and going around the Bird's Head peninsula.

The homeland of Proto-RASH was most likely in the Raja Ampat archipelago, as three of its five primary branches are found there (Fiawat, Proto-Ambel-Biga, and Proto-Maʲya-Matbat). Of the remaining two primary branches, As would have spread eastward to the Bird's Head, while Proto-South Halmahera would have spread westward to Halmahera.

Among the branches of Proto-RASH, Fiawat and other dialects of Maden are spoken only on Salawati, so that is presumably their homeland. Proto-Maʲya-Matbat contains two languages, Maʲya and Matbat; its most plausible homeland is Misool, where both languages are spoken, and from which Maʲya would have spread.[4]

[4]Maʲya oral tradition places their origin in western Waigeo (Remijsen 2001b: 164). This is not straightforwardly consistent with a Misool origin for Proto-Maʲya-Matbat. If this tradition reflects historical reality, one way to reconcile it with a Misool origin would be to assume multiple migrations (from Misool to Waigeo and back again). This would be consistent with the Maʲya's sea-oriented culture (§3.2).

Proto-Ambel-Biga contains two languages: Ambel, spoken in several villages on Waigeo, and Biga, spoken in a single village on Misool. Biga appears to have an unusual linguistic and social history. Remijsen (2001b: 24) makes several interesting observations in this regard:

> A considerable portion of the Biga vocabulary is similar to that of Maˈya. This similarity is consistent with the Biga people's claim that they migrated to Misool from Waigeo, just as the Maˈya on Misool did. … Surprisingly, however, the words which do not bear resemblance to a word in Misool Maˈya in their phonological form, do not have a cognate in any of the Waigeo dialects of Maˈya. Instead, they are similar to words of the languages of land-oriented groups of Salawati and Waigeo [i.e. Fiawat and Ambel]. And with them, the Biga share a number of features defining the interior-oriented social type: (a) they are important sago producers in their local area; and (b) they did not embrace Islam.

Remijsen's observations are consistent with a Waigeo homeland for Proto-Ambel-Biga. The Biga would have then migrated to their present location on Misool. The Biga language appears to have undergone substantial contact influence from Maˈya, which is most evident in the lexicon.[5]

The above conclusions unfortunately do not shed any light on precisely where the homeland of Proto-RASH may have been located in the Raja Ampat archipelago. Misool, Waigeo, and Salawati would appear to be equally likely possibilities.

The homeland of Proto-South Halmahera was most likely along the central-eastern coast of Halmahera (perhaps near the present location of Patani and Gebe), as two of its three primary branches are found there (Gebe and Proto-Central-Eastern South Halmahera). The Proto-Central-Eastern South Halmahera homeland must have been in approximately the same location. Speakers of Proto-Southern South Halmahera would have first spread south, settling where Gane is now spoken, then northwest to Taba. Available data do not make it possible to more precisely locate the Proto-Southern South Halmahera homeland.

The internal subgrouping of Proto-Biakic is not known. However, the fact that three of the four Biakic languages (Dusner, Meoswar, and Roon) are spoken in or near Wandamen Bay in western Cenderawasih Bay suggests Wandamen Bay as a plausible homeland. Speakers of Biak, the remaining Biakic language, would have spread northeast from Wandamen Bay, settling first on the islands of Numfor, Biak, and Supiori.

The homelands of Proto-Yapen, Proto-Western Yapen, Proto-Central Yapen, Proto-Eastern Yapen, and Proto-Southwest Cenderawasih Bay must have been in approximately the locations suggested by their designations. The sole outlier language is Wandamen, whose speakers would have spread westward, reaching the west coast of Cenderawasih Bay and entering Wandamen Bay.

[5]Under this scenario, epenthetic final *o* in Biga (see §5.4, footnote 20) would most likely be attributable to Maˈya influence.

The homeland of Proto-Cenderawasih Bay was probably close to the Proto-SHWNG homeland in southern Cenderawasih Bay. As just discussed, the homeland of Proto-Biakic was in Wandamen Bay in western Cenderawasih Bay, while the homeland of Proto-Southwest Cenderawasih Bay was in southwest Cenderawasih Bay. The Proto-Cenderawasih Bay homeland was most plausibly along this stretch of coastline, perhaps slightly west of the Proto-SHWNG homeland. Speakers of Proto-Yapen would have spread to the northeast, settling on Yapen island.

Chapter 8

Conclusion

I have examined phonological and morphological change in SHWNG, identified shared innovations that possess subgrouping value, produced a new subgrouping of SHWNG languages on this basis, and identified the most likely homelands for the resulting subgroups. Our knowledge of the internal history of SHWNG languages is significantly improved as a result. It is now also possible for the first time to locate the Proto-SHWNG homeland, in southern Cenderawasih Bay.

Morphological innovations prove to be significantly more informative than phonological innovations for inferring family-tree-like splits in the history of SHWNG. This is because they are much less likely than phonological changes to arise independently or to diffuse (§1.3). Special care was taken in chapter 6 to maximize the diagnostic substance of morphological innovations by excluding features that could have been retentions or parallel developments.

Some innovations that were dismissed as parallel developments perhaps might not have been. For example, there is variation in how PMP pronouns are reduced to become subject prefixes (e.g., whether the initial or final syllable of 3PL **sida* is preserved). A well-developed theory of phonological reduction might be able to assess the likelihood of different outcomes, and assign some more subgrouping value than others.

The study of phonological change in SHWNG supports the hypothesis that such changes readily diffuse. This is observed in several cases, such as the outcome of the merger of PMP **d*, **z*, and **l* as *l* in South Halmahara and Raja Ampat and as *r* in Cenderawasih Bay and Mamberamo; **a* > *o* in several South Halmahera languages (§4.2.26); initial **a* > *ya* in various languages (§4.2.27); and the outcome of **ə* in Raja Ampat (§4.2.28). None of these groups of languages are subgroups. In each case they are geographically contiguous, strongly suggesting that these innovations diffused rather than arising independently.

The evident diffusability of phonological changes raises important questions about the early history of Proto-SHWNG, which is justified largely on the basis of phonological change (see chapter 3). Some of the proposed Proto-SHWNG changes are not found in all languages, suggesting that they may have diffused (§4.4). Other changes evidently did occur in Proto-SHWNG. In general, the issue of diffusion versus inheritance in SHWNG is

ripe for future research.

The diagnostic substance scale proposed in §1.3 holds up well. Since it works for a hard case like SHWNG, it may be worth testing on other subgrouping cases and applying to computational phylogenetic algorithms. The development of a better theory of diagnostic substance can make a major contribution to our ability to infer subgrouping histories, and should be a priority for historical linguists.

Language contact was not systematically examined. Now that the tree-like splits in the history of SHWNG have been identified, it should be much easier to detect borrowings among SHWNG languages. However, the precise role of Papuan language contact is still largely unknown. The occurrence of tonogenesis as many as five times independently (see chapter 5) suggests that this contact was not just with a single language, or with a single type of tonal system.

Reconstructing Proto-SHWNG is the logical next step in unraveling the history of the SHWNG languages. The cognate sets in the Appendix can form the basis of an initial reconstruction of Proto-SHWNG. Unfortunately, high quality descriptive data are still lacking for many SHWNG languages, and speakers of many languages are now in the process of shifting to Indonesian. It is thus important that these languages be documented soon, before it is too late.

The reconstruction of Proto-SHWNG is significant for several reasons. It may help elucidate the history of the problematic Bomberai languages (Irarutu, Kuri, Bedoanas, and Erokwanas) and the boundary between SHWNG and CMP (§3.7). It will enable reconstruction of Proto-SHWNG speakers' culture and environment. Perhaps most significantly, it will make it possible to compare Proto-SHWNG with Proto-Oceanic, and thereby to reconstruct PEMP.

Reconstruction of PEMP is key to understanding the spread of Austronesian languages across New Guinea. This spread did not necessarily proceed only in one direction. I have already shown that the Raja Ampat and South Halmahera languages are the result of a back-migration from the Proto-SHWNG homeland in southern Cenderawasih Bay (§7.7). The PEMP homeland remains to be determined. If it was east of Cenderawasih Bay, the formation of Proto-SHWNG must also have involved a back-migration. The reconstruction of PEMP speakers' culture and environment, together with archaeological evidence, may ultimately resolve the question.

In many ways, the "field" of SHWNG is in its infancy. It is my hope that others will soon be inspired to take up research in this fascinating corner of the Austronesian world, so that the many unresolved questions can begin to be answered.

Bibliography

Adelaar, K. Alexander. 1994. The classification of the Tamanic languages. In *Language change and contact in the Austronesian world,* ed. by Thomas Dutton and Darrell T. Tryon, 1–42. Berlin: Mouton de Gruyter.

———. 2005. The Austronesian languages of Asia and Madagascar: a historical perspective. In *The Austronesian languages of Asia and Madagascar,* ed. by K. Alexander Adelaar and Nikolaus P. Himmelmann, 1–42. London: Routledge.

Adelaar, K. Alexander, and Andrew Pawley, eds. 2009. *Austronesian historical linguistics and culture history: a Festschrift for Robert Blust.* Canberra: Pacific Linguistics.

Adriani, N., and Alb. C. Kruyt. 1914. *De Bare'e-sprekende Toradjas van midden-Celebes.* Batavia: Landsdrukkerij.

Anceaux, J. C. 1961a. *The linguistic situation in the islands of Yapen, Kurudu, Nau and Miosnum, New Guinea.* Verhandelingen van het Koninklijk Instituut voor Taal-, Land- en Volkenkunde 35. 's-Gravenhage: Martinus Nijhoff.

———. 1961b. Verslag van een onderzoek naar de taalsituatie in het zuiden en zuidwesten van de Geelvink-baai. Hollandia. Archived at the Nationaal Archief (The Hague), nummer archiefinventaris 2.10.25, inventarisnummer 795.

———. n.d. [Notebook containing grammatical notes on Umar, Roon, Yaur, Moor, Windesi, Dusner, Kuri, Meoswar, Yerisiam, and Tarunggare]. Archived at KITLV (Leiden), aanvraagnummer D Or. 615, inventarisnummer 326.

Andaya, Leonard Y. 1993. *The world of Maluku: eastern Indonesia in the early modern period.* Honolulu: University of Hawaii Press.

Arnold, Laura. 2014. A preliminary grammar of Ambel. Unpublished manuscript, The University of Edinburgh.

Babel, Molly, Andrew Garrett, Michael J. Houser, and Maziar Toosarvandani. 2013. Descent and diffusion in language diversification: a study of Western Numic dialectology. *International Journal of American Linguistics* 79 (4): 445–489.

Bellwood, Peter. 2007. *Prehistory of the Indo-Malaysian archipelago.* 3rd ed. Honolulu: University of Hawaii Press.

Berg, René van den. 2003. The place of Tukang Besi and the Muna-Buton languages. In *Issues in Austronesian historical phonology,* ed. by John Lynch, 87–113. Pacific Linguistics. Canberra: The Australian National University.

———. 2009. Possession in South Halmahera–West New Guinea: typology and reconstruction. In Adelaar and Pawley 2009, 217–247.

Berg, René van den, and Brenda H. Boerger. 2011. A Proto-Oceanic passive? Evidence from Bola and Natügu. *Oceanic Linguistics* 50 (1): 221–246.

Blevins, Juliette, and Andrew Garrett. 1998. The origins of consonant-vowel metathesis. *Language* 74:508–556.

Blust, Robert A. 1974. Eastern Austronesian: a note. *Working Papers in Linguistics, University of Hawai'i* 6 (4): 101–7.

———. 1977. The Proto-Austronesian pronouns and Austronesian subgrouping: a preliminary report. *Working Papers in Linguistics, University of Hawai'i* 9 (2): 1–15.

———. 1978a. Eastern Malayo-Polynesian: a subgrouping argument. In Wurm and Carrington 1978, 1:181–234.

———. 1978b. Eastern Malayo-Polynesian: a subgrouping argument. Paper presented at the Second International Conference on Austronesian Linguistics, Canberra. 130 pp.

———. 1982. The linguistic value of the Wallace line. *Bijdragen tot de Taal-, Land- en Volkenkunde* 2/3:231–250.

———. 1983–4. More on the position of the languages of eastern Indonesia. *Oceanic Linguistics* 23 (1): 1–28.

———. 1993. Central and Central-Eastern Malayo-Polynesian. *Oceanic Linguistics* 32 (2): 241–293.

———. 1999. Subgrouping, circularity, and extinction: some issues in Austronesian comparative linguistics. In *Selected papers from the eighth International Conference on Austronesian Linguistics (taipei, taiwan),* 31–94. Academica Sinica.

———. 2001. Malayo-Polynesian: new stones in the wall. *Oceanic Linguistics* 40:151–155.

———. 2004. *t to k: an Austronesian sound change revisited. *Oceanic Linguistics* 43 (2): 365–410.

———. 2009. The position of the languages of Eastern Indonesia: a reply to Donohue and Grimes. *Oceanic Linguistics* 48 (1): 36–77.

Blust, Robert A. 2012. The marsupials strike back: a reply to Schapper (2011). *Oceanic Linguistics* 51 (1): 261–277.

———. 2013. *The Austronesian languages*. Revised edition. Canberra: Research School of Pacific and Asian Studies, The Australian National University.

———. 2014. Austronesian Comparative Dictionary. Accessed July 20, 2014. `http://www.trussel2.com/ACD/`.

Bowden, John. 2001. *Taba: description of a South Halmahera language*. Pacific Linguistics. Canberra: The Australian National University.

Cahill, Michael. 2003. Tone in languages of Papua New Guinea. Paper presented at the Linguistic Circle, University of Colorado.

Clercq, F. S. A. de. 1888. Iets over het eiland Mor. *De Indische Gids* 10:526–529.

———. 1889a. De baai van Wandamen in het zuidwesten der Geelvink-baai. *De Indische Gids* 11:460–476.

———. 1889b. Een paar dagen op de kust van Ja-oer in de Geelvinkbaai. *De Indische Gids* 11:1112–1120.

———. 1889c. Het gebied der Kalana fat of vier Radja's in Westelijk Nieuw-Guinea. *De Indische Gids* 11:1297–1351.

Clouse, Duane, Mark Donohue, and Felix Ma. 2002. Survey report of the north coast of Irian Jaya. SIL International. `http://www.sil.org/resources/publications/entry/9028`.

Collins, James T. 1982. A short vocabulary of East Makian. In Voorhoeve 1982, 99–128.

Cowan, H. K. J. 1953. *Voorlopige resultaten van een ambtelijk taalonderzoek in Nieuw-Guinea*. 48. 's-Gravenhage: Martinus Nijhoff.

———. 1955. Notes on Windesi grammar. *Oceania* 26 (1): 42–58.

Dalrymple, Mary, and Suriel Mofu. 2011. Dusner dictionary. Accessed April 17, 2013. `http://dusner.clp.ox.ac.uk/`.

———. 2012. *Dusner*. München: Lincom Europa.

Dempwolff, Otto. 1934–38. *Vergleichende Lautlehre des austronesischen Wortschatzes*. Zeitschrift für Eingeborenen-Sprachen. 3 vols. Berlin: Dietrich Reimer.

Donohue, Mark. 1997. Tone systems in New Guinea. *Linguistic Typology* 1:347–386.

———. 1999. *Warembori*. München: Lincom Europa.

———. 2004. Typology and linguistic areas. *Oceanic Linguistics* 43 (1): 221–239.

Donohue, Mark. 2005. Tone and the Trans New Guinea languages. In *Proceedings of the symposium Cross-linguistic studies of tonal phenomena,* ed. by Shigeki Kaji, 33–54. Tokyo: Tokyo University of Foreign Studies.

Donohue, Mark, and Tim Denham. 2010. Farming and language in Island Southeast Asia: reframing Austronesian history. *Current Anthropology* 51 (2): 223–256.

Donohue, Mark, and Charles E. Grimes. 2008. Yet more on the position of the languages of Eastern Indonesia and East Timor. *Oceanic Linguistics* 47 (1): 114–158.

Donohue, Mark, and Simon Musgrave. 2007. Typology and linguistic macro-history of Island Melanesia. *Oceanic Linguistics* 46:348–387.

Donohue, Mark, and Antoinette Schapper. 2008. Whence the Austronesian indirect possession construction? *Oceanic Linguistics* 47 (2): 316–327.

Drabbe, P. 1953. *Spraakkunst van de Kamoro-taal.* 's-Gravenhage: Martinus Nijhoff.

Dunn, Michael, Angela Terrill, Ger Reesink, Robert A. Foley, and Stephen C. Levinson. 2005. Structural phylogenetics and the reconstruction of ancient language history. *Science* 309:2072–2075.

Dyen, Isidore. 1965. *A lexicostatistical classification of the Austronesian languages.* IJAL Memoir 19.

———. 1978. The position of the languages of eastern Indonesia. In Wurm and Carrington 1978, 1:235–254.

Edmondson, Jerold A., and Kenneth J. Gregerson, eds. 1993a. *Tonality in Austronesian languages.* Oceanic Linguistics Special Publications 24. University of Hawaii Press.

———. 1993b. Western Cham as a register tone language. In Edmondson and Gregerson 1993a, 61–74.

Esser, S. J. 1938. Talen. In *Atlas van tropisch Nederland.* Amsterdam: Koninklijk Nederlandsch Aardrijkskundig Genootschap.

Fabritius, G. J. 1855. Aanteekeningen omtrent Nieuw-Guinea. *Tijdschrift voor Indische Taal-, Land-, en Volkenkunde:*209–215.

François, Alexandre. 2015. Trees, waves and linkages: models of language diversification. In *The Routledge handbook of historical linguistics,* ed. by Claire Bowern and Bethwyn Evans. New York: Routledge.

Gasser, Emily. 2013. Wamesa dictionary. Unpublished Toolbox lexicon.

———. 2014. Windesi Wamesa morphophonology. Unpublished Ph.D. dissertation, Yale University.

Gil, David. 2008. Some aspects of the grammar of Roon. Presented at the Max Planck Institute for Evolutionary Anthropology, Leipzig.

Grace, George. 1955–6. Field notebooks. `http://digicoll.manoa.hawaii.edu/grace/Pages/PDFlist.html`.

———. 1971. Notes on the phonological history of the Austronesian languages of the Sarmi coast. *Oceanic Linguistics* 10 (1): 11–37.

Gray, Russell D., Alexei J. Drummond, and Simon J. Greenhill. 2009. Language phylogenies reveal expansion pulses and pauses in Pacific settlement. *Science* 323:479–483.

Greenhill, Simon J., Robert Blust, and Russell D. Gray. 2008. The Austronesian basic vocabulary database: From bioinformatics to lexomics. *Evolutionary Bioinformatics* 4:271–283. `http://language.psy.auckland.ac.nz/austronesian/`.

Hajek, John. 1995. A mystery solved: the forgotten tone languges of New Ireland. *University of Melbourne Working Papers in Linguistics* 14:9–14.

Hasselt, J. L. van, and F. J. F. van Hasselt. 1947. *Noemfoorsche woordenboek.* Amsterdam: N.V. Drukkerij en Uitgeverij J.H. de Bussy.

Held, Gerrit Jan. 1942a. *Grammatica van het Waropensch (Nederlansch Noord Nieuw-Guinea).* Bandoeng: A. C. Nix.

———. 1942b. *Woordenlijst van het Waropensch (Nederlansch Noord Nieuw-Guinea).* Bandoeng: A. C. Nix.

———. 1957. *The Papuas of Waropen.* Koninklijk Instituut voor Taal-, Land- en Volkenkunde, Translation series 2. 's-Gravenhage: Martinus Nijhoff.

Henning, Jean C. 1991. *Wandamen vocabulary / perbendaharaan kata bahasa Wandamen / sane pai ve kavavo nana kavo Wondama.* Irian Jaya: UnCen-SIL.

Heuvel, Wilco van den. 2006. *Biak: description of an Austronesian language of Papua.* Utrecht: LOT.

Holton, Gary. 2008. The rise and fall of semantic alignment in North Halmahera, Indonesia. In *The typology of semantic alignment,* ed. by Mark Donohue and Søren Wichmann, 252–276. Oxford University Press.

Hombert, Jean-Marie, John J. Ohala, and William G. Ewan. 1979. Phonetic explanations for the development of tones. *Language* 55 (1): 37–58.

Hueting, A. 1929. *Geschiedenis der zending op het eiland Halmahera.* Oegstgeest: Zendingsbureau.

Huizinga, F. 1998. Relations between Tidore and the north coast of New Guinea in the nineteenth century. In *Perspectives on the Bird's Head of Irian Jaya, Indonesia,* ed. by Jelle Miedema, Cecilia Odé, and Rien A. C. Dam, 385–419. Amsterdam: Rodopi.

Hume, Elizabeth V. 1997. Vowel preservation in Leti. *Oceanic Linguistics* 36 (1): 65–101.

———. 1998. Metathesis in phonological theory: the case of Leti. *Lingua* 104:147–186.

Kamholz, David. 2013. Toolbox lexicons of Moor, Umar, Yaur, and Yerisiam. `http://lexifier.lautgesetz.com`.

Kamma, Freerk Christiaans. 1977. *Dit wonderlijke werk.* Oegstgeest: Raad voor de Zending der Ned. Hervormde Kerk.

———. 1981–93. *Ajaib di mata kita.* 3 vols. Indonesian translation of Kamma (1977). BPK Gunung Mulia.

———. n.d. Enkele aanwijzingen voor het Wandammen. Het Utrechts Archief, nummer toegang 6737, inventarisnummer 1102-2.

Kijne, Isaac Samuel. n.d.(a). [Notebook containing Umar wordlist and Tandia grammatical notes]. Archived at KITLV (Leiden), aanvraagnummer D Or. 421, inventarisnummer 33.

———. n.d.(b). [Notebook containing Waropen, Roon, and Dusner wordlist and grammatical notes]. Archived at KITLV (Leiden), aanvraagnummer D Or. 421, inventarisnummer 13.

Klamer, Marian, Ger P. Reesink, and Miriam van Staden. 2008. East Nusantara as a linguistic area. In *From linguistic areas to areal linguistics,* ed. by Pieter Muysken, 95–150. Amsterdam: John Benjamins.

Laycock, Donald C. 1978. A little Mor. In Wurm and Carrington 1978, 1:285–316.

Leeden, A. C. van der. 1983. Ga'le12 Ma'ya3 – Phonology of a tone language of the Raja Ampat islands. In *Halmahera dan Raja Ampat sebagai kesatuan majemuk. Studi-studi terhadap suatu daerah transisi,* ed. by E. K. M. Masinambow, 2:77–146. Buletin Lembaga Ekonomi dan Kemasyarakatan Nasional 2. Jakarta: Lembaga Ilmu Pengetahuan Indonesia.

———. 1993. *Ma'ya: a language study: a phonology*. Jakarta: Lembaga Ilmu Pengetahuan Indonesia and Rijksuniversiteit Leiden.

———. 1997. A tonal morpheme in Ma'ya. In *Proceedings of the seventh International Conference on Austronesian Linguistics (Leiden, 1994),* ed. by Cecilia Odé and Wim Stokhof. Universiteit Leiden.

———. n.d. [Ma'ya dictionary, morphology, and syntax]. Unfinished ms.

Lewis, M. Paul, ed. 2009. *Ethnologue: languages of the world.* 16th edition. Dallas: SIL International. http://www.ethnologue.com.

Lynch, John, Malcolm Ross, and Terry Crowley, eds. 2002. *The Oceanic languages.* Surrey: Curzon.

Maan, G. 1940. *Boelisch-Nederlansche woordenlijst met Nederlansch-Boelisch register.* Bandoeng: A. C. Nix.

———. 1951. *Proeve van een Bulische spraakkunst.* 's-Gravenhage: Martinus Nijhoff.

Maddieson, Ian. 1978. Universals of tone. In *Universals of human language, vol. 2: phonology,* ed. by Joseph H. Greenberg, 335–365. Stanford: Stanford University Press.

Maddieson, Ian, and Keng-Fong Pang. 1993. Tone in Utsat. In Edmondson and Gregerson 1993a, 75–89.

Marck, Jeffrey C. 2000. *Topics in Polynesian language and culture history.* Pacific Linguistics 504. Canberra: The Australian National University.

Matsumura, Takashi. 1991. Irarutu phonology. SIL in cooperation with Universitas Cenderawasih, Jayapura, *Workpapers in Indonesian Languages and Cultures* 10:37–74.

Mofu, Suriel. 2008. Biak morphosyntax. Unpublished Ph.D. dissertation, University of Oxford.

Pawley, Andrew. 2007. The origins of early Lapita culture: the testimony of historical linguistics. In *Oceanic explorations: Lapita and western Pacific settlement,* ed. by Stuart Bedford, Christophe Sand, and Sean P. Connaughton, 17–49. Canberra: The Australian National University.

Peski, F. van. 1914. *Beschrijving eener Exploratie van het eiland Misool, met annex woordenlijst der taal.* Deventer: Velders.

Price, David S. n.d. Ambai lexicon.

Price, David S., and Mark Donohue. 2008. Stress in Ambai, and how it became that way. Keynote paper read in Manokwari.

———. 2009. *Report on the Ansus survey, West Yapen island, Papua, Indonesia.* SIL Electronic Survey Report 2009-001. SIL International. http://www-01.sil.org/SILESR/2009/silesr2009-001.pdf.

Reesink, Ger P. 2005. West Papuan languages: roots and development. In *Papuan pasts: cultural, linguistic and biological histories of Papuan-speaking peoples,* ed. by Andrew Pawley, Robert Attenborough, Robin Hide, and Jack Golson, 185–218. Pacific Linguistics. Canberra: The Australian National University.

Remijsen, Bert. 2001a. Dialectal variation between the tone systems of three variants of Ma'ya. *Language and Speech* 44 (4): 473–499.

———. 2001b. *Word-prosodic systems of Raja Ampat languages.* LOT international series 49. Utrecht: LOT.

———. 2002. Lexically contrastive stress accent and lexical tone in Ma'ya. In *Laboratory phonology VII,* ed. by Carlos Gussenhoven and Natasha Warner, 585–614. Berlin: Mouton de Gruyter.

———. 2007. Lexical tone in Magey Matbat. In *Prosody in Indonesian languages,* ed. by V. J. van Heuven and Ellen Agatha van Zanten-Wervelman, 9–34. Occasional series 9. Utrecht: LOT.

———. 2010. Nouns and verbs in Magey Matbat. In *Typological and areal analyses: Contributions from East Nusantara,* 281–311. Pacific Linguistics 618. Canberra: The Australian National University.

Ringe, Don, and Joseph F. Eska. 2013. *Historical linguistics: toward a twenty-first century reintegration.* Cambridge: Cambridge University Press.

Ringe, Don, Tandy Warnow, and Ann Taylor. 2002. Indo-European and computational cladistics. *Transactions of the philological society* 100 (1): 59–129.

Rivierre, Jean-Claude. 1993. Tonogenesis in New Caledonia. In Edmondson and Gregerson 1993a, 155–173.

———. 2001. Tonogenesis and the evolution of tonal systems in New Caledonia, the example of Cèmuhî. In *Proceedings of the symposium Cross-linguistic studies of tonal phenomena,* ed. by Shigeki Kaji, 23–42. Tokyo: Institute for the Study of Languages / Cultures of Asia / Africa.

Ross, Malcolm. 1988. *Proto-Oceanic and the Austronesian languages of Western Melanesia.* Pacific Linguistics, C-98. Canberra: The Australian National University.

———. 1992. The sound of Proto-Austronesian: an outsider's view of the Formosan evidence. *Oceanic Linguistics* 31 (1): 23–64.

———. 1993. Tonogenesis in the North Huon Gulf chain. In Edmondson and Gregerson 1993a, 133–154.

———. 1995. Some current issues in Austronesian linguistics. In Tryon 1995, 1:45–120.

———. 1996. Contact-induced change and the comparative method: cases from Papua New Guinea. In *The comparative method reviewed: irregularity and regularity in language change,* ed. by Mark Durie and Malcolm Ross, 180–217. Oxford University Press.

Ross, Malcolm. 1997. Social networks and kinds of speech-community event. In *Archaeology and language I: theoretical and methodological orientations,* ed. by Roger Blench and Matthew Spriggs, 209–261. London and New York: Routledge.

———. 2002. The history and transitivity of western Austronesian voice and voice-marking. In *The history and typology of Western Austronesian voice systems,* 17–62. Pacific Linguistics 518. The Australian National University.

———. 2006. Reconstructing the case-marking and personal pronoun systems of Proto Austronesian. In *Streams converging into an ocean: festschrift in honor of Professor Paul Jen-kuei Li on his 70th birthday,* ed. by Henry Y. Chang, Lilliam M. Huang, and Dah-an Ho, 521–563. Taipei: Institute of Linguistics, Academica Sinica.

———. 2007. Calquing and metatypy. *Journal of Language Contact: Thema* 1:116–143.

———. 2009. Proto Austronesian verbal morphology: a reappraisal. In Adelaar and Pawley 2009, 295–326.

Ross, Malcolm, Andrew Pawley, and Meredith Osmond, eds. 1998. *The lexicon of Proto-Oceanic: the culture and environment of ancestral Oceanic society*. Canberra: Australian National University.

Saggers, Naomi. 1979. A sketch grammar of Wandamen. Unpublished master's thesis.

Sawaki, Yusuf. 2009. Verbs and pronominal morphology in Wooi. Presented at the Max Planck Institute for Evolutionary Anthropology, Leipzig.

Schapper, Antoinette. 2011. Phalanger facts: notes on Blust's marsupial reconstructions. *Oceanic Linguistics* 50 (1): 258–272.

Silzer, Peter James. 1983. Ambai: an Austronesian language of Irian Jaya, Indonesia. Unpublished Ph.D. dissertation, The Australian National University.

Silzer, Peter, Sheryl Silzer, and Phillips Leonard Wanggai. 1986. *Aroanso diannesa / Mengenal ikan.* Universitas Cenderawasih / SIL.

Slump, F. 1924–38. Grammatica en woordenlijst van de Seroei-Laut taal. Het Utrechts Archief, nummer toegang 2274, inventarisnummer 1102-1.

Smits, L., and C. L. Voorhoeve, eds. 1992a. *The J. C. Anceaux collection of wordlists of Irian Jaya: Austronesian languages (part I)*. Irian Jaya source materials 4. Leiden and Jakarta: DSALCUL/IRIS.

———, eds. 1992b. *The J. C. Anceaux collection of wordlists of Irian Jaya: Austronesian languages (part II)*. Irian Jaya source materials 5. Leiden and Jakarta: DSALCUL/IRIS.

Soeparno. 1977. *Kamus bahasa Biak-Indonesia.* Jakarta: Pusat Pembinaan dan Pengembangan Bahasa, Departemen Pendidikan dan Kebudayaan.

Stokhof, W. A. L., ed. 1980. *Holle lists: vocabularies in languages of Indonesia vol. 2: Sula and Bacan islands, North Halmahera, South and East Halmahera.* Pacific Linguistics, D-28. The Australian National University.

Svantesson, Jan-Olof. 1989. Tonogenetic mechanisms in Northern Mon-Khmer. *Phonetica* 46:60–79.

———. 1991. Hu – a language with unorthodox tonogenesis. In *Austroasiatic languages: essays in honour of H. L. Shorto,* ed. by Jeremy H. C. S. Davidson, 67–79. London: School of Oriental and African Studies, University of London.

Swadling, Pamela. 1996. *Plumes from paradise: trade cycles in outer Southeast Asia and their impact on New Guinea and nearby islands until 1920.* With contributions by Roy Wagner and Billai Laba. Coorparoo DC, Queensland: Papua New Guinea National Museum, in association with Robert Brown & Associates.

Teljeur, Dirk. 1982. Short wordlists from South Halmahera, Kayoa, Makian, Ternate, Tidore and Bacan. In Voorhoeve 1982, 129–148.

Thomas, Michael R. 1983. Pronominal prefixes in Sawai, a Bulic language. In *Papers from the third International Conference on Austronesian Linguistics, vol. 4: thematic variation,* ed. by Amran Halim, Lois Carrington, and S. A. Wurm, 285–289. Pacific Linguistics, C-77. Canberra: The Australian National University.

Thomason, Sarah G., and Terrence Kaufman. 1988. *Language contact, creolization, and genetic linguistics.* Berkeley: University of California Press.

Tryon, Darrell T., ed. 1995. *Comparative Austronesian dictionary: an introduction to Austronesian studies.* Berlin: Mouton de Gruyter.

Velzen, Paul van. 1994. Some remarks on the classification of Waropen. Paper presented at the at 7th International Conference on Austronesian Linguistics, Leiden.

———. n.d. Een voorstudie van het Waropen. Unpublished thesis, Universiteit Leiden.

Voorhoeve, C. L., ed. 1982. *The Makian languages and their neighbors.* 129–148. Pacific Linguistics, D-46. Canberra: The Australian National University.

———. 1989. Notes on Irarutu. *Irian* 18:106–119.

Wallace, Alfred R. 1869. *The Malay archipelago.* London: Macmillian.

Whalen, D. H., and Andrea G. Levitt. 1995. The universality of intrinsic F_0 of vowels. *Journal of Phonetics* 23:349–366.

Whisler, R. 1992. Phonology of Sawai. In *Phonological studies in four languages of Maluku,* ed. by Donald A. Burquest and Wyn D. Laidig. Dallas: SIL.

Whisler, R., and J. Whisler. 1995. Sawai introduction and wordlist. In Tryon 1995.

Wurm, S. A., and Lois Carrington, eds. 1978. *Second International Conference on Austronesian linguistics: proceedings.* Pacific Linguistics. Canberra: Australian National University.

Appendix: Cognate sets

This Appendix contains the complete database of cognate sets used in chapters 4 and 5. It is a snapshot, current at the time of publication, of the online database available at `http://lexifier.lautgesetz.com`. The online database contains more data on individual forms (part of speech, notes, etc.) and should be consulted in preference to this version when possible.

Cognate sets matched with a reconstructed form are listed first, followed by sets lacking one. The cognate forms in each set are arranged into five groupings: proto-languages, South Halmahera languages, Raja Ampat languages, Cenderawasih Bay languages, Mamberamo languages, and other languages. The latter includes the Bomberai languages Arguni, Irarutu, Kowiai, Onin, and Sekar; of these, only Irarutu has been included in SHWNG by some authors.

The source for each form is given in parentheses, often in abbreviated form (see Table A.1 for the list of abbreviations). There is sometimes a brief comment in square brackets after the source. The most common comment is *[?]*, indicating uncertainty as to whether the word belongs in the set.

Unlike in the remainder of the work, original source orthography is preserved without exception. Thus, I write PAn and PMP **e* rather than **ə*, Waropen *w* rather than *v*, etc.

ABVD	Greenhill et al. (2008)
ACD	Blust (2014)
D&M	Dalrymple and Mofu (2011)
G	Gasser (2013)
H	van Hasselt and van Hasselt (1947)
K	Kamholz (2013)
M	Matsumura (1991)
P&D	Price and Donohue (2009)
R	Remijsen (2001b)
Slm	Slump (1924–38)
Slz	Silzer (1983)

Table A.1: Source abbreviations.

PMP ***akaR*** 'root' (ACD); PMP ***wakaR*** 'root' (Blust 1999); PCEMP ***wakaR*** 'root' (Blust 1993); PCEMP ***wakir*** 'kind of root' (ACD); PEMP ***wakaR-i*** 'root' (ACD)

SH: Buli *wā* 'root' (ACD)

RA: Matbat *wa^{21}po* 'root' (R)

CB: Ambai *newa* 'root' (ABVD); Ambai *ne-wa(sa)* 'root' (Slz); Pom *wa-wari* 'root' (ACD); Serui-Laut *rewa* 'root' (Slm); Wandamen *war* 'root' (ACD); Waropen *ghai, wai* 'root' (ACD); Waropen *wai* 'root' (ABVD); Wooi *wari* 'root' (ACD)

Other: Irarutu *kwakare* 'root' (ABVD); Irarutu *warkrikre* 'root' (ABVD); Onin *wakir* 'root' (ACD)

PAN ***aku*** '1sg nominative; I' (ACD); PMP ***aku*** '1S NOM1' (Ross 2006); PMP ***i-aku*** 'I' (Blust 1999); PCEMP ***i-aku*** 'I' (Blust 1993)

SH: Buli *ya* '1sg. nominative pronoun: I' (ACD); Gane *yak* 'I' (ABVD); Sawai *ya* 'I' (CAD); Taba *yak* 'I' (ABVD)

RA: Matbat *ya^{21}k* 'I' (R); Matbat *ya^{21}ka* 'I' (R)

CB: Ambai *yau* 'I' (ABVD); Ansus *yau* 'I, me' (P&D); Biak *ya* 'I' (H); Dusner *ya* 'PRO.1SG' (D&M); Dusner *ya-* '1SG' (D&M); Moor *-i* '1sg' (K); Moor *í-* '1sg' (K); Moor *ígwa* '1sg' (K) [?]; Serui-Laut *yau* 'I' (Slm); Umar *e-* '1sg' (K) [?]; Wandamen *yau* 'I ; 1sg pronoun' (G); Waropen *ra* 'I' (ABVD); Waropen *ya* 'I' (ABVD); Yaur *i-* '1sg.R' (K); Yaur *ìgwá* '1sg' (K); Yaur *ja-* '1sg.I' (K); Yerisiam *j-* '1sg' (K) [?]

Mamberamo: Warembori *iwi* 'I' (Donohue 1999) [?]

Other: Irarutu *ia* 'I' (ABVD); Irarutu *já* 'I' (M); Kowiai *la?* '1sg. nominative pronoun: I' (ACD); Sekar *yai* 'I' (ABVD)

PAN ***ama*** 'father' (ACD); PAN ***ta-ama*** 'father (ref.)' (ACD); PMP ***t-ama*** 'father' (Blust 1999); PCEMP ***t-ama*** 'father' (Blust 1993)

SH: Buli *hmā* 'father, FB' (ACD)

RA: Biga *mai* 'father' (ABVD); Gebe *mam* 'father' (ABVD)

CB: Ambai *tama-* 'father' (Slz); Biak *kěma* 'father (ref.)' (H); Biak *mami* 'father' (H); Dusner *tma* 'father' (D&M); Moor *kamá* 'grandparent' (K); Wandamen *tama* 'father' (ACD); Waropen *imai* 'father' (ABVD)

Other: Sekar *yama-n* 'father' (ABVD)

PMP ***ampu*** 'grandparent/ grandchild (reciprocal)' (ACD); PMP ***empu*** 'grandparent/ grandchild (recipr.); ancestor; lord, master, owner' (ACD)

SH: Buli *bu* 'grandparent/grandchild' (ACD)

CB: Biak *k-ĕpu* 'grandparent/grandchild; totemic animal or plant (may not be eaten out of a kind of piety)' (H)

PMP ***añam*** 'plait (mats, baskets, etc.)' (ACD)

SH: Buli *yanam* 'to plait, weave (as mats)' (ACD); Sawai *n-yɔnɛm* 'to weave, plait' (CAD)

CB: Ambai *anu(m)* 'weave/plait' (Slz); Ansus *anuM* 'weave' (P&D); Biak *yanĕm* 'to plait, weave' (H); Serui-Laut *anu* 'weave' (Slm); Yerisiam *áamáné* 'weave' (K)

PAN ***aNay*** 'insect of the order *Isoptera*: termite, white ant' (ACD)

CB: Ambai *anana* ‘ant’ (Slz) [?]; Ansus *anaana* ‘red_ant’ (P&D); Serui-Laut *anana* ‘ant’ (Slm); Umar *nine* ‘ant’ (K) [?]; Wandamen *anana* ‘ant’ (G); Yerisiam *ánúiní* ‘ant’ (K) [?]

PMP ***apa*** ‘what?’ (Blust 1999); PMP ***apa$_1$*** ‘what?’ (ACD); PMP ***apa-i*** ‘what? which?’ (ACD); PCEMP ***apa*** ‘what?’ (Blust 1993); PCEMP ***sapa*** ‘what?’ (Blust 1993)

SH: Buli *ahai* ‘what?’ (ABVD)

RA: Ambel *letalapa* ‘what’ (R) [?]; Fiawat *nahapa* ‘what’ (R) [?]

Other: Kowiai *lafé* ‘what?’ (ABVD); Sekar *safa* ‘what?’ (ABVD)

PAN ***apu*** ‘grandparent/ grandchild (reciprocal)’ (ACD)

CB: Ambai *tafui* ‘grandparent’ (Slz); Ansus *apus muampi* ‘grandfather’ (P&D); Ansus *apus wawimpi* ‘grandmother’ (P&D); Ansus *tapu* ‘grandchild’ (P&D); Dusner *apui* ‘grandfather’ (D&M); Wandamen *apusi* ‘grandparent’ (G); Wandamen *tapu* ‘grandparent ; grandchild’ (G); Yerisiam *gwápúù* ‘grandmother’ (K)

PMP ***aRuhu*** ‘a shore tree: *Casuarina equisetifolia*’ (ACD); PMP ***qaRuhu*** ‘a shore tree: *Casuarina equisetifolia*’ (ACD)

CB: Ambai *ai-yaru* ‘casuarina’ (Slz); Biak *yār* ‘a tree: *Casuarina equisetifolia*’ (H); Moor *jàrura* ‘tree sp.’ (K); Umar *jaru* ‘tree sp.’ (K); Wandamen *ai yaru* ‘k.o. tree’ (G); Wandamen *yaru* ‘a tree: *Casuarina equisetifolia*’ (ACD); Yaur *jàrmùríe* ‘tree sp.’ (K)

PAN ***asa$_1$*** ‘one’ (ACD); PAN ***esa*** ‘one’ (ACD); PAN ***isa$_1$*** ‘one’ (ACD); PMP ***esa*** ‘one’ (Blust 1999); PMP ***isa*** ‘one’ (Blust 1999); PCEMP ***asa$_2$*** ‘one (of humans)’ (ACD); PCEMP ***isa*** ‘one’ (Blust 1993); PCEMP ***əsa*** ‘one’ (Blust 1993)

SH: Buli *asa* ‘one’ (ACD); Buli *[a] sa/[i]sa* ‘One’ (ABVD); Buli *isa* ‘one’ (ACD); Buli *sa-* ‘one’ (ACD); Gane *pso* ‘One’ (ABVD); Sawai *pu-sɔ* ‘one’ (CAD); Taba *p-so* ‘One’ (ABVD); Taba *-so* ‘one’

RA: As *sa* ‘One’ (ABVD); Gebe *pi-sa* ‘One’ (ABVD); Ma^{l}ya (S.) ^{l}*aksa* ‘one’ (R); Ma^{l}ya (S.) ^{l}*sa* ‘one’ (R)

CB: Biak *saï* ‘one’ (H); Moor *tatá* ‘one’ (K); Wandamen *esa* ‘One’ (ABVD)

Other: Arguni *sia* ‘One’ (ABVD) [?]; Irarutu *eso* ‘One’ (ABVD); Irarutu *esuémə* ‘one’ (M); Kowiai *isamós* ‘One’ (ABVD); Sekar *isa* ‘One’ (ABVD)

PAN ***aya$_2$*** ‘father’s sister, father’s sister’s husband’ (ACD)

CB: Biak *yàï* ‘father’ (H); Wandamen *yai* ‘father’ (G)

Mamberamo: Warembori *ai* ‘F’ (Donohue 1999)

Other: Arguni *yai* ‘mother’ (ACD); Kowiai *yai* ‘father’ (ABVD)

PMP ***ba$_4$*** ‘under, below’ (ACD); PMP ***babaq$_1$*** ‘lower surface, bottom; short, low; below, beneath, under’ (ACD); PMP ***i-babaq*** ‘below’ (Blust 1999); PCEMP ***i babaq*** ‘below’ (Blust 1993)

SH: Buli *pāp* ‘beneath, under’ (ACD); Gane *poli* ‘below’ (ABVD)

RA: Biga *papɔ* ‘below’ (ABVD); Gebe *la-pa* ‘below’ (ABVD); Ma^{l}ya (S.) ^{l}*pa*^{12}*p* ‘lower, low’ (R)

CB: Ambai *dombau* ‘below’ (Slz); Ambai *-weu* ‘below’ (Slz); Ansus *umbau* ‘below’ (P&D); Biak *babni* ‘below, under’ (H); Biak *wabni* ‘below, under’ (H); Dusner *vav* ‘below’ (D&M); Moor *kuvava'î* ‘short’ (K); Serui-Laut *umbau* ‘below’ (Slm); Wandamen *vav[a]* ‘below’ (ABVD)

Other: Irarutu *e-və* ‘below’ (ABVD) [?]; Sekar *ami-boban* ‘below’ (ABVD)

PAN ***baba**$_{1}$* ‘carry a person pick-a-back; ride pick-a-back’ (ACD); PMP ***baba**$_{7}$* ‘carry a person pick-a-back; ride pick-a-back’ (ACD)

CB: Waropen *wawa* ‘sit on the back, carry on the back (as a child)’ (ACD)

Other: Kowiai *na-fafa* ‘carry on the back’ (ACD)

PMP ***baba**$_{2}$* ‘father’ (ACD)

SH: Taba *baba(si)* ‘father’ (ABVD)

CB: Moor *babá* ‘friend’ (K); Wandamen *babai* ‘older sibling’ (G); Wandamen *baba vasia* ‘parents’ (G); Yerisiam *bábà* ‘older sibling’ (K)

Other: Arguni *baba* ‘father’ (ABVD)

PAN ***babaw**$_{3}$* ‘upper surface, top; highlands; on, upon, over, above’ (ACD); PMP ***bawbaw*** ‘upper surface, top, above’ (ACD); PCEMP ***bobo**$_{2}$* ‘upper surface, top, above’ (ACD)

SH: Buli *popô* ‘above’ (ACD); Gane *payau* ‘above’ (ABVD)

RA: Biga *papɔwɔ* ‘above’ (ABVD)

CB: Biak *bo* ‘above’ (H); Moor *ravúana* ‘above’ (K) [?]; Serui-Laut *babo* ‘above’ (Slm); Serui-Laut *vavoyai* ‘above’ (Slm); Wandamen *vavo* ‘on top (of); above’ (G); Waropen *[ru]bo* ‘above’ (ABVD)

Other: Arguni *apo* ‘above’ (ABVD); Kowiai *[-na] féfa* ‘above’ (ABVD)

PCEMP ***bai**$_{1}$* ‘do, make’ (ACD)

SH: Sawai *n-pe* ‘to do, make’ (CAD)

CB: Moor *venî* ‘do’ (K) [?]

PMP ***bak**$_{2}$* ‘negative marker’ (ACD) [?]

SH: Buli *pa* ‘no, not, nothing, no one’ (ACD)

RA: Ambel *po* ‘no’ (R); Biga *saˈpo* ‘no’ (R); Fiawat *hanpo* ‘no’ (R); Gebe *ɛnpa* ‘no, not’ (ABVD); Kawe *po* ‘no’ (R); Laganyan *haˈpo* ‘no’ (R); Matbat *do^{21}po* ‘no’ (R); Maˈya (M.) *saˈpo^{12}* ‘no’ (R); Maˈya (S.) *saˈpo^{12}* ‘no’ (R); Wauyai *po* ‘no’ (R)

CB: Ansus *wa* ‘not’ (P&D); Biak *ba* ‘no, not’ (H); Dusner *va* ‘not’ (D&M); Moor *và* ‘Neg’ (K); Wandamen *va* ‘no ; not’ (G); Waropen *wo* ‘no, not’ (Held 1942); Waropen *womo* ‘no, not’ (Held 1942); Yerisiam *béebà* ‘not yet’ (K); Yerisiam *mábè* ‘no’ (K); Yerisiam *vé* ‘Neg’ (K)

PMP ***baliji*** ‘grass’ (Blust 1999); PMP ***balizi*** ‘kind of grass’ (ACD); PCEMP ***baliji*** ‘grass’ (Blust 1993)

SH: Gane *bibisá* ‘grass’ (ABVD)

RA: Ambel *abris* ‘grass’ (R)

CB: Biak *abris* ‘grass’ (H)

PAN ***baliw*** ‘buy, sell’ (ACD); PMP ***beli*** ‘buy’ (Blust 1999); PCEMP ***bəli*** ‘buy’ (Blust 1993)

CB: Serui-Laut *bori* ‘to buy’ (Slm); Serui-Laut *wori* ‘to buy’ (Slm); Wandamen *bori* ‘buy’ (ACD)

PMP ***banua*** ‘inhabited land, territory supporting the life of a community’ (ACD)

SH: Buli *pnu* ‘village’ (ACD)

RA: Biga *pnu* ‘village’ (R); Fiawat *penuw* ‘village’ (R); Kawe *nu* ‘village’ (R); Laganyan ˡ*nu³* ‘village’ (R); Matbat *nu³* ‘village’ (R); Maˡya (M.) ˡ*pnu³* ‘village’ (R); Maˡya (S.) ˡ*pnu³* ‘village’ (R)

CB: Ambai *munue* ‘village’ (Slz); Ansus *nu* ‘world’ (P&D); Biak *mènu* ‘village’ (H); Biak *mĕnu* ‘village’ (H); Dusner *munuai* ‘village’ (D&M); Moor *manù* ‘forest’ (K); Serui-Laut *nu* ‘the earth’ (Slm); Umar *nuae* ‘village’ (K); Waropen *nu* ‘village’ (Held 1942); Yaur *núùré* ‘village’ (K); Yerisiam *nú* ‘village’ (K)

Mamberamo: Warembori *bunupune* ‘Village’ (Donohue 1999)

PAN ***baqeRuh*** ‘new; bachelor’ (ACD); PMP ***baqeRu*** ‘new, fresh; recent(ly); youth, bachelor; beautiful, in one’s prime’ (ACD); PMP ***ma-baqeRu*** ‘new’ (Blust 1999); PCEMP ***baqəRu*** ‘new’ (Blust 1993)

SH: Buli *po* ‘new; recently’ (ACD); Gane *pou* ‘new’ (ABVD); Taba *powo* ‘new’ (ABVD)

RA: Ambel *ambabo* ‘new’ (R)

CB: Ambai *vevoru* ‘new’ (ABVD); Ambai *waworu* ‘new’ (Slz); Ansus *waworu* ‘new’ (P&D); Biak *babo* ‘new’ (H); Dusner *vavo* ‘young’ (D&M); Kurudu *woru* ‘new’ (ACD); Serui-Laut *vavoru* ‘new’ (Slm); Wandamen *awori* ‘new’ (G); Wandamen *ba-boru* ‘new’ (ACD); Wandamen *vavoru* ‘fresh ; young’ (G); Waropen *boa* ‘new’ (ABVD); Waropen *woa* ‘new’ (ABVD)

Mamberamo: Warembori *uvo-ro* ‘New’ (Donohue 1999) [?]

Other: Arguni *popʷaro* ‘new’ (ABVD); Kowiai *fówa* ‘new’ (ABVD)

PMP ***baRa₁*** ‘hand, arm’ (ACD)

CB: Ambai *wara-* ‘arm’ (Slz); Ambai *waraŋ* ‘hand’ (ABVD); Ansus *warau* ‘arm’ (P&D); Biak *bra* ‘hand, arm’ (Soeparno 1977); Biak *rwa* ‘hand’ (H); Dusner *vra* ‘arm’ (D&M); Moor *veréa* ‘arm’ (K); Munggui *bara* ‘hand’ (ACD); Serui-Laut *wara* ‘arm, hand’ (Slm); Wandamen *vara* ‘hand’ (G); Waropen *baha* ‘hand’ (ABVD); Waropen *waha* ‘hand’ (ABVD); Yaur *vrá’ùgwájè* ‘arm’ (K); Yerisiam *bàkí* ‘arm’ (K)

Mamberamo: Warembori *ke-vera-ro* ‘Arm’ (Donohue 1999); Yoke *βura-* ‘arm’ (Donohue 1999)

Other: Irarutu *frá* ‘arm, hand’ (M)

PAN ***baReq*** ‘abscess, boil, swelling on the body’ (ACD); PMP ***baReq*** ‘swell’ (Blust 1999)

RA: Biga *saba* ‘to swell’ (ABVD) [?]

CB: Ambai *bebara* ‘to swell’ (ABVD); Ansus *bebara* ‘swollen’ (P&D); Biak *biar* ‘to swell’ (H); Moor *vavarà* ‘swollen’ (K); Wandamen *barbara* ‘to swell’ (ABVD); Yaur *névíorè* ‘swollen’ (K)

Other: Irarutu *-nəbərbarə* ‘to swell’ (ABVD); Sekar *abara* ‘to swell’ (ABVD)

PMP ***baseq₂*** ‘wet; wash clothes’ (ACD); PMP ***besaq*** ‘wet, wash’ (ACD); PMP ***biseq*** ‘wet; wash the anus after defecating’ (ACD); PMP ***ma-baseq*** ‘wet’ (Blust 1999); PCEMP ***ma-basəq*** ‘wet’ (Blust 1993)

CB: Ambai *vevasa* ‘wet’ (ABVD); Ambai *wawasa* ‘wet (cloth)’ (Slz); Ansus *wawa* ‘wet’ (P&D); Serui-Laut *vavaa* ‘wet’ (Slm); Wandamen *vabasa* ‘wet’ (G); Wandamen *vavasa* ‘wet’ (ABVD)

PMP ***bataŋ*** ‘tree trunk, fallen tree, log; stem of a plant; body; corpse; self; bridge of the nose; most important or preeminent thing; main course of a river; mushroom or bracket fungus that grows on tree trunks or decaying logs’ (ACD)

SH: Buli *patŋ-o* ‘piece of wood or a tree that is lying on the ground’ (ACD); Buli *pat-pataŋ* ‘lie fallen, of a tree’ (ACD)
RA: Fiawat *batan* ‘tree’ (R)

PAN ***batu₄*** ‘stone; testicle’ (ACD); PMP ***batu*** ‘stone’ (Blust 1999); PCEMP ***batu*** ‘stone’ (Blust 1993)
SH: Buli *pāt* ‘stone’ (ACD)
RA: As *pa* ‘stone’ (ABVD); Biga *kaˈpat* ‘stone’ (R); Biga *kapat* ‘stone’ (ABVD); Fiawat *epat* ‘stone’ (R); Gebe *kapat* ‘stone’ (ABVD); Kawe *aˈpat* ‘stone’ (R); Laganyan *aˈpat* ‘stone’ (R); Matbat *pa^{12}t* ‘stone’ (R); Maˈya (M.) *kaˈpa^{12}t* ‘stone’ (R); Maˈya (S.) *kaˈpa^{12}t* ‘stone’ (R); Wauyai *kaˈpat* ‘stone’ (R)
CB: Moor *vá’a* ‘stone’ (K); Umar *atu* ‘stone’ (K); Yerisiam *áakú* ‘stone’ (K)
Other: Arguni *puat* ‘stone’ (ABVD) [?]; Sekar *bati* ‘stone’ (ABVD)

PAN ***beRay₁*** ‘give’ (ACD); PMP ***beRay₂*** ‘give, present gifts to; gift’ (ACD); PEMP ***boRe*** ‘give’ (ACD)
SH: Buli *po* ‘give, hand over, surrender’ (ACD); Sawai *n-po* ‘give’ (CAD)
RA: Ambel *la-bi* ‘give’ (R); Fiawat *bi* ‘give’ (R); Laganyan *ˈbi(o)* ‘give’ (R); Matbat *be^{21}* ‘give’ (R); Maˈya (M.) *ˈbe(o)* ‘give’ (R); Maˈya (S.) *ˈbe(o)* ‘give’ (R); Wauyai *bi(o)* ‘give’ (R)
CB: Dusner *ve* ‘give’ (D&M); Umar *ve* ‘give’ (K); Yaur *vèné* ‘give’ (K)

PAN ***beRek*** ‘domesticated pig’ (ACD)
SH: Sawai *bow* ‘pig’ (CAD)
RA: Fiawat *bu* ‘pig’ (R); Laganyan *bo* ‘pig’ (R); Maˈya (M.) *ˈbo^{3}* ‘pig’ (R); Maˈya (S.) *ˈbo^{3}* ‘pig’ (R); Wauyai *bo* ‘pig’ (R)
CB: Umar *bue* ‘pig’ (K); Waropen *fo* ‘pig’ (Held 1942)
Mamberamo: Warembori *pue-ro* ‘Pig’ (Donohue 1999) [?]; Yoke *pua* ‘pig’ (Donohue 1999) [?]

PMP ***beRsay*** ‘canoe paddle; paddle a canoe’ (ACD); PEMP ***boRse*** ‘canoe paddle, paddle a canoe’ (ACD)
CB: Ambai *bo* ‘oar’ (Slz); Ambai *wo* ‘paddle (v.)’ (Slz); Ansus *bo* ‘paddle’ (P&D); Ansus *wo* ‘paddle’ (P&D); Biak *borĕs* ‘paddle, oar’ (H); Biak *borĕs* ‘to paddle, row in native fashion (with scooping motion)’ (H); Dusner *vors* ‘paddle’ (D&M); Moor *vóa* ‘paddle’ (K); Moor *vóra* ‘paddle’ (K); Serui-Laut *bo* ‘oar, paddle’ (ACD); Wandamen *bo* ‘paddle’ (ACD); Wandamen *vo* ‘paddle’ (G); Wandamen *vo* ‘paddle’ (G); Wandamen *wo* ‘row ; paddle’ (G); Waropen *wo* ‘to row’ (Held 1942)
Other: Arguni *pores* ‘oar, paddle’ (ACD); Kowiai *fosa* ‘oar, paddle’ (ACD); Onin *pesa* ‘oar, paddle’ (ACD)

PAN ***b‹in›ahi*** ‘[woman, wife]’ (ACD); PMP ***ba-b-in-ahi*** ‘woman’ (Blust 1999); PMP ***b-in-ahi*** ‘woman’ (Blust 1999); PCEMP ***ba-b-in-ay*** ‘woman’ (Blust 1993); PCEMP ***b‹in›ai*** ‘[woman, female]’ (ACD); PCEMP ***b-in-ay*** ‘woman’ (Blust 1993)
SH: Buli *ma-piŋ* ‘woman; female’ (ACD); Gane *mapín* ‘woman/female’ (ABVD); Sawai *mɛpin* ‘female’ (CAD); Taba *mapin* ‘wife’ (ABVD); Taba *mapin* ‘woman/female’ (ABVD)

RA: Ambel *bin* ‘woman’ (R); As *-bin* ‘wife’ (ABVD); Biga *waˈbin* ‘woman’ (R); Fiawat *bin* ‘woman’ (R); Gebe *mapin* ‘woman/female’ (ABVD); Gebe *mapin* ‘wife’ (ABVD); Kawe *pin* ‘woman’ (R); Laganyan *pin* ‘woman’ (R); Maˈya (M.) *ˈpi³n* ‘woman’ (R); Maˈya (S.) *ˈpi³n* ‘woman’ (R); Wauyai *pin* ‘woman’ (R)

CB: Ambai *vivi* ‘wife’ (ABVD); Ambai *vivin* ‘woman’ (Slz); Ambai *viviŋ* ‘woman/female’ (ABVD); Ansus *wawing* ‘woman’ (P&D); Ansus *wawini* ‘wife’ (P&D); Biak *bin* ‘woman; female’ (H); Moor *vavína* ‘woman’ (K); Serui-Laut *vavin* ‘woman’ (Slm); Serui-Laut *vinempi* ‘wife’ (Slm); Umar *inggo* ‘woman’ (K); Wandamen *babi* ‘woman/female’ (ABVD); Wandamen *babin* ‘woman; female’ (ACD); Wandamen *vavi* ‘woman ; female’ (G); Wandamen *vavi[n]* ‘woman/female’ (ABVD); Wandamen *vinie* ‘wife’ (G); Waropen *bino* ‘woman/female’ (ABVD); Waropen *bino* ‘wife’ (ABVD); Yerisiam *îînà* ‘woman’ (K)

Mamberamo: Warembori *bin-do* ‘Woman’ (Donohue 1999)

Other: Arguni *bimbine* ‘woman/female’ (ABVD); Arguni *popin* ‘wife’ (ABVD); Irarutu *bəfínə* ‘woman’ (M); Irarutu *bevine* ‘woman/female’ (ABVD); Kowiai *mafína* ‘woman/female’ (ABVD)

PSHWNG ***bisik₂*** ‘sick; illness’ (ACD)

SH: Buli *pisi* ‘sick, be sick’ (ACD); Buli *pisi kaci* ‘rheumatism’ (ACD); Buli *pis-pisi* ‘illness’ (ACD); Sawai *-pisɛ* ‘hurt’ (CAD)

RA: Gebe *-pisi* ‘painful, sick’ (ABVD); Maˈya (S.) *ˈpisi³* ‘to hurt’ (R)

CB: Biak *bis* ‘sick; illness, particularly fever’ (H)

PMP ***bitil₁*** ‘hungry; starve’ (ACD)

CB: Ambai *wawisi* ‘hungry’ (Slz); Ansus *wawi* ‘hungry’ (P&D); Biak *bisĕr* ‘hungry’ (H); Dusner *mbuser* ‘be.hungry’ (D&M); Wandamen *vawisi* ‘hungry’ (G) [?]

PAN ***bituqen*** ‘star’ (ACD); PMP ***bituqen*** ‘star’ (Blust 1999); PCEMP ***bituqən*** ‘star’ (Blust 1993)

RA: As *taun* ‘star’ (ABVD); Fiawat *tun* ‘star’ (R); Kawe *tun* ‘star’ (R); Maˈya (M.) *toˈi¹²n* ‘star’ (R); Maˈya (S.) *tuˈi³n* ‘star’ (R); Wauyai *tun* ‘star’ (R)

POC ***boto*** ‘short’ (ACD)

SH: Buli *kokopē* ‘short’ (ABVD); Gane *gapópai* ‘short’ (ABVD)

RA: As *kabu* ‘short’ (ABVD); Biga *kup* ‘short’ (ABVD); Gebe *kapoto* ‘short’ (ABVD)

CB: Umar *avu* ‘short’ (K); Umar *gavu* ‘short’ (K); Waropen *kamuto* ‘short’ (ABVD) [?]

Other: Irarutu *kəfútə* ‘short’ (M)

PAN ***buaq₁*** ‘fruit’ (ACD); PMP ***buaq*** ‘fruit’ (Blust 1999); PMP ***buaq₂*** ‘fruit; areca palm and nut; grain; berry; seed; nut; endosperm of a sprouting coconut; kidney; heart; finger; calf of the leg; testicle; various insects; scar tissue; roe; bud; flower; blossom; bear fruit; words, speech, or songs; meaning, contents of discussion; numeral classifier for roundish objects; buttock; Adam’s apple; nipple of the breast; button; marble; tattooing’ (ACD); PCEMP ***buaq*** ‘fruit’ (Blust 1993)

SH: Buli *[ai] pio* ‘fruit’ (ABVD); Gane *bobu* ‘fruit’ (ABVD); Taba *sapo* ‘fruit’ (ABVD)

RA: As *nupu-* ‘fruit’ (ABVD); Biga *puɔ* ‘fruit’ (ABVD); Gebe *kapio* ‘fruit’ (ABVD)

CB: Ambai *bo* ‘fruit’ (ABVD); Ambai *bon* ‘fruit’ (Slz); Ansus *aibong* ‘fruit’ (P&D); Biak *aibòn* ‘fruit’ (H); Moor *vó* ‘fruit’ (K); Serui-Laut *aibon* ‘fruit’ (Slm); Serui-Laut *bo* ‘fruit’ (Slm); Wandamen *buo* ‘fruit’ (ABVD); Waropen *-bo* ‘fruit’ (ABVD); Waropen *wo* ‘fruit’ (ABVD); Yerisiam *ú* ‘fruit’ (K)

Mamberamo: Warembori *bo* ‘fruit’ (Donohue 1999); Warembori *bua* ‘fruit’ (Donohue 1999); Yoke *βua* ‘fruit’ (Donohue 1999)

Other: Irarutu *fo* ‘fruit’ (ABVD); Irarutu *fu* ‘fruit’ (ABVD); Irarutu *fú* ‘fruit’ (M); Sekar *bua-n* ‘fruit’ (ABVD)

PMP ***buku₁*** ‘node (as in bamboo or sugarcane); joint; knuckle; knot in wood; knot in string or rope’ (ACD); PCEMP ***buku₂*** ‘node (as in bamboo or sugarcane); joint; knuckle; knot in wood; knot in string or rope; Mons veneris’ (ACD)

CB: Moor *vú’a* ‘knot’ (K); Umar *vu* ‘knot’ (K); Yaur *gávúujè* ‘knot’ (K); Yaur *vúujè* ‘node’ (K); Yerisiam *búgùa* ‘knot’ (K)

PAN ***bulaN*** ‘moon, month; menstruation’ (ACD); PMP ***bulan*** ‘moon’ (Blust 1999); PMP ***bulan₃*** ‘moon, month; menstruation; shell disk collar piece’ (ACD); PCEMP ***bulan*** ‘moon’ (Blust 1993)

SH: Taba *bulan* ‘moon’ (ABVD)

CB: Moor *vùrina* ‘moon’ (K); Yerisiam *úùrà* ‘moon’ (K)

Other: Arguni *purin* ‘moon’ (ABVD); Kowiai *furan* ‘moon’ (ACD)

PMP ***bulan₂*** ‘unnaturally white, albino’ (ACD); PEMP ***budan*** ‘white’ (Blust 1978)

SH: Buli *bubuláŋ* ‘white’ (ABVD); Gane *bulang* ‘white’ (ABVD); Taba *bulang* ‘white’ (ABVD)

PAN ***bulaw-an*** ‘gold’ (ACD)

CB: Biak *brawĕn* ‘gold’ (H); Roon *barawan* ‘gold’ (ACD); Serui-Laut *barawan* ‘gold’ (Slm)

PMP ***bulu*** ‘feather’ (Blust 1999); PMP ***bulu₁*** ‘body hair; fur; feather; down; floss on plant stems; color; type, kind’ (ACD); PCEMP ***bulu*** ‘feather’ (Blust 1993); PCEMP ***bulu₃*** ‘body hair; fur; feather; down; antenna of insect or crustacean; spikes of sea urchin; floss on plant skins, color; type, kind’ (ACD)

SH: Buli *[mani] plu* ‘feather’ (ABVD); Buli *plu* ‘body hair, feather’ (ACD); Sawai *plu* ‘feather’ (CAD)

RA: Matbat *napo^{21}l* ‘feather’ (R) [?]

CB: Ambai *na-wavuru* ‘body hair’ (Slz); Biak *bur* ‘feather; body hair’ (Soeparno 1977); Moor *vùru* ‘hair’ (K); Umar *uru* ‘body hair’ (K); Waropen *wuro* ‘feather’ (ABVD); Yerisiam *úurúgùa* ‘hair’ (K)

Mamberamo: Warembori *ke-vun-do* ‘Body hair’ (Donohue 1999); Yoke *bo* ‘body hair’ (Donohue 1999)

Other: Arguni *pupure* ‘feather’ (ABVD); Sekar *bunibunim* ‘feather’ (ABVD)

PAN ***buluq₂*** ‘type of slender bamboo; *Schizostachyum* spp.’ (ACD)

CB: Biak *bures* ‘bamboo (thick)’ (Soeparno 1977); Moor *burasìni* ‘bamboo sp.’ (K)

PMP ***buŋ*** ‘deep resounding sound’ (ACD)

SH: Buli *puŋ* ‘heart (perhaps an onomatopoetic word)’ (ACD); Sawai *puŋ* ‘heart’ (CAD)

PAN ***buŋa*** ‘flower, blossom’ (ACD); PMP ***buŋa*** ‘flower’ (Blust 1999); PMP ***buŋa$_a$*** ‘flower, blossom; to flower, bear flowers; yield a benefit (as interest on a loan); first-born child; cotton; vulva (refined or evasive), skin rash, prickly heat; speckled (of fish); kidneys’ (ACD); PCEMP ***buŋa*** ‘flower’ (Blust 1993)

SH: Gane *bungan* ‘flower’ (ABVD); Taba *bungan* ‘flower’ (ABVD)

RA: Biga *buŋa* ‘flower’ (ABVD)

CB: Ambai *ne-bu* ‘flower’ (Slz); Waropen *buŋga* ‘flower’ (ABVD)

Other: Kowiai *búnga* ‘flower’ (ABVD)

PAN ***buNuq*** ‘throw at, hit with a projectile’ (ACD); PMP ***bunuq*** ‘kill’ (Blust 1999); PMP ***bunuq$_2$*** ‘throw at, hit, strike with a sharp object; kill; extinguish (a fire)’ (ACD); PCEMP ***bunuq*** ‘kill’ (Blust 1993)

SH: Buli *fa-pun* ‘to kill (intr.)’ (ACD); Buli *fa-pun-pun* ‘kill each other; kill together, kill jointly’ (ACD); Buli *ma-fa-pun* ‘killer, murderer’ (ACD); Buli *pun* ‘strike, beat; kill’ (ACD); Buli *puni yap* ‘extinguish a fire (term used while at sea – not on land)’ (ACD); Buli *pun-pun* ‘hit repeatedly, ill-treat’ (ACD); Gane *pun* ‘to kill’ (ABVD); Sawai *n-pun* ‘to kill’ (CAD); Sawai *n-pun* ‘to strike’ (CAD); Taba *-pun* ‘to kill’ (ABVD)

RA: Ambel *buni* ‘kill’ (R); As *-bun* ‘to kill’ (ABVD); Biga *bun* ‘kill’ (R); Fiawat *bun* ‘kill’ (R); Gebe *-pun* ‘to kill’ (ABVD); Kawe *bun* ‘kill’ (R); Laganyan ˈ*bu³n* ‘kill’ (R); Matbat *bu³n* ‘kill’ (R); Maˈya (M.) ˈ*bu³n* ‘kill’ (R); Maˈya (S.) ˈ*bu³n* ‘kill’ (R); Wauyai *bun* ‘kill’ (R); Wauyai *falˈpun* ‘kill’ (R)

CB: Ambai *i-muni* ‘to kill’ (ABVD); Ambai *mun* ‘kill’ (Slz); Ansus *muŋg* ‘kill’ (P&D); Biak *mun* ‘to kill’ (H); Dusner *mun* ‘kill’ (D&M); Moor *munâ* ‘kill’ (K); Serui-Laut *mun* ‘to kill’ (Slm); Wandamen *mun* ‘kill’ (G); Waropen *muna* ‘to kill’ (ABVD); Waropen *muna* ‘to hit’ (ABVD)

Mamberamo: Warembori *muni-ro* ‘Kill’ (Donohue 1999); Yoke *mu* ‘kill’ (Donohue 1999)

Other: Irarutu *-bunə* ‘to kill’ (ABVD); Kowiai *-fun* ‘to hit’ (ABVD); Kowiai *-fun i namáta* ‘to kill’ (ABVD)

PMP ***buRbuR$_1$*** ‘rice porridge, rice gruel’ (ACD)

CB: Moor *vùvura* ‘sago porridge’ (K); Waropen *wiwiro* ‘sago porridge’ (Held 1942)

Mamberamo: Warembori *boro-ro* ‘Sago porridge’ (Donohue 1999); Warembori *bu-ro* ‘Sago porridge’ (Donohue 1999)

PMP ***buRuk*** ‘rotten meat; addled eggs; bad character’ (ACD); PCEMP ***buRuk*** ‘rotten’ (Blust 1993)

SH: Gane *puík* ‘rotten’ (ABVD)

CB: Moor *vavarù* ‘rotten’ (K); Waropen *bu* ‘rotten’ (ABVD)

PAN ***Caki*** ‘feces, excreta’ (ACD); PAN ***Caqi*** ‘feces, excrement’ (ACD); PMP ***taki*** ‘feces, excreta’ (ACD); PMP ***taqi*** ‘feces, excrement’ (ACD)

CB: Yerisiam *káà* ‘feces’ (K)

Other: Irarutu *tá* ‘feces’ (M)

PAN ***Canem*** ‘grave; to bury’ (ACD); PMP ***tanem*** ‘to plant’ (Blust 1999); PCEMP ***tanəm*** ‘to plant’ (Blust 1993)

SH: Gane *tonam* ‘to plant’ (ABVD); Sawai *tɔnɛm* ‘to plant’ (CAD)

RA: Gebe *fatanam* ‘to plant’ (ABVD)

CB: Ambai *i-tanamp* ‘to plant’ (ABVD); Ambai *tana(m)* ‘plant (v.)’ (Slz); Ansus *tanami* ‘plant’ (P&D); Moor *’anamî* ‘grow’ (K); Serui-Laut *tana* ‘plant’ (Slm); Umar *tnam* ‘plant’ (K); Wandamen *tanam* ‘to plant’ (ABVD); Waropen *anako* ‘to plant’ (ABVD); Yaur *’èmné* ‘plant’ (K); Yerisiam *káamáné* ‘plant’ (K)

Other: Arguni *-tanem* ‘to plant’ (ABVD); Irarutu *-məta-nə* ‘to plant’ (ABVD); Kowiai *tanom* ‘land, soil’ (ACD)

PAN ***CawiN*** ‘year’ (ACD); PMP ***taqun*** ‘year’ (Blust 1999); PCEMP ***taqun*** ‘year’ (Blust 1993)

SH: Buli *taun* ‘year’ (ABVD); Gane *taun* ‘year’ (ABVD); Taba *taun* ‘year’ (ABVD)

RA: As *tahun* ‘year’ (ABVD); Biga *tahun* ‘year’ (ABVD)

CB: Dusner *tahun* ‘year’ (D&M); Moor *táuna* ‘year’ (K); Wandamen *taune* ‘year’ (G)

Other: Irarutu *taun* ‘year’ (ABVD)

PAN ***CebuS*** ‘sugarcane: *Saccharum officinarum*’ (ACD); PAN ***tebuS*** ‘sugarcane: *Saccharum officinarum*’ (ACD); PMP ***tebuh$_1$*** ‘sugarcane: *Saccharum officinarum*’ (ACD); PMP ***tebuh$_2$*** ‘sugarcane: *Saccharum officinarum*’ (ACD)

SH: Buli *top* ‘sugarcane’ (Blust1978); Sawai *tep* ‘sugarcane’ (CAD)

CB: Ambai *tovu* ‘sugarcane’ (Slz); Ansus *towu* ‘sugarcane’ (P&D); Biak *kòb* ‘sugarcane’ (H); Moor *kóha* ‘sugarcane’ (K); Serui-Laut *tovu* ‘sugarcane’ (Slm); Umar *to* ‘sugarcane’ (K); Waropen *kowu* ‘sugarcane’ (Held 1942); Yaur *òojé* ‘sugarcane’ (K); Yerisiam *kóou* ‘sugarcane’ (K)

Other: Irarutu *túfə* ‘sugarcane’ (M)

PAN ***C‹in›aqi*** ‘small intestine’ (ACD); PMP ***tinaqi*** ‘guts’ (Blust 1999); PCEMP ***tinaqi*** ‘guts’ (Blust 1993)

SH: Buli *hñai walwalo* ‘intestines’ (ABVD); Buli *hñao* ‘belly’ (ABVD); Sawai *sno* ‘stomach’ (CAD)

RA: Ambel *nyay* ‘belly’ (R); Biga *nia-* ‘belly’ (ABVD); Biga *nya(o)* ‘belly’ (R); Fiawat *na* ‘belly’ (R); Gebe *hñainora* ‘intestines’ (ABVD); Gebe *hñao* ‘belly’ (ABVD); Kawe *aˈnyay(o)* ‘belly’ (R); Laganyan *aˈnyay(o)* ‘belly’ (R); Maˈya (M.) *ˈna(o)* ‘belly’ (R); Maˈya (S.) *ˈna(o)* ‘belly’ (R); Wauyai *kaˈnyay(o)* ‘belly’ (R)

CB: Ambai *ene-* ‘abdomen’ (Slz); Ansus *aneu* ‘stomach’ (P&D); Biak *snèwar-* ‘intestines’ (H); Moor *siné* ‘stomach’ (K); Serui-Laut *ane* ‘belly’ (Slm); Serui-Laut *anewai* ‘intestines’ (Slm); Umar *hna* ‘belly’ (K); Wandamen *sane* ‘belly’ (ABVD); Wandamen *sanèwai* ‘intestines’ (ABVD); Waropen *nina* ‘belly’ (ABVD); Yaur *hnáarè* ‘intestines’ (K); Yerisiam *hìná* ‘belly’ (K)

Other: Irarutu *-fta- teni* ‘intestines’ (ABVD) [?]

PAN ***CuNuh*** ‘roast food over a fire’ (ACD); PMP ***tunu*** ‘burn’ (Blust 1999); PMP ***tunu$_1$*** ‘roast food over a fire’ (ACD); PCEMP ***tunu*** ‘burn’ (Blust 1993)

CB: Ambai *i-nunu* ‘to cook’ (ABVD); Ambai *nunun* ‘burn (tr.)’ (Slz); Ansus *nununŋ* ‘burn, cook (tr)’ (P&D); Biak *kun* ‘burn, fry, roast; ignite a fire or lamp; fire a gun’ (H); Dusner *un* ‘roast’ (D&M); Moor *’unî* ‘burn’ (K); Serui-Laut *nunu* ‘to cook’ (ACD); Serui-Laut *tunu* ‘to burn’ (Slm); Umar *tnu* ‘cook’ (K); Wandamen *nunu* ‘grill ; cook’ (G); Wandamen *nunu[m]* ‘to cook’ (ABVD); Yaur *’úndáe* ‘cook’ (K); Yaur *’úndè* ‘burn’ (K); Yerisiam *kúuná* ‘burn’ (K)

Mamberamo: Warembori *akuni-ro* ‘Burn (intr)’ (Donohue 1999); Warembori *kuni* ‘Burn’ (Donohue 1999); Warembori *kuni* ‘Cook’ (Donohue 1999)
Other: Irarutu *-matune* ‘to cook’ (ABVD); Irarutu *túnə* ‘to cook’ (M); Kowiai *-tun* ‘to shoot’ (ABVD)

PAN ***CuSuR*** ‘string together, as beads’ (ACD); PMP ***tuhuR*** ‘string’ (ACD)

CB: Biak *kur* ‘to string (as beads)’ (H); Umar *kuru* ‘beads’ (K)

PMP ***dahun*** ‘leaf’ (Blust 1999); PCEMP ***daun*** ‘leaf’ (Blust 1993)

SH: Buli *ulú* ‘leaf’ (ABVD) [?]; Sawai *ay wlu* ‘leaf’ (CAD) [?]; Taba *llu* ‘leaf’ (ABVD) [?]

RA: As *alaun* ‘leaf’ (ABVD); Kawe *aˈlun* ‘leaf’ (R); Laganyan *aˈlun* ‘leaf’ (R); Matbat *da^{21}n* ‘leaf’ (R); Maˈya (M.) *kaˈlun(o)* ‘leaf’ (R); Maˈya (S.) *kaˈlun(o)* ‘leaf’ (R); Wauyai *kaˈlun* ‘leaf’ (R)

CB: Ambai *rerau* ‘leaf’ (ABVD); Ambai *reraun* ‘leaf’ (Slz); Moor *ràn*u ‘leaf’ (K); Serui-Laut *re-rau* ‘leaf’ (ACD); Wandamen *rau* ‘edible leaf ; vegetable ; greens’ (G); Waropen *rana* ‘leaf’ (ABVD); Yerisiam *ráànìa* ‘leaf’ (K)

Mamberamo: Warembori *andan-do* ‘Leaf’ (Donohue 1999); Yoke *tandu* ‘leaf’ (Donohue 1999)

Other: Irarutu *ró* ‘leaf’ (M); Kowiai *rówce* ‘leaf’ (ABVD)

PAN ***dalem$_1$*** ‘in, inside; deep’ (ACD); PMP ***dalem$_2$*** ‘ins, area within, inner part of something; between; below, under; deep; mind, feelings’ (ACD); PMP ***i-dalem*** ‘in, inside’ (Blust 1999)

SH: Buli *loló* ‘in, inside’ (ABVD)

RA: Gebe *i-lalɔ* ‘in, inside’ (ABVD)

CB: Ambai *rorompu* ‘in, inside’ (ABVD); Ambai *roron* ‘inside’ (Slz); Ansus *rarong* ‘inside’ (P&D); Serui-Laut *raron* ‘in, inside’ (Slm); Wandamen *raro* ‘inside’ (G)

Other: Sekar *ami-nanam* ‘in, inside’ (ABVD)

PAN ***danaw*** ‘lake’ (ACD); PMP ***danaw*** ‘lake’ (Blust 1999); PCEMP ***danaw*** ‘lake’ (Blust 1993)

SH: Buli *lanlan* ‘lake’ (ABVD)

CB: Moor *rán*a ‘lake’ (K)

Mamberamo: Warembori *don-do* ‘Lake’ (Donohue 1999); Yoke *dumb-* ‘lake’ (Donohue 1999)

PAN ***daNum*** ‘fresh water’ (ACD); PMP ***danum*** ‘water (fresh)’ (Blust 1999); PCEMP ***danum*** ‘water (fresh)’ (Blust 1993)

CB: Moor *ràruma* ‘water’ (K); Umar *iran* ‘water’ (K); Waropen *rauno* ‘water’ (ABVD); Yerisiam *ráarámà* ‘water’ (K)

Mamberamo: Warembori *dan-do* ‘Water’ (Donohue 1999)

PAN ***daRaq$_1$*** ‘blood; to bleed; menstruate’ (ACD); PMP ***daRaq*** ‘blood’ (Blust 1999); PCEMP ***daRaq*** ‘blood’ (Blust 1993)

SH: Buli *la* ‘coagulated blood; blood clot’ (ACD); Sawai *lɛlɔ* ‘blood’ (CAD); Taba *llo* ‘blood’ (ABVD)

RA: Gebe *la* ‘blood’ (ABVD)

CB: Moor *ràra* ‘blood’ (K); Umar *nuhra* ‘blood’ (K); Waropen *rara* ‘blood’ (ACD); Yerisiam *rárà* ‘blood’ (K)

Mamberamo: Warembori *ke-ra-ro* ‘Blood’ (Donohue 1999)

Other: Arguni *rare* ‘blood’ (ABVD); Kowiai *rara* ‘blood’ (ACD); Sekar *rara* ‘blood’ (ABVD)

PMP ***de(m)pul*** ‘dull, blunt’ (ACD); PMP ***dumpul*** ‘dull, blunt’ (ACD); PMP ***tumpel*** ‘dull, blunt’ (ACD); PMP ***tumpul*** ‘dull, blunt’ (ACD)

CB: Umar *tvu* ‘blunt’ (K) [?]

Other: Arguni *tumbie* ‘dull, blunt’ (ABVD)

PAN ***deŋeR*** ‘to hear; sound’ (ACD); PMP ***deŋeR*** ‘hear’ (Blust 1999); PMP ***deŋeR$_a$*** ‘to hear, listen; obey; hear about; news; fame, famous; to feel, perceive through any sense other than sight’ (ACD); PCEMP ***dəŋəR*** ‘hear’ (Blust 1993)

SH: Buli *loŋa* ‘to hear’ (ABVD); Gane *longa* ‘to hear’ (ABVD); Sawai *n-loŋɛ* ‘hear’ (CAD); Taba *-malongo* ‘to hear’ (ABVD)

RA: As *-fɔlɔŋɔ* ‘to hear’ (ABVD); Biga *doˈno* ‘hear’ (R); Gebe *lɔŋɔ* ‘to hear’ (ABVD); Kawe ˈ*don[o]* ‘hear’ (R); Laganyan ˈ*don[o]* ‘hear’ (R); Matbat *no^{41}ŋ* ‘hear’ (R); Maˈya (M.) ˈ*do^{12}n* ‘hear’ (R); Maˈya (S.) ˈ*do^{12}n* ‘hear’ (R); Wauyai ˈ*don[o]* ‘hear’ (R)

CB: Moor *oranî* ‘hear’ (K) [?]; Yerisiam *nó* ‘hear’ (K) [?]

Other: Kowiai *banonggar* ‘to hear’ (ABVD) [?]; Kowiai *-fanonggar* ‘to hear’ (ABVD) [?]

PMP ***depa*** ‘fathom’ (ACD)

SH: Buli *lof* ‘fathom’ (ACD); Buli *lof-sa* ‘one fathom’ (ACD); Sawai *lof* ‘fathom’ (CAD)

CB: Biak *ròf* ‘fathom’ (H); Serui-Laut *rowa* ‘fathom’ (Slm) [?]

Other: Kowiai *ref* ‘armspan, fathom’ (ACD)

PMP ***di*** ‘at’ (Blust 1999); PCEMP ***di*** ‘at’ (Blust 1993)

SH: Buli *mali* ‘at’ (ABVD); Gane *li* ‘in, inside’ (ABVD); Gane *li* ‘at’ (ABVD); Gane *liló* ‘in, inside’ (ABVD); Taba *li* ‘at’ (ABVD); Taba *li* ‘in, inside’ (ABVD)

PAN ***diRi*** ‘to stand’ (ACD); PMP ***diRi*** ‘stand’ (Blust 1999); PCEMP ***diRi*** ‘stand’ (Blust 1993)

Other: Irarutu *mərire* ‘to stand’ (ABVD); Kowiai *-marír* ‘to stand’ (ABVD); Sekar *mriri* ‘to stand’ (ABVD)

PMP ***duRi$_2$*** ‘thorn, splinter, fish bone’ (ACD); PCEMP ***ʒuRi*** ‘bone’ (Blust 1993)

Other: Irarutu *rúrə* ‘bone’ (M); Kowiai *rur* ‘bone’ (ABVD); Sekar *rurir* ‘bone’ (ABVD)

PAN ***duSa*** ‘two’ (ACD); PMP ***duha*** ‘two’ (Blust 1999); PCEMP ***dua*** ‘two’ (Blust 1993)

SH: Buli *[si] lu* ‘Two’ (ABVD); Gane *plu* ‘Two’ (ABVD); Sawai *pɛ-lu* ‘two’ (CAD); Taba *-lu* ‘two’; Taba *p-lu* ‘Two’ (ABVD)

RA: Ambel *low* ‘two’ (R); As *lu* ‘Two’ (ABVD); Biga *lo* ‘Two’ (ABVD); Biga *lu* ‘two’ (R); Fiawat *lu* ‘two’ (R); Gebe *pi-lu* ‘Two’ (ABVD); Kawe *lu* ‘two’ (R); Laganyan ˈ*lu^3* ‘two’ (R); Matbat *lu^3* ‘two’ (R); Maˈya (M.) ˈ*lu^3* ‘two’ (R); Maˈya (S.) ˈ*lu^3* ‘two’ (R); Wauyai *lu* ‘two’ (R)

CB: Ambai *bo-ru* ‘two’ (Slz); Biak *duï* ‘two’ (H); Dusner *nuru* ‘two’ (D&M); Moor *rúró* ‘two’ (K); Serui-Laut *boru* ‘two’ (Slm); Umar *edih* ‘two’ (K); Wandamen *muandu* ‘Two’ (ABVD); Waropen *woru* ‘Two’ (ABVD); Yaur *rédúhè* ‘two’ (K); Yerisiam *rúuhí* ‘two’ (K)

Other: Arguni *ru* ‘Two’ (ABVD); Irarutu *rifo* ‘Two’ (ABVD); Irarutu *rú* ‘two’ (M); Kowiai *[ru]wet* ‘Two’ (ABVD); Sekar *nua* ‘Two’ (ABVD)

PMP ***duyuŋ*** ‘dugong’ (Blust 1999); PMP ***duyuŋ$_2$*** ‘dugong’ (ACD)

CB: Biak *rowin* ‘sea cow, dugong’ (H); Moor *rúna* ‘dugong’ (K); Waropen *rui* ‘sea cow, dugong’ (ACD); Yaur *rì’ré* ‘dugong’ (K)

PAN ***enem*** ‘six’ (ACD); PEMP ***onəm*** ‘six’ (ACD)

SH: Buli *wonam* ‘six’ (ACD); Sawai *pɛ-wonɛm* ‘six’ (CAD); Taba *-wonam* ‘six’

RA: Ambel *wanom* ‘six’ (R); Biga *woˈnom* ‘six’ (R); Fiawat *wonom* ‘six’ (R); Kawe *woˈnom* ‘six’ (R); Laganyan *woˈnom* ‘six’ (R); Matbat *no^{12}m* ‘six’ (R); Maˈya (M.) *ˈwono^{12}m* ‘six’ (R); Maˈya (S.) *ˈwono^{3}m* ‘six’ (R); Wauyai *woˈnom* ‘six’ (R)

CB: Ambai *wonan* ‘six’ (Slz); Ambai *wona(ŋ)* ‘Six’ (ABVD); Ansus *wonang* ‘six’ (P&D); Biak *wònĕm* ‘six’ (H); Waropen *ghono* ‘six’ (ACD)

PAN ***gaCel*** ‘itch, feel itchy’ (ACD); PMP ***ma-gatel*** ‘itch’ (ACD)

CB: Ambai *maitata* ‘itch’ (Slz); Ansus *matata* ‘itch’ (P&D); Biak *makèr* ‘to itch’ (H); Moor *matatiarì* ‘itch’ (K); Yerisiam *mákmáakáré* ‘itch’ (K)

PMP ***gekgek*** ‘animal sound’ (ACD)

SH: Buli *gokgok* ‘crow’ (ACD); Sawai *gok?gok* ‘crow’ (CAD)

PMP ***hapen*** ‘fishing line’ (ACD); PEMP ***apen*** ‘fishing line’ (ACD)

SH: Buli *yafan* ‘line used in harpooning sea turtles’ (ACD)

CB: Biak *yàfĕn* ‘harpoon for spearing fish and turtles’ (H)

PMP ***haRezan*** ‘notched log ladder’ (ACD); PEMP ***aRezan*** ‘notched log ladder’ (ACD)

SH: Buli *olan* ‘ladder’ (ACD); Sawai *lon* ‘ladder’ (CAD)

RA: Maˈya (M.) *ˈlo^{12}n* ‘ladder’ (R); Maˈya (S.) *ˈlo^{12}n* ‘ladder’ (R)

CB: Yaur *rògré* ‘ladder’ (K)

Other: Kowiai *roran* ‘ladder, stairs’ (ACD)

PMP ***hasaŋ*** ‘gills’ (ACD)

SH: Sawai *yɔsɛn* ‘gill’ (CAD)

CB: Ambai *ne-wasa* ‘gills’ (Slz); Ansus *newa* ‘gill’ (P&D); Biak *àsĕn* ‘gills’ (H); Serui-Laut *waa* ‘gills’ (Slm)

PMP ***hiup*** ‘to blow’ (Blust 1999); PMP ***tiup*** ‘blow’ (ACD); PCEMP ***hiup*** ‘to blow’ (Blust 1993); PCEMP ***upi*** ‘to blow’ (ACD)

SH: Buli *uf* ‘to blow (person or wind)’ (ACD); Buli *uf[o]* ‘to blow’ (ABVD); Gane *ufu* ‘to blow’ (ABVD); Taba *-uho* ‘to blow’ (ABVD)

RA: Biga *-auf* ‘to blow’ (ABVD)

CB: Biak *uf* ‘to blow’ (H); Biak *wuf* ‘to blow’ (H); Waropen *ufa* ‘to blow’ (ABVD)

Other: Irarutu *nufə* ‘to blow’ (ABVD)

PMP ***h-um-ipi*** ‘dream’ (Blust 1999); PCEMP ***mipi*** ‘dream’ (Blust 1993)

CB: Ambai *-miai* ‘to dream’ (ABVD); Moor *enamí’a* ‘dream’ (K); Serui-Laut *enami* ‘dream’ (Slm); Wandamen *ena-mia* ‘dream’ (ACD); Wandamen *ena miya* ‘dream’ (G); Wandamen *miya* ‘dream’ (G); Yerisiam *mí* ‘dream’ (K)

Other: Sekar *nifi* ‘to dream’ (ABVD)

PAN ***huRaC*** ‘artery, blood vessel, blood vein; muscle; nerve; sinew; tendon’ (ACD); PMP ***uRat*** ‘root’ (Blust 1999)

CB: Biak *urĕk* ‘vein, vessel’ (H)

Other: Kowiai *urat* ‘vein; tendon’ (ACD)

PAN ***ia$_1$*** ‘3sg. personal pronoun: he, she; him, her, it’ (ACD); PAN ***si ia$_1$*** ‘3sg. personal pronoun: he, she, it’ (ACD); PCEMP ***s-ia*** ‘he/she’ (Blust 1993)

SH: Buli *i* ‘3sg.’ (ACD); Gane *i* ‘he/she’ (ABVD); Sawai *i* ‘he/she’ (CAD); Taba *i* ‘he/she’ (ABVD)

RA: As *ia* ‘he/she’ (ABVD); Gebe *ia* ‘he/she’ (ABVD)

CB: Ambai *i* ‘he’ (Slz); Ansus *i* ‘she, her’ (P&D); Ansus *i* ‘he, him’ (P&D); Biak *i* ‘he/she’ (H); Dusner *i* ‘PRO.3SG’ (D&M); Dusner *i-* ‘3SG’ (D&M); Moor *î* ‘3sg’ (K); Serui-Laut *i* ‘he/she’ (Slm); Wandamen *i* ‘he/she’ (ABVD); Waropen *i* ‘he/she’ (ABVD)

Mamberamo: Warembori *yi* ‘He/she’ (Donohue 1999)

Other: Arguni *i* ‘he/she’ (ABVD); Irarutu *í* ‘he/she’ (M); Irarutu *ia* ‘he/she’ (ABVD); Kowiai *i* ‘3sg.’ (ACD); Sekar *ia* ‘he/she’ (ABVD)

PMP ***ia$_2$*** ‘demonstrative pronoun and adverb: this, here; that, there’ (ACD)

SH: Taba *dia* ‘that’ (ABVD)

RA: Kawe *ga* ‘that’ (R); Laganyan *gi(a)* ‘that’ (R); Ma^{l}ya (M.) ^{l}*gia* ‘that’ (R); Ma^{l}ya (S.) ^{l}*gia* ‘that’ (R); Wauyai *gi(a)* ‘that’ (R)

PSHWNG ***iap*** ‘kind of brown fish’ (ACD)

SH: Buli *iaf* ‘brown fish’ (ACD)

CB: Waropen *ia* ‘brown fish’ (ACD)

PMP ***ihap*** ‘count’ (Blust 1999); PCEMP ***ihap*** ‘count’ (Blust 1993)

SH: Taba *-yohan* ‘to count’ (ABVD)

Other: Onin *iaf* ‘count’ (ACD); Sekar *yaf* ‘to count’ (ABVD)

PAN ***ijan*** ‘when?’ (ACD); PMP ***p-ijan*** ‘when?’ (Blust 1999); PCEMP ***p-ijan*** ‘when?’ (Blust 1993)

SH: Buli *ma-fis* ‘when?’ (ABVD); Gane *hafisak* ‘when?’ (ABVD)

PAN ***i-kaSu*** ‘2sg nom., you/thou’ (ACD); PMP ***i-kahu*** ‘you’ (Blust 1999); PCEMP ***i-kau*** ‘you’ (Blust 1993)

SH: Buli *au* ‘thou’ (ABVD); Gane *au* ‘thou’ (ABVD); Sawai *aw* ‘you (sg.)’ (CAD); Taba *au* ‘thou’ (ABVD)

RA: Ambel *awa* ‘you (sg.)’ (R); As *awa* ‘thou’ (ABVD); Biga ^{l}*awa* ‘you (sg.)’ (R); Fiawat *aw* ‘you (sg.)’ (R); Gebe *auya* ‘thou’ (ABVD); Kawe ^{l}*wawa* ‘you (sg.)’ (R); Laganyan ^{l}*awa* ‘you (sg.)’ (R); Matbat *ya^{21}w* ‘you (sg.)’ (R); Matbat *ya^{21}wa* ‘you (sg.)’ (R); Ma^{l}ya (M.) ^{l}*awa* ‘you (sg.)’ (R); Ma^{l}ya (S.) ^{l}*awa* ‘you (sg.)’ (R); Wauyai ^{l}*awa* ‘you (sg.)’ (R)

CB: Ambai *wau* ‘you’ (ABVD); Ambai *wau* ‘thou’ (ABVD); Ansus *au* ‘you’ (P&D); Biak *au* ‘thou’ (H); Dusner *au* ‘PRO.2SG’ (D&M); Moor *-a* ‘2sg’ (K); Moor *á-* ‘2sg’ (K); Moor *ágwa* ‘2sg’ (K); Serui-Laut *wau* ‘you (sg.)’ (Slm); Umar *a-* ‘2sg’ (K); Umar *ate* ‘2sg’ (K); Wandamen *au* ‘you ; 2sg pronoun’ (G); Waropen *auo* ‘thou’ (ABVD); Yaur *a-* ‘2sg’ (K); Yaur *á’è* ‘2sg’ (K); Yerisiam *a-* ‘2sg’ (K); Yerisiam *àné* ‘2sg’ (K); Yerisiam *g-* ‘2sg’ (K)

Mamberamo: Warembori *awi* ‘You’ (Donohue 1999)

Other: Irarutu *ó* ‘you (s.g.)’ (M); Kowiai *au* ‘thou’ (ABVD); Kowiai *o* ‘you’ (ABVD); Sekar *o* ‘thou’ (ABVD)

PMP ***i-na*** ‘that’ (Blust 1999); PCEMP ***ina*** ‘that’ (Blust 1993)

RA: Matbat *into* ‘that’ (R); Matbat *inyo* ‘that’ (R)

CB: Ambai *manana* ‘that’ (ABVD); Moor *nána* ‘yonder’ (K); Wandamen *nina* ‘that’ (ABVD); Wandamen *yana* ‘that’ (ABVD)

Other: Sekar *ine* ‘that’ (ABVD)

PAN ***ina$_1$*** ‘mother, mother’s sister’ (ACD); PMP ***ina$_2$*** ‘mother, mother’s sister; female animal’ (ACD); PMP ***iná-i*** ‘mother, mother’s sister (address, vocative)’ (ACD); PCEMP ***ina$_3$*** ‘mother, mother’s sister; female animal; largest member of a set’ (ACD)

RA: Matbat *ne^{3}n* ‘mother’ (R)

CB: Ambai *ina-* ‘mother’ (Slz); Ansus *inani* ‘mother’ (P&D); Biak *ina* ‘M (obsolescent term)’ (H); Dusner *mini* ‘mother’ (D&M) [?]; Moor *iná* ‘mother’ (K); Serui-Laut *ina-* ‘M’ (ACD); Serui-Laut *inani* ‘mother’ (Slm); Waropen *inai* ‘mother’ (ABVD); Waropen *mini* ‘mother’ (ABVD)

Mamberamo: Warembori *nai* ‘M’ (Donohue 1999)

Other: Irarutu *dena* ‘mother’ (ABVD); Kowiai *néna* ‘mother’ (ABVD); Kowiai *nína* ‘mother’ (ABVD); Sekar *nini-n* ‘mother’ (ABVD) [?]

PAN ***i-ni*** ‘this, here’ (ACD); PMP ***i-ni*** ‘this’ (Blust 1999); PCEMP ***ani*** ‘this’ (Blust 1993); PCEMP ***ini*** ‘this’ (Blust 1993)

SH: Gane *tajini* ‘this’ (ABVD); Taba *ne* ‘this’ (ABVD)

RA: As *inɛrɛ* ‘this’ (ABVD); Biga *titanɛ* ‘that’ (ABVD); Biga *tinɛ* ‘this’ (ABVD); Gebe *tɛnɛ* ‘this’ (ABVD); Kawe ˈ*gine* ‘this’ (R); Laganyan ˈ*gine* ‘this’ (R); Matbat *ino* ‘this’ (R) [?]; Maˈya (M.) ˈ*gine* ‘this’ (R); Maˈya (S.) ˈ*gine* ‘this’ (R); Wauyai ˈ*gine* ‘this’ (R)

CB: Ambai *nini* ‘this’ (ABVD); Ansus *nini* ‘this’ (P&D); Biak *inè* ‘this’ (H); Dusner *ne* ‘DEM.PROX’ (D&M); Moor *néna* ‘this’ (K); Serui-Laut *nina* ‘this’ (Slm); Serui-Laut *nini* ‘this’ (Slm); Umar *vne* ‘this’ (K); Wandamen *nini* ‘this’ (G); Wandamen *yani* ‘this’ (ABVD)

Mamberamo: Warembori *na-ni* ‘This’ (Donohue 1999); Yoke *-ani* ‘this’ (Donohue 1999)

Other: Irarutu *notini* ‘this’ (ABVD); Irarutu *ntíni* ‘this’ (M); Kowiai *ina* ‘this’ (ACD)

PMP ***inum*** ‘drink’ (Blust 1999); PMP ***um-inum*** ‘to drink’ (ACD); PCEMP ***inum*** ‘drink’ (Blust 1993); PCEMP ***unum*** ‘drink’ (ACD)

SH: Gane *imin* ‘to drink’ (ABVD); Sawai *-inɛm* ‘to drink’ (CAD); Taba *-imin* ‘to drink’ (ABVD)

RA: Ambel *l-anum* ‘drink’ (R); As *-nim* ‘to drink’ (ABVD); Biga *-inim* ‘to drink’ (ABVD); Biga *l-iˈnim* ‘drink’ (R); Fiawat *l-enim* ‘drink’ (R); Laganyan ˈ*w-inim* ‘drink’ (R); Matbat *n-ani^{21}m* ‘drink’ (R); Maˈya (M.) ˈ*w-ini^{3}m* ‘drink’ (R); Maˈya (S.) ˈ*w-ini^{3}m* ‘drink’ (R)

CB: Ambai *i-unu* ‘to drink’ (ABVD); Ambai *unumi* ‘drink’ (Slz); Ambai *unun* ‘drink’ (Slz); Ansus *unung* ‘drink’ (P&D); Biak *inĕm* ‘to drink’ (H); Dusner *inem* ‘drink’ (D&M); Moor *anumî* ‘drink’ (K); Serui-Laut *unu* ‘to drink’ (Slm); Serui-Laut *unuŋ* ‘to drink’ (ACD); Umar *umen* ‘drink’ (K); Wandamen *unu* ‘drink’ (G); Wandamen *unum* ‘to drink’ (ACD); Waropen *una* ‘to drink’ (ABVD) [?]; Yerisiam *íímáné* ‘drink’ (K) [?]

Mamberamo: Warembori *mini-ro* ‘Drink’ (Donohue 1999); Yoke *min* ‘drink’ (Donohue 1999)

Other: Arguni *-umun* ‘to drink’ (ABVD); Irarutu *-gin[e]* ‘to drink’ (ABVD) [?]; Kowiai *-in* ‘to drink’ (ABVD); Sekar *nim* ‘to drink’ (ABVD)

PMP ***i-sai*** ‘who?’ (Blust 1999); PCEMP ***sai*** ‘who?’ (Blust 1993); PCEMP ***sei*** ‘who?’ (Blust 1993)

SH: Buli *ise* ‘who?’ (ABVD)

RA: Gebe *siei* ‘who?’ (ABVD); Gebe *site* ‘what?’ (ABVD)

CB: Biak *iseï* ‘who?’ (H); Biak *ròseï* ‘what?’ (H); Dusner *rosai* ‘what’ (D&M); Moor *rosé* ‘what?’ (K)

Mamberamo: Warembori *iti* ‘Who?’ (Donohue 1999)

Other: Kowiai *se* ‘who?’ (ABVD); Sekar *ose* ‘who?’ (ABVD)

PEMP ***ka(d,R)a*** ‘cockatoo, parrot’ (Blust 1978)

CB: Ansus *kara* ‘Sulphur-crested Cockatoo’ (P&D); Serui-Laut *karai* ‘cockatoo’ (Slm)

PAN ***kaen*** ‘eat’ (ACD); PMP ***kaen*** ‘eat’ (Blust 1999); PCEMP ***kan*** ‘eat’ (Blust 1993)

SH: Buli *ān* ‘to eat’ (ABVD)

RA: Ambel *l-anan* ‘eat (intr.)’ (R); Gebe *-anan* ‘to eat’ (ABVD)

CB: Ambai *an* ‘eat (tr.)’ (Slz); Ambai *i-ampi* ‘to eat’ (ABVD); Ansus *ang* ‘eat_(transitive)’ (P&D); Biak *ān* ‘to eat’ (H); Dusner *an* ‘eat’ (D&M); Moor *anî* ‘eat’ (K); Serui-Laut *an* ‘to eat’ (Slm); Umar *anna* ‘eat’ (K); Wandamen *ane* ‘to eat’ (ABVD); Waropen *ano* ‘to eat’ (ABVD); Yaur *jènáe* ‘eat’ (K); Yerisiam *áaní* ‘eat’ (K); Yerisiam *àná* ‘eat’ (K)

Mamberamo: Warembori *an* ‘Eat’ (Donohue 1999); Warembori *ane* ‘Eat’ (Donohue 1999); Yoke *aaŋ* ‘eat’ (Donohue 1999)

PMP ***kalati*** ‘earthworm’ (Blust 1999); PCEMP ***kalati*** ‘earthworm’ (Blust 1993)

SH: Buli *gugulat* ‘worm (earthworm)’ (ABVD); Gane *galét* ‘worm (earthworm)’ (ABVD); Sawai *gɛlat* ‘worm’ (CAD)

RA: Gebe *galawai* ‘worm (earthworm)’ (ABVD) [?]; Kawe *gala*ˈ*tol[o]* ‘worm’ (R); Laganyan *ga*ˈ*lah* ˈ*tol[o]* ‘worm’ (R); Maˈya (M.) *a*ˈ*gla*^{12}*t* ‘worm’ (R); Maˈya (S.) *gara*ˈ*to*^{12}*l* ‘worm (parasite in human)’ (R) [?]; Wauyai *ga*ˈ*lat* ˈ*lol[o]* ‘worm’ (R)

PAN ***kalih*** ‘a hole in the ground; to dig up, excavate, as tubers’ (ACD); PMP ***kali*** ‘dig’ (Blust 1999); PMP ***kali$_2$*** ‘a hole in the ground; to dig up, excavate, as tubers’ (ACD); PCEMP ***kali*** ‘dig’ (Blust 1993); PCEMP ***keli*** ‘dig’ (Blust 1993)

RA: Biga *-kelɛ* ‘to dig’ (ABVD)

Mamberamo: Warembori *ka-yo* ‘Dig’ (Donohue 1999)

Other: Irarutu *məgarə* ‘to dig’ (ABVD); Kowiai *-’ári’* ‘to dig’ (ABVD); Sekar *kani* ‘to dig’ (ABVD)

PMP ***kami*** 'we (incl./excl.)' (Blust 1999); PCEMP ***kami*** 'we (incl./excl.)' (Blust 1993)

SH: Buli *ame* 'we' (ABVD); Gane *am* 'we' (ABVD); Gane *ame* 'we' (ABVD); Sawai *am* 'we (excl.)' (CAD); Taba *am* 'we' (ABVD)

RA: Ambel *amne* 'we (excl.)' (R); As *amne* 'we' (ABVD); Biga *ambana* 'we' (ABVD); Biga *amon* 'we' (ABVD); Gebe *amne* 'we' (ABVD)

CB: Ambai *amea* 'we' (ABVD); Ansus *ama* 'we, not you' (P&D); Moor *áma* '1pl.ex' (K); Serui-Laut *ama* 'we (excl.)' (Slm); Umar *em-* '1pl.ex' (K); Umar *emi* '1pl.ex' (K); Umar *-vte* '1pl.in' (K); Wandamen *ama(te)* 'we ; 1pl excl pronoun' (G); Wandamen *amat* 'we' (ABVD); Waropen *ami* 'we' (ABVD); Waropen *amo* 'we' (ABVD); Yaur *om-* '1pl.ex.R' (K); Yaur *ómí'è* '1pl.ex' (K); Yerisiam *néemé* '1pl.ex' (K); Yerisiam *nem-* '1pl.ex' (K)

Mamberamo: Warembori *ami* 'We (EXCL)' (Donohue 1999)

Other: Arguni *ambami* 'we' (ABVD); Irarutu *am* 'we' (ABVD); Kowiai *am* 'we' (ABVD); Sekar *yami* 'we' (ABVD)

PMP ***kamiu*** 'you (pl.)' (Blust 1999); PMP ***kamu*** '2P NOM1' (Ross 2006); PCEMP ***kamiu*** 'you (pl.)' (Blust 1993)

SH: Buli *meu* 'you' (ABVD); Gane *meu* 'you' (ABVD); Sawai *mew* 'you (pl.)' (CAD); Taba *meu* 'you' (ABVD)

RA: As *mɔu* 'you' (ABVD); Gebe *mevia* 'you' (ABVD)

CB: Ambai *mea* 'ye' (Slz); Ansus *mia* 'you lot' (P&D); Moor *amù* '2pl' (K); Moor *mu'ó* '2pl' (K); Serui-Laut *ma* 'you (pl.)' (Slm); Umar *am-* '2pl' (K); Umar *amu* '2pl' (K); Wandamen *mia(te)* 'y'all ; 2pl pronoun' (G); Wandamen *miat* 'you' (ABVD); Waropen *mu* 'you' (ABVD); Yaur *am-* '2pl' (K); Yaur *ámú'è* '2pl' (K); Yerisiam *am-* '2pl' (K); Yerisiam *ánéemé* '2pl' (K)

Mamberamo: Warembori *mi* 'You (PL)' (Donohue 1999)

Other: Arguni *mbuamu* 'you' (ABVD)

PCEMP ***kandoRa*** 'cuscus, phalanger' (ACD)

SH: Buli *do* 'kind of small marsupial' (ACD)

CB: Yerisiam *átóòrà* 'cuscus' (K)

PEMP ***kanus*** 'spittle; to spit (intr.)' (ACD)

CB: Serui-Laut *kunui* 'saliva' (ACD); Wandamen *kanisu* 'saliva' (ACD)

PCEMP ***kanzupay*** 'rat' (Blust 1993); PCEMP ***kazupay*** 'rat' (ACD)

SH: Buli *luf* 'rat' (ACD); Gane *luf* 'rat' (ABVD); Sawai *luf* 'mouse, rat' (CAD)

RA: Biga *kalof* 'rat' (ABVD); Maˈya *keluf* 'rat' (ACD)

CB: Ambai *karu* 'rat' (Slz); Moor *arùha* 'rat' (K); Serui-Laut *karu* 'rat' (Slm)

PAN ***kaRaw*** 'to scratch an itch' (ACD); PMP ***kaRaw*** 'scratch (an itch)' (Blust 1999); PCEMP ***kaRaw*** 'scratch (an itch)' (Blust 1993)

RA: As *-ka?* 'to scratch' (ABVD); Biga *-kai* 'to scratch' (ABVD)

CB: Biak *rār* 'to scratch' (H); Umar *krar* 'scratch' (K); Wandamen *arar* 'to scratch' (ABVD); Wandamen *kara* 'to scratch' (ABVD); Yerisiam *áráarí* 'scratch' (K)

Other: Kowiai *-áru'* 'to scratch' (ABVD)

PMP ***kasaw**$_1$* 'rafter, diagonal bamboo poles to which thatch panels are lashed' (ACD)

SH: Buli *as* 'rafter, to which the roof thatch is bound' (ACD)

Other: Kowiai *asa* 'rafter' (ACD)

PAN ***kaSiw*** 'wood; tree' (ACD); PMP ***kahiw*** 'wood' (Blust 1999); PCEMP ***kayu*** 'wood' (Blust 1993); PCEMP ***kayu**$_1$* 'wood; tree' (ACD)

SH: Buli *ai* 'tree; wood' (ACD); Sawai *ay* 'tree/wood' (CAD); Taba *ai* 'stick/wood' (ABVD)

RA: Ambel *ay* 'tree' (R); As *a* 'stick/wood' (ABVD); Biga *ai* 'stick/wood' (ABVD); Biga *ay(o)* 'tree' (R); Gebe *kai* 'stick/wood' (ABVD); Kawe *way(o)* 'tree' (R); Laganyan *way(o)* 'tree' (R); Ma^{l}ya (M.) ^{l}*ai(o)* 'tree' (R); Ma^{l}ya (S.) ^{l}*ai(o)* 'tree' (R); Wauyai *(ga) way(o)* 'tree' (R)

CB: Ambai *ai* 'tree' (Slz); Ansus *ai* 'tree' (P&D); Biak *a(i)* 'wood; tree' (H); Dusner *ai* 'wood' (D&M); Moor *ka'úata* 'wood' (K); Serui-Laut *ai* 'wood' (Slm); Umar *ae* 'wood' (K); Wandamen *ai* 'wood; tree' (G); Waropen *a* 'wood; tree (in combination forms)' (ACD); Waropen *ai* 'stick/wood' (ABVD); Yaur *àjé* 'wood' (K); Yerisiam *áì* 'wood' (K)

Mamberamo: Warembori *ayo-ro* 'Tree' (Donohue 1999); Yoke *a* 'tree' (Donohue 1999)

Other: Arguni *a* 'stick/wood' (ABVD); Irarutu *é* 'tree, wood' (M); Kowiai *ai* 'tree' (ACD); Sekar *kai* 'stick/wood' (ABVD)

PMP ***kasuaRi*** 'cassowary'

CB: Ambai *man-soari* 'cassowary' (Slz); Biak *mansuwar* 'cassowary' (H); Moor *atúara* 'cassowary' (K); Waropen *saro* 'cassowary' (Held 1942)

Mamberamo: Warembori *suan-do* 'Cassowary' (Donohue 1999); Yoke *sua(b)* 'cassowary' (Donohue 1999)

PAN ***kawil**$_1$* 'fishhook' (ACD)

SH: Buli *awil* 'fish-hook' (Blust1978)

CB: Biak *awir* 'fish-hook' (H)

PMP ***kepit*** 'narrow' (Blust 1999)

SH: Gane *nakota* 'narrow' (ABVD) [?]

CB: Ambai *katui* 'narrow' (ABVD); Ambai *kota* 'narrow' (Slz); Wandamen *kotar* 'narrow' (ABVD)

PAN ***kita**$_1$* 'we (incl.)' (ACD); PMP ***kita*** '1IP NOM1' (Ross 2006); PCEMP ***k-ita*** 'we (incl./excl.)' (Blust 1993)

SH: Buli *ite* 'we (plural incl.)' (ACD); Gane *kit* 'we' (ABVD); Sawai *it* 'we (incl.)' (CAD); Taba *tit* 'we' (ABVD)

RA: Ambel *isne* 'we (incl.)' (R); Biga *itba*^{l}*na* 'we (incl.)' (R); Gebe *itne* 'we' (ABVD); Kawe *ta*^{l}*fat(a)* 'we (incl.)' (R); Kawe ^{l}*tit(n)e* 'we (incl.)' (R); Laganyan ^{l}*itne* 'we (incl.)' (R); Wauyai ^{l}*titne* 'we (incl.)' (R)

CB: Ambai *tata* 'we (incl.)' (Slz); Ansus *tata* 'we, all of us' (P&D); Biak *ko* 'we (excl.)' (H); Biak *nggo* 'we (excl.)' (H); Moor *-í'a* '1pl.in' (K); Moor *í'a* '1pl.in' (K); Serui-Laut *tata* 'we (incl.)' (Slm); Umar *ete* '1pl.in' (K); Umar *t-* '1pl.in' (K); Wandamen *tata* 'we ; 1pl incl pronoun' (G); Wandamen *tata* 'we' (ABVD); Waropen *iko* 'we' (ABVD); Yaur *o'-* '1pl.in.R' (K); Yaur *ó'í'è* '1pl.in' (K); Yerisiam *néeké* '1pl.in' (K); Yerisiam *nek-* '1pl.in' (K)

Mamberamo: Warembori *ki* 'We (INCL)' (Donohue 1999)

Other: Arguni *ite* ‘we’ (ABVD); Irarutu *it* ‘we’ (ABVD); Kowiai *íta* ‘we’ (ABVD); Sekar *ita* ‘we’ (ABVD)

PAN ***kuCu*** ‘head louse’ (ACD); PMP ***kutu*** ‘head louse’ (Blust 1999); PCEMP ***kutu*** ‘head louse’ (Blust 1993)

SH: Buli *fune ni ut* ‘dog louse, flea’ (ACD); Buli *ut* ‘head louse’ (ACD); Gane *kut* ‘louse’ (ABVD); Sawai *kit* ‘louse’ (CAD); Taba *kut* ‘louse’ (ABVD)

RA: Ambel *ut* ‘louse’ (R); As *u* ‘louse’ (ABVD); Biga *wut* ‘louse’ (R); Fiawat *wut* ‘louse’ (R); Gebe *ut* ‘louse’ (ABVD); Kawe *wut* ‘louse’ (R); Laganyan *wut* ‘louse’ (R); Matbat *wu³t* ‘louse’ (R); Maˈya (M.) *ˈu³t* ‘louse’ (R); Maˈya (S.) *ˈu³t* ‘louse’ (R); Wauyai *wut* ‘louse’ (R)

CB: Ambai *uutu* ‘louse’ (ABVD); Ansus *utu* ‘louse’ (P&D); Biak *uk* ‘louse’ (H); Biak *uk nàf* ‘dog louse, flea’ (H); Moor *kú’a* ‘louse’ (K); Serui-Laut *itu* ‘louse’ (Slm); Umar *utu* ‘louse’ (K); Wandamen *[r]utu* ‘louse’ (ABVD); Waropen *ghui* ‘louse’ (ABVD) [?]; Waropen *wui* ‘louse’ (ABVD) [?]; Yaur *óòjé* ‘louse’ (K) [?]; Yerisiam *úukú* ‘louse’ (K)

Mamberamo: Warembori *ki-ro* ‘Louse’ (Donohue 1999); Yoke *niŋgi* ‘louse’ (Donohue 1999)

Other: Arguni *ut* ‘louse’ (ABVD); Irarutu *utə* ‘louse’ (ABVD); Kowiai *ut* ‘louse’ (ACD); Sekar *kuti* ‘louse’ (ABVD)

PAN ***kuden*** ‘clay cooking pot’ (ACD)

SH: Buli *ulan* ‘pot, pan’ (ACD); Buli *ulan besi* ‘iron pan’ (ACD)

CB: Biak *urĕn* ‘earthenware cooking pot; clay used to make pots’ (H)

PMP ***kudug*** ‘thunder’ (Blust 1999) [??]; PCEMP ***kudug*** ‘thunder’ (Blust 1993)

CB: Moor *kururú’a* ‘thunder’ (K); Wandamen *kruya* ‘thunder’ (G); Wandamen *kuruya* ‘thunder’ (ABVD)

Other: Irarutu *kəlú* ‘thunder’ (M); Irarutu *kərəru* ‘thunder’ (ABVD)

PAN ***kuliC*** ‘rind, peeling of fruits or tubers’ (ACD); PMP ***kulit*** ‘skin’ (Blust 1999); PMP ***kulit₁*** ‘skin; hide; rind; bark’ (ACD); PCEMP ***kulit*** ‘skin’ (Blust 1993)

SH: Gane *kulit* ‘skin’ (ABVD); Taba *kulit* ‘skin’ (ABVD)

Other: Arguni *urut* ‘skin’ (ABVD) [?]; Irarutu *rítə* ‘skin’ (M); Kowiai *urit* ‘skin’ (ACD); Sekar *kunit* ‘skin’ (ABVD)

PMP ***kuluR*** ‘breadfruit’ (ACD)

CB: Biak *ur* ‘breadfruit tree and fruit, *Artocarpus communis*; the fruit is prepared for eating in various ways; the young leaves are eaten as vegetables, and the trunk is hollowed out as a canoe hull’ (H); Moor *ùrina* ‘breadfruit’ (K); Umar *mur* ‘breadfruit’ (K)

PMP ***kuRita*** ‘octopus’ (ACD)

CB: Moor *arí’a* ‘octopus’ (K); Umar *kte* ‘octopus’ (K)

Other: Kowiai *urita* ‘octopus’ (ACD)

PMP ***kutana*** ‘ask’ (ACD); PMP ***kutaña*** ‘ask, inquire about’ (ACD); PMP ***utaña*** ‘ask, inquire’ (ACD)

SH: Buli *fa-utan* ‘ask about something’ (ACD); Buli *utan* ‘to ask’ (ACD)

CB: Ambai *utan* ‘ask’ (Slz); Biak *f-ukĕn* ‘ask’ (H); Dusner *putna* ‘ask’ (D&M); Moor *u’unú* ‘ask for’ (K); Serui-Laut *utana* ‘to ask’ (Slm); Wandamen *uta* ‘ask’ (G); Wandamen *uta* ‘ask’ (G)

PMP ***labeR*** ‘wide’ (ACD); PMP ***ma-labeR*** ‘wide’ (Blust 1999)

RA: As *malapɔ* ‘wide’ (ABVD)

Other: Kowiai *garáfar* ‘wide’ (ABVD)

PAN ***lahud*** ‘downstream, toward the sea’ (ACD)

SH: Buli *la-lau* ‘toward the sea and away from the speaker’ (ACD); Buli *lau* ‘sea-side’ (ACD); Buli *ma-lau* ‘toward the sea and toward the speaker’ (ACD); Buli *po-lau* ‘on the sea-side’ (ACD)

RA: Maˈya (M.) *ˈlo³l* ‘sea’ (R); Maˈya (S.) *ˈlo³l* ‘sea’ (R)

CB: Ambai *ai-rau* ‘sea’ (Slz); Ambai *ravana* ‘sea’ (ABVD); Ambai *rawanan* ‘sea’ (Slz); Ansus *rawanang* ‘sea’ (P&D); Moor *rú* ‘sea’ (K); Serui-Laut *sairau* ‘sea’ (Slm); Wandamen *rau* ‘sea’ (ABVD); Wandamen *rawanam* ‘sea’ (ABVD); Waropen *rau* ‘sea’ (ABVD)

PMP ***lakaj*** ‘to stride, take a step’ (ACD); PMP ***lakaw*** ‘walk, go’ (Blust 1999); PCEMP ***lakaw*** ‘walk, go’ (Blust 1993)

RA: Ambel *la-dok* ‘come’ (R)

CB: Ambai *i-ra* ‘to walk’ (ABVD); Ambai *ra* ‘walk’ (Slz); Ansus *ra* ‘go’ (P&D); Biak *rā* ‘to go, walk’ (H); Moor *rá* ‘go’ (K); Serui-Laut *ra* ‘to go’ (Slm); Umar *ra* ‘go’ (K); Umar *ra ga* ‘walk’ (K); Wandamen *ra* ‘thence’ (G); Wandamen *ra* ‘go’ (G); Waropen *ra* ‘go on foot, go into the bush, walk’ (ACD); Yaur *rèérè* ‘come’ (K); Yerisiam *rá* ‘go’ (K)

Mamberamo: Warembori *da* ‘Go’ (Donohue 1999); Warembori *da-yo* ‘Walk’ (Donohue 1999); Yoke *da* ‘go’ (Donohue 1999)

Other: Arguni *-ra* ‘to walk’ (ABVD)

PCEMP ***laman₁*** ‘deep’ (ACD); PEMP ***laman(a)*** ‘deep sea’ (Blust 1978)

SH: Buli *m-laman* ‘deep (of bay, hole, sea)’ (ACD)

CB: Biak *raměn* ‘very deep’ (H)

PAN ***laŋaw₁*** ‘housefly’ (ACD); PMP ***laŋaw₂*** ‘bluebottle, blowfly, horsefly’ (ACD)

SH: Buli *laŋ* ‘a fly’ (ACD); Buli *laŋ ŋiŋilaw* ‘bluebottle, horsefly’ (ACD)

CB: Biak *ran* ‘kind of small fly’ (H)

PMP ***laŋit*** ‘sky’ (Blust 1999); PCEMP ***laŋit*** ‘sky’ (Blust 1993)

SH: Buli *laŋit* ‘sky, heaven’ (ACD); Gane *langit* ‘sky’ (ABVD); Sawai *laŋɛt* ‘sky’ (CAD); Taba *langit* ‘sky’ (ABVD)

RA: As *lanit* ‘sky’ (ABVD)

CB: Biak *naněk* ‘sky’ (H); Biak *nàngè* ‘sky’ (H); Moor *ará’á* ‘sky’ (K) [?]; Waropen *naniŋgi* ‘sky’ (ABVD) [?]; Yerisiam *ráakátè* ‘sky’ (K)

Other: Arguni *ragit* ‘sky’ (ABVD); Irarutu *ragətə* ‘sky’ (ABVD); Kowiai *ránggit* ‘sky’ (ABVD); Sekar *lagit* ‘sky’ (ABVD)

PAN ***laRiw*** ‘run, run away, flee, escape’ (ACD)

CB: Biak *f-rār* ‘run, run away, flee’ (H); Dusner *prar* ‘run’ (D&M); Yerisiam *ráarú* ‘run’ (K)

PAN ***lawaq₂*** ‘spider; spider web’ (ACD); PMP ***lawaq*** ‘spider’ (Blust 1999); PMP ***lawaq₂ₐ*** ‘spider; spider web’ (ACD); PCEMP ***lawaq*** ‘spider’ (Blust 1993)

SH: Buli *kopolaw* ‘spider’ (ABVD); Gane *tapilou* ‘spider’ (ABVD); Sawai *lawalawa* ‘spiderweb’ (CAD)
RA: Gebe *plaw* ‘spider’ (ABVD)
CB: Moor *ragwa’î* ‘spiderweb’ (K); Umar *bravun* ‘spider’ (K); Yaur *ráàjé* ‘spider’ (K); Yerisiam *ráráàrùmà* ‘spider’ (K)
Other: Irarutu *rara* ‘spider’ (ABVD); Kowiai *ráwar-ráwar* ‘spider’ (ABVD)

PMP ***leseq*** ‘nit, egg of a louse’ (ACD)
SH: Buli *loas* ‘nit, egg of a louse’ (ACD); Sawai *lowɛs* ‘nit’ (CAD)
CB: Yerisiam *róhé* ‘nit’ (K)

PAN ***lima*** ‘five’ (ACD); PCEMP ***lima*** ‘hand’ (Blust 1993)
SH: Buli *fai-lim* ‘five times; the fifth’ (ACD); Buli *lim* ‘five’ (ACD); Buli *lim-lim* ‘five by five; all five’ (ACD); Sawai *pɛ-lim* ‘five’ (CAD); Taba *-lim* ‘five’
RA: Ambel *lim* ‘five’ (R); Biga *lim* ‘five’ (R); Fiawat *lim* ‘five’ (R); Kawe *lim* ‘five’ (R); Laganyan *ˈli³m* ‘five’ (R); Matbat *li³m* ‘five’ (R); Maˈya (M.) *ˈli³m* ‘five’ (R); Maˈya (S.) *ˈli³m* ‘five’ (R); Wauyai *lim* ‘five’ (R)
CB: Ambai *rin* ‘five’ (Slz); Ambai *riŋ* ‘Five’ (ABVD); Ansus *riŋ* ‘five’ (P&D); Biak *rim* ‘five’ (H); Dusner *rimbi* ‘five’ (D&M); Moor *rímó* ‘five’ (K); Munggui *bo-rim* ‘five’ (ACD); Serui-Laut *ri* ‘five’ (Slm); Serui-Laut *riŋ* ‘five’ (ACD); Wandamen *rime* ‘Five’ (ABVD); Waropen *rimo* ‘Five’ (ABVD); Yerisiam *rîmà* ‘five’ (K)
Mamberamo: Warembori *rinti* ‘Five’ (Donohue 1999); Yoke *-rimsi* ‘five’ (Donohue 1999)
Other: Arguni *ruma-* ‘hand’ (ABVD) [?]; Kowiai *nima* ‘hand’ (ABVD)

PAN ***lipen*** ‘tooth’ (ACD); PAN ***nipen*** ‘tooth’ (ACD); PMP ***ipen*** ‘tooth’ (Blust 1999); PMP ***nipen*** ‘tooth’ (Blust 1999); PCEMP ***ipən*** ‘tooth’ (Blust 1993); PCEMP ***nipən*** ‘tooth’ (Blust 1993)
SH: Taba *lalho* ‘tooth’ (ABVD)
RA: Biga *lifo-* ‘tooth’ (ABVD); Biga *liˈfo(o)* ‘tooth’ (R); Kawe *aˈlif(o)* ‘tooth’ (R); Laganyan *aˈlif(o)* ‘tooth’ (R); Maˈya (M.) *kaˈli³f* ‘tooth’ (R); Maˈya (S.) *kaˈlif(o)* ‘tooth’ (R); Wauyai *kaˈlif* ‘tooth’ (R)
Other: Irarutu *-refo-* ‘tooth’ (ABVD) [?]; Irarutu *rəfú* ‘tooth’ (M); Kowiai *rifut* ‘tooth’ (ABVD) [?]; Sekar *nifa-n* ‘tooth’ (ABVD)

PMP ***liteq*** ‘sap of a tree or plant’ (ACD)
SH: Buli *lit* ‘stick, adhere; glue, paste’ (ACD)
CB: Biak *rik* ‘sap of trees’ (H)

PMP ***lumut*** ‘moss, algae, seaweed’ (ACD)
SH: Buli *lu-lumit* ‘kind of water plant, duckweed’ (ACD)
CB: Biak *màndumèk* ‘green’ (H); Biak *rumèk* ‘moss’ (H)

PMP ***ma*** ‘and’ (Blust 1999); PCEMP ***ma*** ‘and’ (Blust 1993)
CB: Biak *ma* ‘and’ (H); Dusner *me* ‘then’ (D&M); Serui-Laut *ma* ‘and’ (Slm); Wandamen *ma* ‘and’ (G); Waropen *ma* ‘and’ (ABVD)

PAN ***ma-aCay*** 'die; dead; eclipse of sun or moon' (ACD); PMP ***matay*** 'die' (Blust 1999); PCEMP ***matay*** 'die' (Blust 1993); PCEMP ***matay$_1$*** 'die; dead' (ACD)

SH: Buli *fa-mat* 'kill' (ACD); Buli *mat* 'dead; die, also said of a light going out, and of a wound, ulcer, or boil that has healed' (ACD); Buli *mat-mat* 'dead body; corpse' (ACD); Gane *mot* 'to die, be dead' (ABVD); Taba *-mot* 'to die, be dead' (ABVD)

RA: Ambel *la-mat* 'die' (R); As *ma-ʔ* 'to die, be dead' (ABVD); Biga *mat* 'die' (R); Fiawat *mat* 'die' (R); Gebe *-mat* 'to die, be dead' (ABVD); Kawe *mat* 'die' (R); Laganyan *mat* 'die' (R); Matbat *ma^{12}t* 'die' (R); Ma^{l}ya (M.) *^{l}ma^{12}t* 'die' (R); Ma^{l}ya (S.) *^{l}ma^{12}t* 'die' (R); Wauyai *mat* 'die' (R)

CB: Biak *mār* 'to die, be dead' (H); Moor *má'a* 'die' (K); Umar *mat* 'die' (K); Yaur *mèé'rè* 'die' (K); Yerisiam *máàkè* 'die' (K)

Other: Arguni *-mat* 'to die, be dead' (ABVD); Irarutu *mátə* 'to die' (M); Kowiai *-máta* 'to die, be dead' (ABVD)

PMP ***ma-beReqat*** 'heavy' (Blust 1999); PCEMP ***ma-bəRat*** 'heavy' (Blust 1993)

SH: Taba *mapot* 'heavy' (ABVD)

RA: Gebe *kapiatan* 'heavy' (ABVD); Kawe *apya^{l}tan* 'heavy' (R); Laganyan *mpa^{l}tan* 'heavy' (R); Ma^{l}ya (M.) *^{l}mpata^{12}n* 'heavy' (R); Ma^{l}ya (S.) *^{l}pata^{3}n* 'heavy' (R)

CB: Ambai *maraba* 'heavy' (Slz); Ambai *miraba* 'heavy' (ABVD); Ansus *mamba* 'heavy' (P&D); Ansus *memba* 'heavy' (P&D); Umar *mat* 'heavy' (K); Wandamen *marabat* 'heavy' (ABVD); Yerisiam *máakí* 'heavy' (K)

Mamberamo: Warembori *mambayo* 'Heavy' (Donohue 1999)

Other: Sekar *maberat* 'heavy' (ABVD)

PCEMP ***madar*** 'ripe, overripe' (ACD); PEMP ***mada*** 'ripe, soft' (Blust 1978)

SH: Buli *mara* 'ripe, cooked' (ACD)

CB: Ambai *mirai* 'ripe' (Slz); Moor *mararù* 'withered' (K); Serui-Laut *marai* 'ripe' (Slm); Yaur *mádrè* 'ripe' (K)

PMP ***ma-diŋdiŋ*** 'cold' (Blust 1999); PCEMP ***ma-dindiŋ*** 'cold' (Blust 1993)

SH: Buli *mairiŋ* 'cold' (ABVD)

RA: Gebe *mijirin* 'cold' (ABVD); Kawe *mari^{l}rin* 'cold' (R); Laganyan *mari^{l}rin* 'cold' (R); Wauyai *mari^{l}rin* 'cold' (R)

CB: Umar *drin* 'cold' (K)

Other: Irarutu *ridənə* 'cold' (ABVD); Kowiai *rídin* 'cold' (ABVD); Sekar *madirig* 'cold' (ABVD)

PMP ***ma-iRaq*** 'red' (Blust 1999); PCEMP ***meRaq*** 'red' (Blust 1993)

RA: Biga *ma^{l}me* 'red' (R); Fiawat *meme* 'red' (R); Kawe *me* 'red' (R); Ma^{l}ya (M.) *ma^{l}me^{12}* 'red' (R); Ma^{l}ya (S.) *ma^{l}me^{3}* 'red' (R); Wauyai *me* 'red' (R)

CB: Ansus *merai* 'red' (P&D); Moor *mararî* 'red' (K); Serui-Laut *merai* 'red' (Slm); Umar *miar* 'red' (K); Wandamen *mirai* 'red' (ABVD)

Mamberamo: Warembori *meme-o* 'Red' (Donohue 1999)

PMP ***ma-kapal*** 'thick' (Blust 1999); PCEMP ***ma-kapal*** 'thick' (Blust 1993)

CB: Biak *kpor* 'thick' (H)

Other: Sekar *makafan* 'thick' (ABVD)

PMP ***ma-kunij*** ‘yellow’ (Blust 1999) [?]; PCEMP ***ma-kunij*** ‘yellow’ (Blust 1993) [?]

SH: Taba *makninis* ‘yellow’ (ABVD)

RA: Ambel *amani* ‘yellow’ (R); Biga *kamaninis* ‘yellow’ (ABVD); Biga *kameniˈnis* ‘yellow’ (R); Fiawat *menenih* ‘yellow’ (R); Kawe *mageniˈni* ‘yellow’ (R); Laganyan *amiˈni* ‘yellow’ (R); Maˈya (M.) *kameˈnini³s* ‘yellow’ (R); Maˈya (S.) *kaˈmini³s* ‘yellow’ (R); Wauyai *kamiˈni* ‘yellow’ (R)

CB: Ambai *byomini* ‘yellow’ (ABVD); Moor *veranggunâ* ‘yellow’ (K)

Other: Arguni *kuniŋ* ‘yellow’ (ABVD) [loan]; Kowiai *’úning* ‘yellow’ (ABVD) [loan]; Sekar *kuniŋ* ‘yellow’ (ABVD) [loan]

PCEMP ***malaw*** ‘paper mulberry tree: *Brousonnetia papyrifera*, used to make bark cloth; men’s loincloth made from this material’ (ACD)

SH: Buli *māl* ‘pounded tree bark; clothing of same’ (ACD)

CB: Biak *mār* ‘loincloth (originally of pounded tree bark)’ (H)

PCEMP ***malip*** ‘laugh’ (Blust 1993)

SH: Buli *a-mlif* ‘laugh’ (ACD); Gane *mlif* ‘to laugh’ (ABVD); Sawai *n-ɛ-mlif* ‘to laugh’ (CAD); Taba *-(ha)mlih* ‘laugh’

RA: As *-melis* ‘to laugh’ (ABVD); Biga *-mlef* ‘to laugh’ (ABVD); Gebe *-mnif* ‘to laugh’ (ABVD)

CB: Ambai *i-miri* ‘to laugh’ (ABVD); Ambai *miri* ‘laugh’ (Slz); Ansus *mari* ‘laugh’ (P&D); Biak *mbrif* ‘to laugh’ (H); Moor *marí’a* ‘laugh’ (K); Serui-Laut *mari* ‘to laugh’ (Slm); Umar *mari* ‘laugh’ (K); Wandamen *mari* ‘laugh’ (G)

Other: Arguni *-marif* ‘to laugh’ (ABVD); Irarutu *-berrife* ‘to laugh’ (ABVD) [?]; Kowiai *-marif* ‘to laugh’ (ABVD); Sekar *manif* ‘to laugh’ (ABVD)

PEMP ***maluRu*** ‘shade’ (Blust 1978)

SH: Buli *ma-malu* ‘dark, black clouds; shadow of objects (but not of people)’ (ACD)

CB: Moor *marùvana* ‘shade’ (K) [?]

PMP ***mamaq*** ‘chew’ (Blust 1999); PCEMP ***mamaq*** ‘chew’ (Blust 1993)

SH: Gane *hamóm* ‘to chew’ (ABVD) [??]

CB: Ambai *mama* ‘chew’ (Slz); Biak *màm* ‘to chew’ (H); Umar *mnam* ‘chew’ (K) [?]; Wandamen *mam* ‘to chew’ (ABVD); Waropen *mama* ‘to chew’ (ABVD); Yaur *jú’mèmné* ‘chew’ (K); Yerisiam *námà* ‘chew’ (K) [?]

Other: Kowiai *-mama* ‘to chew’ (ABVD)

PMP ***mamin*** ‘a fish: wrasse spp.’ (ACD)

SH: Buli *mamiŋ* ‘kind of fish’ (ACD)

CB: Biak *in mamin* ‘kind of fish (can reach large size)’ (H)

PMP ***ma-ñawa*** ‘breathe’ (Blust 1999); PCEMP ***ma-ñawa*** ‘breathe’ (Blust 1993); PCEMP ***ñawa*** ‘breath, breath soul’ (ACD)

SH: Gane *manou* ‘to breathe’ (ABVD); Taba *-manowo* ‘to breathe’ (ABVD)

RA: Gebe *-fañawaya* ‘to breathe’ (ABVD)

CB: Biak *mnasu* ‘to breathe’ (H)

PMP ***ma-nipis*** 'thin (materials)' (Blust 1999); PCEMP ***ma-nipis*** 'thin (materials)' (Blust 1993)

SH: Buli *mlifis* 'thin' (ABVD); Gane *manifis* 'thin' (ABVD); Sawai *n-mɛnifɛs* 'thin' (CAD); Taba *mnihis* 'thin' (ABVD)

CB: Umar *mnieh* 'thin' (K); Wandamen *minis* 'thin' (ABVD); Yaur *némníhè* 'thin' (K); Yerisiam *máníijáhé* 'thin' (K)

Other: Irarutu *bənənifəne* 'thin' (ABVD); Kowiai *manífin* 'thin' (ABVD); Sekar *manipis* 'thin' (ABVD)

PAN ****manuk₁*** 'chicken' (ACD); PMP ****manuk*** 'bird' (Blust 1999); PMP ****manuk₂*** 'chicken' (ACD); PCEMP ****manuk*** 'bird' (Blust 1993)

SH: Buli *mani* 'bird' (ACD); Buli *mani-mani* 'all sorts of birds' (ACD); Gane *manik* 'bird' (ABVD); Sawai *manɛ* 'bird' (CAD); Taba *manik* 'chicken'

RA: Ambel *mani* 'bird' (R); As *mani* 'bird' (ABVD); Biga *miˈni* 'bird' (R); Fiawat *min* 'bird' (R); Gebe *mani* 'bird' (ABVD); Laganyan *ˈmin[i]* 'bird' (R); Maˈya (M.) *ˈmini¹²* 'bird' (R); Maˈya (S.) *ˈmini³* 'bird' (R); Wauyai *ˈmin[i]* 'bird' (R)

CB: Ambai *man-* 'bird' (Slz); Biak *man* 'bird' (H); Moor *mànu* 'bird' (K); Umar *mna* 'bird' (K); Waropen *mani* 'bird, chicken' (ACD); Yaur *mà'ré* 'bird' (K); Yerisiam *máanáà* 'bird' (K)

Mamberamo: Warembori *mani-ro* 'Bird' (Donohue 1999); Yoke *mani* 'bird' (Donohue 1999)

Other: Arguni *mani* 'bird' (ABVD); Irarutu *mánə* 'bird' (M); Kowiai *manuʔ* 'bird' (ACD); Sekar *manik* 'bird' (ABVD)

PMP ****ma-panas*** 'warm, hot' (Blust 1999); PMP ****panas₁*** 'warm, hot' (ACD); PCEMP ****ma-panas*** 'warm, hot' (Blust 1993)

SH: Buli *fànas* 'warm, hot' (ACD); Buli *m-fànas* 'warm, hot, burning; sentiment' (ACD); Gane *psan* 'warm' (ABVD); Sawai *n-mafyanɛs* 'hot' (CAD)

CB: Moor *nanatî* 'hot' (K); Wandamen *mas* 'warm' (ABVD) [?]

Other: Arguni *bamba...* 'warm' (ABVD) [?]

PMP ****ma-pia*** 'good' (Blust 1999); PCEMP ****ma-pia*** 'good' (Blust 1993)

SH: Buli *mafia* 'good' (ABVD); Gane *fia* 'good' (ABVD); Taba *hia* 'good' (ABVD)

RA: As *fi* 'good' (ABVD); Biga *fi* 'good' (R); Fiawat *fiy* 'good' (R); Kawe *fi* 'good' (R); Laganyan *fi* 'good' (R); Matbat *fi³* 'good' (R); Maˈya (M.) *ˈfi³* 'good' (R); Maˈya (S.) *ˈfi³* 'good' (R); Wauyai *fi* 'good' (R)

CB: Serui-Laut *fiboki* 'good' (Slm)

PMP ****ma-putiq*** 'white' (Blust 1999); PCEMP ****ma-putiq*** 'white' (Blust 1993)

SH: Sawai *n-ɛ-mfus* 'white' (CAD)

CB: Moor *vehúta* 'white' (K)

Other: Irarutu *bəfútə* 'white' (M); Irarutu *bəvutə* 'white' (ABVD)

PAN ****ma-qetaq₁*** 'raw, unripe, green (fruit), uncooked' (ACD); PMP ****mataq*** 'green' (Blust 1999); PCEMP ****ma-qetaq₂*** 'raw, unripe, green (fruit), uncooked' (ACD); PCEMP ****mataq*** 'green' (Blust 1993)

CB: Moor *ma'ama'î* 'green' (K); Moor *ma'î* 'raw' (K); Yaur *máa'rùrìe* 'green' (K); Yaur *némàa'è* 'raw' (K); Yerisiam *ahir mákmáaká* 'green' (K); Yerisiam *máaká* 'raw' (K); Yerisiam *mákmáaká* 'blue' (K)

Other: Irarutu *məmatə* 'green' (ABVD); Kowiai *mamáta* 'green' (ABVD); Sekar *matmatak* 'green' (ABVD)

PMP ***ma-qeti*** 'low, of the tide' (ACD)

CB: Moor *móta* 'tide' (K); Yaur *némòohè* 'low tide' (K)

PMP ***ma-qitem*** 'black' (Blust 1999); PCEMP ***ma-qetəm*** 'black' (Blust 1993); PCEMP ***ma-qitom, ma-qétom*** 'black; dirty' (ACD)

RA: Ambel *amatem* 'black' (R); As *matɛm* 'black' (ABVD); Laganyan *matmeˈtem* 'black' (R); Maˈya (M.) *matˈmete¹²m* 'black' (R); Maˈya (S.) *matˈmete³m* 'black' (R); Wauyai *matmeˈtem* 'black' (R)

CB: Ambai *numetan* 'black' (Slz); Ambai *numeta* 'black' (ABVD); Ansus *metaŋ* 'black' (P&D); Biak *paisĕm* 'zwaart' (H); Serui-Laut *numeta* 'black' (Slm); Wandamen *meta* 'black' (G); Wandamen *meta[n]* 'black' (ABVD)

Other: Irarutu *grəmútənə* 'black' (M); Irarutu *grmutəne* 'black' (ABVD); Kowiai *ma-etan* 'black' (ACD)

PAN ***ma-quzaN*** 'rain' (ACD); PAN ***quzaN*** 'rain' (ACD); PMP ***quzan*** 'rain' (Blust 1999); PCEMP ***quzan*** 'rain' (Blust 1993)

SH: Buli *ulan* 'rain' (ACD); Gane *ulan* 'rain' (ABVD); Taba *ulan* 'rain' (ABVD)

PMP ***ma-Raŋaw*** 'dry' (Blust 1999); PCEMP ***ma-Raŋaw*** 'dry' (Blust 1993); PCEMP ***ma-Raŋu?*** 'dry' (ACD)

SH: Buli *māŋ* 'dry' (ABVD); Sawai *n-maŋ* 'dry' (CAD)

RA: Gebe *maŋ* 'dry' (ABVD)

Other: Arguni *mer...* 'dry' (ABVD)

PMP ***ma-Raqan, ma-Raqen*** 'light in weight' (ACD)

CB: Umar *mbran* 'light' (K); Yerisiam *máráné* 'light' (K)

PAN ***ma-Sasak*** 'ripe; cooked' (ACD); PMP ***ma-esak*** 'cooked, ripe' (ACD); PEMP ***ma-qosak*** 'ripe; cooked; ready to eat' (ACD)

SH: Buli *masa* 'cooked, ripe, complete' (ACD)

RA: Matbat *ma¹²* 'cooked' (R) [?]

CB: Umar *mah* 'cooked' (K)

PAN ***ma-Suab*** 'to yawn, yawning' (ACD); PMP ***ma-huab*** 'yawn' (Blust 1999); PMP ***ma-huab$_1$*** 'to yawn, yawning' (ACD); PCEMP ***ma-mawab*** 'to yawn' (ACD); PCEMP ***mawab*** 'to yawn, yawning' (ACD); PCEMP ***mawap*** 'yawn' (Blust 1993)

SH: Buli *ma-ma-ip* 'gape, yawn]' (ACD)

CB: Biak *mabab* 'yawn; in general, open the mouth' (H); Biak *mawab* 'yawn; in general, open the mouth' (H); Moor *máha* 'yawn' (K); Wandamen *mavav* 'to yawn' (ABVD)

PMP ***mata*** 'eye' (Blust 1999); PCEMP ***mata*** 'eye' (Blust 1993)

SH: Buli *mta* ‘eye’ (ABVD); Gane *mto* ‘eye’ (ABVD); Sawai *mtɔ* ‘eye’ (CAD); Taba *mto* ‘eye’ (ABVD)
RA: Gebe *nta* ‘eye’ (ABVD)
CB: Biak *mga* ‘eye’ (H); Moor *masina’ú* ‘eye’ (K); Umar *mta* ‘eye’ (K)
Other: Irarutu *mətíe* ‘eye’ (M); Kowiai *matafut* ‘eye’ (ABVD)

PAN ***ma-takut*** ‘fear’ (ACD); PMP ***ma-takut*** ‘afraid’ (Blust 1999); PCEMP ***ma-takut*** ‘afraid’ (Blust 1993)
SH: Buli *am-cait* ‘to fear’ (ABVD)
RA: Biga *-mtat* ‘to fear’ (ABVD); Gebe *-mtait* ‘to fear’ (ABVD)
CB: Ambai *i-matai* ‘to fear’ (ABVD); Ambai *matai* ‘fear’ (Slz); Ansus *matai* ‘afraid’ (P&D); Biak *mkāk* ‘to fear, be afraid’ (H); Dusner *mtat* ‘afraid’ (D&M); Moor *mukáʼa* ‘afraid’ (K); Serui-Laut *maitai* ‘afraid’ (Slm); Umar *mtat* ‘afraid’ (K); Wandamen *matai* ‘afraid’ (G); Wandamen *matai(t)* ‘to fear’ (ABVD); Waropen *akako* ‘to fear’ (ABVD) [?]; Yerisiam *ngkáké* ‘afraid’ (K)
Other: Irarutu *-mta-te* ‘to fear’ (ABVD); Kowiai *-matatu’* ‘to fear’ (ABVD)

PMP ***ma-taqu*** ‘right side’ (Blust 1999) [?]; PCEMP ***mataqu*** ‘right side’ (Blust 1993) [?]
CB: Umar *mamdu* ‘right’ (K); Yerisiam *bákíkú* ‘right’ (K)
Other: Irarutu *tu* ‘right’ (ABVD)

PMP ***ma-tazem*** ‘sharp’ (Blust 1999); PMP ***ma-tazim*** ‘sharp’ (Blust 1999); PMP ***tazem*** ‘sharp’ (ACD); PCEMP ***ma-tazim*** ‘sharp’ (Blust 1993)
SH: Buli *mdalim* ‘sharp’ (ABVD)
RA: As *talim* ‘sharp’ (ABVD)
CB: Umar *mtan* ‘sharp’ (K)
Other: Irarutu *matadane* ‘sharp’ (ABVD) [?]

PMP ***ma-tuqah*** ‘old (people)’ (Blust 1999); PCEMP ***ma-tuqa*** ‘old (people)’ (Blust 1993); PEMP ***matu*** ‘dry coconut’ (Blust 1978)
SH: Gane *tua* ‘old’ (ABVD); Taba *matuo* ‘old’ (ABVD)
CB: Dusner *tua* ‘old’ (D&M); Dusner *tuar* ‘old’ (D&M); Moor *maʼù* ‘old’ (K); Yerisiam *màkúi* ‘tough’ (K) [?]
Other: Kowiai *tuárin* ‘old’ (ABVD)

PMP ***ma-zauq*** ‘far’ (Blust 1999); PMP ***zauq*** ‘far’ (ACD); PCEMP ***zauq*** ‘far’ (Blust 1993)
SH: Buli *lau* ‘far’ (ABVD); Gane *lou* ‘far’ (ABVD); Sawai *lɔw* ‘far’ (CAD); Taba *nalou* ‘far’ (ABVD)
RA: As *ilao* ‘far’ (ABVD); Gebe *lau* ‘far’ (ABVD)
Other: Irarutu *néro* ‘far’ (M)

PMP ***meñak*** ‘fat, oil’ (Blust 1999); PMP ***miñak*** ‘fat, oil’ (Blust 1999); PCEMP ***meñak*** ‘fat, oil’ (Blust 1993); PCEMP ***miñak*** ‘fat, oil’ (Blust 1993)
SH: Buli *mna* ‘tasty, delicious, sweet; fat of animals’ (ACD)
RA: Biga *maˈna(o)* ‘animal fat’ (R); Fiawat *mena* ‘animal fat’ (R); Kawe *maˈna* ‘animal fat’ (R); Laganyan *maˈna* ‘animal fat’ (R); Matbat *mna*^{12} ‘animal fat’ (R); Maˈya (M.) *maˈna*^{12} ‘animal fat’ (R); Maˈya (S.) *maˈna*^{3} ‘animal fat’ (R); Wauyai *maˈna* ‘animal fat’ (R)

CB: Ambai *ne-main* ‘fat (n.)’ (Slz); Ansus *mai* ‘fat’ (P&D); Moor *mananá* ‘fat’ (K); Serui-Laut *maien* ‘fat (n.)’ (Slm); Umar *mnai* ‘fat’ (K); Wandamen *mai[n]* ‘fat/grease’ (ABVD); Wandamen *vemai* ‘fat’ (G); Waropen *mana* ‘fat/grease’ (ABVD); Yaur *mnáarè* ‘fat’ (K); Yerisiam *mìmná* ‘fat’ (K)

Other: Sekar *minminak* ‘fat/grease’ (ABVD)

PMP ***miqmiq*** ‘urine, urinate’ (ACD)

RA: Maˈya (S.) *taˈmi*^{3} ‘urine’ (R)

Mamberamo: Warembori *mimi-ro* ‘Urine’ (Donohue 1999)

PCEMP ***mutaq*** ‘vomit’ (Blust 1993)

SH: Buli *muta* ‘to vomit’ (ABVD)

CB: Ambai *i-mamuta* ‘to vomit’ (ABVD); Ambai *mamuta* ‘vomit’ (Slz); Ansus *mamuta* ‘vomit’ (P&D); Moor *mamuá’a* ‘vomit’ (K); Umar *mut* ‘vomit’ (K); Wandamen *mamuta* ‘vomit’ (G); Yerisiam *mámúugwáké* ‘vomit’ (K)

Other: Sekar *muta* ‘to vomit’ (ABVD)

PAN ***naNaq*** ‘pus’ (ACD); PMP ***nanaq*** ‘pus’ (ACD)

SH: Buli *nan* ‘pus’ (Blust1978)

CB: Ambai *nana* ‘pus’ (Slz); Biak *nān* ‘pus’ (H); Yerisiam *náanáà* ‘pus’ (K)

PEMP ***natu*** ‘child’ (Blust 1978)

SH: Buli *ntu* ‘child’ (ABVD); Gane *mtuna* ‘child’ (ABVD); Gane *tu* ‘child’ (ABVD); Taba *mtu* ‘child’ (ABVD)

RA: Gebe *ñat* ‘person/human being’ (ABVD)

CB: Ambai *antun* ‘child’ (Slz); Dusner *mtu* ‘baby’ (D&M); Moor *na’ú* ‘person’ (K); Moor *nà’una* ‘child’ (K); Serui-Laut *antum* ‘child’ (Slm); Wandamen *a[n]tu* ‘child’ (ABVD); Waropen *tu[tu]* ‘child’ (ABVD)

Other: Arguni *natu* ‘small’ (ABVD); Irarutu *ntú* ‘small’ (M); Kowiai *net* ‘small’ (ABVD)

PAN ***Neŋ*** ‘look, see’ (ACD)

SH: Buli *niŋa* ‘to see’ (ABVD)

Other: Sekar *niga* ‘to see’ (ABVD)

PAN ***ŋajan***$_{2}$ ‘name’ (ACD); PMP ***ajan*** ‘name’ (ACD); PMP ***ŋajan*** ‘name’ (Blust 1999); PMP ***ŋajan***$_{1}$ ‘name’ (ACD); PCEMP ***ŋajan*** ‘name’ (Blust 1993)

SH: Buli *ŋasan* ‘name; rank; occupation; function’ (ACD); Sawai *ŋɔsɛn* ‘name’ (CAD)

RA: As *gasɛn* ‘name’ (ABVD); Biga *nan* ‘name’ (R); Biga *-nanɔ* ‘name’ (ABVD) [?]; Fiawat *nahan* ‘name’ (R); Gebe *ŋasnɔ-* ‘name’ (ABVD); Kawe *nan* ‘name’ (R); Laganyan *naˈhan* ‘name’ (R); Matbat *na*^{21}*n* ‘name’ (R); Maˈya (M.) *ˈnasa*^{12}*n* ‘name’ (R); Maˈya (S.) *ˈnasa*^{3}*n* ‘name’ (R); Wauyai *nan* ‘name’ (R)

CB: Biak *nasàn* ‘title; office’ (H); Moor *nàtana* ‘name’ (K); Umar *han* ‘name’ (K); Wandamen *sano* ‘name’ (G); Waropen *nasano* ‘name’ (ACD); Yaur *áhgrè* ‘name’ (K); Yerisiam *áaháná* ‘name’ (K)

Mamberamo: Warembori *nan-do* ‘Name’ (Donohue 1999); Yoke *nand* ‘name’ (Donohue 1999)

Other: Kowiai *nésa* ‘name’ (ABVD) [?]

PMP ***niuR*** ‘coconut’ (ACD)

SH: Sawai *niwɛ* ‘coconut’ (CAD); Taba *niwi* ‘coconut’

RA: Biga *ni* ‘coconut (tree)’ (R); Fiawat *nyuw* ‘coconut (tree)’ (R); Kawe *nu* ‘coconut’ (R); Laganyan *nu* ‘coconut’ (R); Matbat *nu*^{1} ‘coconut (tree)’ (R); Maˈya (M.) ˈ*nu*^{12} ‘coconut (tree)’ (R); Maˈya (S.) ˈ*nu*^{12} ‘coconut (tree)’ (R); Maˈya (S.) ˈ*nu*^{3} ‘coconut (tree)’ (R)

CB: Moor *néra* ‘coconut’ (K); Waropen *niwaro* ‘coconut’ (ACD); Yerisiam *núì* ‘coconut’ (K)

Mamberamo: Warembori *nuan-do* ‘Coconut’ (Donohue 1999) [?]; Yoke *ɲia* ‘coconut’ (Donohue 1999) [?]

Other: Kowiai *niu(r)* ‘coconut’ (ACD)

PMP ***nusa**$_{1}$* ‘island’ (ACD)

SH: Buli *nus* ‘island’ (ACD)

CB: Ambai *nu* ‘island’ (Slz); Ansus *nu* ‘island’ (P&D); Biak *nu* ‘island, only used in compounds, as Nu-mfor, Nus Mapi, etc.’ (H); Moor *núta* ‘island’ (K); Serui-Laut *nu* ‘island’ (Slm); Umar *nuhman* ‘island’ (K); Wandamen *nu* ‘island’ (G); Waropen *nusa* ‘island’ (ACD); Yaur *nùhré* ‘island’ (K); Yerisiam *núùhà* ‘island’ (K)

Other: Irarutu *nú* ‘island’ (M)

PAN ***pajay*** ‘rice in the field; rice plant’ (ACD); PMP ***pajey*** ‘rice plant’ (Blust 1999)

SH: Sawai *fɔs* ‘rice’ (CAD)

RA: Maˈya (S.) ˈ*fa*^{12}*s* ‘rice’ (R)

CB: Ambai *pa* ‘rice’ (Slz); Ansus *pa* ‘rice’ (P&D); Biak *fas* ‘rice (in general)’ (H); Dusner *pas* ‘rice’ (ACD); Moor *pása* ‘rice’ (K) [North Moluccan loan]; Serui-Laut *fa* ‘rice’ (Slm); Umar *pah* ‘rice’ (K) [North Moluccan loan]; Wandamen *fas* ‘rice (in general)’ (ACD); Wandamen *pase* ‘rice’ (G); Yaur *pàahré* ‘rice’ (K) [North Moluccan loan]; Yerisiam *páhréevè* ‘rice’ (K) [North Moluccan loan]

Mamberamo: Warembori *pasa-ro* ‘Rice’ (Donohue 1999)

Other: Irarutu *fásə* ‘rice’ (M); Kowiai *fasa* ‘cooked rice, husked rice’ (ACD)

PAN ***panaq*** ‘throw something at a target; shoot with bow and arrow’ (ACD); PMP ***panaq*** ‘shoot (arrow)’ (Blust 1999); PCEMP ***panaq*** ‘shoot (arrow)’ (Blust 1993)

RA: As *fantanus* ‘to shoot’ (ABVD) [?]; Biga *-fan* ‘to shoot’ (ABVD); Gebe *-fan* ‘to shoot’ (ABVD); Maˈya (S.) ˈ*fa*^{12}*n* ‘to shoot (with bow and arrow)’ (R)

CB: Ambai *i-ana* ‘to shoot’ (ABVD); Ansus *ana* ‘shoot’ (P&D); Moor *hinà* ‘shoot’ (K) [?]; Wandamen *ana* ‘to shoot’ (ABVD); Waropen *ana* ‘to shoot’ (ABVD)

Other: Sekar *fanak* ‘to shoot’ (ABVD)

PAN ***paNaw*** ‘go, walk away, depart’ (ACD); PMP ***panaw*** ‘walk, go’ (Blust 1999); PMP ***panaw**$_{2}$* ‘go, walk away, depart’ (ACD); PCEMP ***panaw*** ‘walk, go’ (Blust 1993)

SH: Buli *fān* ‘depart; go, walk’ (ACD); Gane *han* ‘to walk’ (ABVD)

Other: Irarutu *fá* ‘to go’ (M); Irarutu *-fanə* ‘to walk’ (ABVD); Sekar *pana* ‘to walk’ (ABVD)

PMP ***paniki*** ‘fruit bat, flying fox: *Pteropus* spp.’ (ACD)

SH: Buli *fni* ‘flying fox’ (ACD); Gane *fnik* ‘flying fox’ (ACD); Sawai *fni* ‘bat’ (CAD)

PMP ***pa(n)tar**$_{2}$* ‘shelf; bed frame of wooden or bamboo laths’ (ACD)

CB: Ambai *fata* ‘bed’ (Slz); Biak *fakĕr* ‘foundation of stones, wood, etc.’ (H); Wandamen *ai pata* ‘bed’ (G); Wandamen *patar* ‘bed, sleeping place’ (ACD)

PMP ***papan*** ‘plank, board; floor boards of house’ (ACD)

SH: Buli *fafan* ‘plank’ (Blust1978); Sawai *fɔfɛn* ‘board’ (CAD)

CB: Biak *àm-bafĕn* ‘plank’ (H)

PMP ***paqa₂*** ‘stalk or stem of a plant’ (ACD)

CB: Ambai *-fan* ‘palm/sole’ (Slz); Biak *fa* ‘sheath of a palm blossom’ (H)

PAN ***paRiS*** ‘sting’ (ACD); PMP ***paRih*** ‘sting’ (ACD); PCEMP ***paRi₁*** ‘sting’ (ACD)

SH: Buli *fā* ‘stingray’ (ACD); Sawai *fa* ‘stingray’ (CAD)

CB: Yerisiam *ari máanáà* ‘ray sp.’ (K); Yerisiam *páréèmà* ‘ray’ (K)

PAN ***peñu₁*** ‘sea turtle’ (ACD); PMP ***peñu₂*** ‘the green turtle, *Chelonia mydas*’ (ACD)

SH: Sawai *fɛn* ‘sea turtle’ (CAD)

RA: Ambel *ɸen* ‘sea turtle’ (R); Biga *fin* ‘sea turtle’ (R); Fiawat *fin* ‘sea turtle’ (R); Kawe *fin* ‘sea turtle’ (R); Laganyan *fin* ‘sea turtle’ (R); Matbat *fe³¹n* ‘sea turtle’ (R); Maˈya (M.) ˈ*fe³n* ‘sea turtle’ (R); Maˈya (S.) ˈ*fe³n* ‘sea turtle’ (R)

CB: Umar *ono* ‘turtle’ (K); Yerisiam *éenú* ‘turtle’ (K)

PAN ***penuq*** ‘full, of a container’ (ACD); PMP ***ma-penuq*** ‘full’ (ACD)

RA: Ambel *anhon* ‘full’ (R); Biga *fon* ‘full’ (R); Fiawat *fon* ‘full’ (R); Kawe *fon* ‘full’ (R); Laganyan *fon* ‘full’ (R); Matbat *fo³n* ‘full’ (R); Maˈya (M.) ˈ*fo¹²n* ‘full’ (R); Maˈya (S.) ˈ*fo¹²n* ‘full’ (R)

PAN ***piliq*** ‘to choose, to select; to pick out’ (ACD); PMP ***piliq*** ‘choose’ (Blust 1999); PCEMP ***piliq*** ‘choose’ (Blust 1993)

CB: Ambai *iri* ‘choose’ (Slz); Ambai *yi-riri* ‘to choose’ (ABVD) [?]; Moor *irà* ‘choose’ (K) [?]; Serui-Laut *iria* ‘to choose’ (Slm); Umar *nin ariri* ‘choose’ (K) [?]; Wandamen *iri* ‘choose’ (G)

Other: Arguni *-pili* ‘to choose’ (ABVD); Kowiai *-pil* ‘to choose’ (ABVD); Sekar *fini* ‘to choose’ (ABVD)

PMP ***pitu*** ‘seven’

SH: Buli *fit* ‘seven’ (Blust1978); Sawai *pɛ-fit* ‘seven’ (CAD); Taba *-hit* ‘seven’

CB: Ambai *itu* ‘seven’ (Slz); Ansus *itu* ‘seven’ (P&D); Biak *fik* ‘seven’ (H)

PMP ***pula₁*** ‘red’ (ACD); PMP ***pulaq*** ‘red’ (ACD)

CB: Wandamen *urar* ‘red’ (ABVD); Wandamen *urara* ‘red’ (G); Waropen *ura* ‘red color’ (ACD)

PAN ***puluq₁*** ‘group of ten’ (ACD); PAN ***sa-puluq*** ‘ten’ (ACD)

CB: Ambai *sura* ‘ten’ (Slz); Ansus *ura* ‘ten’ (P&D); Biak *sà-m-fur* ‘ten’ (H); Dusner *sampur* ‘ten’ (D&M); Moor *tàura* ‘ten’ (K); Serui-Laut *sura* ‘ten’ (Slm); Wandamen *surai* ‘ten’ (G); Waropen *sauro* ‘Ten’ (ABVD)

PAN ***punti₁*** ‘banana’ (ACD); PMP ***punti*** ‘banana’ (Blust 1999)

CB: Moor *húta* ‘banana’ (K); Umar *idi* ‘banana’ (K); Waropen *ui* ‘banana’ (ACD); Yaur *ìdíe* ‘banana’ (K); Yerisiam *píití* ‘banana’ (K)

Mamberamo: Warembori *uti-ro* ‘Banana’ (Donohue 1999); Yoke *si* ‘banana’ (Donohue 1999)

Other: Irarutu *fúdə* ‘banana’ (M); Kowiai *fun* ‘banana’ (ACD)

PAN ****qabaRa$_1$*** ‘shoulder’ (ACD); PMP ****qabaRa*** ‘shoulder’ (Blust 1999); PMP ****qabaRa$_3$*** ‘shoulder; carry on the shoulder’ (ACD); PCEMP ****qabaRa*** ‘shoulder’ (Blust 1993)

RA: Gebe *kafalɔ* ‘shoulder’ (ABVD)

CB: Biak *wer* ‘carry on the shoulders’ (H); Moor *ovarî* ‘carry on shoulder’ (K); Waropen *awaro* ‘carry on the shoulder’ (ACD); Yerisiam *áarí* ‘carry on shoulder’ (K) [?]

Other: Irarutu *fəravo* ‘shoulder’ (ABVD) [metathesis?]; Kowiai *fafalan* ‘shoulder’ (ABVD); Sekar *barar* ‘shoulder’ (ABVD)

PAN ****qabu$_1$*** ‘ash, cinder, powder’ (ACD); PMP ****qabu*** ‘ash’ (Blust 1999); PMP ****qabu$_2$*** ‘ash, hearth, cinder, powder, dust; gray’ (ACD); PCEMP ****qabu*** ‘ash’ (Blust 1993)

SH: Buli *gigiáp* ‘ash’ (ABVD) [?]; Gane *tapin* ‘ash’ (ABVD) [??]; Gane *yipyáp* ‘dust’ (ABVD); Sawai *gɛyap* ‘ashes’ (CAD); Taba *yapyap* ‘dust’ (ABVD); Taba *yapyap* ‘ash’ (ABVD)

RA: Ambel *lagalap* ‘ashes’ (R); As *yap-apin* ‘ash’ (ABVD); Biga *ka^{l}lap* ‘ashes’ (R); Fiawat *alap* ‘ashes’ (R); Gebe *bayap* ‘dust’ (ABVD); Gebe *bayap* ‘ash’ (ABVD); Laganyan *ga^{l}lap* ‘ashes’ (R); Ma^{l}ya (M.) *ga^{l}la^{12}p* ‘ashes’ (R); Ma^{l}ya (S.) *ga^{l}la^{12}p* ‘ashes’ (R); Wauyai *ga^{l}lap* ‘ashes’ (R)

CB: Ansus *wawu* ‘ashes’ (P&D); Moor *áha* ‘ashes’ (K) [??]; Serui-Laut *wabu* ‘ash’ (Slm); Serui-Laut *wawu* ‘ash’ (ACD); Umar *au* ‘ashes’ (K); Wandamen *wabu* ‘dust’ (ABVD); Wandamen *wabu* ‘ash’ (ABVD) [?]; Waropen *awu* ‘hearth, ash’ (ACD)

Mamberamo: Warembori *aivu-ro* ‘Ashes’ (Donohue 1999)

Other: Arguni *avuvune* ‘dust’ (ABVD); Arguni *avune* ‘ash’ (ABVD); Irarutu *ɔbə* ‘smoke’ (ABVD); Irarutu *ɔbə* ‘dust’ (ABVD); Kowiai *abuba* ‘dust’ (ABVD); Sekar *afiruk* ‘ash’ (ABVD) [?]; Sekar *afruk* ‘dust’ (ABVD) [?]

PAN ****qaCay*** ‘liver’ (ACD); PMP ****qatay*** ‘liver’ (Blust 1999); PCEMP ****qatay*** ‘liver’ (Blust 1993)

SH: Buli *yatay* ‘liver’ (ACD); Gane *yocu* ‘liver’ (ABVD); Sawai *yɔtɛy* ‘liver’ (CAD); Taba *yoco* ‘heart’

RA: Ambel *latey* ‘liver’ (R); Gebe *atai* ‘liver’ (ABVD); Kawe *la^{l}te(y)* ‘liver’ (R); Laganyan *^{l}lati* ‘liver’ (R); Matbat *ta^{21}y* ‘liver’ (R); Ma^{l}ya (M.) *^{l}lati^{12}* ‘liver’ (R); Ma^{l}ya (S.) *^{l}lati^{3}* ‘liver’ (R)

CB: Ambai *anteni* ‘liver’ (ABVD); Biak *kèn* ‘liver’ (H); Kurudu *ate* ‘liver’ (ACD); Moor *à’a* ‘liver’ (K); Moor *siné a’ára* ‘liver’ (K); Wandamen *ateni* ‘liver’ (ABVD); Yerisiam *ákéènà* ‘liver’ (K)

Other: Arguni *atane* ‘liver’ (ABVD); Irarutu *-te* ‘liver’ (ABVD) [?]; Kowiai *lata* ‘liver’ (ACD); Sekar *yata-n* ‘liver’ (ABVD)

PMP ****qalejaw*** ‘day’ (Blust 1999); PCEMP ****qaləjaw*** ‘day’ (Blust 1993)

CB: Moor *oro’á* ‘sun’ (K); Yerisiam *óòrà* ‘sun’ (K)

Mamberamo: Warembori *oro-ro* ‘Sun’ (Donohue 1999)

Other: Kowiai *óra* ‘day’ (ABVD)

PAN ****qalu-Sipan*** ‘centipede’ (ACD); PCEMP ****qalipan*** ‘centipede’ (ACD)

SH: Buli *lif-lifaŋ* ‘centipede’ (ACD); Sawai *lɛlifɛn* ‘centipede’ (CAD)

PAN ****qaNiŋu*** ‘’ shadow, reflection’ (ACD); PMP ****qaninu*** ‘shadow, reflection’ (ACD); PMP ****qaninu, qaninuŋ*** ‘reflect, reflection’ (ACD); PMP ****qanunu$_1$*** ‘shadow’ (ACD)

CB: Ambai *nuaninu* ‘shadow’ (Slz); Biak *nin* ‘ghost, shadow’ (H); Biak *ninima(n)* ‘ghost, shadow’ (H); Moor *anìno* ‘shadow’ (K); Yaur *núndìe* ‘shadow’ (K); Yerisiam *ánúunúgùa* ‘shadow’ (K) [?]

PAN ***qapuR*** ‘lime, calcium’ (ACD)

SH: Buli *yafi* ‘lime, calcium’ (ACD)

RA: Ambel *ahar* ‘lime (for betel)’ (R)

CB: Biak *afĕr* ‘lime, calcium’ (H); Dusner *aper* ‘lime’ (ACD); Moor *ára* ‘lime’ (K); Umar *au* ‘lime’ (K); Yerisiam *áau* ‘lime’ (K)

PMP ***qasawa*** ‘wife’ (Blust 1999); PMP ***qasawa*** ‘husband’ (Blust 1999); PCEMP ***qasawa*** ‘wife’ (Blust 1993); PCEMP ***qasawa*** ‘husband’ (Blust 1993)

CB: Ansus *awani* ‘husband’ (P&D); Biak *swa-* ‘spouse’ (H); Wandamen *sawa* ‘husband (or ’man’?)’ (ACD); Wandamen *sawan* ‘husband’ (G)

Other: Kowiai *soa* ‘spouse’ (ACD); Kowiai *sóa mafíne* ‘wife’ (ABVD); Kowiai *sóa muáne* ‘husband’ (ABVD); Sekar *isawa-n* ‘husband’ (ABVD); Sekar *isawa-n* ‘wife’ (ABVD)

PAN ***qasiN*** ‘saltiness, salty taste’ (ACD); PMP ***ma-qasin*** ‘salty’ (ACD); PCEMP ***maqasin*** ‘salty, brackish’ (ACD)

SH: Gane *myasing* ‘salt’ (ABVD); Taba *yasin* ‘salt’ (ABVD)

RA: As *masin* ‘sea’ (ABVD); Biga *lesen* ‘salt’ (ABVD); Maˈya (S.) *ˈlisi³n* ‘salt’ (R)

CB: Ambai *ai* ‘salt’ (Slz); Ansus *ai* ‘salt’ (P&D); Biak *màsĕn* ‘salt; saltwater, sea’ (H); Dusner *masen* ‘seawater’ (D&M); Serui-Laut *sai* ‘seawater’ (Slm); Wandamen *sasi* ‘salt’ (G) [?]; Wandamen *sasi-tarai* ‘salt’ (ABVD) [?]

PAN ***qasiRa*** ‘salt’ (ACD); PMP ***qasiRa*** ‘salt’ (Blust 1999); PCEMP ***qasiRa*** ‘salt’ (Blust 1993)

Other: Arguni *sirer* ‘salt’ (ABVD); Kowiai *sira* ‘salt’ (ACD); Sekar *sira* ‘salt’ (ABVD)

PMP ***qasu*** ‘smoke’ (Blust 1999); PMP ***qasu₃*** ‘smoke, fumes, steam; to smoke (as a fire)’ (ACD); PCEMP ***qasu*** ‘smoke’ (Blust 1993)

SH: Buli *mamayás* ‘smoke’ (ABVD); Gane *nyas* ‘smoke’ (ABVD); Sawai *mɛyas* ‘smoke’ (CAD); Taba *yaso* ‘smoke’ (ABVD)

RA: As *kapyas* ‘smoke’ (ABVD); Biga *kaˈplas* ‘smoke’ (R); Biga *kaplasɔ* ‘smoke’ (ABVD); Gebe *mayas* ‘smoke’ (ABVD); Maˈya (M.) *ˈla¹²s* ‘smoke’ (R); Maˈya (S.) *ˈla¹²s* ‘smoke’ (R)

CB: Biak *ās* ‘to smoke (of a fire)’ (H); Waropen *asi* ‘smoke, fumes, steam’ (ACD); Waropen *[awu]asi* ‘smoke’ (ABVD); Yerisiam *ógwáahúgùa* ‘smoke’ (K)

Mamberamo: Warembori *kati-ro* ‘Smoke’ (Donohue 1999)

Other: Arguni *evas* ‘smoke’ (ABVD); Sekar *masi* ‘smoke’ (ABVD)

PMP ***qateluR*** ‘egg’ (Blust 1999); PMP ***qiteluR*** ‘egg’ (Blust 1999); PCEMP ***qatəluR*** ‘egg’ (Blust 1993)

SH: Buli *tāl* ‘egg’ (ABVD); Buli *tolo* ‘egg’ (ACD); Gane *toli* ‘egg’ (ABVD); Taba *tolo* ‘egg’ (ABVD)

RA: Ambel *talo* ‘egg’ (R); As *talɔ* ‘egg’ (ABVD); Biga *toˈlo* ‘egg’ (R); Fiawat *tol* ‘egg’ (R); Kawe *ˈtol[o]* ‘egg’ (R); Laganyan *ˈtol[o]* ‘egg’ (R); Matbat *to²¹l* ‘egg’ (R); Maˈya (M.) *ˈtol(o)* ‘egg’ (R); Maˈya (M.) *ˈtolo¹²* ‘egg’ (R); Maˈya (S.) *ˈto¹²l* ‘egg’ (R); Wauyai *ˈtol[o]* ‘egg’ (R)

CB: Umar *tor* ‘egg’ (K); Yaur *òó’rè* ‘egg’ (K); Yerisiam *ákóoré* ‘egg’ (K)

Other: Irarutu *təru* ‘egg’ (ABVD); Irarutu *trú* ‘egg’ (M); Kowiai *tóron* ‘egg’ (ABVD)

PMP ***qatep*** ‘thatch’ (Blust 1999)

SH: Buli *fa-yatf-o* ‘cover with thatch’ (ACD); Buli *yataf* ‘thatch; roof’ (ACD); Gane *yotaf* ‘thatch/roof’ (ABVD); Sawai *yɔtɛf* ‘roof’ (CAD)

RA: Gebe *yataf* ‘thatch/roof’ (ABVD)

CB: Ambai *antarau* ‘thatch/roof’ (ABVD); Ambai *antaraun* ‘roof’ (Slz); Moor *rà’a* ‘roof’ (K); Serui-Laut *ratarau* ‘roof’ (Slm); Waropen *aka* ‘thatch’ (ACD); Yerisiam *ákáráaníà* ‘roof’ (K)

Other: Irarutu *atífro* ‘roof’ (M); Irarutu *ativrɔ* ‘thatch/roof’ (ABVD)

PMP ***qatimun*** ‘cucumber: *Cucumis sativa L.*’ (ACD)

SH: Buli *ti-timin* ‘kind of cucumber’ (ACD)

CB: Dusner *tinem* ‘gherkin’ (ACD)

Other: Kowiai *atumin* ‘melon, watermelon’ (ACD)

PAN ****qayam$_1$*** ‘bird’ (ACD); PMP ****qayam*** ‘bird’ (Blust 1999)

CB: Ansus *aya* ‘bird’ (P&D); Serui-Laut *aya* ‘bird’ (Slm); Wandamen *aya* ‘bird’ (G)

PEMP ****qayawan*** ‘banyan, strangler fig’ (ACD)

SH: Buli *yawan* ‘banyan tree’ (ACD); Sawai *ay yɔwɛn* ‘banyan’ (CAD)

PAN ****qenay*** ‘sand’ (ACD); PMP ****qenay*** ‘sand’ (Blust 1999); PCEMP ****qənay*** ‘sand’ (Blust 1993)

RA: As *in* ‘sand’ (ABVD) [?]

CB: Biak *kayĕn* ‘white sand’ (H); Biak *yèn* ‘white sandy beach’ (H); Moor *áena* ‘sand’ (K)

Other: Arguni *ain* ‘sand’ (ABVD); Kowiai *ena* ‘sand’ (ACD)

PMP ****qe(n)sem*** ‘sour’ (ACD)

CB: Ambai *sisasa* ‘sour’ (Slz); Serui-Laut *sisaa* ‘sour’ (Slm)

PAN ****qinep*** ‘lie down to sleep’ (ACD); PMP ****qinep*** ‘lie down’ (Blust 1999); PCEMP ****qenəp*** ‘lie down to sleep’ (ACD); PCEMP ****qenəp*** ‘lie down’ (Blust 1993); PCEMP ****qinəp*** ‘lie down’ (Blust 1993)

SH: Sawai *n-yɛnɛf* ‘to sleep’ (CAD)

RA: Ambel *l-ane* ‘sleep’ (R); As *-nɛ-k* ‘to sleep’ (ABVD); Biga *-enef* ‘to sleep’ (ABVD); Biga *l-eˈnef* ‘sleep’ (R); Fiawat *l-ene* ‘sleep’ (R); Gebe *yenɛf* ‘to lie down’ (ABVD); Gebe *yenɛf* ‘to sleep’ (ABVD); Kawe *ˈw-eˈnef* ‘sleep’ (R); Laganyan *ˈw-enef* ‘sleep’ (R); Matbat *n-e^{41}n* ‘sleep’ (R); Maˈya (M.) *ˈw-ene^{12}f* ‘sleep’ (R); Maˈya (S.) *ˈw-ene^{3}f* ‘sleep’ (R); Wauyai *ˈw-enef* ‘sleep’ (R)

CB: Ambai *ena* ‘sleep’ (Slz); Ambai *i-ena* ‘to sleep’ (ABVD); Ansus *ena* ‘sleep’ (P&D); Biak *enĕf* ‘to sleep’ (H); Dusner *enep* ‘sleep’ (D&M); Moor *enâ* ‘lie’ (K); Serui-Laut *ena* ‘to sleep’ (Slm); Umar *ne* ‘sleep’ (K); Wandamen *ena* ‘sleep’ (G); Waropen *ena-ko* ‘sleep’ (ACD); Yerisiam *éené* ‘lie’ (K)

Mamberamo: Warembori *nan-do* ‘Sleep’ (Donohue 1999); Yoke *na* ‘sleep’ (Donohue 1999)

Other: Arguni *-re?enef* ‘to sleep’ (ABVD); Irarutu *gínə* ‘to sleep’ (M); Irarutu *gin gerevivare-* ‘to lie down’ (ABVD) [?]; Kowiai *ena-n* ‘sleep, lie down’ (ACD)

PAN ****quay*** ‘rattan, *Calamus* sp.’ (ACD)

Other: Irarutu *ú* ‘rattan’ (M); Kowiai *ua* ‘rattan’ (ACD)

PMP ***qubi*** 'yam: *Dioscorea alata Linn.*' (ACD)

SH: Buli *up* 'kind of tuber' (ACD)

CB: Ambai *uvi* 'yam' (Slz); Wandamen *uwi* 'sweet potato ; yam' (G); Waropen *uwi* 'tuberous plant, yam' (ACD)

Other: Kowiai *uf* 'wild roots' (ACD)

PAN ***qudaŋ*** 'shrimp, crayfish, lobster' (ACD)

SH: Buli *ulaŋ* 'shrimp' (ACD)

CB: Umar *ure* 'shrimp' (K); Yerisiam *úuráà* 'shrimp' (K)

PAN ***qulej₁*** 'type of small worm' (ACD); PMP ***qulej₂*** 'maggot, caterpillar, larva of a metamorphosing insect' (ACD)

CB: Biak *urò* 'caterpillar, seaworm' (H); Moor *óra* 'snake' (K)

PAN ***qulu₁*** 'head' (ACD); PMP ***qulu*** 'head' (Blust 1999); PMP ***qulu₂*** 'head; top part; leader, chief; headwaters; handle of a bladed implement; prow of a boat; first, first-born' (ACD); PMP ***qulu-an*** 'head-end, upper part' (ACD); PCEMP ***qulu*** 'head' (Blust 1993); PCEMP ***qulu₃*** 'head; top part; leader, chief; headwaters; handle of a bladed implement; prow of a boat; first, first-born; hair of the head' (ACD)

SH: Buli *olo-an* 'village head; owner of something' (ACD); Buli *ulu* 'beginning, origin' (ACD); Buli *waya ulu* 'source of a river' (ACD)

Other: Kowiai *ur* 'handle' (ACD); Sekar *uni-n* 'head' (ABVD)

PAN ***qumah*** 'swidden, work a swidden' (ACD); PMP ***quma*** 'work (in garden)' (Blust 1999); PCEMP ***quma*** 'work (in garden)' (Blust 1993)

CB: Yerisiam *ùmá* 'do' (K)

Other: Kowiai *um* 'garden, plot' (ACD)

PAN ***quSeNap*** 'fish scale' (ACD); PCEMP ***qunap₁*** 'scale of fish, turtle shell' (ACD); PCEMP ***qunep*** '" > scales of fish or snake' (ACD)

SH: Buli *unaf* 'to scale fish' (ACD); Buli *un-unaf* 'scales of a fish' (ACD); Sawai *wɛn-wunɛf* 'fishscale' (CAD)

CB: Ambai *ne-una* 'scales' (Slz); Biak *unèf* 'fish scale' (H)

PMP ***qutan*** 'small, wild herbaceous plants; scrub-land, bush' (ACD)

SH: Taba *uat* 'woods/forest' (ABVD)

CB: Wandamen *uta[n]* 'woods/forest' (ABVD)

PAN ***qutiN*** 'penis' (ACD); PMP ***qutin*** 'penis' (ACD)

SH: Sawai *fsi* 'penis' (CAD)

CB: Ambai *i-* 'penis' (Slz); Biak *si-* 'penis' (H); Moor *ùsi* 'penis' (K)

Other: Kowiai *ut* 'penis' (ACD)

PAN ***RabuC*** 'uproot, pull out by the roots' (ACD)

CB: Ambai *rabi(t)* 'pull' (Slz); Serui-Laut *rabiti* 'to pull' (Slm)

PMP ***Rambia*** 'sago palm' (ACD)

RA: Ambel *bey* ‘sago tree’ (R); Biga *bi* ‘sago tree’ (R); Fiawat *bi* ‘sago tree’ (R); Kawe *bi* ‘sago tree’ (R); Laganyan ˈ*bi³* ‘sago tree’ (R); Maˈya (M.) ˈ*bi³* ‘sago tree’ (R); Maˈya (S.) ˈ*bi³* ‘sago tree’ (R)

CB: Umar *abi* ‘sago’ (K); Umar *biae* ‘small sago ribs’ (K); Wandamen *abis* ‘sago grub’ (G); Waropen *fi* ‘sago, baked sago’ (Held 1942); Yerisiam *pí* ‘sago palm’ (K)

PAN ****Rames*** ‘squeeze, knead’ (ACD); PMP ****Rames*** ‘squeeze’ (Blust 1999); PCEMP ****Ramәs*** ‘squeeze’ (Blust 1993)

SH: Buli *amas* ‘sift, squeeze out or wash sago’ (ACD)

CB: Ambai *rami* ‘squeeze’ (Slz); Ansus *rami* ‘rinse_(sago)’ (P&D); Ansus *rang* ‘rinse, rub’ (P&D); Biak *òmĕs* ‘to squeeze’ (H); Biak *ramĕs* ‘press out with both hands’ (H); Dusner *ramas* ‘press’ (D&M); Moor *amatà* ‘squeeze’ (K) [?]; Umar *rman* ‘squeeze’ (K)

PMP ****Rebek*** ‘to fly’ (Blust 1999); PCEMP ****Rəbək*** ‘to fly’ (Blust 1993)

SH: Buli *opa* ‘to fly’ (ACD); Gane *opa* ‘to fly’ (ABVD); Sawai *n-opɛ* ‘to fly’ (CAD); Taba *-opa* ‘to fly’ (ABVD)

RA: Ambel *l-apo* ‘fly (v.)’ (R); As *napɔ* ‘to fly’ (ABVD) [?]; Biga *l-o*ˈ*bo* ‘fly (v.)’ (R); Biga *-obo* ‘to fly’ (ABVD); Fiawat *l-op* ‘fly (v.)’ (R); Gebe *-opo* ‘to fly’ (ABVD); Kawe ˈ*w-op[o]* ‘fly (v.)’ (R); Laganyan ˈ*w-op[o]* ‘fly (v.)’ (R); Maˈya (M.) ˈ*w-opo¹²* ‘fly (v.)’ (R); Maˈya (S.) ˈ*w-opo³* ‘fly (v.)’ (R); Wauyai ˈ*w-op[o]* ‘fly (v.)’ (R)

CB: Biak *ròb* ‘to fly’ (H); Waropen *roko* ‘to fly’ (ABVD) [?]; Waropen *rorako* ‘to fly’ (ABVD) [?]

Mamberamo: Warembori *dove* ‘Fly’ (Donohue 1999)

PAN ****Rumaq*** ‘house’ (ACD); PMP ****Rumaq*** ‘house’ (Blust 1999); PCEMP ****Rumaq*** ‘house’ (Blust 1993)

SH: Gane *um* ‘house’ (ABVD); Sawai *um* ‘house’ (CAD)

RA: Biga *um* ‘house’ (R); Biga *[w]um* ‘house’ (ABVD); Gebe *um* ‘house’ (ABVD); Kawe *um* ‘house’ (R); Laganyan *wum* ‘house’ (R); Maˈya (M.) ˈ*u³m* ‘house’ (R); Maˈya (S.) ˈ*u³m* ‘house’ (R); Wauyai *wum* ‘house’ (R)

CB: Biak *rum* ‘house’ (H); Dusner *rum* ‘house’ (D&M); Moor *rùma* ‘house’ (K); Umar *ron* ‘house’ (K); Waropen *ruma* ‘house; shop; branch of a family’ (ACD); Yaur *rúùgré* ‘ceremonial house’ (K); Yerisiam *rúmà* ‘ceremonial house’ (K)

Other: Arguni *rume* ‘house’ (ABVD); Sekar *ruma* ‘house’ (ABVD)

PAN ****RuqaNay*** ‘male’ (ACD); PMP ****ma-Ruqanay*** ‘male/man’ (Blust 1999); PCEMP ****ma-Ruqanay*** ‘male/man’ (Blust 1993)

SH: Buli *mān* ‘man/male’ (ABVD); Gane *maón* ‘man/male’ (ABVD); Sawai *mɔn* ‘male’ (CAD); Taba *mon* ‘husband’ (ABVD); Taba *mon* ‘man/male’ (ABVD)

RA: Ambel *man* ‘man’ (R); As *-man* ‘husband’ (ABVD); As *-man* ‘father’ (ABVD); As *-man* ‘man/male’ (ABVD); Biga *wa*ˈ*man* ‘man’ (R); Fiawat *man* ‘man’ (R); Gebe *man* ‘man/male’ (ABVD); Gebe *man* ‘husband’ (ABVD); Kawe ˈ*man[a]* ‘man’ (R); Laganyan ˈ*man[a]* ‘man’ (R); Matbat *wa³yma²¹n* ‘man’ (R); Maˈya (M.) ˈ*ma¹²n* ‘man’ (R); Maˈya (S.) ˈ*ma¹²n* ‘man’ (R); Wauyai ˈ*man[a]* ‘man’ (R)

CB: Ambai *man* ‘man/male’ (Slz); Ambai *muaŋ* ‘man/male’ (ABVD); Ambai *muaŋ* ‘husband’ (ABVD); Ambai *ne-man* ‘husband’ (Slz); Ansus *muang* ‘man’ (P&D); Biak *man* ‘man/male’ (H); Dusner *snoman* ‘male’ (D&M); Moor *vurána* ‘man’ (K); Serui-Laut *man* ‘male’ (Slm); Umar *mambo* ‘husband’ (K); Umar *noman* ‘man’ (K); Wandamen *mua* ‘man ; male’ (G); Wandamen *mua[n]* ‘man/male’ (ABVD); Waropen *mano* ‘husband’ (ABVD); Waropen *mano* ‘man/male’ (ABVD); Yaur *jòmàgré* ‘man’ (K); Yerisiam *híomáané* ‘husband’ (K); Yerisiam *máànà* ‘man’ (K)

Mamberamo: Warembori *man-do* ‘Man’ (Donohue 1999); Yoke *mamb-* ‘man’ (Donohue 1999)

Other: Arguni *[i]maran* ‘husband’ (ABVD); Arguni *mañañane* ‘man/male’ (ABVD); Irarutu *mərane* ‘man/male’ (ABVD); Irarutu *mərane* ‘husband’ (ABVD); Kowiai *mu[ruˌ]ána* ‘man/male’ (ABVD); Sekar *murarara* ‘man/male’ (ABVD)

PAN ***SabaRat*** ‘south wind (?)’ (ACD); PMP ***habaRat*** ‘south’ (ACD)

SH: Buli *pāt* ‘west, west wind’ (ACD)

CB: Biak *bărĕk* ‘west’ (H); Biak *wām-barek* ‘west wind, west monsoon’ (H)

PAN ***SadiRi*** ‘house’ (ACD)

SH: Buli *li* ‘post, pillar, corner post’ (ACD); Buli *li pupuŋ-an* ‘main post, center post’ (ACD)

CB: Ambai *diri* ‘post’ (Slz); Ansus *riri* ‘pole’ (P&D); Ansus *riri amang* ‘short house post’ (P&D); Ansus *riri au* ‘long house post’ (P&D); Biak *rir* ‘post, pile, pillar’ (H); Serui-Laut *iri* ‘post’ (Slm); Umar *ae dri* ‘wood post’ (K); Waropen *ri* ‘pile, post under a house’ (ACD)

PAN ***sakay*** ‘walk’ (ACD); PMP ***sakay*** ‘climb’ (Blust 1999); PCEMP ***sakay*** ‘climb’ (Blust 1993)

SH: Gane *sapák* ‘to climb’ (ABVD)

RA: Biga *-sa* ‘to climb’ (ABVD); Gebe *-sa* ‘to climb’ (ABVD); Laganyan ˈ*sak* ‘to make a step’ (R); Maˈya (M.) ˈ*sak* ‘to make a step’ (R); Maˈya (S.) ˈ*sak* ‘to make a step’ (R)

CB: Wandamen *sa* ‘climb’ (G)

Other: Kowiai *-sa’a* ‘to climb’ (ABVD); Sekar *sa* ‘to climb’ (ABVD)

PMP ***salaq*** ‘wrong, in error (of behavior); miss (a target); mistake, error, fault’ (ACD)

RA: Maˈya (M.) ˈ*sa*^{3}*l* ‘wrong, error’ (R); Maˈya (S.) ˈ*sa*^{3}*l* ‘error’ (R)

CB: Ambai *sarawai* ‘wrong’ (Slz); Wandamen *sasara* ‘err; make a mistake; wrong’ (G)

PCEMP ***saŋan*** ‘branch’ (Blust 1993)

SH: Sawai *sɛŋsɔŋ* ‘branch’ (CAD)

Other: Kowiai *sang ai* ‘branch’ (ABVD); Sekar *saga-n* ‘branch’ (ABVD)

PAN ***Sapuy*** ‘fire’ (ACD); PMP ***hapuy*** ‘fire’ (Blust 1999); PCEMP ***hapuy*** ‘fire’ (Blust 1993); PEMP ***api***$_{1}$ ‘fire’ (ACD)

SH: Buli *yap* ‘fire’ (ACD)

RA: Ambel *lap* ‘fire’ (R); As *yap* ‘fire’ (ABVD); Biga *lap* ‘fire’ (R); Fiawat *lap* ‘fire’ (R); Gebe *yap* ‘fire’ (ABVD); Kawe *lap* ‘fire’ (R); Laganyan *lap* ‘fire’ (R); Matbat *ya*^{3}*p* ‘fire’ (R); Maˈya (M.) ˈ*la*^{12}*p* ‘fire’ (R); Maˈya (S.) ˈ*la*^{12}*p* ‘fire’ (R); Wauyai *lap* ‘fire’ (R)

CB: Yerisiam *jáai* ‘fire’ (K)

Other: Arguni *yaf* ‘fire’ (ACD); Kowiai *laf* ‘fire’ (ABVD); Sekar *yafi* ‘fire’ (ABVD)

PAN ***Sasaq*** 'whet, sharpen' (ACD); PMP ***hasaq*** 'whet, sharpen' (ACD); PEMP ***asaq*** 'sharpen, rub, grate' (ACD)

CB: Ansus *asasumi* 'sharpen_(with_wood)' (P&D); Biak *yās* 'whet, sharpen' (H); Serui-Laut *aa* 'sharpen' (Slm); Yerisiam *áhà* 'sharpen' (K)

PAN ***Sepat*** 'four' (ACD); PMP ***epat*** 'four' (Blust 1999); PCEMP ***pati*** 'four' (Blust 1993); PCEMP ***(ə)pat*** 'four' (Blust 1993); PEMP ***pat*** 'four' (ACD)

SH: Buli *fat* 'four' (ACD); Buli *[si] fat* 'Four' (ABVD); Gane *pfot* 'Four' (ABVD); Sawai *pɛ-fɔt* 'four' (CAD); Taba *-hot* 'four'; Taba *p-hot* 'Four' (ABVD)

RA: Ambel *ɸat* 'four' (R); As *fat* 'Four' (ABVD); Biga *fat* 'four' (R); Fiawat *fat* 'four' (R); Gebe *pi-fat* 'Four' (ABVD); Kawe *fat* 'four' (R); Laganyan *fat* 'four' (R); Matbat *fa³t* 'four' (R); Maˡya (M.) *ˡfa¹²t* 'four' (R); Maˡya (S.) *ˡfa¹²t* 'four' (R); Wauyai *fat* 'four' (R)

CB: Ambai *bo-a* 'Four' (ABVD); Biak *fiàk* 'four' (H); Dusner *ata* 'four' (D&M); Dusner *pati* 'four' (D&M); Marau *ati* 'four' (ACD); Moor *á'ó* 'four' (K); Serui-Laut *boa* 'four' (Slm); Umar *eat* 'four' (K); Wandamen *ate* 'four' (G); Waropen *ako* 'Four' (ABVD); Yaur *ríahè* 'four' (K); Yerisiam *áakà* 'four' (K)

Other: Arguni *fat* 'four' (ACD); Kowiai *fat* 'four' (ACD); Sekar *fat* 'Four' (ABVD)

PAN ***sepsep*** 'sip, suck' (ACD); PAN ***supsup*** 'sip, suck' (ACD); PMP ***sepsep*** 'suck' (Blust 1999); PCEMP ***səsəp*** 'suck' (Blust 1993)

SH: Buli *sus* 'to suck' (ABVD)

CB: Ambai *i-sufi* 'to suck' (ABVD); Ambai *su(f)* 'suck' (Slz); Biak *syòsěf* 'to suck' (H)

Other: Arguni *sus* 'to suck' (ABVD); Sekar *susi* 'to suck' (ABVD)

PAN ***Seyaq*** 'shyness, embarrassment; shame' (ACD); PMP ***ma-hiaq*** 'shy; ashamed' (Blust 1999); PCEMP ***mayaq*** 'shy; ashamed' (Blust 1993)

SH: Buli *mai* 'ashamed; shame, disgrace' (ACD); Gane *moi* 'shy, ashamed' (ABVD)

RA: Maˡya (S.) -*ˡma³* 'to be ashamed' (R)

CB: Biak *ma* 'ashamed, embarrassed' (H); Serui-Laut *mamaya* 'ashamed' (Slm); Umar *mae* 'ashamed' (K); Wandamen *mamaya* 'shy, ashamed' (ABVD); Yerisiam *mái* 'ashamed' (K)

Other: Kowiai *-mála* 'shy, ashamed' (ABVD); Kowiai *ma-mala* 'shy, ashamed' (ACD)

PMP ***sida*** '3P NOM1' (Ross 2006); PMP ***si-ida*** 'they' (Blust 1999); PCEMP ***sida*** 'they' (Blust 1993)

SH: Buli *sil(e)* 'they, them' (ACD); Gane *si* 'they' (ABVD); Sawai *si* 'they' (CAD); Taba *si* 'they' (ABVD)

RA: As *sia* 'they' (ABVD); As *sire* 'they' (ABVD); Gebe *sia* 'they' (ABVD); Kawe ˡ*si(a)* 'they' (R); Laganyan ˡ*hia* 'they' (R); Maˡya (M.) ˡ*sia* 'they' (R); Maˡya (S.) ˡ*sia* 'they' (R)

CB: Ambai *ea* 'they (pl.)' (Slz); Ansus *ya* 'they' (P&D); Biak *si* 'they' (H); Dusner *si* 'PRO.3PL' (D&M); Dusner *si-* '3PL' (D&M); Dusner *si-* '3PL' (D&M); Moor *-ti* '3pl' (K); Moor *-ti* 'pl' (K); Moor *ti-* '3pl' (K); Moor *ti'ó* '3pl' (K); Serui-Laut *sa* 'they' (Slm); Umar *-hi* '3pl' (K); Umar *-hiem* '3pl' (K); Umar *ih-* '3pl' (K); Umar *ihi* '3pl' (K); Wandamen *sia(te)* 'they ; 3pl pronoun' (G); Wandamen *si[at]* 'they' (ABVD); Waropen *ki* 'they' (ABVD); Yaur *éhè* '3pl' (K); Yaur *-he* 'Pl' (K); Yaur *óhè* '3pl' (K); Yerisiam *-he* 'Pl' (K); Yerisiam *ih-* '3pl' (K); Yerisiam *ínífihí* '3pl' (K)

Mamberamo: Warembori *ti* 'They' (Donohue 1999)

Other: Arguni *sire* ‘they’ (ABVD); Irarutu *írə* ‘they’ (M); Kowiai *si* ‘they’ (ABVD); Sekar *sina* ‘they’ (ABVD)

PAN ***Sikan*** ‘fish’ (ACD); PMP ***hikan*** ‘fish’ (Blust 1999); PCEMP ***hikan*** ‘fish’ (Blust 1993); PEMP ***ikan*** ‘fish’ (ACD)

SH: Buli *ian* ‘fish’ (ACD); Gane *ian* ‘fish’ (ABVD); Sawai *in* ‘fish’ (CAD)

RA: Ambel *dun* ‘fish’ (R); As *dun* ‘fish’ (ABVD); Biga *don* ‘fish’ (R); Gebe *in* ‘fish’ (ABVD); Kawe ˈ*in[i]* ‘fish’ (R); Laganyan *dun* ‘fish’ (R); Matbat *yi*^{1}*n* ‘fish’ (R); Maˈya (M.) ˈ*i*^{12}*n* ‘fish’ (R); Maˈya (S.) ˈ*do*^{3}*n* ‘fish’ (R); Wauyai *dun* ‘fish’ (R)

CB: Ambai *dia* ‘fish’ (ABVD); Ambai *dian* ‘fish (n.)’ (Slz); Ansus *diang* ‘fish’ (P&D); Biak *in* ‘fish’ (H); Dusner *in* ‘fish’ (D&M); Moor *ìjana* ‘fish’ (K); Serui-Laut *dian* ‘fish’ (Slm); Wandamen *dia* ‘fish’ (G); Wandamen *dia[n]* ‘fish’ (ABVD); Yerisiam *dĩijánà* ‘fish’ (K)

Other: Kowiai *don* ‘fish’ (ABVD)

PMP ***siwa*** ‘nine’

SH: Taba *-sio* ‘nine’

CB: Waropen *sighiro* ‘Nine’ (ABVD)

PEMP ***suda*** ‘comb’ (Blust 1978); PEMP ***sura*** ‘comb’ (ACD)

CB: Ambai *su* ‘comb (v.)’ (Slz); Moor *isúra* ‘comb’ (K); Umar *hurtu* ‘comb’ (K); Waropen *sura* ‘comb’ (ACD)

PAN ***SuRas*** ‘wash body parts, cooking or eating utensils (but not clothes)’ (ACD); PEMP ***uRas*** ‘wash body parts, cooking or eating utensils (but not clothes)’ (ACD)

SH: Buli *uas* ‘wash oneself, wash the face, dishes, pans, etc.’ (ACD); Sawai *n-ɛus* ‘to wash’ (CAD)

PAN ***susu***$_{1}$ ‘female breast; udder’ (ACD); PMP ***susu*** ‘breast’ (Blust 1999); PCEMP ***susu*** ‘breast’ (Blust 1993)

SH: Buli *fa-sus* ‘to nurse, give the breast to’ (ACD); Buli *sus* ‘breast, udder, mammary gland; to suck’ (ACD); Gane *susu* ‘breast’ (ABVD); Sawai *sus* ‘breast’ (CAD); Taba *susu* ‘breast’ (ABVD)

RA: Ambel *su* ‘breast’ (R); As *sus* ‘breast’ (ABVD); Biga *sus* ‘breast’ (R); Fiawat *suh* ‘breast’ (R); Gebe *sus* ‘breast’ (ABVD); Kawe *su* ‘breast’ (R); Laganyan ˈ*tut[u]* ‘breast’ (R) [?]; Matbat *su*^{3} ‘breast’ (R); Maˈya (M.) ˈ*su*^{3}*s* ‘breast’ (R); Maˈya (S.) ˈ*su*^{3}*s* ‘breast’ (R); Wauyai *su* ‘breast’ (R)

CB: Ambai *ui* ‘breast’ (Slz); Ansus *u* ‘breast’ (P&D); Biak *sus* ‘milk; breast’ (H); Moor *túta* ‘breast’ (K); Serui-Laut *su* ‘breast’ (Slm); Umar *huhu* ‘breast’ (K); Wandamen *susu* ‘breast’ (ABVD); Waropen *susi* ‘female breast; suckling’ (ACD); Yaur *húhìe* ‘breast’ (K); Yerisiam *húuhúgùa* ‘breast’ (K)

Mamberamo: Warembori *ke-tutu-ro* ‘Breast’ (Donohue 1999)

Other: Arguni *sus* ‘breast’ (ABVD); Irarutu *-susu* ‘breast’ (ABVD); Kowiai *sus* ‘female breast’ (ACD); Sekar *susi* ‘breast’ (ABVD)

PCMP ***ta*** ‘negative marker: no, not’ (ACD)

SH: Gane *tes* ‘no, not’ (ABVD); Gane *tesin* ‘no, not’ (ABVD); Taba *te* ‘no, not’ (ABVD)

CB: Dusner *te* ‘Ques’ (D&M); Wandamen *te* ‘question particle; right? ; eh?’ (G)

Other: Kowiai *tei* ‘no, not’ (ABVD); Sekar *-ta* ‘no, not’ (ABVD)

PMP ***tabuRi*** ‘conch shell trumpet’ (ACD); PMP ***tabuRiq*** ‘conch shell trumpet’ (ACD)

CB: Ambai *tabura* ‘conch’ (Slz); Biak *kubur* ‘triton/conch shell’ (H); Moor *avùra* ‘shellfish sp.’ (K); Wandamen *tabura* ‘conch’ (G)

PMP ***taliŋa*** ‘ear’ (Blust 1999); PMP ***taliŋa$_1$*** ‘ear’ (ACD); PCEMP ***taliŋa*** ‘ear’ (Blust 1993)

SH: Gane *tinge* ‘ear’ (ABVD) [?]; Gane *tingena* ‘ear’ (ABVD)

RA: Ambel *talamtum* ‘ear’ (R); As *tana* ‘ear’ (ABVD); Biga *nanɔ* ‘ear’ (ABVD); Biga *na(o)* ‘ear’ (R); Fiawat *tena* ‘ear’ (R); Kawe *taˈna(o)* ‘ear’ (R); Laganyan *taˈna(o)* ‘ear’ (R); Maˈya (M.) *taˈna(o)* ‘ear’ (R); Maˈya (S.) *taˈna(o)* ‘ear’ (R); Wauyai *taˈna(o)* ‘ear’ (R)

CB: Ambai *tara-* ‘ear’ (Slz); Biak *kna* ‘ear’ (H); Moor *ìna* ‘ear’ (K); Serui-Laut *tara* ‘ear’ (Slm)

Other: Arguni *etiga-* ‘ear’ (ABVD); Irarutu *təgrá* ‘ear’ (M); Kowiai *teriga* ‘ear’ (ABVD); Sekar *taniga-n* ‘ear’ (ABVD)

PMP ***taŋis*** ‘cry’ (Blust 1999); PCEMP ***taŋis*** ‘cry’ (Blust 1993)

SH: Buli *taŋis* ‘to weep, cry; howl’ (ACD); Gane *tangis* ‘to cry’ (ABVD)

RA: As *-tanis* ‘to cry’ (ABVD); Biga *-tinis* ‘to cry’ (ABVD); Gebe *-tenis* ‘to cry’ (ABVD)

CB: Biak *kanĕs* ‘to weep, cry; howl’ (H); Moor *’ànita* ‘cry’ (K); Waropen *anisa* ‘to cry’ (ABVD); Waropen *[k]aniko* ‘to cry’ (ABVD); Yaur *’èéhrè* ‘cry’ (K); Yerisiam *káhé* ‘cry’ (K) [?]

Other: Arguni *-tagis* ‘to cry’ (ABVD); Irarutu *-metage* ‘to cry’ (ABVD); Irarutu *tágə* ‘to cry’ (M); Kowiai *-tagis* ‘to cry’ (ABVD); Sekar *tagis* ‘to cry’ (ABVD)

PCEMP ***taqe ni laŋit*** ‘cloud’ (Blust 1993)

Other: Arguni *ta...* ‘cloud’ (ABVD); Irarutu *tajé* ‘cloud’ (M); Irarutu *taye* ‘cloud’ (ABVD)

PMP ***taqu*** ‘know’ (Blust 1999); PMP ***taqu$_2$*** ‘to know how, be able to, be skilled at’ (ACD); PCEMP ***taqu*** ‘know’ (Blust 1993)

SH: Buli *tō* ‘to know, be knowledgeable’ (ABVD)

CB: Ambai *tawana* ‘to know, be knowledgeable’ (ABVD)

PMP ***taRaq*** ‘cut (wood)’ (Blust 1999); PCEMP ***taRaq*** ‘cut (wood)’ (Blust 1993)

CB: Umar *tarto* ‘cut’ (K); Wandamen *tara* ‘to cut, hack’ (ABVD)

PMP ***tasik*** ‘sea, saltwater’ (Blust 1999); PCEMP ***tasik*** ‘salt’ (Blust 1993); PCEMP ***tasik*** ‘sea, saltwater’ (Blust 1993)

SH: Buli *gasi* ‘salt’ (ABVD); Gane *gasi* ‘salt’ (ABVD)

RA: As *gasi* ‘salt’ (ABVD); Gebe *gasi* ‘salt’ (ABVD)

CB: Moor *àti* ‘saltwater’ (K); Umar *tah* ‘salt’ (K); Yaur *àahré* ‘salt’ (K); Yaur *àáhrè* ‘sea water’ (K); Yerisiam *káhìa* ‘salt’ (K)

Other: Irarutu *té* ‘saltwater’ (M); Sekar *sasik* ‘sea’ (ABVD)

PMP ***tata$_1$*** ‘elder male relative’ (ACD)

CB: Biak *kaka-* ‘mother’s brother’ (H); Dusner *atai* ‘father’ (D&M); Dusner *tetei* ‘grandfather’ (D&M); Umar *tatai* ‘father’ (K); Yaur *táatì* ‘grandfather’ (K)

PEMP ***tatu*** ‘true’ (Blust 1978)

SH: Gane *hatú* ‘correct, true’ (ABVD); Taba *tuo* ‘correct, true’ (ABVD)

RA: Gebe *cu* ‘correct, true’ (ABVD)

CB: Dusner *tatu* ‘correct’ (D&M); Yerisiam *mìtìkú* ‘true’ (K)

Other: Irarutu *vitue* ‘correct, true’ (ABVD); Sekar *tutu* ‘correct, true’ (ABVD)

PMP ***tawan*** ‘kind of fruit tree: *Pometia pinnata*’ (ACD); PEMP ***tawan*** ‘a tree: *Pommetia pinnata*’ (Blust 1978)

CB: Ambai *tawa* ‘a tree: *Pometia* spp.’ (ACD); Ambai *tawan* ‘*Pometia* sp.’ (Slz); Ansus *tawan* ‘a tree: *Pometia* spp.’ (ACD); Moor *kagwahéta* ‘tree sp.’ (K); Moor *kàgwana* ‘tree sp.’ (K); Wandamen *tawa* ‘matoa’ (G); Wandamen *tawa* ‘matoa fruit’ (G); Waropen *kawano* ‘a tree: *Pometia spp.*’ (ACD)

PAN ***tebek*** ‘pierce, stab’ (ACD)

SH: Buli *tepa* ‘tusks of a boar or elephant; pierce or wound with a tusk’ (ACD); Gane *tapa* ‘to stab, pierce’ (ABVD); Sawai *n-ɛtɛpɛs* ‘to stab’ (CAD)

RA: Biga *-ete* ‘to stab, pierce’ (ABVD); Gebe *-tɛ* ‘to stab, pierce’ (ABVD)

Other: Kowiai *-ta’* ‘to stab, pierce’ (ABVD)

PMP ***telen*** ‘to swallow’ (Blust 1999)

CB: Ambai *ton* ‘swallow (v.)’ (Slz); Biak *òrĕn* ‘swallow’ (H); Moor *’oranî* ‘swallow’ (K); Serui-Laut *tooni* ‘to swallow’ (Slm); Umar *dor* ‘swallow’ (K); Yerisiam *kóorí* ‘swallow’ (K)

PAN ***telu*** ‘three’ (ACD); PMP ***telu*** ‘three’ (Blust 1999); PCEMP ***təlu*** ‘three’ (Blust 1993); PEMP ***tolu*** ‘three’ (ACD)

SH: Sawai *pɛ-tel* ‘three’ (CAD); Taba *-tol* ‘three’

RA: Biga *tol* ‘three’ (R); Fiawat *tol* ‘three’ (R); Matbat *to³l* ‘three’ (R); Maˈya (M.) ˈ*to³l* ‘three’ (R); Maˈya (S.) ˈ*to³l* ‘three’ (R)

CB: Ambai *bo-toru* ‘three’ (Slz); Ansus *toru* ‘three’ (P&D); Dusner *tori* ‘three’ (D&M); Moor *óró* ‘three’ (K); Serui-Laut *botoru* ‘three’ (Slm); Umar *etro* ‘three’ (K); Wandamen *toru* ‘three’ (G); Waropen *oro* ‘Three’ (ABVD); Yerisiam *kóoríhé* ‘three’ (K)

Other: Arguni *taor* ‘Three’ (ABVD); Irarutu *túrə* ‘three’ (M); Kowiai *tor* ‘Three’ (ABVD); Sekar *teni* ‘Three’ (ABVD)

PCEMP ***təlu*** ‘thick’ (ACD)

RA: As *mtalɔ* ‘thick’ (ABVD); Biga *matɔlɔ* ‘thick’ (ABVD)

PMP ***temu*** ‘all surround, surrounding’ (ACD)

CB: Biak *kàm* ‘all’ (H); Umar *tam* ‘all’ (K)

Other: Irarutu *temebe* ‘all’ (ABVD)

PCMP ***tibal*** ‘small drum’ (ACD)

CB: Moor *tìvara* ‘drum’ (K)

Other: Kowiai *tifar* ‘drum’ (ACD)

PAN ***timuR$_1$*** ‘south or east wind’ (ACD); PMP ***timuR$_2$*** ‘south’ (ACD)

SH: Buli *simi* ‘south, south wind’ (ACD); Sawai *timɛl* ‘east’ (CAD)

PMP ***t-ina*** ‘mother’ (Blust 1999); PCEMP ***t-ina*** ‘mother’ (Blust 1993)

SH: Buli *hñe* ‘M (ref.)’ (ACD)

CB: Biak *sna-* ‘mother’ (H); Dusner *snari* ‘mother-3SG.POSS’ (D&M); Wandamen *sinia* ‘mother’ (ABVD)

PMP ***tubuq*** ‘grow, germinate, sprout’ (ACD); PMP ***tu(m)buq*** ‘grow’ (Blust 1999); PCEMP ***tumbuq*** ‘grow’ (Blust 1993)

SH: Buli *tub* ‘to live, be alive’ (ABVD); Buli *tub* ‘to grow’ (ABVD); Gane *tub* ‘to grow’ (ABVD); Sawai *n-tub* ‘grow’ (CAD); Taba *-antub* ‘to live, be alive’ (ABVD)

RA: Gebe *-tub* ‘to live, be alive’ (ABVD)

CB: Ambai *tifu* ‘grow’ (Slz); Moor *ùvu* ‘branch’ (K) [?]

PMP ***tudan*** ‘sit’ (Blust 1999); PMP ***tu(n)daŋ*** ‘to sit’ (ACD); PCEMP ***todan*** ‘sit’ (Blust 1993)

SH: Buli *to-tolaŋ* ‘sit’ (ACD); Sawai *n-tolɛn* ‘sit’ (CAD); Taba *battalón* ‘to sit’ (ABVD)

RA: Gebe *tɔlɔn* ‘to sit’ (ABVD); Kawe *to*ˈ*lon* ‘sit’ (R); Laganyan *to*ˈ*lon* ‘sit’ (R); Matbat *ho*^{121}*l* ‘sit’ (R) [?]; Maˈya (M.) ˈ*solo*^{12}*n* ‘sit’ (R); Maˈya (S.) ˈ*solo*^{3}*n* ‘sit’ (R); Wauyai *to*ˈ*lon* ‘sit’ (R)

CB: Dusner *ton* ‘sit’ (D&M); Moor *’ò* ‘sit’ (K); Umar *tot* ‘sit’ (K); Yerisiam *kó* ‘sit’ (K)

Other: Arguni *-mdagen* ‘to sit’ (ABVD); Irarutu *matorə* ‘to sit’ (ABVD) [?]; Kowiai *-matóran* ‘to sit’ (ABVD); Sekar *mtonag* ‘to sit’ (ABVD)

PMP ***tuktuk*** ‘to pound’ (Blust 1999); PMP ***tutu*** ‘to pound’ (Blust 1999); PCEMP ***tutuk*** ‘to pound’ (Blust 1993)

SH: Buli *tok* ‘to pound, beat’ (ABVD)

Other: Irarutu *-mətu-tə* ‘to pound, beat’ (ABVD); Kowiai *-tu’* ‘to pound, beat’ (ABVD); Sekar *tuti* ‘to pound, beat’ (ABVD)

PAN ***tuqed*** ‘tree stump; stubble’ (ACD)

SH: Sawai *tuɛl* ‘tree stump’ (CAD)

Other: Irarutu *túrə* ‘stump’ (M)

PMP ***tuqelan*** ‘condylous bone; bone of fauna exclusive of fish’ (ACD); PMP ***tuqela(n,ŋ)*** ‘bone’ (Blust 1999)

SH: Buli *loŋ* ‘bone’ (ABVD) [?]

RA: Gebe *kalɔŋ* ‘bone’ (ABVD) [?]

CB: Biak *kor* ‘bone’ (H); Moor *òro* ‘bone’ (K); Umar *tor* ‘bone’ (K); Waropen *kori* ‘bone’ (ABVD); Yaur *’òórè* ‘bone’ (K); Yerisiam *kóovárà* ‘bone’ (K)

Other: Arguni *tor* ‘bone’ (ABVD)

PCEMP ***tusi*** ‘draw, make marks or designs’ (ACD)

CB: Moor *’otî* ‘sharpen’ (K) [?]; Serui-Laut *toi* ‘to write’ (Slm)

PAN ***um-ai*** ‘to come’ (ACD); PAN ***um-aRi*** ‘to come’ (ACD); PMP ***maRi*** ‘come’ (Blust 1999); PCEMP ***mai*** ‘come’ (Blust 1993); PCEMP ***maRi*** ‘come’ (Blust 1993)

SH: Buli *ma* ‘hither, toward the speaker’ (ACD)

RA: As *-ma* ‘to come’ (ABVD); Biga *mata* ‘to come’ (ABVD)

CB: Ambai *-ma* ‘to come’ (ABVD); Ambai *ra-ma* ‘come’ (Slz); Ansus *ma* ‘hither, in this direction’ (P&D); Ansus *rama* ‘come’ (P&D); Biak *ma* ‘toward the speaker’ (H); Biak *rā-ma* ‘come hither’ (H); Dusner *ma* ‘towards.here’ (D&M); Moor *ráma* ‘come’ (K); Serui-Laut *ra-ma* ‘to come’ (Slm); Umar *rma* ‘come’ (K); Wandamen *ma* ‘hither ; to here’ (G); Wandamen *rama* ‘come’ (G); Wandamen *rama* ‘to come’ (ABVD); Waropen *aede ma* ‘come here’ (ACD); Waropen *ma* ‘hither, toward the speaker’ (ACD); Waropen *rama* ‘to come’ (ABVD)

Mamberamo: Warembori *da-mo* ‘Come’ (Donohue 1999)

Other: Arguni *-ma* ‘to come’ (ABVD); Irarutu *má* ‘come, arrive’ (M); Sekar *ma* ‘to come’ (ABVD)

PMP ***utik*** ‘marine fish with thorny skin’ (ACD)

CB: Biak *us* ‘pufferfish (both spiny and spineless types)’ (H); Yaur *bàbùhré* ‘puffer’ (K)

PMP ***wahiR*** ‘water (fresh)’ (Blust 1999); PCEMP ***waiR*** ‘water (fresh)’ (Blust 1993); PCEMP ***waiR$_1$*** ‘fresh water’ (ACD)

SH: Buli *wai, waya* ‘water; river’ (ACD); Buli *waya* ‘water’ (ABVD); Gane *waya* ‘water’ (ABVD); Sawai *wɔɛ* ‘water’ (CAD); Taba *woya* ‘water’ (ABVD)

RA: Ambel *we* ‘water’ (R); As *wɛʔ* ‘water’ (ABVD); Biga *vɛi* ‘water’ (ABVD); Biga *wey* ‘water’ (R); Fiawat *wey* ‘water’ (R); Gebe *wa* ‘water’ (ABVD); Kawe ˈ*way[a]* ‘water’ (R); Laganyan ˈ*way[a]* ‘water’ (R); Maˈya (M.) ˈ*waya*^{12} ‘water’ (R); Maˈya (S.) ˈ*waya*^{3} ‘water’ (R); Wauyai ˈ*way[a]* ‘water’ (R)

CB: Ambai *waya* ‘river’ (Slz); Biak *wār* ‘river, fresh water’ (H); Dusner *war* ‘water’ (D&M); Kurudu *way* ‘river’ (ACD); Moor *gwàjara* ‘river’ (K); Serui-Laut *waya* ‘river’ (Slm); Waropen *ghai* ‘water’ (ABVD)

Mamberamo: Warembori *waren-do* ‘River’ (Donohue 1999) [?]

Other: Arguni *wir* ‘water’ (ABVD); Irarutu *wérə* ‘water’ (M); Kowiai *wálar* ‘water’ (ABVD); Sekar *wer* ‘water’ (ABVD)

PMP ***wai*** ‘mango sp.’ (ACD)

CB: Biak *awa* ‘mango’ (H); Moor *gwarìto* ‘mango’ (K); Moor *igwá* ‘mango’ (K); Yaur *gwàihré* ‘mango’ (K); Yerisiam *kúgúài* ‘mango’ (K)

Other: Kowiai *i-wai* ‘mango’ (ACD)

PMP ***wakat*** ‘mangrove root’ (ACD)

SH: Buli *wat* ‘a tree: *Rhizophore*’ (ACD)

Other: Kowiai *waʔat* ‘mangrove tree’ (ACD)

PAN ***walu*** ‘eight (of non-humans)’ (ACD)

SH: Sawai *pɛ-wal* ‘eight’ (CAD); Taba *-wal* ‘eight’

RA: Maˈya (M.) ˈ*wa*^{3}*l* ‘eight’ (R); Maˈya (S.) ˈ*wa*^{3}*l* ‘eight’ (R)

CB: Biak *wār* ‘eight’ (H)

PCEMP ***waŋka$_1$*** ‘canoe’ (ACD); PEMP ***waŋka$_2$*** ‘outrigger canoe with dugout hull’ (ACD)

RA: Maˈya (S.) ˈ*wa*^{12}*k* ‘canoe’ (R)

CB: Ambai *wa* ‘canoe’ (Slz); Ansus *wa* ‘canoe’ (P&D); Biak *wa(i)* ‘single or double outrigger canoe (used only of canoes with dugout hulls)’ (H); Dusner *wak* ‘boat’ (D&M); Moor *gwá’a* ‘canoe’ (K); Serui-Laut *wa* ‘canoe’ (Slm); Wandamen *wa* ‘boat ; canoe’ (G); Waropen *gha* ‘boat, canoe’ (ACD); Yerisiam *gwáà* ‘canoe’ (K)

Mamberamo: Warembori *wa-ro* ‘Canoe’ (Donohue 1999); Yoke *wapi* ‘canoe’ (Donohue 1999)

PAN ***waqay*** ‘foot, leg’ (ACD); PCEMP ***waqay*** ‘leg, foot’ (Blust 1993)

SH: Gane *we* ‘leg/foot’ (ABVD); Taba *we* ‘leg/foot’ (ABVD)

CB: Ambai *we* ‘leg/foot’ (ABVD); Ansus *aeu* ‘leg’ (P&D); Biak *we-* ‘foot, leg’ (H); Dusner *we* ‘foot, leg’ (ACD); Serui-Laut *ae* ‘foot’ (ACD); Serui-Laut *aen* ‘leg’ (Slm); Wandamen *ae* ‘foot’ (ACD); Wandamen *ai* ‘leg’ (G); Waropen *e* ‘foot’ (ACD)

Other: Kowiai *ai-m* ‘leg/foot’ (ABVD)

PMP ***waRej*** ‘vine, creeper’ (ACD); PCEMP ***waRəj*** ‘rope’ (Blust 1993)

SH: Buli *wala* ‘rope’ (ABVD); Sawai *wɔlɛ* ‘rope’ (CAD); Taba *wola* ‘rope’ (ABVD)

RA: As *wali?* ‘rope’ (ABVD); Biga *wili* ‘rope’ (ABVD); Gebe *wala* ‘rope’ (ABVD)

CB: Ambai *wai* ‘rope’ (Slz); Ansus *wai* ‘rope’ (P&D); Moor *gwàri’a* ‘rope’ (K); Serui-Laut *wai* ‘rope’ (Slm) [?]; Umar *wari* ‘rope’ (K); Wandamen *wai* ‘rope’ (G) [?]; Yaur *gwàríe* ‘rope’ (K); Yerisiam *gwáarí* ‘rope’ (K)

Other: Arguni *warir* ‘rope’ (ABVD); Irarutu *wará* ‘rope’ (M); Kowiai *wáras* ‘rope’ (ABVD); Sekar *warwaras* ‘rope’ (ABVD)

PAN ***waRi$_1$*** ‘day; sun; dry in the sun’ (ACD)

CB: Ambai *wo* ‘sun’ (Slz); Ansus *wo* ‘sun’ (P&D); Serui-Laut *woo* ‘sun’ (Slm); Wandamen *wor* ‘sun’ (G)

Mamberamo: Warembori *wau-ro* ‘Dry in sun’ (Donohue 1999); Yoke *weru* ‘dry in sun’ (Donohue 1999)

PAN ***wiRi*** ‘left side or direction’ (ACD); PMP ***ka-wiRi*** ‘left side’ (Blust 1999); PCEMP ***ka-wiRi*** ‘left side’ (Blust 1993)

CB: Moor *sagwìri* ‘left (side)’ (K); Yaur *vráagwìrìe* ‘left’ (K); Yerisiam *bágírú* ‘left’ (K)

PAN ***zalan$_1$*** ‘path, made by a human as opposed to an animal; way or means to do something’ (ACD); PMP ***zalan*** ‘road’ (Blust 1999); PMP ***zalan$_2$*** ‘path, made by a human as opposed to an animal; way or means to do something; wake of a boat; the Milky Way’ (ACD); PCEMP ***zalan*** ‘road’ (Blust 1993)

SH: Buli *laliŋ* ‘road/path’ (ABVD); Gane *lolan* ‘road/path’ (ABVD); Taba *lolan* ‘road/path’ (ABVD)

RA: As *alin* ‘road/path’ (ABVD); Biga *liˈlin* ‘road’ (R); Fiawat *lelin* ‘road’ (R); Kawe *liˈlin* ‘road’ (R); Laganyan *liˈlin* ‘road’ (R); Maˈya (M.) *ˈlili^{12}n* ‘road’ (R); Maˈya (S.) *ˈlili^{3}n* ‘road’ (R)

CB: Ambai *ran* ‘road/path’ (Slz); Ambai *raŋ* ‘road/path’ (ABVD); Ansus *rang* ‘path’ (P&D); Dusner *ran* ‘way’ (D&M); Dusner *rando* ‘road’ (D&M); Moor *ràrina* ‘path’ (K); Serui-Laut *ran* ‘path, road’ (Slm); Umar *jar* ‘path/road’ (K); Wandamen *ra* ‘road’ (G); Wandamen *ran* ‘road/path’ (ABVD); Waropen *rarado* ‘road/path’ (ABVD) [?]; Yerisiam *jáàrà* ‘path/road’ (K)

Other: Arguni *rarin* ‘road/path’ (ABVD); Irarutu *radeni* ‘road/path’ (ABVD) [?]; Kowiai *raran* ‘path, road’ (ACD)

PAN ****zaRum*** 'needle' (ACD); PMP ****zaRum*** 'needle' (Blust 1999); PCEMP ****zaRum*** 'needle' (Blust 1993)
SH: Gane *laim* 'needle' (ABVD)
RA: Matbat *la[1]m* 'needle' (R)
Other: Kowiai *láin* 'needle' (ABVD) [?]

CB: Moor *a'à* 'roast' (K); Umar *ta* 'smoke' (K); Yerisiam *ákáai* 'smoke' (K)

CB: Yaur *áà'ré* 'sitting platform' (K); Yerisiam *áatárà* 'wood platform' (K)

CB: Biak *abru* 'bean' (H); Umar *kvaru* 'bean' (K); Wandamen *kavaru* 'bean' (G); Yaur *óvárùuré* 'bean' (K); Yerisiam *kávárúùrà* 'bean' (K)

CB: Ambai *adai* 'tall' (Slz); Ansus *tedai* 'tall' (P&D)

CB: Ansus *adia* 'fire' (P&D); Serui-Laut *adia* 'fire' (Slm)

CB: Ambai *adia* 'fire' (Slz); Wandamen *adia* 'fire' (G)

CB: Ambai *adiwa(r)* 'hide (intr.)' (Slz); Wandamen *aniwa(ri)* 'hide ; conceal ; keep' (G)

CB: Umar *ae* 'wing' (K); Yaur *àájè* 'wing' (K)

CB: Ambai *afai* 'sail (v.)' (Slz); Serui-Laut *afai* 'to sail' (Slm)

CB: Ambai *afai* 'bow (n.)' (Slz); Ansus *apai* 'bow' (P&D)

CB: Ambai *afuran* 'pigeon' (Slz); Moor *kapurán* 'large hawk' (K); Umar *kapuran* 'pigeon sp.' (K); Yerisiam *kápúurámpì* 'pigeon sp.' (K)

CB: Ambai *ai* 'mother' (Slz); Serui-Laut *ai* 'mother' (Slm)

CB: Ansus *ai* 'cry' (P&D); Serui-Laut *sai* 'to cry' (Slm); Wandamen *sais* 'cry' (G); Wandamen *sai[se]* 'to cry' (ABVD)

SH: Buli *aibobaŋ* 'butterfly' (Blust1978); Sawai *kalɛbobɛn* 'butterfly' (CAD)
RA: Biga *kalabuˈbun* 'butterfly' (R); Kawe *abyoˈbon* 'butterfly' (R); Kawe *labyoˈbon* 'butterfly' (R); Laganyan *abyoˈbon* 'butterfly' (R); MaˈIya (M.) *kalaˈbyobo[12]n* 'butterfly' (R); MaˈIya (S.) *kalaˈbyobo[3]n* 'butterfly' (R)
CB: Ansus *apopa* 'butterfly' (P&D); Biak *àpòp* 'butterfly' (H); Wandamen *apopi* 'butterfly' (G)
Other: Irarutu *apápro* 'butterfly' (M)

CB: Biak *aikor* 'massoi' (H); Moor *aikòri* 'massoi tree' (K); Umar *aikori* 'massoi tree' (K)

SH: Buli *ailoló* 'woods/forest' (ABVD)
RA: Biga *ailo* 'woods/forest' (ABVD)

CB: Moor *aimúa* 'fruit sp.' (K); Umar *ai* 'tree sp.' (K)

CB: Ansus *ai mungkang* 'langsat' (P&D); Serui-Laut *aimungkai* 'langsat' (Slm)

CB: Ambai *airai* 'gourd' (Slz); Ansus *airaing* 'pumpkin' (P&D); Serui-Laut *airay* 'squash, gourd' (Slm); Umar *ariain* 'squash sp.' (K); Wandamen *arie* 'squash' (G); Yaur *áráipîré* 'squash' (K)

CB: Ambai *ai-rape* 'beam' (Slz); Ansus *ai rape* 'beam_(wood)' (P&D)

CB: Serui-Laut *airaron* ‘forest, jungle’ (Slm); Wandamen *ai raro* ‘forest’ (G)

CB: Ambai *ai-rerawa* ‘bark (n.)’ (Slz); Ansus *ai rerawa* ‘bark’ (P&D)

CB: Ambai *ai-ron* ‘ironwood’ (Slz); Ansus *rong* ‘ironwood’ (P&D); Wandamen *ron* ‘ironwood’ (G)

CB: Serui-Laut *airua* ‘pillow’ (Slm); Yerisiam *árúùrà* ‘pillow’ (K)

RA: Kawe *aˈit* ‘skin’ (R); Laganyan *aˈit* ‘skin’ (R); Wauyai *kaˈit* ‘skin’ (R)

CB: Umar *ajuki* ‘water scoop’ (K); Yaur *àjùˈïivré* ‘water scoop’ (K); Yerisiam *ájúùkì* ‘water scoop’ (K)

RA: Biga *ambaˈna* ‘we (excl.)’ (R); Fiawat *ame* ‘we (excl.)’ (R); Kawe *amˈfata* ‘we (excl.)’ (R); Kawe *ˈam(n)e* ‘we (excl.)’ (R); Laganyan *ˈamne* ‘we (excl.)’ (R); Matbat *ya^{21}m* ‘we (excl.)’ (R); Matbat *ya^{21}ma* ‘we (excl.)’ (R); Maˈya (M.) *ˈamne* ‘we (excl.)’ (R); Maˈya (S.) *ˈamne* ‘we (excl.)’ (R); Wauyai *amˈfat(a)* ‘we (excl.)’ (R); Wauyai *ˈam(n)e* ‘we (excl.)’ (R)

CB: Biak *àmber* ‘foreigner’ (H); Moor *andéra* ‘foreign’ (K); Serui-Laut *ambé* ‘foreign’ (Slm); Umar *amber* ‘foreigner’ (K); Yerisiam *ámbéèr* ‘foreign’ (K)

RA: Ambel *ambu* ‘white’ (R); As *bus* ‘white’ (ABVD); Biga *mabos* ‘white’ (ABVD); Biga *maˈbus* ‘white’ (R); Fiawat *mehbuh* ‘white’ (R); Kawe *bu* ‘white’ (R); Kawe *buˈsu* ‘white’ (R); Laganyan *buh* ‘white’ (R); Matbat *bu^{3}* ‘white’ (R); Maˈya (M.) *ˈbu^{3}s* ‘white’ (R); Maˈya (S.) *ˈbu^{3}s* ‘white’ (R); Wauyai *bu* ‘white’ (R)

CB: Ambai *bua* ‘white’ (ABVD); Ansus *bua* ‘white’ (P&D); Serui-Laut *bua* ‘white’ (Slm); Wandamen *busa[r]* ‘white’ (ABVD); Wandamen *vusa* ‘white’ (G) [?]

RA: Ambel *ambyau* ‘green/blue’ (R) [?]; Biga *baˈla* ‘green/blue’ (R); Fiawat *melaw* ‘green/blue’ (R); Kawe *maˈla(o)* ‘green/blue’ (R); Laganyan *maˈla* ‘green/blue’ (R); Matbat *bla^{12}w* ‘green/blue’ (R); Maˈya (M.) *maˈla^{3}* ‘green/blue’ (R); Maˈya (S.) *maˈla^{3}* ‘green/blue’ (R); Wauyai *maˈla* ‘green/blue’ (R)

RA: Ambel *ame* ‘dry’ (R); As *mɛ* ‘dry’ (ABVD)

CB: Dusner *amo* ‘aunt’ (D&M); Moor *amói* ‘aunt’ (K); Wandamen *amoi* ‘aunt’ (G)

Mamberamo: Warembori *amo* ‘FZ’ (Donohue 1999)

CB: Biak *amò* ‘armband used to guard against the snap of a bowstring’ (H); Serui-Laut *ampa* ‘armband’ (Slm) [?]

CB: Ambai *amo* ‘tree kangaroo’ (Slz); Dusner *amor* ‘tree.kangaroo’ (D&M); Yerisiam *áóorè* ‘tree kangaroo’ (K)

RA: Ambel *amon* ‘heavy’ (R); Matbat *mo^{1}n* ‘heavy’ (R)

CB: Ambai *ampi* ‘eat (intr.)’ (Slz); Ansus *ampi* ‘eat’ (P&D); Wandamen *api* ‘eat’ (G)

CB: Moor *amuà* ‘hide’ (K); Waropen *ame* ‘to hide’ (ABVD)

CB: Ambai *an* ‘scabies’ (Slz); Ansus *ang* ‘scabies’ (P&D)

CB: Moor *’anáma* ‘anchor’ (K); Umar *neman* ‘float’ (K); Yerisiam *knáàmè* ‘float’ (K)

RA: Ambel *anan* ‘burn (intr. 3S)’ (R); Matbat *pa^{3}n* ‘burn (intr. 3S)’ (R) [?]

CB: Umar *an* ‘burn’ (K); Yaur *àágrè* ‘driftwood’ (K); Yerisiam *íaané* ‘burn’ (K)

CB: Ambai *andari* ‘mango’ (Slz); Ansus *andani* ‘mango’ (P&D); Serui-Laut *anda* ‘mango’ (Slm)

CB: Ambai *andau* ‘breadfruit’ (Slz); Ansus *andaung* ‘breadfruit’ (P&D); Wandamen *andau* ‘wild breadfruit’ (G)

CB: Ambai *andaun* ‘mat’ (Slz); Ansus *andaung* ‘mat’ (P&D); Serui-Laut *andau* ‘mat’ (Slm)

CB: Ambai *andi-doni* ‘where?’ (ABVD); Ambai *na-doni* ‘where’ (Slz); Serui-Laut *nadonie* ‘where?’ (Slm)

Mamberamo: Warembori *an-do* ‘Laugh’ (Donohue 1999); Yoke *aambi* ‘laugh’ (Donohue 1999)

CB: Serui-Laut *andori* ‘fruit sp.’ (Slm); Wandamen *andori* ‘guava’ (G)

RA: Biga *ane* ‘what?’ (ABVD); Biga *maˈne* ‘what’ (R); Matbat *pane^{21}n* ‘what’ (R)

Other: Arguni *sanane* ‘what?’ (ABVD)

CB: Umar *anggana* ‘bait’ (K); Yaur *nánggánàivré* ‘bait’ (K); Yerisiam *ánggánáavè* ‘bait’ (K)

RA: Ambel *aŋkapupur* ‘round’ (R); Fiawat *popohul* ‘round’ (R); Matbat *sapu^{41}lu^{12}y* ‘round’ (R); Maˈya (S.) *kasˈpupu^{3}l* ‘round’ (R)

RA: As *-ani* ‘skin’ (ABVD); Biga *kaˈin(o)* ‘skin’ (R); Gebe *kaini* ‘skin’ (ABVD); Maˈya (M.) *kaˈini^{3}* ‘skin (human)’ (R); Maˈya (M.) *kaˈin(o)* ‘skin (animal)’ (R); Maˈya (S.) *kaˈini^{3}* ‘skin (human)’ (R); Maˈya (S.) *kaˈin(o)* ‘skin (animal)’ (R)

CB: Ambai *aniai* ‘needle’ (Slz); Moor *anígwa* ‘needle’ (K)

CB: Ambai *anita* ‘breadfruit’ (Slz); Ansus *andita* ‘breadfruit’ (P&D); Serui-Laut *anita* ‘breadfruit’ (Slm); Wandamen *andita* ‘k.o. fruit’ (G); Wandamen *andita buo* ‘breadfruit’ (G)

CB: Ambai *aniwa* ‘bee’ (Slz); Ansus *andiwa* ‘bee’ (P&D); Wandamen *anibar* ‘bee’ (G)

CB: Ambai *ankadi* ‘coconut’ (Slz); Ansus *anggadi* ‘coconut’ (P&D); Serui-Laut *angkari* ‘coconut’ (Slm); Wandamen *anggadi* ‘coconut’ (G)

CB: Ambai *ankadi kuru* ‘coconut juice’ (Slz); Wandamen *anggadi karu* ‘coconut water’ (G)

RA: Fiawat *anlaw* ‘seed’ (R); Kawe *la(o)* ‘seed’ (R); Laganyan *la(o)* ‘seed’ (R); Matbat *ya^{21}w* ‘seed’ (R) [?]; Wauyai *la(o)* ‘seed’ (R)

CB: Ambai *anonai* ‘wait’ (Slz); Wandamen *anota* ‘wait’ (G)

CB: Ansus *anou* ‘name’ (P&D); Serui-Laut *anoma* ‘name’ (Slm)

RA: Kawe *(an) saˈgi* ‘what’ (R); Laganyan *(an) saˈgya* ‘what’ (R); Maˈya (M.) *fiˈsa-gia* ‘what’ (R); Maˈya (S.) *ˈfisa* ‘what’ (R); Wauyai *(an) saˈgya* ‘what’ (R)

CB: Ambai *a(nsa)wai-bon* ‘papaya’ (Slz); Ansus *aiyawai* ‘papaya’ (P&D); Biak *asàwa* ‘papaya’ (H); Serui-Laut *ansowai* ‘papaya’ (Slm)

Mamberamo: Warembori *anta-ro* ‘Fish’ (Donohue 1999); Yoke *anta* ‘fish’ (Donohue 1999)

CB: Ambai *anten* ‘good’ (Slz); Wandamen *ate* ‘good’ (G); Wandamen *aten* ‘good’ (ABVD)

CB: Ambai *anumari* ‘fly (n.)’ (Slz); Ansus *amoma* ‘fly’ (P&D); Serui-Laut *amandori marea* ‘fly (n.)’ (Slm); Umar *nanumen* ‘fly’ (K); Wandamen *amumar* ‘fly’ (G)
Mamberamo: Warembori *namamba-ro* ‘Fly’ (Donohue 1999)

CB: Ambai *aparandin* ‘praise’ (Slz); Ansus *paranding* ‘praise’ (P&D)

CB: Wandamen *aparapiri* ‘gnat’ (G); Yaur *párápìrìivré* ‘sandfly’ (K)

CB: Wandamen *apor* ‘catfish’ (G); Yerisiam *ápóòrà* ‘fish sp.’ (K)

CB: Umar *apre* ‘coconut husk’ (K); Yaur *àpré* ‘coconut husk’ (K)

CB: Ansus *ara* ‘bait’ (P&D); Biak *ara* ‘fishing bait’ (H)

CB: Moor *àra’a* ‘garden fence’ (K); Umar *rar* ‘fence’ (K); Yaur *àrré* ‘fence’ (K); Yerisiam *áàrà* ‘garden fence’ (K)

CB: Ambai *arahiai* ‘dry (cloth)’ (Slz); Moor *araria’î* ‘dry’ (K)

CB: Moor *arái* ‘sibling-in-law’ (K); Yaur *àràì* ‘sibling-in-law’ (K)

CB: Moor *aráná* ‘tree canopy’ (K); Yerisiam *áránà* ‘tree branch’ (K)

CB: Moor *ararè* ‘untie’ (K); Wandamen *rera* ‘untie’ (G)

CB: Moor *aráta* ‘coconut husk’ (K); Yerisiam *ráàhà* ‘coconut husk’ (K)

CB: Ambai *arawan* ‘branch’ (Slz); Serui-Laut *arawai* ‘branch’ (Slm); Wandamen *rawan(e)* ‘branch’ (ABVD)

CB: Ambai *arawin* ‘sail (n.)’ (Slz); Ansus *arawi* ‘sail’ (P&D); Serui-Laut *arawa* ‘sail’ (Slm); Umar *harawin* ‘sail’ (K); Wandamen *sarawi* ‘sail’ (G); Yerisiam *hárágwîrà* ‘sail’ (K)

RA: As *-arɛ* ‘tongue’ (ABVD); Maˈya (M.) *ˈar(o)* ‘tongue’ (R); Maˈya (S.) *ˈara(o)* ‘tongue’ (R)

CB: Wandamen *arepa* ‘cloud’ (G); Waropen *arepa* ‘cloud’ (ABVD)

CB: Dusner *ari* ‘week’ (D&M); Moor *àri* ‘worship’ (K); Umar *ari* ‘worship’ (K); Wandamen *ari* ‘week’ (G); Wandamen *ari* ‘church’ (G)

CB: Biak *ari* ‘Sunday’ (H); Moor *marasína àri* ‘Sunday’ (K); Umar *ire ari* ‘Sunday’ (K); Yaur *ojoh àaríe* ‘Sunday’ (K)

CB: Umar *arian* ‘hot water’ (K); Yerisiam *ríà* ‘hot water’ (K)

CB: Moor *aríara* ‘coral sp.’ (K); Wandamen *riar* ‘coral’ (G)

CB: Moor *arikâ* ‘look at’ (K); Yerisiam *áréekí* ‘see’ (K)

CB: Ambai *arikan* ‘child’ (Slz); Ambai *arikaŋ* ‘child’ (ABVD); Serui-Laut *ariang* ‘child’ (Slm); Umar *ariatun* ‘child’ (K)

CB: Ansus *aro* ‘sago_patch’ (P&D); Waropen *aro* ‘sago palm’ (Held 1942)

RA: Biga *-asa* ‘to open, uncover’ (ABVD); Gebe *-ausa* ‘to open, uncover’ (ABVD)

CB: Ansus *Asua* ‘Ansus’ (P&D); Yerisiam *áhúuhvè* ‘Ansus’ (K)

RA: Kawe *atˈbig* ‘land turtle’ (R); Laganyan *big* ‘land turtle’ (R)

CB: Moor *atíata* ‘bandicoot’ (K); Waropen *sisa* ‘bandicoot’ (Held 1942); Yerisiam *ásísìa* ‘bandicoot’ (K)

RA: Fiawat *atne* ‘we (incl.)’ (R); Matbat *ya^{21}t* ‘we (incl.)’ (R); Matbat *ya^{21}ta* ‘we (incl.)’ (R); Maˈya (M.) ˈ*akne* ‘we (incl.)’ (R); Maˈya (S.) ˈ*akne* ‘we (incl.)’ (R)

CB: Ambai *ato* ‘arrow’ (Slz); Ansus *ato* ‘arrow’ (P&D); Ansus *atowini* ‘arrow for birds, barbed arrow’ (P&D); Serui-Laut *ato* ‘arrow’ (Slm); Serui-Laut *atovin* ‘arrow’ (Slm); Yaur *àtòoré* ‘arrow’ (K)

CB: Ambai *ator* ‘count’ (Slz); Ambai *i-eto* ‘to count’ (ABVD); Ansus *tora* ‘count’ (P&D); Biak *kor* ‘to count’ (H); Serui-Laut *dato* ‘to count’ (Slm); Umar *tor* ‘count’ (K); Yaur *túurnè* ‘count’ (K)

CB: Serui-Laut *atora* ‘to read’ (Slm); Serui-Laut *tori* ‘to read’ (Slm); Yaur *túurnáe* ‘read’ (K)

CB: Ansus *aturei* ‘door’ (P&D); Wandamen *ature* ‘door’ (G)

CB: Serui-Laut *au* ‘to call’ (Slm); Wandamen *sau* ‘call’ (G); Wandamen *sawi* ‘call’ (G)

CB: Ansus *aumarini* ‘Mangrove snake’ (P&D); Moor *sasimarìni* ‘sea snake sp.’ (K)

CB: Ambai *aunai* ‘areca nut’ (Slz); Ansus *awu* ‘betel nut’ (P&D); Serui-Laut *anoai* ‘areca’ (Slm); Yerisiam *háù* ‘areca’ (K)

CB: Ambai *avaha* ‘star’ (ABVD); Ambai *awaka* ‘star’ (Slz); Serui-Laut *avaa* ‘star’ (Slm)

CB: Moor *avarî* ‘disappear’ (K); Yerisiam *bábárà* ‘disappear’ (K)

SH: Gane *awá* ‘to vomit’ (ABVD); Sawai *wɛʔwɛ* ‘vomit’ (CAD); Taba *-wak* ‘to vomit’ (ABVD)

CB: Biak *awu* ‘to vomit’ (H)

Other: Kowiai *-arwe’* ‘to vomit’ (ABVD)

CB: Ansus *awa* ‘village’ (P&D); Serui-Laut *awa* ‘village’ (Slm)

CB: Ambai *awa* ‘sew’ (Slz); Ambai *i-awa* ‘to sew’ (ABVD); Serui-Laut *daawa* ‘to sew’ (Slm); Umar *wawar* ‘sew’ (K); Wandamen *aware* ‘sew’ (G)

CB: Ansus *awai* ‘coral’ (P&D); Serui-Laut *avai* ‘coral’ (Slm); Wandamen *awair* ‘dead coral’ (G)

CB: Ansus *awaku* ‘tobacco’ (P&D); Moor *sambà’u* ‘tobacco’ (K); Serui-Laut *awaku* ‘tobacco’ (Slm); Umar *baku* ‘tobacco’ (K); Wandamen *sambaku* ‘tobacco’ (G); Yaur *hámbá’úùré* ‘tobacco’ (K); Yerisiam *hábàkù* ‘tobacco’ (K)

CB: Ambai *awe-buka* ‘knee’ (Slz); Moor *verevú’a* ‘elbow’ (K); Umar *mavu* ‘elbow’ (K); Yaur *vrávúujè* ‘elbow’ (K); Yerisiam *bábúgùa* ‘elbow’ (K)

Mamberamo: Warembori *ke-vera-*ˈ*bua-ro* ‘Elbow’ (Donohue 1999)

CB: Ansus *awi* ‘sago_grub’ (P&D); Moor *avá’a* ‘sago grub’ (K)

CB: Ambai *awi(t)* ‘tie’ (Slz); Moor *arągwì* ‘tie’ (K)

SH: Gane *awoyan* ‘right’ (ABVD); Sawai *wɔnɛy* ‘right (side)’ (CAD); Taba *woyan* ‘right’ (ABVD)

CB: Ambai *moya* ‘right’ (ABVD) [?]

RA: Biga *-awut* ‘to bite’ (ABVD); Biga *l-aˈut* ‘bite’ (R); Fiawat *l-ewot* ‘bite’ (R); Kawe *aˈot[o]* ‘bite’ (R); Laganyan *aˈot[o]* ‘bite’ (R); Maˈya (M.) *w-akaˈo¹²t* ‘bite’ (R); Maˈya (S.) *w-akaˈo¹²t* ‘bite’ (R); Wauyai *aˈot[o]* ‘bite’ (R)

CB: Ansus *aya* ‘tree grub’ (P&D); Moor *ái’a* ‘canoe worm’ (K); Wandamen *ayas* ‘sago grub?’ (G)

CB: Ambai *aya-diru* ‘bat’ (Slz); Ansus *ayadiru* ‘bat’ (P&D)

RA: Laganyan *aˈyah(o)* ‘seed’ (R); Maˈya (S.) *kaˈyas(o)* ‘seed’ (R)

RA: Biga *ay kaˈin(o)* ‘bark’ (R); Kawe *ga aˈin(o)* ‘bark’ (R); Laganyan *ga aˈin(o)* ‘bark’ (R); Maˈya (M.) *ˈga³ kaˈin(o)* ‘bark’ (R); Maˈya (S.) *ˈga³ kaˈin(o)* ‘bark’ (R); Wauyai *ga kaˈin(o)* ‘bark’ (R)

RA: Ambel *ay lo(y)* ‘forest’ (R); Biga *ay lo* ‘forest’ (R); Fiawat *ay lo* ‘forest’ (R); Gebe *kamun-alo* ‘woods/forest’ (ABVD); Kawe *aˈre lo* ‘forest’ (R); Kawe *ga lo* ‘forest’ (R); Laganyan *ga lol(o)* ‘forest’ (R); Matbat *ha³y lamo³l* ‘forest’ (R); Maˈya (M.) *ˈga³ ˈlol(o)* ‘forest’ (R); Maˈya (S.) *ˈga³ ˈlol(o)* ‘forest’ (R); Wauyai *ga lol(o)* ‘forest’ (R)

RA: Biga *ay pu(o)* ‘heart’ (R); Fiawat *ay pu* ‘heart’ (R); Kawe *taˈpyuw* ‘heart’ (R); Laganyan *malamˈpyu* ‘heart’ (R); Maˈya (M.) *paˈpyo³* ‘heart’ (R); Maˈya (S.) *ˈga³ kaˈpyo* ‘heart’ (R); Wauyai *ga kaˈpyu(o)* ‘heart’ (R)
CB: Ambai *ai-bon* ‘heart’ (Slz); Ansus *aiboi* ‘heart’ (P&D); Wandamen *aibuo* ‘heart’ (G)

RA: Kawe *ba* ‘say’ (R); Laganyan *ba* ‘say’ (R); Maˈya (M.) *ˈbas(o)* ‘say’ (R); Maˈya (S.) *ˈbas(o)* ‘say’ (R); Wauyai *ba(o)* ‘say’ (R)

RA: As *-ba* ‘to sit’ (ABVD); Biga *-abai* ‘to sit’ (ABVD); Biga *l-aˈbay* ‘sit’ (R); Fiawat *l-ebay* ‘sit’ (R)

CB: Biak *babĕr* ‘naked’ (H); Umar *va* ‘naked’ (K); Yerisiam *hìbàbá* ‘naked’ (K)

CB: Yaur *bàgwé* ‘Bawei’ (K); Yerisiam *bágwéi* ‘Bawei’ (K)

CB: Ambai *bai(t)* ‘pay’ (Slz); Serui-Laut *bait* ‘to pay’ (Slm)

SH: Taba *bakan* ‘big’ (ABVD)

CB: Ambai *baba* ‘big’ (Slz); Ansus *beba* ‘big’ (P&D); Biak *ba* ‘big’ (H); Biak *baba* ‘small’ (H); Wandamen *baba* ‘big ; large ; parents’ (G); Waropen *ba[wa]* ‘big’ (ABVD); Yaur *nébátúe* ‘big’ (K) [?]
Other: Irarutu *nabade* ‘big’ (ABVD) [?]

CB: Ambai *baki* ‘carry on back’ (Slz); Wandamen *bai* ‘carry’ (G)

SH: Taba *bale* ‘to turn’ (ABVD)

RA: As *-balɛk* ‘to turn’ (ABVD)

CB: Ambai *bera* ‘to turn’ (ABVD); Biak *kabĕr* ‘to turn’ (H); Biak *kawĕr* ‘to turn’ (H); Wandamen *sobera* ‘to turn’ (ABVD)

SH: Buli *balit* ‘left’ (ABVD); Gane *abalit* ‘left’ (ABVD); Sawai *balɛt* ‘left (side)’ (CAD); Taba *balit* ‘left’ (ABVD)

SH: Gane *baloám* ‘wet’ (ABVD); Sawai *n-mɛlom* ‘wet’ (CAD)

RA: As *malɔm* ‘wet’ (ABVD); Fiawat *melom* ‘wet’ (R); Kawe *baˈlom[o]* ‘wet’ (R); Laganyan *baˈlom[o]* ‘wet’ (R); Maˈya (M.) *maˈlo¹²m* ‘wet’ (R); Maˈya (M.) *maˈlomo¹²* ‘wet’ (R); Maˈya (S.) *maˈlo¹²m* ‘wet’ (R)
CB: Umar *brom* ‘wet’ (K); Yaur *némárò* ‘wet’ (K)

RA: Biga *balyaban* ‘lightning’ (ABVD); Kawe *malyaˈman* ‘lightning’ (R); Maˈya (M.) *maˈlyama¹²n* ‘lightning’ (R); Maˈya (S.) *maˈlyaba³n* ‘lightning’ (R)

RA: Biga *baˈni* ‘fly (insect)’ (R); Fiawat *benyuw* ‘fly (insect)’ (R)

CB: Umar *bar* ‘ball’ (K); Wandamen *bar* ‘ball’ (G); Yaur *bàárè* ‘ball’ (K); Yerisiam *báaré* ‘ball’ (K)

CB: Umar *bara* ‘young unmarried man’ (K); Yerisiam *báráavè* ‘young unmarried man’ (K)

CB: Ambai *barimu* ‘taro’ (Slz); Ansus *barimu* ‘taro’ (P&D); Moor *barìmu* ‘taro’ (K); Wandamen *barimu* ‘k.o. taro root’ (G)

RA: Biga *baˈʃef* ‘all’ (R); Fiawat *besih* ‘all’ (R); Kawe *beˈsef* ‘all’ (R); Laganyan *baˈsef* ‘all’ (R); Matbat *batu¹²p* ‘all’ (R); Maˈya (M.) *baˈse³f* ‘all’ (R); Maˈya (S.) *baˈʃe³f* ‘all’ (R); Wauyai *baˈsef* ‘all’ (R)

CB: Umar *batem* ‘sibling-in-law’ (K); Yerisiam *báàtìa* ‘sibling-in-law’ (K)

SH: Gane *batól* ‘star’ (ABVD); Taba *battól* ‘star’ (ABVD)

SH: Gane *bau* ‘snake’ (ABVD)
RA: Gebe *bai* ‘snake’ (ABVD)

CB: Ambai *bau(r)* ‘split’ (Slz); Ansus *bau* ‘split (wood)’ (P&D)

CB: Ambai *baya* ‘basket’ (Slz); Ansus *bayai* ‘basket’ (P&D)

RA: Biga *baybuˈlu* ‘round’ (R); Kawe *awuˈli* ‘round’ (R); Maˈya (M.) *balˈbuli³* ‘round’ (R); Wauyai *kawuˈli* ‘round’ (R)
Mamberamo: Warembori *boworo* ‘round’ (Donohue 1999); Yoke *boβua* ‘round’ (Donohue 1999)

CB: Ambai *be* ‘good’ (ABVD); Biak *bye* ‘good’ (H); Serui-Laut *ben* ‘good’ (Slm); Wandamen *besyen* ‘good’ (ABVD)

Mamberamo: Warembori *berasu-ro* ‘Left’ (Donohue 1999); Yoke *berasia* ‘left’ (Donohue 1999)

CB: Ambai *berika* ‘red’ (ABVD); Biak *rik* ‘red’ (H)

SH: Sawai *bɛt-bɛt* ‘earth = ground, soil’ (CAD)
RA: Ambel *bat* ‘ground’ (R); Gebe *batbat* ‘earth/soil’ (ABVD); Kawe *aˈbat* ‘ground’ (R); Laganyan *aˈbat* ‘ground’ (R); Matbat *ba³t* ‘ground’ (R); Maˈya (M.) *ˈba¹²t* ‘ground’ (R); Maˈya (S.) *ˈba¹²t* ‘ground’ (R); Wauyai *kaˈbat* ‘ground’ (R)

RA: Biga *-bi* ‘to live, be alive’ (ABVD); Maˈya (S.) *waˈbi¹²* ‘to be alive’ (R)
CB: Serui-Laut *been* ‘to live’ (Slm)

RA: Ambel *bi* ‘smoke’ (R); Kawe *laˈbi* ‘smoke’ (R); Laganyan *aˈbli* ‘smoke’ (R); Wauyai *kaˈbli* ‘smoke’ (R)

SH: Gane *bi* ‘to say’ (ABVD); Gane *bing* ‘to say’ (ABVD)

RA: As *-bin* ‘to say’ (ABVD); Biga *ˈbitin(o)* ‘say’ (R)
Other: Irarutu *-biere* ‘to say’ (ABVD)

RA: As *-biap* ‘to cook’ (ABVD); Biga *-blap* ‘to cook’ (ABVD)

CB: Serui-Laut *biatoya* ‘thick’ (Slm); Wandamen *batoyar* ‘thick’ (G); Yerisiam *átátóorí* ‘thick’ (K)

RA: Biga *biˈnis* ‘hot’ (R); Fiawat *benih* ‘hot’ (R); Kawe *biˈni* ‘hot’ (R); Laganyan *biˈni* ‘hot’ (R); Maˈya (M.) *ˈbini¹²s* ‘hot’ (R); Maˈya (S.) *ˈbini³s* ‘hot’ (R); Wauyai *biˈni* ‘hot’ (R)

CB: Ambai *bireri* ‘no’ (Slz); Ansus *wereria* ‘no’ (P&D)

SH: Buli *bisbis* ‘green’ (ABVD); Sawai *n-bɛsbis* ‘green/blue’ (CAD)

SH: Buli *boboko* ‘head’ (ABVD); Sawai *bɛbok-o* ‘head’ (CAD)

CB: Umar *bogre* ‘hat’ (K); Yaur *bòhgré* ‘hat’ (K)

CB: Ambai *boi* ‘hit’ (Slz); Serui-Laut *boi* ‘to hit’ (Slm)

CB: Moor *bòku* ‘puffer sp.’ (K); Yaur *bó’úgwàavré* ‘puffer’ (K); Yerisiam *bókúugwà* ‘puffer sp.’ (K)

CB: Biak *bòpi* ‘father’s sister’ (H); Biak *pòpi* ‘father’s sister’ (H); Umar *bovai* ‘father’s sister’ (K); Yerisiam *bóò* ‘father’s sister’ (K)

CB: Ambai *boro-rawa* ‘lip’ (Slz); Ansus *woreu arawa* ‘lip’ (P&D)

CB: Moor *bororóa* ‘fire starter’ (K); Umar *boha* ‘fire starter’ (K); Yaur *bòròròovré* ‘lighter’ (K); Yerisiam *bóróróovè* ‘bamboo sp.’ (K)

SH: Buli *bos* ‘to swell’ (ABVD); Taba *-bos* ‘to swell’ (ABVD)

RA: Biga *bot* ‘come’ (R); Fiawat *but* ‘come’ (R); Kawe *but* ‘come’ (R); Laganyan *but* ‘come’ (R); Matbat *bo³t* ‘come’ (R); Maˈya (M.) *ˈbo³t* ‘come’ (R); Maˈya (S.) *ˈbo³t* ‘come’ (R); Wauyai *but* ‘come’ (R)

CB: Ambai *botenan* ‘bird of paradise’ (Slz); Serui-Laut *botena* ‘bird of paradise’ (Slm)

CB: Ambai *bo-yari* ‘one’ (Slz); Ambai *bo-yori* ‘One’ (ABVD) [?]; Ansus *koiri* ‘one’ (P&D); Serui-Laut *boiri* ‘one’ (Slm); Wandamen *siri* ‘one’ (G)

CB: Ambai *bui* ‘blow (flute)’ (Slz); Ansus *burari* ‘blow’ (P&D); Serui-Laut *bui* ‘to blow’ (Slm); Wandamen *bub[u]* ‘to blow’ (ABVD)

CB: Biak *buk* ‘marry’ (H); Dusner *parvut* ‘marry’ (D&M)

SH: Sawai *čalɛn-čɔ* ‘thousand’ (CAD); Taba *calan* ‘thousand’

SH: Buli *cut* ‘to pound, beat’ (ABVD); Gane *tut* ‘to pound, beat’ (ABVD)
RA: Biga *-tut* ‘to pound, beat’ (ABVD); Gebe *katut* ‘to pound, beat’ (ABVD)
CB: Ambai *i-tutahi* ‘to pound, beat’ (ABVD); Biak *nuk* ‘to pound, beat’ (H)

RA: Biga *dagim* ‘meat/flesh’ (ABVD)
Other: Arguni *dagim* ‘meat/flesh’ (ABVD)

CB: Ambai *dai* ‘father’ (Slz); Moor *dài* ‘father’ (K); Waropen *daidai* ‘father’ (ABVD); Yaur *dâì* ‘father’ (K); Yaur *dâìdà* ‘father’ (K); Yerisiam *dáîì* ‘father’ (K)

Mamberamo: Warembori *dapen-do* ‘Fall’ (Donohue 1999) [?]; Yoke *sapa* ‘fall’ (Donohue 1999) [?]

CB: Serui-Laut *darefi* ‘to lick’ (Slm); Wandamen *repi* ‘lick’ (G)

CB: Ambai *daru* ‘sago stirrer’ (Slz); Ansus *duaru* ‘sago stirring spoon’ (P&D); Serui-Laut *daru* ‘sago stirrer’ (Slm); Yerisiam *dìarúa* ‘sago stirrer’ (K)

CB: Ambai *dauroi* ‘long’ (ABVD); Ambai *dewaroi* ‘long’ (Slz); Serui-Laut *doroi* ‘long’ (Slm); Wandamen *aroi* ‘long’ (ABVD); Waropen *doro* ‘long’ (ABVD)

SH: Gane *dekin* ‘near’ (ABVD); Sawai *rakɛn* ‘near’ (CAD); Taba *dakin* ‘near’ (ABVD)

RA: Kawe *deˈle* ‘fly (insect)’ (R); Laganyan *laˈle* ‘fly (insect)’ (R); Maˈya (M.) *waraˈle*^{12} ‘fly (insect)’ (R); Maˈya (S.) *waraˈle*^{3} ‘fly (insect)’ (R)

RA: Fiawat *deli* ‘neck’ (R)

Other: Irarutu *dərbunə* ‘neck’ (ABVD); Irarutu *drəbúnə* ‘neck, throat’ (M)

CB: Ambai *dere-* ‘tooth’ (Slz); Ambai *dore-* ‘tooth’ (Slz); Ansus *dereu* ‘tooth’ (P&D); Serui-Laut *doreng* ‘tooth’ (Slm); Wandamen *dire* ‘tooth’ (G)

CB: Ambai *dereun* ‘edge’ (Slz); Wandamen *dere* ‘edge’ (G)

CB: Umar *diet* ‘hit target’ (K); Yerisiam *dìtía* ‘be hit’ (K)

SH: Gane *dimdím* ‘thunder’ (ABVD)

Other: Arguni *dudum* ‘thunder’ (ABVD); Kowiai *dúdun* ‘thunder’ (ABVD); Sekar *dudim* ‘thunder’ (ABVD)

SH: Buli *diŋ* ‘to sew’ (ABVD); Gane *badidíng* ‘to sew’ (ABVD)

RA: Biga *-fadin* ‘to sew’ (ABVD)

CB: Ansus *dira* ‘current_(ocean)’ (P&D); Umar *dirar* ‘current’ (K)

CB: Ambai *diru* ‘night’ (Slz); Ansus *diru* ‘night’ (P&D); Serui-Laut *diru* ‘night’ (Slm); Wandamen *diru* ‘night’ (G)

CB: Ambai *do* ‘inside’ (Slz); Biak *do* ‘in, inside’ (H)

CB: Ambai *dodoku* ‘bridge’ (Slz); Ansus *doudou* ‘bridge’ (P&D)

CB: Yaur *dòivré* ‘money’ (K); Yerisiam *dóoi* ‘money’ (K)

RA: Biga *doloha*ˈ*ya* ‘worm (sea worm)’ (R); Maˈya (M.) *dulu*ˈ*hai* ‘worm (sea worm)’ (R)

SH: Gane *dom* ‘woods/forest’ (ABVD)

RA: As *dam* ‘woods/forest’ (ABVD)

SH: Buli *dom* ‘to drink’ (ABVD)

RA: Gebe *-dom* ‘to drink’ (ABVD); Kawe *dum* ‘drink’ (R); Wauyai *dum* ‘drink’ (R)

CB: Yaur *rùmné* ‘drink’ (K)

CB: Waropen *dora* ‘rain’ (ABVD)

Mamberamo: Warembori *doro-ro* ‘Rain’ (Donohue 1999)

CB: Waropen *dora-ruru* ‘thunder’ (ABVD)

Mamberamo: Warembori *doroba-ro* ‘Thunder’ (Donohue 1999)

CB: Biak *dòsun* ‘saltwater eel’ (H); Yaur *dìohùuvré* ‘eel sp.’ (K)

Mamberamo: Warembori *dote-ro* ‘Flower’ (Donohue 1999); Yoke *dot-ia* ‘flower’ (Donohue 1999)

CB: Ambai *dotu* ‘sound (v.)’ (Slz); Moor *vorò’u* ‘sound’ (K); Wandamen *rotu* ‘sound’ (G)

CB: Ansus *dowatang* ‘right’ (P&D); Wandamen *vata* ‘right ; correct’ (G); Wandamen *vata* ‘right (side)’ (G); Wandamen *watan* ‘right’ (ABVD)

CB: Umar *dran* ‘leaf k.o.’ (K); Yaur *dràagré* ‘leaf used to relieve pain’ (K)

CB: Umar *drin* ‘wind’ (K)

Other: Sekar *diri* ‘wind’ (ABVD)

RA: Kawe *du* ‘lie down’ (R); Wauyai *du* ‘lie down’ (R)

CB: Umar *du* ‘bathe’ (K); Yaur *dùpìírè* ‘bathe’ (K)

CB: Umar *dum* ‘suck’ (K); Yaur *dúmbrù’né* ‘suck’ (K)

SH: Buli *dumi* ‘all’ (ABVD); Buli *fa-rumi* ‘all’ (ABVD); Gane *hadumik* ‘all’ (ABVD)

CB: Dusner *dunia* ‘earth’ (D&M); Wandamen *dunia* ‘world’ (G)

CB: Ansus *duwira* ‘spring’ (P&D); Biak *(i)ryuwěr* ‘spring (source from a river)’ (H)

RA: Fiawat *ələp* ‘hole’ (R); Kawe *lop* ‘hole’ (R); Laganyan *aˈlep[e]* ‘hole’ (R); Maˈya (M.) *kaˈle^{12}p* ‘hole’ (R); Maˈya (S.) *kaˈle^{12}p* ‘hole’ (R); Wauyai *kaˈlep[e]* ‘hole’ (R)

SH: Buli *ēm* ‘to see’ (ABVD); Gane *am* ‘to see’ (ABVD); Taba *-am* ‘to see’ (ABVD)

RA: Ambel *l-em* ‘see’ (R); Biga *-em* ‘to see’ (ABVD); Biga *l-em* ‘see’ (R); Fiawat *l-em* ‘see’ (R); Gebe *-em* ‘to see’ (ABVD); Kawe *w-em* ‘see’ (R); Laganyan *w-em* ‘see’ (R); Maˈya (M.) ˈ*w-e^{12}m* ‘see’ (R); Maˈya (S.) ˈ*w-e^{12}m* ‘see’ (R); Wauyai *w-em* ‘see’ (R)

CB: Biak *màm* ‘to see’ (H); Dusner *man* ‘see’ (D&M)

RA: Fiawat *eme lih* ‘hand’ (R); Maˈya (M.) *kaˈne ˈle^{3}s* ‘hand’ (R); Maˈya (S.) *kaˈne ˈle^{3}s* ‘hand’ (R)

RA: Fiawat *eme pap* ‘foot’ (R); Gebe *kame pap* ‘leg/foot’ (ABVD); Kawe *kam* ‘foot’ (R); Maˈya (M.) *kaˈne pa^{12}p* ‘foot’ (R); Maˈya (S.) *kaˈne ˈpa^{12}p* ‘foot’ (R); Wauyai ˈ*kam[a]* ‘foot’ (R)

CB: Umar *e nakrih* ‘crazy’ (K); Umar *nakrih* ‘crazy person’ (K); Yaur *énà’rìihré* ‘crazy’ (K)

RA: Fiawat *enyat* ‘land turtle’ (R); Maˈya (M.) *kaˈnya^{12}t* ‘land turtle’ (R)

RA: Fiawat *eˈpa ri* ‘shoulder’ (R); Kawe *aˈpya aˈpli(o)* ‘shoulder’ (R); Laganyan *aˈpya pop(o)* ‘shoulder’ (R); Maˈya (M.) *kaˈpya kaˈri(o)* ‘shoulder’ (R); Maˈya (S.) *kaˈpya kaˈri(o)* ‘shoulder’ (R); Wauyai *kaˈpya pop(o)* ‘shoulder’ (R)

CB: Serui-Laut *warabon* ‘shoulder’ (Slm); Wandamen *varabo* ‘shoulder’ (ABVD)

Other: Arguni *aru* ‘shoulder’ (ABVD)

CB: Biak *èr* ‘to dig’ (H); Yerisiam *éerá* ‘dig’ (K)

CB: Ambai *eran* ‘fishnet’ (Slz); Ansus *erang* ‘net’ (P&D); Umar *heran* ‘fishnet’ (K); Wandamen *sera* ‘net’ (G)

CB: Ambai *-eria* ‘to swim’ (ABVD); Ambai *eriai* ‘swim’ (Slz); Ansus *eiwai* ‘swim’ (P&D)

CB: Moor *etâ* ‘stand’ (K)

Mamberamo: Warembori *etan-do* ‘Stand’ (Donohue 1999); Yoke *enta* ‘stand’ (Donohue 1999)

RA: Fiawat *ewyal* ‘frog’ (R) [?]; Laganyan *kataˈyal[a]* ‘frog’ (R); Maˈyaˈwyaˈˈl ‘frog’ (R)

RA: Gebe *-fafɔn* ‘to cook’ (ABVD)

CB: Biak *(fa)fnap* ‘to cook’ (H)

CB: Biak *fararur* ‘to work’ (H); Dusner *parareur* ‘work’ (D&M)

CB: Biak *fas* ‘to write’ (H); Moor *atî* ‘write’ (K); Yerisiam *àhía* ‘write’ (K)

SH: Buli *fatan* ‘to sniff, smell’ (ABVD); Gane *fotan* ‘to sniff, smell’ (ABVD); Taba *-hotan* ‘to sniff, smell’ (ABVD)

RA: As *-fɛtɛn* ‘to sniff, smell’ (ABVD); Biga *-fatam* ‘to sniff, smell’ (ABVD); Gebe *fiatan* ‘to sniff, smell’ (ABVD)

CB: Ambai *fau* ‘many’ (Slz); Ansus *tampau* ‘many’ (P&D); Dusner *pau* ‘many’ (D&M); Wandamen *pau* ‘a lot ; many’ (G)

CB: Ambai *feran* ‘cut (grass)’ (Slz); Ansus *pera* ‘cut’ (P&D); Wandamen *pera* ‘cut’ (G)

CB: Ambai *fi-rotu* ‘drum’ (Slz); Ansus *pindotu* ‘drum’ (P&D); Wandamen *pandotu* ‘traditional drum’ (G); Wandamen *piverotu* ‘traditional drum’ (G)

SH: Buli *fisan* ‘to choose’ (ABVD)

RA: Biga *-fihi* ‘to choose’ (ABVD); Gebe *fisa* ‘to choose’ (ABVD)

CB: Biak *fòki-fòki* ‘eggplant’ (H); Moor *papòki* ‘eggplant’ (K); Umar *popoki* ‘eggplant’ (K); Wandamen *popoki* ‘eggplant’ (G); Yaur *pópó’îvré* ‘eggplant’ (K)

CB: Ambai *fon* ‘front’ (Slz); Ansus *repong* ‘in front’ (P&D); Dusner *pon* ‘front’ (D&M); Wandamen *dopo* ‘in front of’ (G)

SH: Gane *fon* ‘to eat’ (ABVD); Taba *-ahon* ‘to eat’ (ABVD); Taba *-on* ‘to eat’ (ABVD)

RA: Biga *-apon* ‘to eat’ (ABVD); Biga *l-aˈpon* ‘eat (intr.)’ (R); Kawe *aˈpon* ‘eat (intr.)’ (R); Laganyan *w-aˈpon* ‘eat (intr.)’ (R); Matbat *n-a²¹pon* ‘eat (intr.)’ (R); Maˈyaˈpoˈˈn ‘eat (intr.)’ (R); Maˈyaˈpoˈˈn ‘eat (intr.)’ (R); Wauyai *aˈpon* ‘eat (intr.)’ (R)

CB: Biak *for* ‘fire’ (H); Dusner *por* ‘fire’ (D&M)

SH: Buli *forār* ‘to squeeze’ (ABVD)

RA: Biga *-fɔgɔl* ‘to squeeze’ (ABVD); Gebe *kafɔrɔl* ‘to squeeze’ (ABVD)

Other: Irarutu *frífrə* ‘wing’ (M); Irarutu *-frivre* ‘wing’ (ABVD); Kowiai *furifur* ‘wing’ (ABVD)

SH: Buli *fun* ‘dog’ (ABVD)

CB: Ambai *wona* ‘dog’ (Slz); Ansus *wona* ‘dog’ (P&D); Biak *nàf* ‘dog’ (H); Dusner *nap* ‘dog’ (D&M); Moor *áuna* ‘dog’ (K); Umar *vaen* ‘dog’ (K); Wandamen *wona* ‘dog’ (G); Waropen *una* ‘dog’ (ABVD); Yerisiam *náà* ‘dog’ (K)

Mamberamo: Warembori *mena-ro* ‘Dog’ (Donohue 1999); Yoke *ɲaaβ* ‘dog’ (Donohue 1999)

Other: Arguni *afun* ‘dog’ (ABVD); Irarutu *fúnə* ‘dog’ (M); Kowiai *-afúna* ‘dog’ (ABVD)

Other: Arguni *gadin* ‘name’ (ABVD); Sekar *garar̄* ‘name’ (ABVD)

SH: Buli *gāg* ‘to scratch’ (ABVD); Gane *agág* ‘to scratch’ (ABVD); Taba *-gak* ‘to scratch’ (ABVD)

RA: Gebe *-agag* ‘to scratch’ (ABVD)

SH: Gane *gaji* ‘fat/grease’ (ABVD); Taba *gaji* ‘fat/grease’ (ABVD)

RA: Kawe *gal aˈit(o)* ‘lip’ (R); Laganyan *gal aˈit(o)* ‘lip’ (R); Maˈya (M.) *ˈgal kaˈin(o)* ‘lip’ (R); Maˈya (S.) *ˈgal kaˈin(o)* ‘lip’ (R); Wauyai *gal kaˈit(o)* ‘lip’ (R)

RA: Biga *gaˈlen kaˈbay(o)* ‘neck’ (R); Biga *geli- kabayo* ‘neck’ (ABVD); Kawe *aˈlu ˈlay(o)* ‘neck’ (R); Laganyan *aˈlu aˈbay(o)* ‘neck’ (R); Maˈya (M.) *gaˈle kaˈri(o)* ‘neck’ (R); Maˈya (S.) *ˈkolo³ kaˈba(o)* ‘neck’ (R); Wauyai *kaˈlu ˈbay(o)* ‘neck’ (R)

CB: Umar *kbae* ‘neck’ (K); Yerisiam *káaré* ‘neck’ (K)

RA: Ambel *gam* ‘night’ (R); Matbat *ka¹m* ‘night’ (R)

SH: Gane *gamós* ‘dry’ (ABVD); Taba *gamós* ‘dry’ (ABVD)

RA: Kawe *gaˈni* ‘sago (food)’ (R); Laganyan *gaˈni* ‘sago (food)’ (R); Matbat *ni¹²* ‘sago (food)’ (R); Maˈya (M.) *gaˈni³* ‘sago (food)’ (R); Maˈya (S.) *gaˈni³* ‘sago (food)’ (R)

Other: Kowiai *garan* ‘neck’ (ABVD); Sekar *gurar* ‘neck’ (ABVD)

Other: Arguni *gare* ‘year’ (ABVD); Sekar *gara* ‘year’ (ABVD)

RA: Ambel *ga(y)* ‘mouth’ (R); Kawe *gal(o)* ‘mouth’ (R); Laganyan *gal(o)* ‘mouth’ (R); Matbat *ga²¹l* ‘mouth’ (R); Maˈya (M.) *ˈgal(o)* ‘mouth’ (R); Maˈya (S.) *ˈgal(o)* ‘mouth’ (R); Wauyai *gal(o)* ‘mouth’ (R)

RA: As *gɛlaɔ* ‘new’ (ABVD); Biga *galaˈwa* ‘new’ (R); Biga *galawaɔ* ‘new’ (ABVD); Gebe *galawau* ‘new’ (ABVD); Kawe *gaˈwa* ‘new’ (R); Laganyan *galˈwa* ‘new’ (R); Matbat *wa³w* ‘new’ (R); Maˈya (M.) *galaˈwa¹²* ‘new’ (R); Maˈya (S.) *galaˈwa¹²* ‘new’ (R); Wauyai *galˈwa* ‘new’ (R)

SH: Sawai *gɛmunɛ* ‘grass’ (CAD)

RA: Gebe *kamun* ‘grass’ (ABVD)

SH: Gane *git* ‘blood’ (ABVD)

CB: Yaur *jìitré* ‘blood’ (K)

RA: Biga *go* ‘hole’ (R); Matbat *ga¹w* ‘hole’ (R)

SH: Sawai *gɔf* ‘bamboo’ (CAD) [?]

CB: Yerisiam *gúàpà* ‘bamboo sp.’ (K) [?]

SH: Buli *golo* ‘tail’ (ABVD)

RA: Ambel *gale(y)* ‘tail’ (R)

CB: Umar *goma* ‘maggot’ (K); Yaur *gómáàbré* ‘maggot’ (K)

CB: Ansus *gore marawang* ‘snake,_k.o.’ (P&D)
Other: Arguni *gor* ‘snake’ (ABVD); Arguni *wata-gor* ‘worm (earthworm)’ (ABVD); Sekar *gorgor* ‘worm (earthworm)’ (ABVD)

SH: Buli *gu* ‘snake’ (ABVD); Sawai *gu* ‘snake’ (CAD)

RA: As *gu?* ‘earth/soil’ (ABVD); Biga *gago?* ‘earth/soil’ (ABVD); Biga *gaˈgu* ‘ground’ (R)

SH: Buli *guguo* ‘nose’ (ABVD); Sawai *gɛgwɛs-o* ‘nose’ (CAD)

CB: Moor *gwapiatáo* ‘moray sp.’ (K); Yaur *gwápíatàavré* ‘eel sp.’ (K); Yerisiam *gwáapíàtè* ‘freshwater eel’ (K)

CB: Yaur *gwáváréjàavré* ‘goanna’ (K); Yerisiam *gwábáréèjà* ‘goanna’ (K)

CB: Yaur *gwòókàavré* ‘crow’ (K); Yerisiam *gwòókà* ‘crow sp.’ (K)

CB: Moor *gworío* ‘tendon’ (K); Yerisiam *gwáarídìa* ‘tendon’ (K)

RA: Kawe *haˈfat(a)* ‘they’ (R); Matbat *hafo*[21] ‘they’ (R)

CB: Yaur *hàgwàáré* ‘branch’ (K); Yerisiam *óháháagwà* ‘tree branches’ (K)

CB: Umar *hamuen* ‘grass’ (K); Wandamen *samuen* ‘grass’ (ABVD)
Other: Irarutu *samwine* ‘grass’ (ABVD)

SH: Gane *hapuí* ‘how?’ (ABVD); Gane *pei hapuí* ‘how?’ (ABVD); Taba *ha pu* ‘how?’ (ABVD)

CB: Moor *haràma’a* ‘shark sp.’ (K); Yerisiam *héerápà* ‘hammerhead shark’ (K)

CB: Umar *hari* ‘drum’ (K); Yaur *hìrré* ‘drum’ (K); Yerisiam *áhíráà* ‘drum’ (K)

CB: Moor *haríta* ‘Hariti’ (K); Yaur *hàrìitíe* ‘Hariti’ (K)

CB: Umar *haru* ‘coral’ (K); Yerisiam *háarú* ‘coral’ (K)

CB: Umar *hennen* ‘papaya’ (K); Yaur *hèrré* ‘papaya’ (K); Yerisiam *hénéróvà* ‘papaya’ (K)

RA: Fiawat *henyu* ‘nose’ (R); Kawe *aˈnyu(o)* ‘nose’ (R)

CB: Umar *hiaranho kotem* ‘one thousand’ (K); Yaur *híar rèebé* ‘one thousand’ (K)

CB: Umar *hibombrer* ‘cockroach’ (K); Yaur *hìbòogré* ‘cockroach’ (K)

CB: Umar *hien* ‘feces’ (K); Yaur *hìaré* ‘feces’ (K)

CB: Umar *hih* ‘cloth’ (K); Wandamen *sis* ‘cloth’ (G); Yaur *hìvíe* ‘cloth’ (K) [?]

CB: Umar *hikro* ‘gecko’ (K); Yaur *hí’óròovré* ‘gecko sp.’ (K)

CB: Umar *hir* ‘dry in sun’ (K); Yerisiam *híiré* ‘dry in sun’ (K)

CB: Umar *honan* ‘outrigger’ (K); Yaur *hònggré* ‘outrigger’ (K)

CB: Umar *honno* ‘roof’ (K); Yaur *hòròvré* ‘roof’ (K)

CB: Umar *hovane* ‘arrow’ (K); Yaur *óovàndé* ‘arrow’ (K); Yerisiam *óovánè* ‘arrow’ (K)

CB: Umar *huae* ‘vegetable’ (K); Yaur *húùré* ‘vegetable’ (K)

CB: Umar *huder* ‘go in’ (K); Yaur *hùdèeré* ‘go up’ (K)

CB: Umar *hugbo* ‘white’ (K); Yaur *húabóogrè* ‘white’ (K)

CB: Yaur *hùhùú’rè* ‘ask’ (K); Yerisiam *àhàhú* ‘ask’ (K); Yerisiam *hú* ‘ask’ (K)

CB: Umar *hun* ‘stab’ (K); Yaur *húundè* ‘stab’ (K); Yaur *húunè* ‘stab’ (K); Yerisiam *háhúnìa* ‘stab’ (K); Yerisiam *húnìa* ‘stab’ (K)

CB: Umar *hvatun* ‘tail’ (K); Yaur *hévúugrè* ‘tail’ (K)

RA: Biga *ies* ‘dog’ (ABVD); Biga *yes*^{65} ‘dog’ (R); Ma^{l}ya (M.) ^{l}*ye*^{3}*s* ‘dog’ (R)

RA: Biga *if* ‘crocodile’ (R); Fiawat *wih* ‘crocodile’ (R); Laganyan *wif* ‘crocodile’ (R); Ma^{l}ya (M.) ^{l}*wi*^{12}*f* ‘crocodile’ (R); Ma^{l}ya (S.) ^{l}*wi*^{12}*f* ‘crocodile’ (R); Wauyai *yif* ‘crocodile’ (R)

RA: As *ifɛrɛ* ‘that’ (ABVD)

Other: Kowiai *ifá* ‘that’ (ABVD)

CB: Ambai *i-isaŋ* ‘to stab, pierce’ (ABVD); Ambai *isan* ‘stab’ (Slz); Wandamen *isan* ‘to stab, pierce’ (ABVD); Wandamen *isa(ne)* ‘stab’ (G); Wandamen *isani* ‘spear ; stab’ (G)

CB: Moor *ìjo* ‘3sg.Poss’ (K); Umar *-i* ‘3sg’ (K); Umar *i-* ‘3sg’ (K); Umar *ije* ‘3sg’ (K); Yerisiam *i-* ‘3sg’ (K); Yerisiam *ìní* ‘3sg’ (K)

CB: Ambai *i-kanui* ‘to spit’ (ABVD); Ambai *kaniu* ‘spit’ (Slz); Ansus *kanyung* ‘spit’ (P&D); Wandamen *kanisu* ‘to spit’ (ABVD)

CB: Ambai *ikararutu* ‘cold’ (ABVD); Serui-Laut *kararutu* ‘cold’ (Slm)

CB: Ambai *i-kiri* ‘to bite’ (ABVD); Ambai *kiri* ‘bite’ (Slz); Ansus *kari* ‘bite’ (P&D); Serui-Laut *karifi* ‘to bite’ (Slm); Wandamen *karipe* ‘bite’ (G)

CB: Ambai *i-kuari* ‘to squeeze’ (ABVD); Ambai *kuwa(r)* ‘squeeze’ (Slz); Wandamen *kusar* ‘to squeeze’ (ABVD)

RA: Ambel *il* ‘mountain’ (R); Biga *yel* ‘mountain’ (R); Kawe *yil* ‘mountain’ (R); Laganyan *yil* ‘mountain’ (R); Matbat *he*^{3}*l* ‘mountain’ (R); Ma^{l}ya (M.) ^{l}*ye*^{3}*l* ‘mountain’ (R); Ma^{l}ya (S.) ^{l}*ye*^{3}*l* ‘mountain’ (R); Wauyai *yil* ‘mountain’ (R)

CB: Moor *éra* ‘mountain’ (K); Yerisiam *éerídìa* ‘mountain’ (K)

CB: Yaur *ìmìhìivré* ‘insect sp.’ (K); Yerisiam *kímíhíivè* ‘beetle sp.’ (K)

CB: Ambai *ina* ‘bone’ (Slz); Ansus *ina* ‘bone’ (P&D); Serui-Laut *ina* ‘bone’ (Slm); Wandamen *sina* ‘bone’ (ABVD)

CB: Serui-Laut *ina* ‘widow’ (Slm); Umar *inar* ‘widow’ (K); Yaur *ínárpîré* ‘widow’ (K); Yerisiam *ínídrà* ‘widow’ (K)

CB: Ansus *ina katuni* ‘aunt (mother’s younger sister)’ (P&D); Wandamen *sinia katu* ‘mother’s younger sister’ (G); Yerisiam *îînà àkùnía* ‘younger sister’ (K)

CB: Yaur *ínárúipîré* ‘sea spirit’ (K); Yerisiam *ínárvúui* ‘river spirit’ (K)

CB: Ambai *indeatan* ‘nine’ (Slz); Ansus *indiatang* ‘nine’ (P&D)

CB: Ambai *indea-toru* ‘eight’ (Slz); Ansus *indiatoru* ‘eight’ (P&D)

CB: Ambai *inon-tarai* ‘person’ (Slz); Ambai *inonturai* ‘person/human being’ (ABVD); Ansus *inyontarai* ‘person’ (P&D); Serui-Laut *inontarai* ‘person’ (Slm)

CB: Ambai *i-oa* ‘to stand’ (ABVD); Ambai *oa* ‘stand’ (Slz); Ansus *oa* ‘stand’ (P&D); Serui-Laut *oa* ‘to stand’ (Slm)

CB: Umar *ire* ‘day’ (K) [?]; Wandamen *raria* ‘day’ (ABVD)

Other: Irarutu *rere* ‘day’ (ABVD); Sekar *rerera* ‘day’ (ABVD)

CB: Ansus *irei* ‘sarong’ (P&D); Moor *seregwía* ‘robe’ (K); Umar *hereu* ‘cloth’ (K); Wandamen *serei* ‘sarong cloth’ (G); Yaur *hèràuvré* ‘sarong’ (K)

RA: Ambel *irip(i)* ‘skin’ (R)

CB: Biak *rib* ‘skin’ (H)

CB: Moor *iròri* ‘shellfish sp.’ (K); Yerisiam *dìorí* ‘shellfish sp.’ (K)

CB: Ambai *i-ruti* ‘to hold’ (ABVD); Ambai *ru(t)* ‘hold’ (Slz); Ansus *ru* ‘hold’ (P&D); Wandamen *ruti* ‘hold; grasp’ (G)

CB: Ambai *i-so* ‘to throw’ (ABVD); Ambai *so* ‘throw’ (Slz); Biak *so* ‘to throw’ (H); Moor *toà* ‘throw’ (K); Wandamen *so* ‘to throw’ (ABVD); Waropen *soko* ‘to throw’ (ABVD)

Other: Arguni *-so* ‘to throw’ (ABVD)

CB: Ambai *i-tarabauri* ‘to split’ (ABVD); Ansus *tarabawi* ‘split (tree)’ (P&D)

CB: Ambai *i-tawa* ‘to fall’ (ABVD); Ambai *tawa* ‘fall’ (Slz); Ansus *tawa* ‘fall’ (P&D); Wandamen *tawa* ‘fall’ (G)

RA: Gebe *-itif* ‘to spit’ (ABVD)

Other: Irarutu *-mətefe* ‘to spit’ (ABVD)

CB: Ambai *i-vata* ‘to lie down’ (ABVD); Ambai *watai* ‘lie down’ (Slz); Wandamen *bata* ‘to lie down’ (ABVD); Wandamen *vata* ‘lie down’ (G)

CB: Ambai *i-vori* ‘to buy’ (ABVD); Ambai *wori(r)* ‘buy’ (Slz); Serui-Laut *wori* ‘buy’ (ACD); Wandamen *vori* ‘to buy’ (ABVD)

CB: Yaur *jáagrè* ‘year’ (K); Yerisiam *jámà* ‘year’ (K)

CB: Yaur *jáàré* ‘house’ (K); Yerisiam *ájáà* ‘house’ (K)

CB: Umar *jabo* ‘cuscus sp.’ (K); Yerisiam *jàbó* ‘cuscus sp.’ (K)

RA: Fiawat *ɟelum* ‘rain’ (R); Kawe *guˈlum* ‘rain’ (R); Laganyan *guˈlum* ‘rain’ (R); Maˈya (M.) *ˈgoli*^{12}*m* ‘rain’ (R); Maˈya (S.) *ˈguli*^{3}*m* ‘rain’ (R); Wauyai *guˈlum* ‘rain’ (R)

CB: Umar *jet* ‘mangrove worm’ (K); Yerisiam *jáàkà* ‘mangrove worm’ (K)

RA: Ambel *ɟey* ‘areca nut (Malay pinang)’ (R); Biga *gey* ‘areca nut (Malay pinang)’ (R)

CB: Yaur *jòoré* ‘new’ (K); Yerisiam *óoré* ‘new’ (K)

RA: Ambel *kabe* ‘nail’ (R); Biga *kaˈip(o)* ‘nail’ (R); Fiawat *esip* ‘nail’ (R); Kawe *aˈseb(o)* ‘nail’ (R); Laganyan *aˈseb(o)* ‘nail’ (R); Maˈya (M.) *kaˈsi^{12}b* ‘nail’ (R); Maˈya (S.) *kaˈsi^{3}p* ‘nail’ (R); Maˈya (S.) *kaˈʃi^{3}p* ‘nail’ (R); Wauyai *kaˈʃeb(o)* ‘nail’ (R)

CB: Yerisiam *káabí* ‘nail’ (K) [?]

RA: Gebe *kablei* ‘dog’ (ABVD); Kawe *aˈbli* ‘dog’ (R); Laganyan *aˈbli* ‘dog’ (R); Maˈya (S.) *kaˈble^{3}* ‘dog’ (R); Wauyai *kaˈbli* ‘dog’ (R)

RA: Ambel *kabom* ‘bone’ (R); Biga *kaˈbom(o)* ‘bone’ (R); Fiawat *abom* ‘bone’ (R); Kawe *aˈbom* ‘bone’ (R); Laganyan *aˈbom* ‘bone’ (R); Matbat *bo^{21}m* ‘bone’ (R); Maˈya (M.) *kaˈbo^{12}m* ‘bone’ (R); Maˈya (S.) *kaˈbo^{12}m* ‘bone’ (R); Wauyai *kaˈbom* ‘bone’ (R)

RA: Ambel *kabyot* ‘cold’ (R); Biga *kabuˈtu* ‘cold’ (R); Fiawat *eblut* ‘cold’ (R); Matbat *lo^{12}t* ‘cold’ (R); Maˈya (M.) *kaˈbloti^{12}* ‘cold’ (R); Maˈya (S.) *kaˈbluti^{3}* ‘cold’ (R)

CB: Ambai *kadidu* ‘thunder’ (ABVD); Ansus *kaidu* ‘thunder’ (P&D); Biak *kadadu* ‘thunder’ (H); Serui-Laut *kandidau* ‘thunder’ (Slm)

CB: Ansus *kaeri* ‘urine’ (P&D); Wandamen *keri* ‘defecate’ (G)

CB: Ambai *kafa(r)* ‘fold’ (Slz); Ansus *kapa* ‘fold’ (P&D)

RA: Gebe *kahñə-k* ‘nose’ (ABVD); Wauyai *(kaˈnya) kaˈsum(o)* ‘nose’ (R)

CB: Ambai *kahopa* ‘earth/soil’ (ABVD); Ambai *kakofa* ‘earth/soil’ (Slz); Ansus *kakopa* ‘soil’ (P&D); Serui-Laut *kakofa* ‘land, soil’ (Slm); Wandamen *kakopa* ‘earth ; ground’ (G)

CB: Ansus *kai* ‘chopsticks’ (P&D); Moor *kaké* ‘sago chopsticks’ (K); Umar *kae* ‘sago chopsticks’ (K); Wandamen *kai* ‘papeda spoon’ (G); Yerisiam *káèpà* ‘sago chopsticks’ (K)

RA: As *kai* ‘long’ (ABVD)

CB: Biak *kwaïm* ‘long’ (H); Biak *kwaïn* ‘long’ (H); Umar *kvon* ‘a long time’ (K)

CB: Serui-Laut *kai* ‘sago stirrer’ (Slm); Umar *kajavre* ‘sago stirrer’ (K)

RA: Biga *kaˈi* ‘grass’ (R); Kawe *aˈi* ‘grass’ (R); Matbat *kai^{12}* ‘grass’ (R); Maˈya (M.) *kaˈi^{3}* ‘grass’ (R); Maˈya (S.) *kaˈi^{3}* ‘grass’ (R); Wauyai *kaˈi* ‘grass’ (R)

RA: Biga *kaˈi ko* ‘toe’ (R); Biga *kaˈna ko* ‘finger’ (R); Fiawat *eme kop* ‘finger/toe’ (R); Kawe *kop aˈut[u]* ‘finger’ (R); Maˈya (M.) *kaˈne ˈkop(o)* ‘finger/toe’ (R); Maˈya (M.) *ˈko^{12}p* ‘finger/toe’ (R); Maˈya (S.) *kaˈne ˈkop(o)* ‘finger/toe’ (R)

CB: Ambai *kaina* ‘cucumber’ (Slz); Ambai *kasina* ‘cucumber’ (Slz); Serui-Laut *kaina* ‘cucumber’ (Slm); Umar *kahnian* ‘cucumber’ (K); Wandamen *kasina* ‘cucumber’ (G)

CB: Ansus *kaitera* ‘corn’ (P&D); Biak *kastera* ‘corn’ (H); Biak *katera* ‘corn’ (H)

CB: Ambai *kaiveva* ‘lightning’ (ABVD); Ambai *kaiwewa* ‘lightning’ (Slz); Ansus *keiwiewari* ‘lightning’ (P&D); Serui-Laut *kiabobari* ‘lightning’ (Slm); Wandamen *kabiebar* ‘lightning’ (G)

SH: Buli *kakalā* ‘red’ (ABVD)

RA: Matbat *ka^{3}la^{3}n* ‘red’ (R)

CB: Yerisiam *kárárárá* ‘red’ (K)

CB: Moor *kakaná'a* 'jackfruit' (K); Serui-Laut *nakinaki* 'jackfruit' (Slm); Umar *aknak* 'fruit sp.' (K); Wandamen *akanak* 'breadfruit' (G); Yaur *á'nápîré* 'fruit sp.' (K); Yerisiam *náknáàkà* 'fruit sp.' (K)

RA: Ambel *kalo* 'star' (R); Biga *kalaˈmo* 'star' (R); Laganyan *aˈlo* 'star' (R); Matbat *kamo[12]w* 'star' (R)

RA: Biga *kaˈlu(o)* 'tail' (R); Kawe *aˈyu* 'tail' (R); Laganyan *aˈyu(o)* 'tail' (R); Maˈyaˈyaˈyaˈya (M.) *kaˈyu(o)* 'tail' (R); Maˈyaˈyaˈyaˈya (S.) *kaˈyu(o)* 'tail' (R); Wauyai *kaˈyu(o)* 'tail' (R)

CB: Umar *kama* 'shellfish sp.' (K); Wandamen *kama* 'k.o. spiral shell' (G)

CB: Ansus *kamadadirui* 'swallow' (P&D); Serui-Laut *kamaridiri* 'bird sp.' (Slm)

CB: Ambai *kamambo* 'butterfly' (Slz); Serui-Laut *kamambo* 'butterfly' (Slm)

CB: Ansus *kamawo* 'starfish' (P&D); Umar *kabuabu* 'sea star' (K); Wandamen *kamuavu* 'starfish' (G)

CB: Ansus *kambirei* 'hole' (P&D); Wandamen *kamberei* 'hole' (G)

CB: Ambai *kamiai* 'seed' (Slz); Ansus *kami* 'seed' (P&D)

CB: Ambai *kamiai* 'stone' (Slz); Ansus *kami* 'stone' (P&D); Serui-Laut *kami* 'stone' (Slm)

Other: Irarutu *kamí* 'stone' (M)

RA: Biga *kamiaran* 'small' (ABVD)

CB: Moor *marà'u* 'small' (K); Waropen *kumara* 'small' (ABVD)

SH: Gane *kamudi* 'thick' (ABVD); Taba *kamudu* 'thick' (ABVD)

CB: Umar *kamo* 'thick' (K)

CB: Ambai *kamuki* 'friend' (Slz); Dusner *kamuk* 'friend' (D&M); Moor *kamúka* 'friend' (K); Umar *kamuk* 'friend' (K); Yaur *ámú'rè* 'friend' (K)

CB: Ambai *kamutu* 'anchor' (Slz); Ansus *kamutu* 'anchor' (P&D); Biak *kàmutu* 'anchor' (H); Moor *kamitúa* 'anchor' (K); Umar *kamutu* 'anchor' (K); Wandamen *kamita* 'anchor' (G); Yaur *àmùtùuvré* 'anchor' (K); Yerisiam *kámútúuvè* 'anchor' (K)

RA: Biga *kaˈnan* 'sago (food)' (R)

CB: Ambai *anan* 'sago pudding' (Slz); Ansus *anang* 'sago_tree' (P&D); Ansus *anang* 'sago_(processed)' (P&D); Serui-Laut *ana* 'sago porridge' (Slm); Umar *utan* 'sago flour' (K) [?]; Wandamen *ana* 'sago porridge' (G); Yerisiam *íníaahánà* 'sago porridge' (K)

CB: Ambai *kananata* 'firefly' (Slz); Umar *natar* 'firefly' (K)

CB: Ambai *kanaŋ* 'neck' (ABVD)

Mamberamo: Warembori *koran* 'neck' (Donohue 1999); Yoke *karamb-* 'neck' (Donohue 1999)

CB: Umar *kaneba* 'honey' (K); Yerisiam *kénébà* 'honey' (K)

CB: Ansus *kangkani* 'White-bellied Sea Eagle' (P&D); Biak *mangangan* 'large bird, bird of prey' (H); Umar *ggan* 'eagle' (K); Wandamen *kakane* 'eagle' (G); Yaur *gánggánìivré* 'hawk' (K); Yerisiam *gánggáaní* 'hawk sp.' (K)

Other: Irarutu *kangkáni* ‘eagle’ (M)

SH: Buli *kaño* ‘ear’ (ABVD)

RA: Gebe *kahña-* ‘ear’ (ABVD)

CB: Ambai *kantantini* ‘cockroach’ (Slz); Ansus *kantanting* ‘cockroach’ (P&D)

RA: Biga *kaˈnun(o)* ‘human hair (body)’ (R); Gebe *kaliñun* ‘hair’ (ABVD); Maˈya (M.) *kaˈnyunu³t* ‘human hair (body)’ (R); Maˈya (S.) *kaˈnyunu³t* ‘human hair (body)’ (R)

RA: Biga *kaˈnyan* ‘small’ (R); Kawe *gaˈnan* ‘small’ (R); Laganyan *gaˈnan* ‘small’ (R); Maˈya (M.) *gaˈna¹²n* ‘small’ (R); Maˈya (S.) *gaˈna¹²n* ‘small’ (R); Wauyai *gaˈnan* ‘small’ (R)

CB: Ansus *kapa* ‘sea_sponge’ (P&D); Ansus *kapo* ‘fungus’ (P&D); Wandamen *kapo* ‘mushroom’ (G)

Other: Irarutu *kapúpə* ‘mushroom’ (M)

CB: Ansus *kapa dupapei* ‘Spotted Cuscus’ (P&D); Ansus *kapa dura* ‘red cuscus’ (P&D); Ansus *kapa duwua* ‘white cuscus’ (P&D); Ansus *kapa gondoi* ‘cuscus,_k.o._terrestrial’ (P&D); Biak *kapa* ‘cuscus’ (H)

CB: Ansus *kapa musi* ‘tree kangaroo’ (P&D); Ansus *musi* ‘tree kangaroo’ (P&D); Moor *vùsi* ‘tree kangaroo’ (K); Waropen *wusi* ‘tree kangaroo’ (Held 1942)

SH: Buli *kapcut* ‘thick’ (ABVD)

RA: Gebe *kapcit* ‘thick’ (ABVD)

CB: Biak *kàprer* ‘tongue’ (H)

Mamberamo: Warembori *ke-peren-do* ‘Tongue’ (Donohue 1999)

Other: Sekar *kerir* ‘tongue’ (ABVD)

RA: Ambel *kaprun* ‘feather’ (R); As *pərun* ‘feather’ (ABVD); Biga *kanono* ‘feather’ (ABVD); Biga *kaˈnun(o)* ‘feather’ (R); Fiawat *enun* ‘feather’ (R); Laganyan *apˈnuni* ‘feather’ (R); Maˈya (M.) *kaˈnyun(o)* ‘feather’ (R); Maˈya (S.) *kaˈlun(o)* ‘feather’ (R); Wauyai *kapˈnun* ‘feather’ (R)

SH: Gane *kapudung* ‘dull, blunt’ (ABVD)

CB: Serui-Laut *kabu* ‘dull, blunt’ (Slm); Wandamen *kabur* ‘dull, blunt’ (ABVD); Yerisiam *kámpúté* ‘blunt’ (K)

Other: Sekar *akapugam* ‘dull, blunt’ (ABVD)

RA: Ambel *kapyan(i)* ‘hand’ (R); Kawe *kop(o)* ‘hand’ (R); Laganyan *aˈne kop(o)* ‘hand’ (R)

CB: Umar *kar* ‘thick bamboo sp.’ (K); Wandamen *karie* ‘k.o. bamboo’ (G); Yerisiam *káàrà* ‘bamboo’ (K)

CB: Ambai *karata* ‘jellyfish’ (Slz); Ansus *karata* ‘jellyfish’ (P&D); Serui-Laut *karata* ‘jellyfish’ (Slm); Wandamen *sarata* ‘jellyfish’ (G)

CB: Biak *karĕmbòbò* ‘shellfish sp.’ (H); Moor *korombòvi* ‘shellfish sp.’ (K); Wandamen *korombowi* ‘cowrie shell’ (G)

RA: As *karɛn* ‘to sew’ (ABVD); Gebe *fakariŋ* ‘to sew’ (ABVD)

CB: Moor *kariʔì* ‘throw’ (K); Serui-Laut *ka* ‘to throw’ (Slm); Yerisiam *káará* ‘throw’ (K)

CB: Biak *karuk* ‘to cut, hack’ (H); Yerisiam *ká róokáté* ‘cut’ (K)

CB: Ambai *kase* ‘tie’ (Slz); Ansus *kaei* ‘tie’ (P&D); Wandamen *kasie* ‘tie’ (G); Wandamen *kasies* ‘to tie up, fasten’ (ABVD)

CB: Ambai *kasou* ‘angry’ (Slz); Serui-Laut *kaisau* ‘angry’ (Slm); Wandamen *kasio* ‘angry’ (G)

Other: Arguni *kasumbe* ‘red’ (ABVD); Sekar *kasumba* ‘red’ (ABVD)

CB: Ansus *katerine* ‘just now’ (P&D); Wandamen *katuerinei* ‘progressive aspect ; just now’ (G)

CB: Moor *katibúa* ‘maize’ (K); Umar *kavuki* ‘corn’ (K); Wandamen *pavuki* ‘corn’ (G); Yerisiam *kávókíivè* ‘corn’ (K)

SH: Gane *katobat* ‘short’ (ABVD); Sawai *n-kɛtobɛ* ‘short’ (CAD)

Other: Kowiai *tóba* ‘short’ (ABVD)

RA: Biga *kaˈtum(o)* ‘seed’ (R); Maˈya (M.) *ˈʃum(o)* ‘seed’ (R)

CB: Ambai *kauboi* ‘worm’ (Slz); Wandamen *kasibui* ‘worm (earthworm)’ (ABVD)

CB: Serui-Laut *kaumayai* ‘fog’ (Slm); Wandamen *kamayow* ‘fog’ (ABVD)

CB: Ambai *kaun* ‘ginger’ (Slz); Serui-Laut *kau* ‘ginger’ (Slm)

CB: Biak *kawàsa* ‘person/human being’ (H); Wandamen *kawasa* ‘guest ; person ; society’ (G)

RA: Biga *kaˈwat(o)* ‘root’ (R); Fiawat *awa* ‘root’ (R); Gebe *kawao* ‘root’ (ABVD); Kawe *aˈwat(o)* ‘root’ (R); Laganyan *aˈhat(o)* ‘root’ (R); Maˈya (M.) *kaˈwat(o)* ‘root’ (R); Maˈya (S.) *kaˈwat(o)* ‘root’ (R); Wauyai *kaˈwat* ‘root’ (R)

CB: Ambai *kaweini* ‘prawn’ (Slz); Ansus *kaweing* ‘shrimp’ (P&D)

CB: Ansus *kawio* ‘speak’ (P&D); Wandamen *kavio* ‘speak ; talk’ (G)

CB: Ansus *kawio* ‘language’ (P&D); Serui-Laut *kavo* ‘language’ (Slm); Wandamen *kavio* ‘word ; language’ (G)

CB: Ansus *kawuwu* ‘bamboo,_k.o._thin’ (P&D); Moor *kòvu’a* ‘bamboo’ (K) [?]; Wandamen *kavuvui* ‘bamboo shoot’ (G)

CB: Umar *kdiar* ‘leech’ (K); Yerisiam *ídíèrà* ‘leech’ (K)

Mamberamo: Warembori *keere-ro* ‘Tall’ (Donohue 1999); Yoke *keri* ‘tall’ (Donohue 1999)

CB: Ambai *kefa* ‘near’ (ABVD); Ambai *kefan* ‘near’ (Slz); Serui-Laut *(na) kefa* ‘near’ (Slm)

CB: Ambai *keke* ‘green’ (Slz); Ansus *mekae* ‘green’ (P&D); Umar *mkat* ‘green’ (K); Wandamen *kake* ‘green/blue’ (G); Waropen *kakesio* ‘green’ (ABVD)

Mamberamo: Warembori *ke-kombo-ro* ‘Bone’ (Donohue 1999); Yoke *akombu* ‘bone’ (Donohue 1999)

CB: Biak *keněm* ‘to live, be alive’ (H); Umar *tomun* ‘live’ (K) [?]; Wandamen *tenam* ‘live’ (G)

Mamberamo: Warembori *k-epi-ro* ‘Leg’ (Donohue 1999); Yoke *pi* ‘leg’ (Donohue 1999)

CB: Umar *ker* ‘sago waste’ (K); Yaur *èrré* ‘leftover sago’ (K)

CB: Biak *kèrět* ‘clan’ (H); Moor *kèret* ‘clan’ (K)

CB: Biak *kèrĕt* ‘canoe shelter’ (H); Moor *kèret* ‘canoe shelter’ (K); Umar *keret* ‘canoe shelter’ (K)

CB: Ambai *kerira* ‘bad, evil’ (ABVD); Wandamen *kariria* ‘bad ; evil’ (G)

RA: As *kerja* ‘to work’ (ABVD); Biga *-karəjan* ‘to work’ (ABVD); Gebe *karajan* ‘to work’ (ABVD)

CB: Dusner *kardia* ‘work’ (D&M); Dusner *kardian* ‘work’ (D&M); Moor *kardíana* ‘work’ (K); Yerisiam *kárádíané* ‘work’ (K)

Other: Kowiai *-’arjang* ‘to work’ (ABVD); Sekar *kərja* ‘to work’ (ABVD)

Mamberamo: Warembori *ke-waro-ro* ‘Stomach’ (Donohue 1999); Yoke *waro* ‘stomach’ (Donohue 1999)

CB: Biak *kfo* ‘to shoot (with an arrow)’ (H); Dusner *tpo* ‘shoot.with.an.arrow’ (D&M)

CB: Ansus *kiai* ‘completely’ (P&D); Wandamen *kiais* ‘empty ; gone’ (G)

Mamberamo: Warembori *-kiaw* ‘completive’ (Donohue 1999); Yoke *-kiaw* ‘completive’ (Donohue 1999)

CB: Umar *kibuni* ‘goanna’ (K); Yerisiam *kímbúníivè* ‘goanna sp.’ (K)

SH: Gane *kidkuda* ‘black’ (ABVD); Taba *kuda* ‘black’ (ABVD)

Other: Arguni *udude* ‘black’ (ABVD); Sekar *kudkuda* ‘black’ (ABVD)

CB: Ambai *kikairi* ‘leech’ (Slz); Serui-Laut *kiairi* ‘leech’ (Slm)

SH: Gane *kiklé* ‘hair’ (ABVD); Gane *kiklena* ‘hair’ (ABVD); Taba *kakle* ‘hair’ (ABVD)

CB: Umar *kimbo* ‘chile pepper’ (K); Yaur *ìmbòovré* ‘chile pepper’ (K); Yerisiam *kímbóovè* ‘chile pepper’ (K)

CB: Ambai *kipau* ‘crooked’ (Slz); Ansus *kepau* ‘crooked’ (P&D)

RA: Ambel *kitem* ‘one’ (R); Biga *kaˈtem* ‘one’ (R); Biga *katen* ‘One’ (ABVD); Fiawat *ətem* ‘one’ (R); Kawe *aˈtem* ‘one’ (R); Laganyan *aˈtem* ‘one’ (R); Matbat *te³m* ‘one’ (R); Maˈya (M.) *kaˈte¹²m* ‘one’ (R); Maˈya (S.) *kaˈte¹²m* ‘one’ (R); Wauyai *kaˈtem* ‘one’ (R)

CB: Umar *kotem* ‘one’ (K)

CB: Umar *kman* ‘worm’ (K); Yaur *màambré* ‘worm’ (K)

CB: Umar *kmaren* ‘barbed spear’ (K); Wandamen *kamareni* ‘many-pointed fishing spear’ (G)

CB: Biak *kneněf* ‘peer’ (H); Moor *aninì* ‘peer’ (K); Umar *tnin* ‘peek at’ (K)

CB: Moor *kodovío* ‘frog’ (K); Wandamen *kodo* ‘frog’ (G)

CB: Ambai *koi* ‘bed’ (Slz)

Other: Irarutu *kói* ‘bed’ (M)

RA: As *kɔ-k* ‘snake’ (ABVD); Biga *kok* ‘snake’ (R); Fiawat *ko* ‘snake’ (R); Kawe *kok* ‘snake’ (R); Laganyan *kok* ‘snake’ (R); Matbat *ko³k* ‘snake’ (R); Maˈya (M.) *ˈko¹²k* ‘snake’ (R); Maˈya (S.) *ˈko¹²k* ‘snake’ (R)

CB: Biak *ikàk* ‘snake’ (H)

SH: Gane *koku* ‘neck’ (ABVD); Sawai *koko* ‘neck’ (CAD)

RA: Ambel *kakon* ‘neck’ (R); As *-akɔ* ‘neck’ (ABVD); Gebe *kɔkɔ* ‘neck’ (ABVD)

SH: Taba *kolay* ‘snake’ (ABVD)

CB: Biak *kòrwèn* ‘legendary giant snake’ (H); Dusner *kariom* ‘snake’ (D&M); Umar *kro* ‘snake’ (K); Wandamen *koro* ‘snake’ (G); Wandamen *korow* ‘snake’ (ABVD)

SH: Gane *komu* ‘hand’ (ABVD); Taba *komo* ‘hand’ (ABVD)

RA: Gebe *kame* ‘hand’ (ABVD)

CB: Umar *konori* ‘flute’ (K); Yaur *ónórìivré* ‘flute’ (K)

CB: Ambai *kontai* ‘also’ (Slz); Wandamen *kota* ‘also ; too’ (G)

CB: Biak *kosàn* ‘bamboo sp. (edible)’ (H); Wandamen *kosa* ‘k.o. bamboo’ (G)

RA: Biga *kotor* ‘dirty’ (ABVD)

CB: Yaur *’òotòrè* ‘dirty’ (K)

Other: Arguni *koturo* ‘dirty’ (ABVD); Kowiai *’otor* ‘dirty’ (ABVD)

CB: Biak *kum* ‘feather’ (H); Wandamen *tu[m]* ‘feather’ (ABVD)

CB: Ansus *kumai* ‘child’ (P&D); Dusner *komoi* ‘son’ (D&M); Moor *komòi* ‘male child’ (K); Wandamen *komoi* ‘term of address for a younger man from an elder’ (G)

CB: Moor *kumamí* ‘sea cucumber’ (K); Umar *kumami* ‘sea cucumber’ (K); Wandamen *kumami* ‘sea cucumber’ (G)

CB: Serui-Laut *kumariri* ‘spinach’ (Slm); Wandamen *rau kumawi* ‘spinach’ (G); Yaur *úmágwìirìjé* ‘spinach sp.’ (K); Yerisiam *kómágwìirì* ‘spinach’ (K)

CB: Ansus *kurakura* ‘White-lipped Tree Frog’ (P&D); Biak *kròkrò* ‘frog’ (H); Moor *karekuré’a* ‘frog’ (K); Serui-Laut *kura kurai* ‘frog’ (Slm)

CB: Ambai *kuru-* ‘back’ (Slz); Ambai *kuruu-* ‘back’ (ABVD); Biak *kru-* ‘back’ (H); Wandamen *karu* ‘back’ (ABVD)

RA: Biga *-kut* ‘to cut, hack’ (ABVD)

CB: Ambai *i-kutui* ‘to cut, hack’ (ABVD); Ambai *kutu* ‘cut through’ (Slz); Ansus *tekutu* ‘cut’ (P&D); Dusner *kut* ‘cut’ (D&M); Dusner *totkut* ‘cut.into.pieces’ (D&M); Serui-Laut *kutu* ‘to cut’ (Slm); Serui-Laut *kutui* ‘to cut down’ (Slm); Umar *utu* ‘cut down’ (K); Wandamen *kutu* ‘cut’ (G)

RA: Gebe *kutɔ* ‘head’ (ABVD); Kawe *aˈut sap(o)* ‘head’ (R); Maˈya (M.) *kaˈu³t* ‘head’ (R); Maˈya (S.) *kaˈu³t* ‘head (fig.)’ (R); Maˈya (S.) *kaˈut(o)* ‘head’ (R); Wauyai *kaˈut* ‘head’ (R)

SH: Taba *kutu* ‘small’ (ABVD) [?]

CB: Ambai *katui* ‘small’ (Slz); Ambai *ketui* ‘small’ (ABVD); Biak *kasun* ‘small’ (H) [?]; Wandamen *katu* ‘small’ (G); Yerisiam *ákúuná* ‘small’ (K)

CB: Ansus *kuwera* ‘bathe (self)’ (P&D); Serui-Laut *kobira* ‘to bathe’ (Slm); Wandamen *kubira* ‘bathe’ (G)

RA: Matbat *la³n* ‘song’ (R)

CB: Wandamen *ran(u)* ‘song’ (G)

SH: Gane *lai* ‘stone’ (ABVD); Sawai *lɔy* ‘stone’ (CAD); Taba *lalai* ‘stone’ (ABVD)

RA: As *lali* ‘dirty’ (ABVD)

CB: Ambai *rarika* ‘dirty’ (Slz); Wandamen *rariai* ‘dirty’ (ABVD); Yerisiam *órárîijárà* ‘dirty’ (K)

RA: Ambel *lalo* ‘thunder’ (R); As *alɔʔ* ‘thunder’ (ABVD); Biga *loˈlo* ‘thunder’ (R); Gebe *lɔlɔ* ‘thunder’ (ABVD); Kawe *ˈlol[o]* ‘thunder’ (R); Laganyan *ˈlol[o]* ‘thunder’ (R); Maˈya (M.) *ˈlolo¹²* ‘thunder’ (R); Maˈya (S.) *ˈlolo³* ‘thunder’ (R); Wauyai *ˈlol[o]* ‘thunder’ (R)

RA: Ambel *lan* ‘fly (insect)’ (R); Matbat *kala¹²ŋ* ‘fly (insect)’ (R)

RA: Ambel *lanyan wane* ‘today’ (R); Biga *manˈyan ene* ‘today’ (R); Fiawat *yahan eme* ‘today’ (R); Kawe *yan gin* ‘today’ (R); Laganyan *lyahaˈŋin* ‘today’ (R); Matbat *la¹²¹ ino* ‘today’ (R); Maˈya (M.) *ˈlyasan ne* ‘today’ (R); Maˈya (S.) *ˈlasan ˈgine* ‘today’ (R); Wauyai *lan ˈgine* ‘today’ (R)

SH: Buli *las* ‘near’ (ABVD)

RA: Gebe *las* ‘near’ (ABVD)

RA: Ambel *l-asabyay* ‘burn (trans.)’ (R); Kawe *aˈblay* ‘burn (trans.)’ (R); Wauyai *w-asaˈblay* ‘burn (trans.)’ (R)

RA: Ambel *layn* ‘sand’ (R); Biga *len* ‘sand’ (R); Fiawat *len* ‘sand’ (R); Kawe *len* ‘sand’ (R); Laganyan *aˈlen* ‘sand’ (R); Matbat *ye³n* ‘sand’ (R); Maˈya (M.) *ˈle¹²n* ‘sand’ (R); Maˈya (S.) *ˈle¹²n* ‘sand’ (R); Wauyai *len* ‘sand’ (R)

RA: Maˈya (M.) *ˈle³* ‘land’ (R); Maˈya (S.) *ˈle³* ‘land’ (R)

CB: Ambai *rei* ‘land’ (Slz); Dusner *re* ‘landward’ (D&M); Moor *ré* ‘land’ (K); Serui-Laut *reirei* ‘land’ (Slm); Wandamen *rei* ‘land ; shore’ (G)

SH: Gane *lekat* ‘bad, evil’ (ABVD)

RA: Gebe *lɛ* ‘bad, evil’ (ABVD)

SH: Gane *lekat* ‘rotten’ (ABVD); Taba *lekto* ‘rotten’ (ABVD)

SH: Buli *lēmlēm* ‘lightning’ (ABVD)

RA: Ambel *lalew* ‘lightning’ (R); As *lɛu* ‘lightning’ (ABVD); Gebe *lamlɛm* ‘lightning’ (ABVD); Laganyan *labˈleb* ‘lightning’ (R); Wauyai *labˈleb* ‘lightning’ (R)

RA: Ambel *l-ey* ‘eat (tr.)’ (R) [?]; As *-aʔ* ‘to eat’ (ABVD); Biga *l-a* ‘eat (tr.)’ (R); Fiawat *l-a* ‘eat (tr.)’ (R); Kawe *w-a* ‘eat (tr.)’ (R); Laganyan *w-a* ‘eat (tr.)’ (R); Matbat *n-a²¹* ‘eat (tr.)’ (R); Maˈya (M.) *w-a* ‘eat (tr.)’ (R); Maˈya (S.) *w-a* ‘eat (tr.)’ (R); Wauyai *w-a* ‘eat (tr.)’ (R)

SH: Gane *loál* ‘big’ (ABVD); Taba *lollol* ‘big’ (ABVD)

SH: Buli *lois* ‘to steal’ (ABVD)

RA: Gebe *-lous* ‘to steal’ (ABVD)

RA: Ambel *lomo* ‘blood’ (R); As *lamɔs* ‘blood’ (ABVD); Biga *loˈmos* ‘blood’ (R); Fiawat *ləmoh* ‘blood’ (R); Laganyan *ˈlomoh* ‘blood’ (R); Maˈya (M.) *ˈlomo¹²s* ‘blood’ (R); Maˈya (S.) *ˈlomo³s* ‘blood’ (R); Wauyai *ˈlomo* ‘blood’ (R)

RA: As *-lu* ‘to vomit’ (ABVD)

CB: Waropen *koraru* ‘to vomit’ (ABVD) [?]; Yaur *dùú’rè* ‘vomit’ (K) [?]

Other: Irarutu *mərue* ‘to vomit’ (ABVD)

SH: Buli *luā* ‘where?’ (ABVD); Gane *paló* ‘where?’ (ABVD); Gane *paló li* ‘where?’ (ABVD); Taba *lo (li)* ‘where?’ (ABVD)

RA: Gebe *loa* ‘where?’ (ABVD)

SH: Gane *lutan* ‘fire’ (ABVD); Sawai *lutɛn* ‘fire’ (CAD); Taba *lutan* ‘fire’ (ABVD)

RA: Matbat *ma^{21}ta* ‘hand’ (R)

CB: Umar *mamon* ‘palm of hand’ (K)

CB: Yaur *màahré* ‘dry’ (K); Yerisiam *máhé* ‘dry’ (K)

RA: Biga *maˈbis* ‘black’ (R); Matbat *kabi^{12}t* ‘black’ (R)

CB: Yaur *mábórrè* ‘Mambor’ (K); Yerisiam *mámbóòrè* ‘Mambor’ (K)

RA: Ambel *mabot* ‘sweat’ (R); Biga *baˈbos* ‘sweat’ (R) [?]; Fiawat *mesəbot* ‘sweat’ (R); Kawe *manyoˈbot* ‘sweat’ (R); Laganyan *manyoˈbot* ‘sweat’ (R); Matbat *sabo^{12}t* ‘sweat’ (R); Maˈya (M.) *masˈmasa^{12}* ‘sweat’ (R); Maˈya (S.) *masˈmasa^{3}* ‘sweat’ (R); Maˈya (S.) *maˈʃobo^{3}t* ‘sweat’ (R)

RA: Kawe *maˈcu* ‘areca nut (Malay pinang)’ (R); Laganyan *amˈcu* ‘areca nut (Malay pinang)’ (R); Maˈya (M.) *kamaˈʃu^{3}* ‘areca nut (Malay pinang)’ (R); Maˈya (S.) *kamˈʃu^{3}* ‘areca nut (Malay pinang)’ (R); Wauyai *kamˈcu* ‘areca nut (Malay pinang)’ (R)

RA: Kawe *madyoˈrom* ‘night’ (R); Laganyan *madyoˈrom* ‘night’ (R); Wauyai *madyoˈrom* ‘night’ (R)

SH: Buli *mafŋél* ‘to dream’ (ABVD)

RA: Biga *-mñal* ‘to dream’ (ABVD); Gebe *masŋel* ‘to dream’ (ABVD)

CB: Biak *mafu* ‘to dream’ (H)

SH: Gane *magamin* ‘sharp’ (ABVD)

CB: Moor *maraminî* ‘sharp’ (K)

CB: Yaur *màhèeré* ‘tuna sp.’ (K); Yerisiam *máhéréevè* ‘tuna sp.’ (K)

CB: Umar *mai* ‘mother’ (K); Wandamen *mai* ‘mother’ (G)

RA: As *mai?* ‘rain’ (ABVD)

CB: Ambai *meta* ‘rain’ (ABVD); Biak *mèkĕm* ‘rain’ (H); Serui-Laut *metan* ‘rain’ (Slm)

RA: As *makam* ‘rotten’ (ABVD); Biga *malakamɔ* ‘rotten’ (ABVD); Gebe *mjakam* ‘rotten’ (ABVD)

RA: Biga *maˈlas* ‘long’ (R); Fiawat *malah* ‘long’ (R); Gebe *malawas* ‘long’ (ABVD); Kawe *baˈla(w)* ‘long’ (R); Laganyan *baˈlah* ‘long’ (R); Maˈya (M.) *maˈla^{12}s* ‘long’ (R); Maˈya (S.) *maˈla^{12}s* ‘long’ (R); Wauyai *baˈla* ‘long’ (R)

CB: Umar *mbrar* ‘long’ (K); Yaur *bràá’rè* ‘long’ (K)

Other: Arguni *mbara…* ‘long’ (ABVD); Irarutu *mərəro* ‘long’ (ABVD) [?]; Kowiai *maráwas* ‘long’ (ABVD); Sekar *manawas* ‘long’ (ABVD)

SH: Gane *maleu* ‘other’ (ABVD); Taba *maleo* ‘other’ (ABVD)

SH: Buli *mamagal* ‘big’ (ABVD)

Other: Sekar *mage:n* ‘big’ (ABVD)

Mamberamo: Warembori *mamana-ro* ‘Good’ (Donohue 1999); Yoke *mamana* ‘good’ (Donohue 1999)

CB: Ansus *mamang* ‘rain’ (P&D); Serui-Laut *mama* ‘rain’ (Slm)

Mamberamo: Warembori *mamasi* ‘Yellow’ (Donohue 1999); Warembori *mamasi* ‘Green’ (Donohue 1999); Yoke *mamasa* ‘green/yellow’ (Donohue 1999)

CB: Moor *mambéra* ‘sweet potato’ (K); Yaur *úmámbéèrrè* ‘sweet potato’ (K)

CB: Ambai *mambiriu* ‘crowned pigeon’ (Slz); Ansus *mambaru* ‘Victoria Crowned Pigeon’ (P&D)

CB: Biak *mambruk* ‘crown pigeon’ (H); Umar *mambrut* ‘crown pigeon’ (K); Wandamen *mambruke* ‘crowned pigeon’ (G); Yaur *máavrùgré* ‘crown pigeon’ (K)

CB: Umar *mamen* ‘fish-hook’ (K); Wandamen *mamei* ‘hook ; fish hook’ (G)

CB: Wandamen *mamo* ‘so that’ (G); Yaur *máamónáhă* ‘for that reason’ (K)

CB: Ambai *mamuna* ‘evil’ (Slz); Ansus *mamuna* ‘evil’ (P&D)

CB: Ansus *mamurang* ‘bamboo,_large’ (P&D); Dusner *mamora* ‘bamboo’ (D&M); Serui-Laut *mamura* ‘bamboo sp. (large)’ (Slm); Wandamen *mamura* ‘bamboo’ (G)

CB: Moor *mananà* ‘sweet’ (K); Umar *eman* ‘sweet’ (K)

CB: Wandamen *manana* ‘to steal’ (ABVD); Waropen *wumana* ‘to steal’ (ABVD)

Other: Arguni *-menena* ‘to steal’ (ABVD)

RA: Biga *mañanam* ‘sharp’ (ABVD); Gebe *myaŋan* ‘sharp’ (ABVD)

CB: Ambai *mananu* ‘leader’ (Slz); Biak *mànanir* ‘clan leader’ (H); Biak *mànanur* ‘clan leader’ (H); Umar *mananir* ‘leader’ (K); Yaur *mànànìivré* ‘head’ (K)

CB: Moor *mandakíra* ‘sea cucumber sp.’ (K); Wandamen *mandakiri* ‘’ (G)

RA: Ambel *mandep* ‘cloud’ (R)

CB: Ansus *mandipi* ‘cloud’ (P&D); Biak *màndif* ‘cloud’ (H)

CB: Ambai *maneiru* ‘how many (animate)’ (Slz); Yaur *ménéerà* ‘how many?’ (K)

Mamberamo: Warembori *manggamba-ro* ‘Cloud’ (Donohue 1999); Yoke *ɲaŋgamba* ‘cloud’ (Donohue 1999)

Other: Kowiai *mánggan* ‘sharp’ (ABVD); Sekar *magan* ‘sharp’ (ABVD)

CB: Umar *maniani* ‘tree sp.’ (K); Yerisiam *máníànì* ‘tree sp.’ (K)

Mamberamo: Warembori *man(i)-indowa-ro* ‘Egg’ (Donohue 1999); Yoke *-nduβ(u)* ‘egg’ (Donohue 1999)

CB: Ambai *maninkapoi* ‘hot (water)’ (Slz); Ansus *mangkakopi* ‘hot’ (P&D)

CB: Moor *manitá* ‘friend’ (K); Serui-Laut *maneta* ‘sibling’ (Slm); Umar *maneta* ‘friend’ (K); Wandamen *maneta* ‘friend’ (G)

CB: Ambai *manivovi* ‘friend’ (Slz); Biak *manibob* ‘friend’ (H); Biak *manibowi* ‘friend’ (H); Serui-Laut *manivovi* ‘friend’ (Slm); Yerisiam *márábóòvà* ‘friend’ (K) [?]
Mamberamo: Warembori *manivovi-ro* ‘Friend’ (Donohue 1999)

CB: Ambai *manken* ‘sea bird’ (Slz); Ansus *mangkeng* ‘tern’ (P&D); Moor *mànggena* ‘bird sp.’ (K); Umar *manggen* ‘bird sp.’ (K)

CB: Biak *mankòkò* ‘chicken’ (H); Moor *kokó* ‘chicken’ (K); Umar *kokor* ‘chicken’ (K); Wandamen *kokori* ‘chicken’ (G); Yaur *ò’òoré* ‘chicken’ (K); Yerisiam *kókórvè* ‘chicken’ (K)

CB: Serui-Laut *mankombararei* ‘dolphin’ (Slm); Umar *manggombo* ‘dolphin’ (K)

CB: Ambai *man-kukei* ‘chicken’ (Slz); Ansus *mangkuei* ‘chicken’ (P&D)

CB: Ambai *mansani* ‘widower’ (Slz); Biak *mànsiani* ‘widower’ (H); Moor *maisána* ‘widower’ (K); Serui-Laut *mansani* ‘widower’ (Slm); Umar *mahian* ‘widower’ (K); Yaur *máhíapîré* ‘widower’ (K)

CB: Dusner *mansren* ‘God’ (D&M); Dusner *sern* ‘God’ (D&M); Moor *síen* ‘God’ (K); Wandamen *sien* ‘god ; master’ (G)

CB: Ambai *man-tei* ‘who’ (Slz); Ansus *matei* ‘who?’ (P&D); Wandamen *tei* ‘who’ (G)

SH: Gane *manusia* ‘person/human being’ (ABVD); Taba *manusia* ‘person/human being’ (ABVD)
Other: Sekar *mancia* ‘person/human being’ (ABVD)

CB: Dusner *manvetatu* ‘bird.of.paradise’ (D&M); Yerisiam *máná tóotà* ‘bird of paradise’ (K)

RA: Biga *mapane* ‘who?’ (ABVD); Biga *ma^{l}pe* ‘who’ (R); Matbat *ma^{21}n* ‘who’ (R)

CB: Moor *màpara* ‘valley’ (K); Wandamen *mapar* ‘valley ; plain’ (G)

CB: Moor *mará’a* ‘steal’ (K); Moor *marahá* ‘steal’ (K); Umar *an mare* ‘steal’ (K); Yerisiam *bàmàrá* ‘steal’ (K)

CB: Ambai *marain-deni* ‘fishhook’ (Slz); Ansus *maraindeng* ‘fish hook’ (P&D)

CB: Ambai *marandin* ‘decorate’ (Slz); Wandamen *marandi* ‘wear jewelry ; decorate oneself’ (G); Yerisiam *párátía* ‘decorate’ (K)

CB: Ansus *marapa werau* ‘greens,_k.o.’ (P&D); Ansus *marapa weraung* ‘tulip’ (P&D); Wandamen *marapa rau* ‘k.o. vegetable’ (G)

CB: Moor *mararígwa* ‘storm’ (K); Yerisiam *órárígùa* ‘noise’ (K)

CB: Ansus *marewa* ‘ray’ (P&D); Serui-Laut *marebo* ‘ray sp.’ (Slm); Umar *nambrer* ‘ray sp.’ (K)

CB: Ambai *marisani* ‘pepper’ (Slz); Biak *marisàn* ‘chile pepper’ (H); Wandamen *marisia* ‘chili pepper’ (G)

CB: Moor *maró’a* ‘sink’ (K); Serui-Laut *marutu* ‘to sink’ (Slm)

CB: Moor *maruatî* ‘dry’ (K); Umar *mare* ‘dry’ (K)

CB: Moor *masasu’î* ‘destroyed’ (K); Wandamen *masabu* ‘broken ; cracked’ (G); Wandamen *masasabu* ‘smashed; shattered’ (G)

RA: As *masɔn* ‘heavy’ (ABVD); Biga *mason* ‘heavy’ (ABVD); Biga *maˈsun* ‘heavy’ (R); Fiawat *meson* ‘heavy’ (R); Laganyan *maˈʃon[o]* ‘heavy’ (R)
CB: Waropen *mahuna* ‘heavy’ (ABVD)

CB: Moor *matì* ‘ripe’ (K); Yerisiam *máaté* ‘ripe’ (K)

Mamberamo: Warembori *matin-do* ‘Bathe (tr)’ (Donohue 1999); Yoke *masi* ‘wash’ (Donohue 1999)

Mamberamo: Warembori *matiran-do* ‘Roof’ (Donohue 1999); Yoke *maseraŋgan* ‘roof’ (Donohue 1999)

RA: Kawe *mat saˈgi* ‘who’ (R); Laganyan *mat saˈgya* ‘who’ (R); Maˈya (M.) *miˈsa-gia* ‘who’ (R); Maˈya (S.) *miˈsa* ‘who’ (R); Wauyai *mat saˈgya* ‘who’ (R)

RA: Biga *maˈtumol(o)* ‘people’ (R); Kawe *maˈtumol(o)* ‘people’ (R); Laganyan *maˈtumol(o)* ‘people’ (R); Maˈya (M.) *maˈtumol(o)* ‘people’ (R); Maˈya (S.) *muˈtumol(o)* ‘people’ (R); Wauyai *maˈtumol(o)* ‘people’ (R)
Other: Irarutu *matú* ‘person’ (M)

CB: Ambai *mawai* ‘sago pounder’ (Slz); Ansus *amau* ‘sago_pounder’ (P&D)

CB: Ansus *mayapi* ‘younger sister’ (P&D); Wandamen *madiawi* ‘younger sibling’ (G)

Mamberamo: Warembori *maya-ro* ‘Cuscus’ (Donohue 1999); Yoke *marayi* ‘cuscus’ (Donohue 1999)

CB: Ansus *mayoi* ‘sit, be at’ (P&D); Wandamen *masoi* ‘sit’ (G)

CB: Umar *mbre* ‘see’ (K); Waropen *ambora* ‘to see’ (ABVD)

CB: Umar *mbren* ‘tongue’ (K); Waropen *mebero* ‘tongue’ (ABVD); Waropen *mero* ‘tongue’ (ABVD)

CB: Ambai *mei* ‘play’ (Slz); Moor *méa* ‘play’ (K); Moor *mearà* ‘play’ (K); Wandamen *meire* ‘play’ (G)

CB: Ambai *meiri* ‘alone’ (Slz); Ambai *mesiri* ‘alone’ (Slz); Wandamen *mesari* ‘alone’ (G)

RA: Fiawat *meɟul* ‘oil’ (R); Laganyan *maˈɟul[u]* ‘oil’ (R); Maˈya (S.) *maˈɟulu*^{3} ‘oil’ (R)

RA: Fiawat *melim* ‘night’ (R); Laganyan *maˈle* ‘night’ (R); Maˈya (M.) *maˈle*^{12} ‘night’ (R); Maˈya (S.) *maˈle*^{12} ‘night’ (R); Wauyai *maˈle* ‘night’ (R)

CB: Ambai *meŋgapoi* ‘warm’ (ABVD); Serui-Laut *mengkakopi* ‘warm’ (Slm)

CB: Ambai *mereha* ‘water’ (ABVD); Wandamen *maria* ‘water’ (G)

SH: Buli *mẽt* ‘cloud’ (ABVD)

RA: Biga *met* ‘cloud’ (R); Fiawat *mit* ‘cloud’ (R); Gebe *miɛt* ‘cloud’ (ABVD); Kawe *met* ‘cloud’ (R); Laganyan *met* ‘cloud’ (R); Maˈya (M.) ˈ*me*^{12}*t* ‘cloud’ (R); Maˈya (S.) ˈ*me*^{12}*t* ‘cloud’ (R); Wauyai *met* ‘cloud’ (R)

RA: Ambel *metapa* ‘who’ (R); Fiawat *metsapa* ‘who’ (R)

RA: Biga *metɛn* ‘dry’ (ABVD); Fiawat *meten* ‘dry’ (R); Kawe *meˈten* ‘dry’ (R); Laganyan *meˈten* ‘dry’ (R); Maˈya (M.) ˈ*mete*^{12}*n* ‘dry’ (R); Maˈya (S.) ˈ*mete*^{3}*n* ‘dry’ (R); Wauyai *meˈten* ‘dry’ (R)

SH: Buli *mgini* ‘to burn’ (ABVD)

RA: Biga *l-agiˈnim* ‘burn (trans.)’ (R); Maˈya (M.) *waˈgini³m* ‘burn (trans.)’ (R)

CB: Umar *mhe* ‘sago swamp’ (K); Yaur *hèríe* ‘sago area’ (K)

SH: Gane *mikoat* ‘red’ (ABVD); Sawai *n-mɛkɔt* ‘red’ (CAD); Taba *makot* ‘red’ (ABVD)

RA: Ambel *milik* ‘oil’ (R) [?]; Matbat *mni¹²k* ‘oil’ (R)

CB: Ambai *manin* ‘oil’ (Slz); Ansus *maning* ‘oil’ (P&D); Biak *mani* ‘oil’ (H); Serui-Laut *mani* ‘oil’ (Slm); Umar *mani* ‘oil’ (K)

CB: Ambai *mireka* ‘die’ (Slz); Serui-Laut *marea* ‘to die’ (Slm)

SH: Buli *mlàŋa* ‘long’ (ABVD); Gane *mlonga* ‘long’ (ABVD); Sawai *n-ɛ-mlɔŋɛ* ‘long’ (CAD); Taba *mlongan* ‘long’ (ABVD)

CB: Biak *mniwěr* ‘wasp’ (H); Moor *mananíva* ‘bee’ (K); Wandamen *mania(i)* ‘wasp ; bee’ (G); Yaur *nìjé* ‘wasp’ (K); Yerisiam *kénébà níainé* ‘bee’ (K); Yerisiam *nánǐijárà* ‘wasp’ (K)

SH: Taba *mnopa* ‘wide’ (ABVD)

RA: Biga *manapa* ‘wide’ (ABVD)

CB: Umar *mnue* ‘out’ (K); Yaur *nèmnîì* ‘used up’ (K)

CB: Moor *mo* ‘place’ (K); Yaur *mó* ‘place’ (K)

SH: Gane *moda* ‘wind’ (ABVD); Sawai *morɛ* ‘wind’ (CAD); Taba *moda* ‘wind’ (ABVD)

RA: Ambel *moro* ‘wind’ (R); Biga *moˈro* ‘wind’ (R); Fiawat *mor* ‘wind’ (R); Gebe *mɔrɔ* ‘wind’ (ABVD); Kawe ˈ*mor[o]* ‘wind’ (R); Laganyan ˈ*mor[o]* ‘wind’ (R); Maˈya (M.) ˈ*moro¹²* ‘wind’ (R); Maˈya (S.) ˈ*moro³* ‘wind’ (R); Wauyai ˈ*mor[o]* ‘wind’ (R)

CB: Umar *moga* ‘crow sp.’ (K); Wandamen *moga* ‘crow’ (G)

CB: Yaur *móhámè* ‘Neg’ (K); Yerisiam *má* ‘Neg’ (K)

Mamberamo: Warembori *mopi* ‘PP, PPSi’ (Donohue 1999); Yoke *mopay* ‘grandparent’ (Donohue 1999)

CB: Moor *mòra* ‘Moor’ (K); Yaur *mórrè* ‘Moor’ (K); Yerisiam *móòrè* ‘Moor’ (K)

CB: Moor *mòra ríana* ‘Moor language’ (K); Yaur *rǐin mórrè* ‘Moor language’ (K)

CB: Umar *mot* ‘baked sago’ (K); Yaur *móò’ré* ‘baked sago’ (K); Yerisiam *móòkà* ‘baked sago’ (K)

CB: Umar *mot aka* ‘ball-shaped sago’ (K); Yaur *mó àkáe* ‘ball-shaped baked sago’ (K); Yerisiam *àká* ‘ball-shaped baked sago’ (K)

CB: Umar *mot hoda* ‘oven-baked sago’ (K); Yerisiam *móhàdáà* ‘oven’ (K)

RA: Biga *moˈto* ‘much’ (R); Fiawat *mot* ‘much’ (R); Kawe ˈ*mot[o]* ‘much’ (R); Laganyan ˈ*mot[o]* ‘much’ (R); Matbat *to¹²* ‘much’ (R); Maˈya (M.) ˈ*moto¹²* ‘much’ (R); Maˈya (S.) ˈ*mo¹²t* ‘much’ (R); Wauyai ˈ*mot[o]* ‘much’ (R)

SH: Buli *[m]sai* ‘wide’ (ABVD); Sawai *n-ɛ-msɔy* ‘wide’ (CAD)

SH: Buli *mumis* ‘mosquito’ (ABVD)

RA: Biga *kamumus* ‘mosquito’ (ABVD)

CB: Biak *muměs* ‘mosquito’ (H); Wandamen *kamumi[s]* ‘mosquito’ (ABVD)

CB: Ansus *muna* ‘fish_with_net’ (P&D) [?]; Yaur *múùré* ‘fish net’ (K) [?]

CB: Ambai *mundiai* ‘earthquake’ (Slz); Wandamen *mundiya* ‘earthquake’ (G); Yaur *múndíijàavré* ‘earthquake’ (K)

CB: Umar *munia* ‘spear’ (K); Yerisiam *múnîjà* ‘spear’ (K)

CB: Ambai *muntun* ‘pigeon’ (Slz) [?]; Ansus *mandung* ‘Ped Imperial Pigeon’ (P&D); Yaur *màndùhré* ‘pigeon’ (K)

CB: Ambai *munu* ‘house’ (Slz); Ansus *manu* ‘house’ (P&D); Serui-Laut *manu* ‘house’ (Slm)

CB: Ansus *munua* ‘tuna’ (P&D); Umar *munua* ‘tuna sp.’ (K)

CB: Ambai *muran* ‘east’ (Slz); Ansus *wope murang* ‘east’ (P&D); Serui-Laut *wana murang* ‘east’ (Slm)

CB: Yaur *mù’ré* ‘canoe mooring’ (K); Yerisiam *múngkrè* ‘canoe mooring’ (K)

CB: Ansus *muri* ‘crab’ (P&D); Wandamen *muri* ‘crab’ (G)

CB: Ambai *na* ‘at’ (ABVD); Ansus *na* ‘at’ (P&D); Moor *-na* ‘Loc’ (K); Serui-Laut *na* ‘in/from’ (Slm); Wandamen *na* ‘at ; in’ (G); Waropen *na* ‘at’ (ABVD)

Other: Kowiai *-na* ‘at’ (ABVD)

RA: Matbat *na*^{1} ‘rain’ (R)

CB: Ansus *miuna* ‘rain_(verb)’ (P&D); Moor *ùnuma* ‘rain’ (K); Wandamen *muna* ‘rain’ (G); Yaur *nàtèehré* ‘rain’ (K) [??]

Other: Arguni *umun* ‘rain’ (ABVD); Kowiai *óma* ‘rain’ (ABVD) [?]

RA: Matbat *na*^{12}*n* ‘animal’ (R)

CB: Yaur *náhnáàrré* ‘animal’ (K)

RA: Matbat *n-a*^{21}*t* ‘bite’ (R)

CB: Moor *a’ì* ‘bite’ (K); Umar *wat* ‘bite’ (K); Yerisiam *áaká* ‘bite’ (K)

CB: Biak *nadi* ‘pray’ (H); Dusner *nadi* ‘prayer’ (D&M); Moor *ve-nàdi* ‘pray’ (K); Umar *nadi* ‘pray’ (K); Wandamen *venadi* ‘pray’ (G); Yaur *náadìe* ‘pray’ (K); Yerisiam *nàádì* ‘pray’ (K)

CB: Umar *nae* ‘leaf’ (K); Yaur *náaròɡré* ‘leaf’ (K)

Other: Arguni *nane* ‘leaf’ (ABVD)

CB: Ambai *nafa* ‘sand’ (Slz); Moor *nàha’a* ‘sand’ (K); Waropen *nafa* ‘sand’ (ABVD)

CB: Dusner *nai* ‘later’ (D&M); Moor *nóndé* ‘later’ (K); Wandamen *nani* ‘later’ (G); Yaur *nádà* ‘later’ (K)

CB: Ansus *nai* ‘live_at’ (P&D); Wandamen *na(i)* ‘be at ; reside’ (G)

Other: Sekar *nais* ‘to live, be alive’ (ABVD)

CB: Umar *najat* ‘plate’ (K); Yaur *nàjàa’ré* ‘plate’ (K)

RA: Biga *n-aˈmat* ‘burn (intr. 3S)’ (R); Kawe *nyaˈmat* ‘burn (intr. 3S)’ (R); Laganyan *nyaˈmat* ‘burn (intr. 3S)’ (R); Maˈya (M.) *ny-ˈama^{12}t* ‘burn (intr. 3S)’ (R); Maˈya (S.) *ny-ˈama^{3}t* ‘burn (intr. 3S)’ (R); Wauyai *nyaˈmat* ‘burn (intr. 3S)’ (R)

CB: Umar *naniet* ‘orphan’ (K); Yaur *nànèetré* ‘orphan’ (K)

CB: Ansus *nao, na tatoi* ‘where?’ (P&D); Wandamen *na toi* ‘where’ (G)

Mamberamo: Warembori *napermba* ‘Beach’ (Donohue 1999); Yoke *naupa* ‘beach’ (Donohue 1999)

CB: Waropen *-nasa* ‘to hear’ (ABVD); Waropen *nata* ‘to hear’ (ABVD)

Mamberamo: Warembori *nata-na-o* ‘Hear’ (Donohue 1999); Yoke *nanta* ‘hear’ (Donohue 1999)

CB: Ansus *nau* ‘cat’ (P&D); Umar *nao* ‘cat’ (K); Wandamen *niau* ‘cat’ (G); Yaur *nàovré* ‘cat’ (K); Yerisiam *náò* ‘cat’ (K)

CB: Moor *naviré* ‘Nabire’ (K); Umar *navirei* ‘Nabire’ (K); Yaur *návírèijè* ‘Nabire’ (K); Yerisiam *návírèi* ‘Nabire’ (K)

CB: Ambai *nawan* ‘basket’ (Slz); Ansus *rawang* ‘fish_basket’ (P&D); Wandamen *nawa* ‘net ; basket’ (G)

SH: Sawai *n-bɔy* ‘to lie down’ (CAD)

RA: Laganyan *w-abaˈlyoy(o)* ‘lie down’ (R); Wauyai *aˈbloy[o]* ‘lie down’ (R)

CB: Dusner *ndi-* ‘3SG’ (D&M); Wandamen *andi* ‘he/she/it ; 3sg pronoun’ (G)

CB: Ambai *neki* ‘cat’ (Slz); Serui-Laut *méki* ‘cat’ (Slm)

CB: Moor *nèma* ‘tongue’ (K); Yerisiam *níaméené* ‘tongue’ (K)

SH: Buli *nēsa* ‘other’ (ABVD)

RA: As *nsa* ‘other’ (ABVD)

CB: Serui-Laut *netava* ‘sibling’ (Slm); Wandamen *neta katu* ‘younger sibling’ (G)

CB: Ansus *neuna* ‘scale,_fish’ (P&D); Moor *noná* ‘fish scale’ (K); Yerisiam *núuné* ‘fish-scale’ (K)

RA: Gebe *ŋa* ‘sky’ (ABVD); Maˈya (M.) ˈna^{12} ‘sky’ (R); Maˈya (S.) ˈna^{12} ‘sky’ (R)

SH: Buli *ŋa* ‘moon’ (ABVD)

RA: Matbat *na^{41}* ‘moon’ (R)

SH: Taba *ngan* ‘day’ (ABVD)

RA: As *nan* ‘day’ (ABVD); Biga *mañan* ‘day’ (ABVD)

SH: Gane *nganga* ‘to yawn’ (ABVD); Sawai *n-ɛŋaɛp* ‘to yawn’ (CAD)

SH: Sawai *ŋaŋ-o* ‘tooth’ (CAD)

CB: Biak *na* ‘tooth’ (H)

CB: Ambai *nin-* ‘here’ (Slz); Ansus *na nina* ‘here’ (P&D); Wandamen *nina* ‘here’ (G)

SH: Buli *ñiñēn* ‘sand’ (ABVD); Gane *minyana* ‘sand’ (ABVD); Taba *nyanyana* ‘sand’ (ABVD)

RA: Gebe *miñen* ‘sand’ (ABVD)

CB: Ambai *ninuai* ‘sand’ (ABVD); Serui-Laut *nunoi* ‘sand’ (Slm)

Other: Irarutu *inneñevo* ‘sand’ (ABVD)

SH: Gane *ninik* ‘mosquito’ (ABVD); Sawai *ninɛ* ‘mosquito’ (CAD)

RA: Gebe *nini* ‘mosquito’ (ABVD)

CB: Moor *tanìna* ‘mosquito’ (K) [?]; Waropen *nini* ‘mosquito’ (ABVD)

Mamberamo: Warembori *ini-ro* ‘Mosquito’ (Donohue 1999); Yoke *niŋa* ‘mosquito’ (Donohue 1999)

CB: Ambai *noi* ‘knife’ (Slz); Ansus *nyoi* ‘knife’ (P&D); Dusner *noi* ‘knife’ (D&M); Serui-Laut *noi* ‘knife’ (Slm); Wandamen *nioi* ‘knife’ (G); Yerisiam *níòi* ‘machete’ (K)

RA: Ambel *now* ‘house’ (R); Fiawat *now* ‘house’ (R)

SH: Sawai *n-pɛlɔy* ‘big’ (CAD)

RA: Biga *paˈley* ‘big’ (R); Fiawat *peley* ‘big’ (R); Gebe *pial* ‘big’ (ABVD); Kawe *paˈle(y)* ‘big’ (R); Laganyan *paˈle* ‘big’ (R); Maˈya (M.) *paˈle³* ‘big’ (R); Maˈya (S.) *paˈle³* ‘big’ (R); Wauyai *paˈle* ‘big’ (R)

RA: Matbat *nu¹²* ‘to kiss’ (R)

CB: Ambai *-naha* ‘to sniff, smell’ (ABVD); Biak *nàsĕm* ‘to sniff, smell’ (H); Moor *anità* ‘kiss’ (K); Umar *noh* ‘smell’ (K); Wandamen *anasa* ‘to sniff, smell’ (ABVD); Waropen *asasa* ‘to sniff, smell’ (ABVD) [?]; Yaur *núuhnè* ‘kiss’ (K); Yerisiam *nóhà* ‘kiss’ (K)

CB: Ambai *numbuain* ‘sand’ (Slz); Ansus *ruwuang* ‘sand’ (P&D); Wandamen *rubua* ‘sand’ (G); Wandamen *rubua[n]* ‘sand’ (ABVD)

CB: Ambai *nu-randaun* ‘hair (head)’ (Slz); Ansus *duandaung* ‘hair’ (P&D); Wandamen *ru nandao* ‘hair’ (G); Wandamen *runandau* ‘hair’ (ABVD)

Mamberamo: Warembori *nut dipi-ro* ‘Betel’ (Donohue 1999); Yoke *dipiβu* ‘betel nut’ (Donohue 1999)

CB: Serui-Laut *nyai* ‘disappear’ (Slm); Umar *niot* ‘disappear’ (K); Wandamen *nai* ‘disappear’ (G)

RA: Ambel *nyan* ‘betel leaf (Malay biji sirih)’ (R); Kawe *ˈnyana* ‘betel leaf (Malay biji sirih)’ (R); Laganyan *nyan[a]* ‘betel leaf (Malay biji sirih)’ (R); Matbat *na¹n* ‘betel leaf (M. biji sirih)’ (R); Maˈya (M.) *ˈnyana¹²* ‘betel leaf (Malay biji sirih)’ (R); Maˈya (S.) *ˈnya¹²n* ‘betel leaf (Malay biji sirih)’ (R); Wauyai *nyan[a]* ‘betel leaf (Malay biji sirih)’ (R)

CB: Biak *nān* ‘betel pepper’ (H); Moor *inána* ‘betel pepper’ (K); Umar *nian* ‘betel’ (K); Yerisiam *nárínìànà* ‘betel’ (K)

Mamberamo: Warembori *nan-do* ‘Chewing betel’ (Donohue 1999); Yoke *nans-* ‘betel pepper’ (Donohue 1999)

CB: Umar *o* ‘mouth’ (K); Yaur *ómògrè* ‘mouth’ (K); Yerisiam *ópáahé* ‘hole’ (K)

CB: Umar *odu* ‘smoke’ (K); Yaur *ódùgrè* ‘smoke’ (K)

RA: Gebe *-of* ‘to say’ (ABVD)

CB: Biak *kòfèn* ‘to say’ (H); Serui-Laut *afa* ‘to say’ (Slm); Waropen *afa* ‘to say’ (ABVD); Waropen *ofa* ‘to say’ (ABVD)

SH: Gane *ofal* ‘to squeeze’ (ABVD); Taba *-ohal* ‘to squeeze’ (ABVD)

RA: Biga *-ogol* ‘to vomit’ (ABVD); Gebe *-ɔgɔl* ‘to vomit’ (ABVD)

CB: Umar *oh* ‘paddle’ (K); Yaur *úhrè* ‘paddle’ (K); Yerisiam *óòhà* ‘paddle’ (K)

SH: Gane *ólai* ‘to dig’ (ABVD); Sawai *n-oylɛ* ‘to dig’ (CAD)

RA: Gebe *-alai* ‘to dig’ (ABVD)

CB: Ambai *arai* ‘dig’ (Slz); Ambai *i-sarai* ‘to dig’ (ABVD); Ambai *sirai* ‘dig’ (Slz); Ansus *irai* ‘dig’ (P&D); Serui-Laut *arai* ‘to dig’ (Slm); Serui-Laut *irai* ‘to dig’ (Slm); Umar *hrae* ‘dig’ (K); Wandamen *sarai* ‘to dig’ (ABVD)

SH: Buli *olat* ‘sea’ (ABVD); Gane *wolat* ‘sea’ (ABVD); Sawai *wɔlɛt* ‘sea’ (CAD); Taba *wolat* ‘sea’ (ABVD)

RA: Biga *wulut* ‘sea’ (ABVD)

SH: Buli *oŋ* ‘to bite’ (ABVD); Gane *pakat* ‘to bite’ (ABVD) [?]

RA: Gebe *-kɔŋɔt* ‘to bite’ (ABVD)

CB: Ansus *ong* ‘give’ (P&D); Serui-Laut *ona* ‘to give’ (Slm); Serui-Laut *ona* ‘to give’ (Slm); Serui-Laut *oni* ‘to give’ (Slm); Serui-Laut *oni* ‘to give’ (Slm); Wandamen *one* ‘give’ (G)

CB: Umar *opun* ‘bamboo stem’ (K); Yerisiam *ópúnè* ‘bamboo stem’ (K)

CB: Dusner *or* ‘call’ (D&M); Moor *orî* ‘call’ (K)

CB: Moor *oranî* ‘pull’ (K); Yerisiam *óoránà* ‘pull’ (K)

Mamberamo: Warembori *ore* ‘Give’ (Donohue 1999); Yoke *o* ‘give’ (Donohue 1999)

SH: Buli *osal* ‘to stand’ (ABVD); Gane *wosal* ‘to stand’ (ABVD); Sawai *n-osɛl* ‘stand’ (CAD); Taba *-wosal* ‘to stand’ (ABVD)

RA: Ambel *l-ol* ‘stand’ (R); As *-sɔ* ‘to stand’ (ABVD); Biga *-awol* ‘to stand’ (ABVD); Biga *l-aˈwul* ‘stand’ (R); Fiawat *l-ohol* ‘stand’ (R); Kawe *w-ol* ‘stand’ (R); Laganyan ˈ*w-ohol* ‘stand’ (R); Matbat *n-o*^{12}*l* ‘stand’ (R); Maˈya (M.) ˈ*w-oso*^{12}*l* ‘stand’ (R); Maˈya (S.) ˈ*w-oso*^{3}*l* ‘stand’ (R); Wauyai *w-ol* ‘stand’ (R)

CB: Biak *orĕs* ‘to stand’ (H); Dusner *ors* ‘stand’ (D&M); Umar *he* ‘stand’ (K); Wandamen *osa* ‘stand’ (G); Wandamen *osa[r]* ‘to stand’ (ABVD); Waropen *osaro* ‘to stand’ (ABVD); Waropen *otaro* ‘to stand’ (ABVD); Yerisiam *óohé* ‘stand’ (K)

Other: Arguni *-ser* ‘to stand’ (ABVD)

Mamberamo: Warembori *ovo-ro* ‘Arrow’ (Donohue 1999); Yoke *aβua* ‘arrow’ (Donohue 1999)

CB: Ambai *padamara* ‘lamp’ (Slz); Ansus *padamara* ‘lamp’ (P&D); Moor *padamára* ‘gas lantern’ (K); Wandamen *padamara* ‘lamp’ (G)

Mamberamo: Warembori *pandamara* ‘Lamp’ (Donohue 1999)

CB: Ansus *pai* ‘run’ (P&D); Serui-Laut *afai-afai* ‘to run’ (Slm); Wandamen *apai* ‘run’ (G)

CB: Ansus *pai* ‘that over there’ (P&D); Wandamen *pai* ‘DET’ (G)

SH: Gane *pait* ‘moon’ (ABVD)

RA: As *pai?* ‘moon’ (ABVD); Biga *pet* ‘moon’ (ABVD); Biga *pit* ‘moon’ (R); Fiawat *pit* ‘moon’ (R); Gebe *pait* ‘moon’ (ABVD); Kawe *pit* ‘moon’ (R); Laganyan *pit* ‘moon’ (R); Maˈya (M.) *ˈpi^{12}t* ‘moon’ (R); Maˈya (S.) *ˈpi^{12}t* ‘moon’ (R); Wauyai *pit* ‘moon’ (R)

CB: Ambai *embai* ‘moon’ (Slz); Ansus *yembai* ‘moon’ (P&D); Biak *païk* ‘moon’ (H); Serui-Laut *embai* ‘moon’ (Slm); Wandamen *sembai* ‘moon’ (ABVD); Wandamen *sembie* ‘moon’ (G)

Other: Irarutu *seba* ‘moon’ (ABVD); Irarutu *sibá* ‘moon’ (M); Sekar *bunan* ‘moon’ (ABVD)

RA: As *pa-lfi* ‘right’ (ABVD); Biga *palafi* ‘right’ (ABVD)

Mamberamo: Warembori *pamarsa* ‘Knife’ (Donohue 1999) [Malay loan]; Yoke *pamaraasi* ‘knife’ (Donohue 1999) [Malay loan]

CB: Biak *pànda* ‘gun’ (H); Moor *pandá* ‘gun’ (K); Umar *pandija* ‘gun’ (K); Wandamen *pandaya* ‘gun’ (G); Yaur *pándépîré* ‘gun’ (K); Yerisiam *páandépì* ‘gun’ (K)

CB: Wandamen *papano* ‘soft coral’ (G); Yerisiam *pàmpùnúa háarú* ‘coral sp.’ (K)

SH: Buli *papleo* ‘tongue’ (ABVD); Sawai *pɛplɛ-o* ‘tongue’ (CAD); Taba *plelo* ‘tongue’ (ABVD)

RA: Matbat *para^{12}l* ‘tongue’ (R)

SH: Taba *pappuko* ‘knee’

RA: Biga *kaˈi kaˈpuk(o)* ‘knee’ (R); Fiawat *epyabu* ‘knee’ (R); Kawe *kam aˈpuk(o)* ‘knee’ (R); Laganyan *aˈne aˈpuk(o)* ‘knee’ (R); Matbat *we^{21}ta-pu^{21}k* ‘knee’ (R); Maˈya (M.) *kaˈpu^{3}k* ‘knee’ (R); Maˈya (S.) *kaˈne kaˈpuk(o)* ‘knee’ (R); Wauyai *kaˈne kaˈpuk(o)* ‘knee’ (R)

CB: Ansus *aeu bu* ‘knee’ (P&D); Moor *nevú’a* ‘knee’ (K); Serui-Laut *aebua* ‘knee’ (Slm); Umar *gavu* ‘knee’ (K); Wandamen *aibu* ‘knee’ (G); Yaur *évúujè* ‘knee’ (K); Yerisiam *níbúgùa* ‘knee’ (K)

Mamberamo: Warembori *ke-vua-ro* ‘Knee’ (Donohue 1999); Yoke *βuak* ‘knee’ (Donohue 1999)

Other: Irarutu *wifú* ‘knee’ (M)

CB: Ansus *parai* ‘mangrove’ (P&D); Wandamen *ai parai* ‘k.o. mangrove tree’ (G)

CB: Moor *parìgi* ‘well’ (K); Umar *parigi* ‘well’ (K); Yaur *pàrìgìivré* ‘well’ (K)

CB: Ansus *paroai* ‘plate’ (P&D); Serui-Laut *faurai* ‘plate’ (Slm)

CB: Dusner *pasis* ‘quietly’ (D&M); Wandamen *asisi* ‘silent’ (G)

RA: Biga *pelimi* ‘left’ (ABVD); Gebe *palpalima* ‘left’ (ABVD)

CB: Biak *pĕnor* ‘egg’ (H); Wandamen *ponori* ‘egg’ (G)

Mamberamo: Warembori *pere-o* ‘Cold’ (Donohue 1999); Yoke *puru* ‘cold’ (Donohue 1999)

Mamberamo: Warembori *pere-yo* ‘Die’ (Donohue 1999); Yoke *piru* ‘die’ (Donohue 1999)

RA: As *pɛrim* ‘cold’ (ABVD)

CB: Biak *prim* ‘cold’ (H)

CB: Ambai *pia-rei* ‘twenty’ (Slz); Ansus *piarei* ‘twenty’ (P&D)

CB: Biak *pimàm* ‘sea cucumber’ (H) [?]; Wandamen *piomberi* ‘k.o. sea cucumber’ (G) [?]

RA: Maˈya (S.) *ˈpina^{3}* ‘widow’ (R)

CB: Moor *bindó* ‘widow’ (K)

CB: Biak *piòpěr* ‘white’ (H); Biak *piupěr* ‘white’ (H)
Mamberamo: Warembori *pepera* ‘White’ (Donohue 1999)

CB: Moor *pìpi* ‘money’ (K); Umar *pipi* ‘money’ (K); Wandamen *pipi* ‘money’ (G); Yaur *pìpìivré* ‘money’ (K)

CB: Dusner *pir* ‘put’ (D&M); Wandamen *pi* ‘place ; put’ (G)

CB: Ambai *pirandima* ‘bitter’ (Slz); Serui-Laut *piarima* ‘bitter’ (Slm)

SH: Buli *pitan* ‘to tie up, fasten’ (ABVD); Sawai *n-pitɛn* ‘to tie’ (CAD)
RA: As *-batin* ‘to tie up, fasten’ (ABVD); Gebe *kapitan* ‘to tie up, fasten’ (ABVD)

CB: Ansus *poa* ‘flood’ (P&D); Moor *fóara* ‘flood’ (K)

SH: Gane *poi* ‘head’ (ABVD); Taba *poyo* ‘head’ (ABVD)

CB: Moor *pondaràn*u ‘pandanus leaf’ (K); Umar *ponda* ‘pandanus’ (K)

Mamberamo: Warembori *poso-ro* ‘Spear’ (Donohue 1999); Yoke *poso* ‘spear’ (Donohue 1999)

CB: Ansus *poT* ‘fish with line’ (P&D); Wandamen *pote* ‘catch (fish) ; go fishing’ (G)

CB: Ansus *poti* ‘Hawksbill_Turtle’ (P&D); Wandamen *poti* ‘small sea turtle’ (G)

SH: Gane *puí* ‘what?’ (ABVD); Taba *pu* ‘what?’ (ABVD)

CB: Yerisiam *púmáànà* ‘grandfather’ (K)
Mamberamo: Warembori *puma* ‘CC’ (Donohue 1999); Yoke *puma* ‘grandchild’ (Donohue 1999)

SH: Buli *puŋpuŋ* ‘dull, blunt’ (ABVD)
Other: Irarutu *púmə* ‘dull’ (M)

Mamberamo: Warembori *pu-ro* ‘tail’ (Donohue 1999); Yoke *pi-a* ‘tail’ (Donohue 1999)

Other: Arguni *-pʷaper* ‘to hit’ (ABVD); Kowiai *-bába’* ‘to hit’ (ABVD); Sekar *baban* ‘to hit’ (ABVD)

RA: Ambel *pya* ‘human hair (head)’ (R); Biga *pa* ‘human hair (head)’ (R); Kawe *taˈpla* ‘human hair (head)’ (R); Laganyan *taˈplya* ‘human hair (head)’ (R); Maˈya (M.) *ˈplya*^{12} ‘human hair (head)’ (R); Maˈya (S.) *ˈplya*^{3} ‘human hair (head)’ (R); Wauyai *taˈpla* ‘human hair’ (R)

CB: Ambai *rabuan* ‘between’ (Slz); Ambai *rabuan* ‘middle’ (Slz); Moor *ravu’éna* ‘middle’ (K); Serui-Laut *rabua(n)* ‘between, among’ (Slm); Wandamen *vara kei rabua* ‘middle finger; ring finger’ (G); Yerisiam *ráúugwánà* ‘in the middle’ (K)

CB: Moor *ragwènde* ‘bamboo pole’ (K); Umar *rawojan* ‘barbed spear’ (K); Waropen *raghéano* ‘fish spear with three or four points’ (Held 1942); Yaur *ràgwìapìiré* ‘barbed spear’ (K)

CB: Ambai *rai* ‘enemy’ (Slz); Serui-Laut *verait* ‘enemy’ (Slm)

CB: Ansus *rai* ‘later’ (P&D); Moor *ré* ‘later’ (K)

CB: Serui-Laut *raida* ‘day’ (Slm); Wandamen *raria* ‘day’ (G)

CB: Ambai *rain* ‘bay’ (Slz); Ansus *rawing* ‘bay’ (P&D); Wandamen *raimu* ‘bay area’ (G)

CB: Serui-Laut *rain* ‘nest’ (Slm); Wandamen *karaini* ‘bee hive ; nest’ (G)

CB: Biak *rāk* ‘slave raiding group’ (H); Moor *rá’a* ‘slave raiding group’ (K); Serui-Laut *rait* ‘war’ (Slm); Serui-Laut *rait* ‘slave raid’ (Slm); Umar *rat* ‘raiding group’ (K); Yaur *rèe’ré* ‘raiding group’ (K); Yerisiam *rátìa* ‘raiding group’ (K)

CB: Moor *ráma* ‘bead’ (K); Wandamen *ramor* ‘bead’ (G)

CB: Serui-Laut *ramansea* ‘hot water’ (Slm); Wandamen *karumas* ‘hot water’ (G)

CB: Ambai *ramati* ‘to scratch’ (ABVD); Ansus *karamuti* ‘scratch’ (P&D)

CB: Ansus *randaung* ‘roof’ (P&D); Wandamen *nandau* ‘thatched roof made of sago leaves’ (G)

CB: Ambai *randawai* ‘mast’ (Slz); Ansus *nandowai* ‘mast’ (P&D); Umar *nandowain* ‘mast’ (K)

CB: Ambai *rando* ‘banana’ (Slz); Ansus *nando* ‘banana’ (P&D); Serui-Laut *nando* ‘banana’ (Slm); Wandamen *nando* ‘banana’ (G)

CB: Ambai *raori* ‘beads’ (Slz); Biak *ira* ‘bead’ (H); Yerisiam *ráù* ‘beads’ (K)

CB: Yerisiam *rárì* ‘know’ (K)

Other: Irarutu *-rarune* ‘to know, be knowledgeable’ (ABVD)

CB: Ambai *rarika* ‘cloud’ (Slz); Moor *rìra’a* ‘storm cloud’ (K); Serui-Laut *raria* ‘cloud’ (Slm); Yaur *rìiré* ‘cloud’ (K); Yerisiam *rárűijárà* ‘rain cloud’ (K)

CB: Moor *raròni* ‘ray sp.’ (K); Umar *raroni* ‘ray sp.’ (K)

CB: Ambai *raukai* ‘octopus’ (Slz); Ansus *rakuai* ‘octopus’ (P&D); Yaur *réè’ré* ‘octopus’ (K) [?]; Yerisiam *rákúài* ‘octopus’ (K)

CB: Serui-Laut *raukana* ‘neck’ (Slm); Wandamen *rau* ‘neck’ (G); Yaur *rá’gwárìe* ‘neck’ (K)

CB: Ansus *rau paraing* ‘thirsty’ (P&D); Serui-Laut *raufarai* ‘thirsty’ (Slm); Wandamen *rauparare* ‘thirsty’ (G)

CB: Ambai *reantenan* ‘first’ (Slz); Wandamen *retena* ‘first’ (G)

Other: Irarutu *-rega* ‘to live, be alive’ (ABVD); Kowiai *rúga* ‘to live, be alive’ (ABVD)

CB: Ambai *reirei* ‘jungle’ (Slz); Serui-Laut *rei* ‘forest, jungle’ (Slm); Wandamen *rei* ‘woods/forest’ (ABVD)

CB: Ambai *rema* ‘betel pepper’ (Slz); Ansus *rema* ‘betel pepper’ (P&D); Serui-Laut *remah* ‘betel pepper’ (Slm)

CB: Serui-Laut *repati* ‘arrow’ (Slm); Waropen *repati* ‘large arrow’ (Held 1942); Waropen *repeti* ‘large arrow’ (Held 1942)

CB: Ansus *repui* ‘back’ (P&D); Dusner *pur* ‘back’ (D&M); Wandamen *pui* ‘behind’ (G)

CB: Ambai *rerawa* ‘skin’ (Slz); Ansus *rerawa (riri)* ‘skin’ (P&D); Serui-Laut *rerawa* ‘skin’ (Slm); Wandamen *rawa* ‘skin’ (G); Waropen *ru* ‘skin’ (ABVD) [?]

CB: Ambai *reti* ‘needle’ (Slz); Biak *rèt* ‘needle’ (H); Moor *rèti* ‘sewing needle’ (K); Serui-Laut *reti* ‘needle’ (Slm); Umar *ret* ‘needle’ (K); Wandamen *ret* ‘needle’ (ABVD); Waropen *rete* ‘needle’ (ABVD); Yaur *rèt pàivré* ‘sewing needle’ (K)

CB: Ambai *rewankuai* ‘plate’ (Slz); Moor *revanggúa* ‘plate’ (K); Moor *verenggúa* ‘plate’ (K); Yerisiam *rémbágwóníài* ‘plate’ (K)

CB: Ambai *rewo-* ‘forehead’ (Slz); Wandamen *re worera* ‘forehead’ (G)

CB: Moor *ríana* ‘language’ (K); Yaur *rîigrè* ‘language’ (K); Yerisiam *árínà* ‘voice’ (K)

CB: Ansus *riapu* ‘itch’ (P&D); Umar *riavu* ‘itch’ (K); Yaur *révrè* ‘itch’ (K)

CB: Dusner *riari* ‘so’ (D&M); Moor *rarî* ‘so’ (K)

CB: Umar *rien* ‘centipede’ (K); Yaur *rìgré* ‘centipede’ (K)

CB: Yaur *rîîhré* ‘garden’ (K); Yerisiam *ríhìa* ‘garden’ (K)

CB: Ambai *rika* ‘blood’ (Slz); Ansus *ria* ‘blood’ (P&D); Biak *rik* ‘blood’ (H); Serui-Laut *riaat* ‘blood’ (Slm); Wandamen *ria[t]* ‘blood’ (ABVD); Wandamen *riate* ‘blood’ (G)

CB: Ambai *rirau* ‘smoke’ (ABVD); Ambai *riraun* ‘smoke’ (Slz); Serui-Laut *rirau* ‘smoke’ (Slm)

CB: Ambai *riwan* ‘change’ (Slz); Wandamen *riwa* ‘change’ (G)

CB: Biak *ro* ‘at’ (H); Dusner *ro* ‘at’ (D&M)

CB: Biak *rò* ‘thing’ (H); Biak *roï* ‘thing’ (H); Dusner *ro* ‘thing’ (D&M); Moor *ró* ‘thing’ (K); Serui-Laut *raa* ‘thing’ (Slm)

CB: Ambai *roa* ‘lime’ (Slz); Serui-Laut *rowa* ‘lime (for betel)’ (Slm)

CB: Ansus *roi* ‘sing’ (P&D); Serui-Laut *roi* ‘to sing’ (Slm); Umar *rui* ‘sing’ (K); Wandamen *roi* ‘sing’ (G); Yaur *rùújè* ‘sing’ (K); Yerisiam *rói* ‘sing’ (K)
Mamberamo: Warembori *du-yo* ‘Sing’ (Donohue 1999)

CB: Umar *rojo* ‘night’ (K); Yaur *òròójè* ‘night’ (K); Yaur *ròojé* ‘night low tide’ (K); Yerisiam *róoi* ‘night’ (K)

CB: Ambai *romi* ‘garden’ (Slz); Ansus *romi* ‘garden’ (P&D); Serui-Laut *romi* ‘garden’ (Slm); Wandamen *rom(i)* ‘garden’ (G)

CB: Yaur *ròojé* ‘song’ (K); Yerisiam *rói* ‘song’ (K)

CB: Ansus *rora* ‘hit’ (P&D); Wandamen *rora* ‘hit’ (G)

CB: Ambai *rora* ‘sky’ (ABVD); Ansus *rora* ‘sky’ (P&D); Serui-Laut *rora* ‘sky’ (Slm); Wandamen *rora* ‘sky’ (ABVD); Waropen *dora* ‘sky’ (ABVD)
Mamberamo: Warembori *doromo-ro* ‘Sky’ (Donohue 1999)

CB: Ambai *roro-(man/win)-katui* ‘sibling (younger, different sex)’ (Slz); Dusner *srar* ‘sibling’ (D&M); Moor *raròti* ‘sibling’ (K); Serui-Laut *raro* ‘sibling’ (Slm); Yerisiam *ráaó* ‘sibling’ (K)

CB: Ambai *rotan* ‘bag’ (Slz); Ansus *rotang* ‘net bag’ (P&D); Dusner *roton* ‘bag’ (D&M); Wandamen *rota* ‘bag’ (G)

CB: Ansus *rowang* ‘chop down’ (P&D); Serui-Laut *robani* ‘to cut down’ (Slm)

CB: Ambai *roya(r)* ‘roll’ (Slz); Wandamen *royare* ‘roll’ (G)

CB: Umar *rui* ‘yellow’ (K); Yerisiam *ràúi* ‘yellow’ (K)

Other: Arguni *-rur* ‘to swim’ (ABVD); Sekar *ruri* ‘to swim’ (ABVD)

CB: Ambai *ruru* ‘lake’ (ABVD); Ansus *ruru* ‘lake’ (P&D); Serui-Laut *ruru* ‘lake’ (Slm); Wandamen *ruru* ‘lake’ (G)

CB: Umar *rut* ‘pull’ (K); Yaur *rú’útnè* ‘pull tight’ (K)

CB: Yaur *rùuríe* ‘bird sp.’ (K); Yerisiam *rúrùíijáà* ‘bird sp.’ (K)

RA: Gebe *safsɛf* ‘rat’ (ABVD)

Other: Irarutu *səfé* ‘rat, mouse’ (M)

RA: Laganyan *saˈgul(o)* ‘nose’ (R); Maˈya (M.) *ʃoˈgul(o)* ‘nose’ (R); Maˈya (S.) *saˈgul(o)* ‘nose’ (R)

Other: Arguni *sair* ‘fish’ (ABVD); Sekar *sair* ‘fish’ (ABVD)

CB: Biak *samaràka* ‘watermelon’ (H); Moor *samaràka* ‘watermelon’ (K); Umar *hamaraka* ‘watermelon’ (K); Wandamen *samaraka* ‘watermelon’ (G); Yaur *hámárà’àavré* ‘watermelon’ (K)

CB: Biak *sàmbròr* ‘ray sp. (large)’ (H); Moor *samaróráo* ‘ray sp.’ (K)

CB: Moor *sanipapó* ‘langsat fruit’ (K); Wandamen *sanaipori* ‘k.o. fruit’ (G); Wandamen *sanaivepori* ‘k.o. fruit’ (G); Yaur *hánérèpòovré* ‘langsat fruit’ (K)

RA: Maˈya (S.) *sanˈsu³n* ‘clothes’ (R)

CB: Ansus *asung* ‘clothes’ (P&D); Dusner *sasun* ‘shirt’ (D&M); Moor *raresúna* ‘clothing’ (K); Umar *hahun* ‘shirt’ (K); Wandamen *sasu* ‘clothes’ (G)

CB: Biak *sār* ‘left (side)’ (H); Wandamen *sara* ‘left’ (ABVD)

CB: Ansus *saraka* ‘armband’ (P&D); Biak *sāràk* ‘silver; silver armband’ (H); Moor *saráka* ‘armband’ (K); Serui-Laut *saraka-wara* ‘armband’ (Slm); Serui-Laut *seraka* ‘silver’ (Slm); Umar *hiarak* ‘armband’ (K); Wandamen *sarak* ‘bracelet’ (G); Yaur *hàràa’ré* ‘armband’ (K); Yerisiam *háráakvè* ‘armband’ (K)

CB: Biak *sarera* ‘fishing rod’ (H); Moor *saréra* ‘fishing rod’ (K); Umar *harera* ‘fishing rod’ (K); Wandamen *sarera* ‘fishing pole’ (G); Yaur *háréràavré* ‘fishing rod’ (K); Yerisiam *sárérà* ‘fishing rod’ (K)

CB: Ambai *saroi* ‘whale’ (Slz); Ansus *aroi* ‘whale’ (P&D); Serui-Laut *aroowi* ‘whale’ (Slm); Umar *haroi* ‘whale’ (K); Yaur *hàròovré* ‘whale’ (K); Yerisiam *háróvréevè* ‘whale’ (K)

CB: Ansus *sasinai* ‘thorn’ (P&D); Serui-Laut *ansasinai* ‘thorn’ (Slm)

CB: Wandamen *sasiri* ‘see’ (G); Wandamen *ser[a]* ‘to see’ (ABVD); Wandamen *serai* ‘see’ (G); Waropen *sira* ‘to see’ (ABVD)

Other: Irarutu *-məsi* ‘to see’ (ABVD); Irarutu *sí* ‘to see’ (M); Kowiai *-sefa* ‘to see’ (ABVD)

CB: Biak *sasurum* ‘fish sp.’ (H); Umar *hahuru* ‘fish sp.’ (K)

Other: Kowiai *sawana* ‘fog’ (ABVD); Sekar *soan* ‘fog’ (ABVD)

CB: Ambai *sawaya* ‘crawl’ (Slz); Wandamen *sabaya* ‘crawl ; trap’ (G)

SH: Buli *segal* ‘to split’ (ABVD); Gane *sagal* ‘to split’ (ABVD); Sawai *n-čɛgɛl* ‘to split’ (CAD)

CB: Ansus *sekop* ‘shovel’ (P&D); Wandamen *sikop* ‘shovel’ (G)

CB: Ambai *sera* ‘seek’ (Slz); Dusner *serep* ‘seek’ (D&M); Wandamen *sasera(i)* ‘look for ; seek’ (G)

CB: Wandamen *sereni* ‘papaya’ (G)

Other: Irarutu *siríne* ‘papaya’ (M)

CB: Ambai *siai* ‘other’ (ABVD); Biak *wèsĕ* ‘other’ (H); Wandamen *esa* ‘other’ (ABVD); Wandamen *esi[a]* ‘other’ (ABVD)

Other: Kowiai *ésa* ‘other’ (ABVD)

CB: Ambai *sifo* ‘fly (v.)’ (Slz); Serui-Laut *safo* ‘to fly’ (Slm); Wandamen *sapo(p)* ‘fly’ (G)

Other: Kowiai *-tif* ‘to fly’ (ABVD)

Other: Arguni *-sigir* ‘to sniff, smell’ (ABVD); Sekar *sigir* ‘to sniff, smell’ (ABVD)

CB: Ambai *simbena* ‘thin’ (ABVD); Serui-Laut *sambena* ‘thin (materials)’ (Slm)

CB: Ambai *simitoi* ‘citrus’ (Slz); Moor *simutó* ‘citrus fruit’ (K); Wandamen *simuti* ‘orange ; lemon’ (G); Yaur *hímútòovré* ‘citrus’ (K)

RA: Maˈya (S.) ˈ*siri(o)* ‘juice’ (R)

CB: Moor *iró* ‘broth’ (K); Umar *ari* ‘broth’ (K); Yerisiam *óría* ‘broth’ (K)

SH: Buli *[si] tol* ‘Three’ (ABVD); Gane *ptol* ‘Three’ (ABVD); Taba *p-tol* ‘Three’ (ABVD)

RA: Ambel *tul* ‘three’ (R); As *tu* ‘Three’ (ABVD); Gebe *pi-tol* ‘Three’ (ABVD); Kawe *tul* ‘three’ (R); Laganyan *tul* ‘three’ (R); Wauyai *tul* ‘three’ (R)

CB: Ambai *bo-toru* ‘Three’ (ABVD); Biak *kiòr* ‘three’ (H); Wandamen *toru* ‘Three’ (ABVD)

Other: Irarutu *torə* ‘Three’ (ABVD)

CB: Wandamen *siverere* ‘star’ (ABVD); Wandamen *sivererei* ‘star’ (G); Waropen *siwerere* ‘star’ (ABVD); Yaur *hívérèrè pàivré* ‘star’ (K)

SH: Buli *smat* ‘person/human being’ (ABVD)

RA: Ambel *met* ‘person’ (R); Biga *mat* ‘person’ (R); Biga *matumolo* ‘person/human being’ (ABVD); Fiawat *met* ‘person’ (R); Kawe *mat* ‘person’ (R); Laganyan *mat* ‘person’ (R); Matbat *ma³t* ‘person’ (R); Maˈya (S.) ˈ*mat* ‘person’ (R); Wauyai *mat* ‘person’ (R)

Other: Irarutu *matu* ‘person/human being’ (ABVD)

SH: Buli *smo* ‘mouth’ (ABVD); Gane *sumu* ‘mouth’ (ABVD); Taba *sumo* ‘mouth’ (ABVD)

RA: Biga *samo-* ‘mouth’ (ABVD)

Other: Sekar *suma-n* ‘mouth’ (ABVD)

CB: Biak *snòn-snòn* ‘name’ (H); Dusner *snori* ‘name-3SG.POSS’ (D&M)

CB: Dusner *snontu* ‘person’ (D&M); Umar *nomtu* ‘person’ (K)

SH: Gane *soat* ‘to tie up, fasten’ (ABVD)

CB: Serui-Laut *sawooi* ‘to tie’ (Slm) [?]

Other: Kowiai *-sáut* ‘to tie up, fasten’ (ABVD); Sekar *sait* ‘to tie up, fasten’ (ABVD)

RA: Biga ˈ*sobo* ‘horn’ (R); Matbat *so^{21}p* ‘horn’ (R)

CB: Waropen *soko* ‘to pound, beat’ (ABVD)
Other: Arguni *-so* ‘to pound, beat’ (ABVD)

CB: Moor *somúna* ‘shark’ (K); Wandamen *suomuse* ‘shark’ (G)

CB: Biak *sònger* ‘musical instrument’ (H); Moor *sòngger* ‘flute’ (K); Serui-Laut *songger* ‘flute’ (Slm)

SH: Buli *soraf* ‘to suck’ (ABVD)
RA: Biga *suruf* ‘to suck’ (ABVD); Gebe *-sɔrɔf* ‘to suck’ (ABVD)

CB: Wandamen *sorane* ‘wear’ (G); Yerisiam *óoráné* ‘use’ (K)

RA: Maˈya (S.) ˈ*su^{3}n* ‘to enter’ (R)
CB: Ambai *suai* ‘enter’ (Slz); Moor *’atù* ‘enter’ (K) [?]; Wandamen *su* ‘enter’ (G)

CB: Biak *sum* ‘to suck, kiss’ (H); Moor *tuamà* ‘suck on’ (K); Wandamen *sum* ‘to suck’ (ABVD); Waropen *suma* ‘to suck’ (ABVD); Waropen *tutuma* ‘to suck’ (ABVD) [?]; Yerisiam *húumé* ‘suck’ (K)

CB: Ambai *sumoi* ‘aunt (FS)’ (Slz); Ansus *sumoni* ‘aunt (father’s sister)’ (P&D); Wandamen *sumo* ‘aunt’ (G)

CB: Biak *surat* ‘book’ (H); Umar *hurat* ‘book’ (K); Waropen *suraka* ‘book’ (Held 1942); Waropen *surati* ‘book’ (Held 1942); Yaur *hùràatré* ‘book’ (K); Yerisiam *húráakvè* ‘book’ (K)
Other: Irarutu *súrəti* ‘letter’ (M)

CB: Moor *susu ìjo* ‘sea cucumber sp.’ (K); Wandamen *susu* ‘’ (G)

SH: Buli *ta* ‘to pound, beat’ (ABVD)
CB: Ambai *tara* ‘pound (sago)’ (Slz); Ansus *tara* ‘pound (sago tree)’ (P&D); Dusner *tar* ‘shred’ (D&M); Moor *’arà* ‘strike’ (K); Umar *tar* ‘pound (sago)’ (K); Wandamen *tara* ‘pound sago’ (G); Yaur *’èérè* ‘pound (sago)’ (K); Yerisiam *káré* ‘pound (sago)’ (K)

CB: Ambai *taba* ‘wall’ (Slz); Serui-Laut *ampetaba* ‘wall’ (Slm)

RA: Biga *-tabu* ‘to hold’ (ABVD)
CB: Wandamen *tapu* ‘hug ; grasp ; hold’ (G)

SH: Taba *-tagil* ‘to walk’ (ABVD)
RA: Ambel *la-tan* ‘walk’ (R); As *-tan* ‘to walk’ (ABVD); Biga *tag* ‘walk’ (R); Fiawat *ta* ‘walk’ (R); Kawe *dag* ‘walk’ (R); Laganyan *dag* ‘walk’ (R); Maˈya (M.) ˈ*da^{12}g* ‘walk’ (R); Maˈya (S.) ˈ*da^{12}k* ‘walk’ (R); Wauyai *dag* ‘walk’ (R)
Other: Kowiai *-táng* ‘to walk’ (ABVD)

RA: Ambel *taɟi* ‘eye’ (R); Biga *ta kaˈus(o)* ‘eye’ (R); Biga *taŋkabul* ‘eye’ (ABVD); Fiawat *ta* ‘eye’ (R); Kawe *ta bul(o)* ‘eye’ (R); Laganyan *ta abul(o)* ‘eye’ (R); Maˈya (M.) *ta kaˈbul(o)* ‘eye’ (R); Maˈya (S.) ˈ*ta(o)* ‘eye’ (R); Wauyai *ta bul(o)* ‘eye’ (R)

Mamberamo: Warembori *taka-ro* ‘Bad’ (Donohue 1999) [?]; Yoke *yaɣaɣa* ‘bad’ (Donohue 1999) [?]

CB: Ambai *takatui* ‘sibling (younger, different sex)’ (Slz); Ansus *tama katuni* ‘uncle (father’s younger brother)’ (P&D)

RA: Ambel *tal* ‘banana’ (R); Biga *tal* ‘banana’ (R); Fiawat *tal* ‘banana’ (R); Kawe ˈ*tal[a]* ‘banana’ (R); Laganyan ˈ*tal[a]* ‘banana’ (R); Maˈya (M.) ˈ*tala*^{12} ‘banana’ (R); Maˈya (S.) ˈ*tala*^{3} ‘banana’ (R); Wauyai ˈ*tal[a]* ‘banana’ (R)

SH: Gane *talaga* ‘lake’ (ABVD); Taba *talaga* ‘lake’ (ABVD)

RA: Biga *taˈleb(o)* ‘tongue’ (R); Biga *telebo-* ‘tongue’ (ABVD); Fiawat *telebey* ‘tongue’ (R)

CB: Ambai *taman* ‘axe’ (Slz); Ansus *tamang* ‘axe’ (P&D); Dusner *tman* ‘axe’ (D&M); Moor *tamasî* ‘axe’ (K); Serui-Laut *tama* ‘axe’ (Slm); Waropen *mano* ‘axe’ (Held 1942)

Mamberamo: Warembori *man-do* ‘Axe’ (Donohue 1999)

CB: Ansus *tamepa* ‘turtle,_k.o.’ (P&D); Yerisiam *tápépà* ‘turtle sp.’ (K)

CB: Ambai *tana* ‘short’ (ABVD); Ambai *tanan* ‘short (vertical)’ (Slz); Ambai *tinan* ‘short (horizontal)’ (Slz); Ansus *tenang* ‘short’ (P&D); Serui-Laut *sana* ‘short’ (Slm); Wandamen *tanam* ‘short’ (ABVD)

Other: Arguni *tam...* ‘short’ (ABVD) [?]

RA: Kawe *tanˈduk* ‘horn’ (R); Laganyan ˈ*tandu* ‘horn’ (R); Maˈya (M.) ˈ*tandu*^{3} ‘horn’ (R); Maˈya (S.) ˈ*tandu*^{3} ‘horn’ (R)

Other: Arguni *-tanem* ‘to hear’ (ABVD); Sekar *tanam* ‘to hear’ (ABVD)

CB: Ambai *tapere-* ‘tongue’ (Slz); Serui-Laut *ore-tapare* ‘tongue’ (Slm); Wandamen *sore tapare* ‘tongue’ (G); Wandamen *tapara* ‘tongue’ (ABVD); Yaur *tápárémbrè* ‘tongue’ (K)

CB: Ansus *tapui* ‘pig’ (P&D); Serui-Laut *tafui* ‘pig’ (Slm)

CB: Ambai *taraa-* ‘ear’ (ABVD); Wandamen *taradir* ‘ear’ (ABVD)

CB: Ambai *tarai* ‘meat’ (Slz); Ansus *tarai* ‘body’ (P&D); Ansus *tarai tarai* ‘flesh’ (P&D); Biak *kràf* ‘meat/flesh’ (H); Moor *tùra* ‘flesh’ (K) [?]; Serui-Laut *tarai* ‘body, flesh’ (Slm); Umar *trai* ‘flesh’ (K); Wandamen *tarai* ‘body; flesh’ (G)

CB: Moor *tarána* ‘harpoon’ (K); Yaur *tràgré* ‘harpoon’ (K); Yerisiam *tárâànà* ‘harpoon’ (K)

CB: Ambai *tara-o* ‘hear’ (Slz); Ansus *tarao* ‘hear’ (P&D); Serui-Laut *taraoa* ‘to hear’ (Slm)

CB: Ambai *tara-pararo* ‘deaf’ (Slz); Ansus *tarau paro* ‘deaf’ (P&D)

CB: Ambai *tara-reai* ‘cheek’ (Slz); Ansus *tarandeu* ‘cheek’ (P&D); Serui-Laut *tararei* ‘cheek’ (Slm); Wandamen *tarare* ‘cheek’ (G)

SH: Taba *tatal* ‘to split’ (ABVD)

CB: Waropen *taka* ‘to split’ (ABVD)

CB: Ambai *taun* ‘sago powder’ (Slz); Serui-Laut *tau* ‘sago’ (Slm); Wandamen *tau* ‘sago’ (G)

Other: Irarutu *taúnə* ‘sago cake’ (M) [?]

CB: Ambai *tawa* ‘old (thing)’ (Slz); Ansus *tawa* ‘old (things)’ (P&D); Ansus *tewa* ‘old (people)’ (P&D)

CB: Ambai *tawai* ‘snake’ (Slz); Serui-Laut *tawai* ‘snake’ (Slm); Wandamen *tawai* ‘snake’ (G)

CB: Ansus *tei* ‘ladder’ (P&D); Umar *tet* ‘ladder’ (K); Wandamen *ate* ‘ladder; stair’ (G); Yerisiam *kéèkà* ‘ladder’ (K)

RA: As *təlami* ‘red’ (ABVD); Laganyan *talˈme* ‘red’ (R)

RA: Biga *ten(o)* ‘give’ (R); Kawe *ten(o)* ‘give’ (R)

RA: Fiawat *tepyep* ‘lightning’ (R)

CB: Umar *tpe* ‘lightning’ (K)

CB: Ansus *tera* ‘hit_(target)’ (P&D); Wandamen *tera* ‘fall on ; hit’ (G)

SH: Buli *tig* ‘to throw’ (ABVD)

RA: As *-ti?* ‘to throw’ (ABVD); Biga *-ete* ‘to throw’ (ABVD); Gebe *-tɛ* ‘to throw’ (ABVD)

CB: Umar *matin* ‘throw’ (K)

Other: Irarutu *-məti* ‘to throw’ (ABVD)

SH: Gane *tijá* ‘that’ (ABVD)

RA: Gebe *tea* ‘that’ (ABVD)

CB: Ansus *timburi* ‘cassava’ (P&D); Biak *fàrkia timòr* ‘cassava’ (H); Moor *timùri* ‘cassava’ (K); Umar *timuri* ‘cassava’ (K); Wandamen *timuri rau* ‘cassava leaf’ (G); Yaur *tìmùrìivré* ‘cassava’ (K)

Mamberamo: Warembori *timori* ‘Cassava’ (Donohue 1999); Yoke *timor βua* ‘cassava’ (Donohue 1999)

RA: Fiawat *tit* ‘run’ (R); Kawe *ˈtit[i]* ‘run’ (R); Laganyan *ˈtit[i]* ‘run’ (R); Maˈya (M.) *ˈsiti*^{12} ‘run’ (R); Maˈya (S.) *ˈsiti*^{3} ‘run’ (R)

CB: Ambai *tita(k)* ‘peel (v.)’ (Slz); Ansus *tita* ‘peel’ (P&D)

CB: Umar *to* ‘measure’ (K); Yerisiam *kàkó* ‘measure’ (K)

Mamberamo: Warembori *totai* ‘eZ, (P)*PeSiD’ (Donohue 1999); Yoke *otay* ‘elder sister’ (Donohue 1999)

CB: Ambai *towai* ‘swamp’ (Slz); Ansus *towai* ‘swamp’ (P&D)

SH: Gane *tua* ‘to buy’ (ABVD)

CB: Umar *tuat* ‘buy’ (K)

CB: Ambai *tukai* ‘fish (v.)’ (Slz); Ansus *tui* ‘catch fish’ (P&D); Ansus *tuia* ‘catch fish with a line’ (P&D)

CB: Moor *turé* ‘mouth’ (K); Wandamen *sore* ‘mouth; lips’ (G)

CB: Moor *tùruma* ‘halfbeak’ (K); Yerisiam *túurúmà* ‘fish sp.’ (K)

SH: Buli *tusa* ‘to stab, pierce’ (ABVD); Taba *-tusa* ‘to stab, pierce’ (ABVD)

CB: Wandamen *tisa* ‘stab’ (G)

RA: As *-uaɛ* ‘back’ (ABVD)

CB: Waropen *ruai* ‘back’ (ABVD)

CB: Ambai *uai* ‘mountain’ (Slz); Ansus *wi* ‘mountain’ (P&D); Ansus *wi* ‘mountain’ (P&D); Serui-Laut *wi* ‘mountain’ (Slm); Wandamen *wis* ‘mountain’ (G)

SH: Buli *uba* ‘gunpowder’ (ACD)

CB: Ansus *uba* ‘medicinal plants’ (P&D); Biak *uba* ‘gunpowder’ (H); Waropen *uba* ‘medicine; gunpowder’ (ACD)

CB: Moor *úma* ‘star’ (K); Yerisiam *túùmà* ‘star’ (K)

Other: Kowiai *oma-óma* ‘star’ (ABVD)

CB: Ambai *umbe* ‘bushknife’ (Slz); Ansus *umbe* ‘machete’ (P&D); Dusner *smber* ‘machete’ (D&M); Serui-Laut *umbe* ‘machete’ (Slm)

SH: Gane *unak* ‘to know, be knowledgeable’ (ABVD); Taba *-unak* ‘to know, be knowledgeable’ (ABVD)

RA: As *-nun* ‘to know, be knowledgeable’ (ABVD); Biga *l-un(o)* ‘know’ (R); Biga *-uno* ‘to know, be knowledgeable’ (ABVD); Fiawat *l-un* ‘know’ (R); Gebe *-una* ‘to know, be knowledgeable’ (ABVD); Kawe *w-un(o)* ‘know’ (R); Laganyan ˈ*w-un(o)* ‘know’ (R); Maˈya (M.) ˈ*w-un(o)* ‘know’ (R); Maˈya (S.) ˈ*w-un(o)* ‘know’ (R); Wauyai *w-un(o)* ‘know’ (R)

CB: Umar *nune* ‘know’ (K)

CB: Yaur *ú’nè* ‘draw water’ (K); Yerisiam *úukú* ‘draw water’ (K)

SH: Buli *untuŋ* ‘luck, fortune, profit’ (ACD)

CB: Biak *untung* ‘windfall, piece of good luck’ (H)

Other: Kowiai *untuŋ* ‘profit; to win’ (ACD)

RA: Biga *u(o)* ‘head’ (R); Biga *wu-* ‘head’ (ABVD)

CB: Biak *rwu-* ‘head’ (H); Dusner *rvu* ‘head’ (D&M); Moor *vàru* ‘head’ (K); Umar *du* ‘head’ (K); Wandamen *ru* ‘head’ (G); Yaur *dójè* ‘head’ (K)

Other: Arguni *aru-* ‘head’ (ABVD)

RA: As *up* ‘night’ (ABVD); Gebe *op* ‘night’ (ABVD)

CB: Biak *ròb* ‘night’ (H); Dusner *rov* ‘night’ (D&M)

Mamberamo: Warembori *upi-ro* ‘Sago tree’ (Donohue 1999); Yoke *upi* ‘sago tree’ (Donohue 1999)

CB: Ambai *ure-* ‘eye’ (Slz); Serui-Laut *re* ‘eye’ (Slm); Serui-Laut *rure* ‘eye’ (Slm); Wandamen *re* ‘eye’ (G)

CB: Ansus *urundaing* ‘wok’ (P&D); Serui-Laut *rundai* ‘wok’ (Slm); Umar *rundain* ‘wok’ (K)

SH: Gane *usnu* ‘nose’ (ABVD); Gane *usnut* ‘nose’ (ACD); Taba *hungo* ‘nose’ (ABVD)

RA: Ambel *sun* ‘nose’ (R); As *-samu* ‘nose’ (ABVD) [?]; Biga *saˈnu(o)* ‘nose’ (R); Biga *senu-* ‘nose’ (ABVD)

CB: Biak *snò-* ‘nose’ (H); Wandamen *suo* ‘nose’ (G)

RA: Biga *uta-* ‘back’ (ABVD)

CB: Umar *uten* ‘back’ (K)

RA: Biga *uˈtum* ‘betel leaf (Malay biji sirih)’ (R); Fiawat *wotum* ‘betel leaf (Malay biji sirih)’ (R)

CB: Umar *uv* ‘hit’ (K); Yaur *ùvrùhné* ‘hit’ (K)

CB: Wandamen *vakirini* ‘frog’ (G)
Other: Irarutu *wagrí* ‘frog’ (M)

CB: Ambai *varapema* ‘wing’ (ABVD); Ambai *wara-peman* ‘wing’ (Slz); Ansus *warapema* ‘wing’ (P&D)

CB: Dusner *ve* ‘VBLZ’ (D&M); Umar *e-* ‘Vblz’ (K); Yaur *e-* ‘Vblz’ (K); Yerisiam *e-* ‘Vblz’ (K)

CB: Dusner *ve* ‘become’ (D&M); Wandamen *ve* ‘become’ (G)

CB: Moor *vehío* ‘light’ (K); Yaur *né’véhè* ‘light’ (K)

CB: Moor *verìra’a* ‘dirty’ (K); Wandamen *vereriate* ‘dirty’ (G); Waropen *werira* ‘dirty’ (ABVD)

CB: Ambai *vioai* ‘lory’ (Slz); Ansus *wioi* ‘Black-capped Lory’ (P&D)

CB: Umar *vodar* ‘flood’ (K); Yaur *vòdré* ‘flood’ (K)

CB: Umar *vramogre* ‘outrigger-boom rod’ (K); Yaur *vràmòogré* ‘boom-outrigger rod’ (K)

CB: Umar *wae* ‘oh’ (K); Yaur *gwáè* ‘how sad!’ (K); Yerisiam *gwáéè* ‘pity’ (K)

CB: Umar *wahi* ‘tree kangaroo’ (K); Yaur *gwàhíe* ‘tree kangaroo’ (K)

SH: Gane *wai* ‘small’ (ABVD)
RA: Fiawat *we* ‘small’ (R); Matbat *wa³y* ‘small’ (R)

SH: Gane *waik* ‘to turn’ (ABVD)
RA: Gebe *-kawai-* ‘to turn’ (ABVD)

CB: Ambai *wairoi* ‘far’ (ABVD); Ambai *waroi* ‘far’ (Slz); Ansus *woroi* ‘far’ (P&D); Serui-Laut *woroi* ‘far’ (Slm); Wandamen *woroi* ‘far’ (ABVD)

CB: Biak *wairus* ‘needle’ (H); Serui-Laut *wairusi* ‘large needle’ (Slm); Yaur *gwàirùuhré* ‘sewing needle’ (K); Yerisiam *gwáirúuvè* ‘needle’ (K)

RA: Ambel *wali* ‘tooth’ (R); Fiawat *weli* ‘tooth’ (R)

RA: As *-walu* ‘mouth’ (ABVD)
CB: Ambai *boro-* ‘mouth’ (Slz); Ansus *woreu* ‘mouth’ (P&D); Waropen *boro* ‘mouth’ (ABVD); Waropen *woro[do]* ‘mouth’ (ABVD)
Mamberamo: Warembori *ke-vo-ro* ‘Mouth’ (Donohue 1999); Yoke *βundu-* ‘mouth’ (Donohue 1999)

CB: Wandamen *wam* ‘blood’ (G)
Other: Irarutu *wáməsə* ‘blood’ (M)

CB: Ambai *wama* ‘hornbill’ (Slz); Ansus *wama* ‘hornbill’ (P&D); Serui-Laut *uama* ‘hornbill’ (Slm); Wandamen *wamar* ‘Papuan (Blyth’s) hornbill’ (G)
Mamberamo: Warembori *waman-do* ‘Hornbill’ (Donohue 1999)

CB: Biak *wān* ‘wallaby’ (H); Moor *gwaná* ‘wallaby’ (K)

CB: Ambai *wana* ‘wind’ (ABVD); Ansus *wanang* ‘wind’ (P&D); Biak *wām* ‘wind’ (H); Moor *ragwamá* ‘north-east wind’ (K); Serui-Laut *wana* ‘wind’ (Slm); Wandamen *wana* ‘wind’ (G); Waropen *wama* ‘wind’ (ABVD)

Mamberamo: Warembori *wame-ro* ‘Wind’ (Donohue 1999); Yoke *wamb-a* ‘wind’ (Donohue 1999)

CB: Ansus *wane, na wana* ‘over there’ (P&D); Wandamen *wana* ‘there (far distance)’ (G)

CB: Biak *wàngar* ‘rat, mouse’ (H); Umar *wanggar* ‘rat’ (K); Wandamen *wanggar* ‘mouse’ (G)

SH: Buli *wàŋat* ‘meat/flesh’ (ABVD); Gane *wontu* ‘meat/flesh’ (ABVD) [?]

RA: Ambel *wanat(i)* ‘flesh, meat, fruit’ (R); Biga ˈ*wanat(o)* ‘flesh, meat, fruit’ (R); Fiawat *wanat* ‘flesh, meat, fruit’ (R); Gebe *waŋat* ‘meat/flesh’ (ABVD); Kawe *awa*ˈ*nat* ‘flesh, meat, fruit’ (R); Laganyan *a*ˈ*wanat* ‘flesh, meat, fruit’ (R); Matbat *ŋa*^{21}*t* ‘flesh, meat, fruit’ (R); Maˈya (M.) ˈ*wana*^{12}*t* ‘flesh, meat, fruit’ (R); Maˈya (S.) ˈ*wana*^{3}*t* ‘flesh, meat, fruit’ (R); Wauyai *kawa*ˈ*nat* ‘flesh, meat, fruit’ (R)

CB: Dusner *wanggou* ‘arrow’ (D&M); Umar *wagu* ‘arrow’ (K)

Other: Irarutu *wagəbú* ‘arrow’ (M)

CB: Ambai *wankori* ‘crocodile’ (Slz); Ansus *wonggori* ‘crocodile’ (P&D); Biak *wòngor* ‘crocodile’ (H); Serui-Laut *wangkori* ‘crocodile’ (Slm); Waropen *anggoro* ‘crocodile’ (Held 1942)

SH: Buli *wao* ‘neck’ (ABVD); Taba *ggowo* ‘neck’ (ABVD)

CB: Ambai *wape* ‘but’ (Slz); Dusner *vape* ‘but’ (D&M); Wandamen *vape* ‘but’ (G)

CB: Ambai *wara-diu* ‘fingernail’ (Slz); Ansus *waraudi* ‘fingernail’ (P&D); Serui-Laut *varadi* ‘fingernail, toenail’ (Slm); Wandamen *vara kiai dir* ‘fingernail’ (G); Wandamen *vara kiai dire* ‘fingernail’ (G)

CB: Ambai *wara-keka* ‘finger’ (Slz); Ansus *warau kikea* ‘finger’ (P&D); Serui-Laut *warakea* ‘finger’ (Slm); Wandamen *vara kiai* ‘finger’ (G)

CB: Serui-Laut *wararu* ‘tendon, vein’ (Slm); Wandamen *wai re* ‘vein’ (G)

RA: Ambel *ware(y)* ‘tongue’ (R); Kawe *wal(o)* ‘tongue’ (R); Wauyai *wal(o)* ‘tongue’ (R)

Other: Kowiai *yera* ‘tongue’ (ABVD)

Mamberamo: Warembori *wati* ‘Four’ (Donohue 1999); Yoke *ɣasi* ‘four’ (Donohue 1999)

CB: Ambai *wati* ‘see’ (Slz); Serui-Laut *wai* ‘to see’ (Slm)

CB: Ansus *wawu* ‘flee’ (P&D) [?]; Dusner *mbur* ‘go.home’ (D&M); Moor *vavú* ‘go home’ (K); Umar *vur* ‘go home’ (K); Wandamen *vavu* ‘go home’ (G); Yaur *híivújè* ‘go home’ (K); Yerisiam *pú* ‘go home’ (K) [?]

CB: Ansus *wawu* ‘fireplace’ (P&D); Umar *wavun* ‘fireplace’ (K)

CB: Ambai *we* ‘for’ (Slz); Ansus *we* ‘for’ (P&D); Biak *be* ‘to’ (H); Dusner *ve* ‘to’ (D&M); Moor *ve* ‘Loc’ (K); Waropen *we* ‘in, inside’ (ABVD)

RA: As *-wɛʔ kapaʔ* ‘to split’ (ABVD); Biga *-apa* ‘to split’ (ABVD); Gebe *kapau* ‘to split’ (ABVD)

CB: Biak *kabas* ‘to split’ (H)

Mamberamo: Warembori *wen-do* ‘Rope’ (Donohue 1999); Yoke *wani* ‘rope’ (Donohue 1999)

SH: Taba *-wet* ‘to hit’ (ABVD)

CB: Waropen *we* ‘to hit’ (ABVD)

CB: Biak *wèwěr* ‘lightning’ (H); Wandamen *vera-vera* ‘lightning’ (G)

CB: Ansus *wi* ‘forest’ (P&D)

Other: Irarutu *witú* ‘forest, jungle’ (M)

CB: Ansus *wio* ‘smoke’ (P&D); Wandamen *woyow* ‘smoke’ (ABVD)

SH: Sawai *witɛn-čɔ* ‘hundred’ (CAD); Taba *utin* ‘hundred’

CB: Umar *utinho kotem* ‘one hundred’ (K); Wandamen *utin* ‘twenty’ (G); Yaur *útín rèebé* ‘one hundred’ (K)

RA: As *wɔ* ‘wind’ (ABVD); Matbat *wo*^{41} ‘wind’ (R); Matbat *wu*^{41} ‘wind’ (R)

SH: Gane *wom* ‘to come’ (ABVD); Taba *-wom* ‘to come’ (ABVD)

CB: Ambai *woman* ‘outrigger’ (Slz); Ansus *womang* ‘outrigger’ (P&D); Wandamen *soma* ‘bamboo pole stabilizing an outrigger canoe’ (G)

CB: Ambai *wombua* ‘spear (n.)’ (Slz); Ansus *wondua* ‘spear’ (P&D)

CB: Ambai *womin* ‘servant/captive’ (Slz); Biak *wòmìn* ‘slaaf’ (H); Moor *gwòmina* ‘bait’ (K)

CB: Ansus *wongkiang* ‘board’ (P&D); Serui-Laut *ongka* ‘board’ (Slm); Umar *wonggian* ‘board’ (K)

CB: Ansus *wonyai* ‘bucket’ (P&D); Wandamen *wonioi* ‘k.o. traditional wooden bowl’ (G); Yerisiam *gwóníài* ‘wooden bowl’ (K)

CB: Ansus *wopeu* ‘nose’ (P&D); Serui-Laut *wompi* ‘nose’ (Slm)

CB: Ansus *wope wanamba* ‘north’ (P&D); Serui-Laut *wana mba* ‘north’ (Slm)

CB: Ansus *worewu* ‘peninsular’ (P&D); Waropen *ghoro* ‘snake’ (ABVD); Waropen *[w]oro* ‘snake’ (ABVD); Yerisiam *gwóorú* ‘snake’ (K)

CB: Ambai *wori* ‘sea spirit’ (Slz); Ansus *wori* ‘spirit,_sea*’ (P&D); Umar *ori* ‘sea spirit’ (K); Yaur *gwóorìjé* ‘sea spirit’ (K)

CB: Umar *woriori* ‘bird sp.’ (K); Yerisiam *gwóríorívè* ‘bird sp.’ (K)

CB: Ansus *woroi* ‘old (things)’ (P&D); Wandamen *woroi* ‘long (time)’ (G); Yaur *vòrré* ‘old’ (K)

SH: Sawai *wɔwo* ‘root’ (CAD); Taba *wowo* ‘root’ (ABVD)

SH: Taba *wulo* ‘liver’ (ABVD)

RA: Biga *lu(o)* ‘liver’ (R); Ma^{l}ya (S.) ^{l}*lo*^{3}*n* ‘liver’ (R); Wauyai *lu* ‘liver’ (R)

RA: Kawe ^{l}*w-ɯn[u]* ‘swim’ (R); Ma^{l}ya (S.) *w-a*^{l}*u*^{3}*n* ‘swim’ (R)

RA: Fiawat *yahan* ‘sun, day’ (R); Kawe *yan* ‘sun, day’ (R); Laganyan *lya*^{l}*han* ‘sun, day’ (R); Matbat *la*^{121} ‘sun, day’ (R); Ma^{l}ya (M.) ^{l}*lyasa*^{12}*n* ‘sun, day’ (R); Ma^{l}ya (S.) ^{l}*lasa*^{3}*n* ‘sun, day’ (R); Wauyai *lan* ‘sun, day’ (R)

CB: Ambai *aha* ‘day’ (ABVD)

SH: Buli *yas* ‘to swim’ (ABVD)

RA: Ambel *la* ‘swim’ (R); As *-as* ‘to swim’ (ABVD); Biga *l-as* ‘swim’ (R); Biga *-mas* ‘to swim’ (ABVD); Fiawat *l-ah* ‘swim’ (R); Gebe *-yas* ‘to swim’ (ABVD); Laganyan *w-ah* ‘swim’ (R); Matbat *la*^{3}*s* ‘swim’ (R); Ma^{l}ya (M.) ^{l}*w-a*^{12}*s* ‘swim’ (R); Wauyai *w-a* ‘swim’ (R)

CB: Biak *ās* ‘to swim’ (H); Moor *áta* ‘swim’ (K); Umar *ejah* ‘swim’ (K) [?]; Wandamen *as* ‘swim’ (G); Wandamen *as(e)* ‘to swim’ (ABVD)

Mamberamo: Warembori *ate* ‘Swim’ (Donohue 1999)

CB: Ambai *yawa* ‘reef’ (Slz); Umar *jawar* ‘reef’ (K)

CB: Ambai *ye* ‘fishtrap’ (Slz); Ansus *ye* ‘fish poison’ (P&D); Wandamen *yer* ‘fish poison’ (G)

SH: Sawai *yɛfɛn* ‘road’ (CAD)

RA: Gebe *yefen* ‘road/path’ (ABVD)

CB: Ansus *yenayu* ‘dry’ (P&D); Serui-Laut *sanaya* ‘dry’ (Slm); Wandamen *sanaia* ‘dry’ (G); Wandamen *sinaya* ‘dry’ (ABVD)

RA: Ambel *yene* ‘I’ (R); As *anɛ* ‘I’ (ABVD); Biga *in* ‘I’ (R); Biga *ini* ‘I’ (ABVD); Fiawat *ine* ‘I’ (R); Gebe *ane* ‘I’ (ABVD); Kawe ^{l}*yene* ‘I’ (R); Laganyan ^{l}*yene* ‘I’ (R); Ma^{l}ya (M.) ^{l}*ene* ‘I’ (R); Ma^{l}ya (S.) ^{l}*ene* ‘I’ (R); Wauyai ^{l}*yene* ‘I’ (R)

CB: Umar *ene* ‘1sg’ (K); Yerisiam *ne-* ‘1sg’ (K); Yerisiam *né* ‘1sg’ (K)

Other: Arguni *embie* ‘I’ (ABVD)

SH: Gane *yo* ‘dog’ (ABVD); Sawai *yaw* ‘dog’ (CAD); Taba *nyo* ‘dog’ (ABVD)

RA: Ambel *yoy* ‘heart’ (R); Matbat *lo*^{21}*y* ‘heart’ (R)