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Systematics of the blindsnakes (Serpentes: Scolecophidia: Typhlopoidea) based on molecular and morphological evidence

ROBERT ALEXANDER PYRON[1,3] & VAN WALLACH[2]
[1]*Dept. of Biological Sciences, The George Washington University, 2023 G St. NW, Washington, D.C. 20052*
[2]*4 Potter Park, Cambridge, MA 02138*
[3]*Corresponding author. E-mail: rpyron@colubroid.org*

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Abstract

The blindsnake superfamily Typhlopoidea (Gerrhopilidae, Typhlopidae, and Xenotyphlopidae) is a diverse, widespread part of the global snake fauna. A recent systematic revision based on molecular phylogenetic analyses and some morphological evidence presented a preliminary solution to the non-monophyly of many previously recognized genera, but additional clarification is needed regarding the recognition of some species and genera. We rectify these problems here with a new molecular phylogenetic analysis including 95 of the 275 currently recognized, extant typhlopoids, incorporating both nuclear and mitochondrial loci. We supplement this with data on the external, visceral, and hemipenial morphology of nearly all species to generate a revised classification for Typhlopoidea. Based on morphological data, we re-assign *Cathetorhinus* from Typhlopidae to Gerrhopilidae. Xenotyphlopidae maintains its current contents (*Xenotyphlops*). In Typhlopidae, one monotypic genus is synonymized with its larger sister-group as it cannot be unambiguously diagnosed morphologically (*Sundatyphlops* with *Anilios*), and two genera are synonymized with *Typhlops* (*Antillotyphlops* and *Cubatyphlops*), as they are not reciprocally monophyletic. The genus *Asiatyphylops* is renamed *Argyrophis,* the senior synonym for the group. We erect one new genus (*Lemuriatyphlops*) for a phylogenetically distinct species-group in Asiatyphlopinae. Fourteen of eighteen recognized typhlopid genera are maintained in four subfamilies: Afrotyphlopinae (*Afrotyphlops, Grypotyphlops* [re-assigned from Asiatyphlopinae]*, Letheobia,* and *Rhinotyphlops*), Asiatyphlopinae (*Acu-*

totyphlops, Anilios, Cyclotyphlops, Indotyphlops, Malayotyphlops, Ramphotyphlops, and *Xerotyphlops*), Madatyphlopinae (*Madatyphlops*), and Typhlopinae (*Amerotyphlops* and *Typhlops*), some with altered contents. Diagnoses based on morphology are provided for all 19 typhlopoid genera, accounting for all 275 species. This taxonomy provides a robust platform for future revisions and description of new species.

Key words: Serpentes, Scolecophidia, Typhlopoidea, Typhlopidae, *Typhlops*, blind snakes

Introduction

With the recent separation of the genera *Gerrhopilus* and *Xenotyphlops* into the families Gerrhopilidae and Xenotyphlopidae (Vidal *et al.* 2010), the superfamily Typhlopoidea now contains three families: Gerrhopilidae, Typhlopidae, and Xenotyphlopidae (Table 1). Gerrhopilidae inhabits south and southeast Asia and the East Indies, and Xenotyphlopidae occurs only in northeastern Madagascar. In contrast, Typhlopidae is globally distributed, containing at least 257 species (see McDiarmid *et al.* 1999 and Wallach *et al.* 2014 for species accounts and synonymies), and represents a clade with significantly elevated rates of net diversification in snakes (Pyron & Burbrink 2012). Major radiations occur in the New World tropics, Africa, Madagascar, South Asia, Southeast Asia, and Australia (Vitt & Caldwell 2009). New species are commonly reported from all of these areas (Wallach 1993a; Wynn & Leviton 1993; Khan 1999; Wallach 1999; 2001; Franzen & Wallach 2002; Broadley & Wallach 2007; Thomas & Hedges 2007; Wynn *et al.* 2012; Marin *et al.* 2013; Pyron *et al*. 2013a, etc.).

The true diversity of the group is likely much higher, as evidenced by a recent molecular study of Australian *Ramphotyphlops,* which showed that the actual number of species is 200–340% greater than currently recognized (Marin *et al.* 2013). Discovery and description of new species is limited in some ways by their fossorial nature (making them difficult to encounter), and relatively conserved morphology (making them difficult to diagnose and delimit). As a result, there has been little in-depth phylogenetic analysis or systematic investigation of the group, usually restricted primarily to single geographic areas and relatively few characters (McDowell 1974; Roux-Estève 1974; Rabosky *et al.* 2004; Broadley & Wallach 2009).

Throughout most of their recent history (e.g., Boulenger 1893; Werner 1921; Hahn 1980), all blindsnakes were included in the genus *Typhlops*. In the mid-20th century, solid coiled hemipenes and paired retrocloacal sacs were discovered in the Australasian radiation (Robb 1960, 1967), leading these species to be separated into *Ramphotyphlops* (Robb, 1967). The name *Typhlina* (Wagler, 1830) was also applied to this group (McDowell 1974), but was found to be in the synonymy of both *Ramphotyphlops* and *Leptotyphlops*, and was thus later suppressed (Opinion 1207) by the International Commission on Zoological Nomenclature on appeal (ICZN 1982). Until very recently (Broadley & Wallach 2009; Hedges *et al.* 2014), most species were placed in *Typhlops* and *Ramphotyphlops* (McDiarmid *et al.* 1999).

Other genera were erected or resurrected and species moved between them on the basis of morphological characters, but rarely, if ever, from phylogenetic analysis of either morphological or molecular data (see in den Bosch & Ineich 1994; Wallach 1995, 1998a; Broadley & Wallach 2007, 2009). These include the African radiation (*Letheobia, Rhinotyphlops, Afrotyphlops,* and *Megatyphlops*), and two morphologically divergent groups from Oceania (*Acutotyphlops* and *Cyclotyphlops*). The genus *Cathetorhinus* was resurrected for the morphologically divergent *Typhlops melanocephalus* (Wallach & Pauwels 2008), which was previously considered *incertae sedis* (McDiarmid *et al.* 1999). The genus *Grypotyphlops* was resurrected for *Rh. acutus*, the only Indian member of a group otherwise found solely in Africa (Wallach 2003).

Multiple species groups were identified within these larger genera (particularly *Typhlops*), based on shared morphological features such as the number of lateral and transverse scale rows, supralabial imbrication patterns, hemipenial morphology, and lung architecture (Wallach 1993b, 1998a, b). The differences between these groups suggested that current taxonomic arrangements did not describe monophyletic genera. This suspicion was confirmed by recent molecular phylogenetic analyses, which revealed that numerous taxonomic problems existed within Typhlopidae, and that previous nomenclature did not reflect monophyletic groups revealed in the available phylogenies (Vidal *et al.* 2010; Pyron *et al*. 2013b).

The morphological distinction between *Ramphotyphlops* and *Typhlops* was not corroborated by molecular evidence, and species from these and other genera interdigitated with each other in molecular phylogenies (Vidal *et* *al.* 2010; Pyron *et al.* 2013b). Problematic genera included *Typhlops, Letheobia, Afrotyphlops,* and *Ramphotyphlops*, which were rendered paraphyletic both by each other and *Rhinotyphlops, Megatyphlops,* and *Acutotyphlops*. A recent study incorporating a new molecular phylogenetic analysis with some accompanying morphological diagnoses provided a preliminary resolution to these problems, and presented a first-pass taxonomic revision of Typhlopidae (Hedges *et al.* 2014).

Within Typhlopidae, those authors erected four subfamilies containing eighteen genera: Afrotyphlopinae (*Afrotyphlops, Letheobia, Rhinotyphlops*), Asiatyphlopinae (*Acutotyphlops, Anilios, Asiatyphlops, Cyclotyphlops, Grypotyphlops, Indotyphlops, Malayotyphlops, Ramphotyphlops, Sundatyphlops, Xerotyphlops*), Madatyphlopinae (*Madatyphlops*), and Typhlopinae (*Amerotyphlops, Antillotyphlops, Cubatyphlops, Typhlops*). These genera generally comprise species groups that were split out of or moved between previously non-monophyletic genera such as *Afrotyphlops, Typhlops,* and *Ramphotyphlops*. These groups were all recovered as monophyletic in molecular phylogenetic analyses (Vidal *et al.* 2010; Pyron *et al.* 2013b; Hedges *et al.* 2014), and provide a robust starting point for typhlopid classification.

However, that study was limited in several ways: (i) by providing incomplete diagnoses for some genera due to a lack of morphological data such as internal anatomy for most species, characters which are historically important in typhlopid classification (e.g., Roux-Estève 1974, Wallach 1998a); (ii) recognizing three species that are not valid, and not recognizing four valid species; (iii) recognition of some genera that are not unambiguously diagnosable morphologically, (iv) apparently erroneous placement of some species into the wrong genera based on inaccurate interpretation of morphological characters, and (v) at least one lapsus in determining priority for genus-group names. We also note that some non-scientific works of taxonomic vandalism have introduced a number of putative senior synonyms for the taxa discussed by Hedges *et al.* (2014) and here, but these are generally being ignored by the scientific community (Kaiser 2013; Kaiser *et al.* 2013) and are pending review for suppression by the International Commission on Zoological Nomenclature (Hoser 2013; Kaiser *et al.* 2014).

We supplement this previous analysis with a large-scale dataset of our own, containing external and internal morphological data for nearly all of the 275 recognized typhlopid species. We also present a new molecular phylogenetic analysis of 95 of those species, revealing that some of the 18 genera diagnosed by Hedges *et al.* (2014) are not monophyletic. From this, we generate a revised classification that addresses remaining issues in the systematics of typhlopoid snakes. We change the generic classification of 58 species from that provided by Hedges *et al.* (2014), detailing characters that support this. While placement of some species may change in the future, this provides a robust taxonomy accounting for all known species in the superfamily. Our results and those of Hedges *et al.* (2014) provide a platform for future species descriptions, and clarify the distribution of diagnostic characters that may be useful in such studies.

Material and methods

Rationale. We address the problems noted above with a revised classification of the blindsnake superfamily Typhlopoidea, incorporating both molecular and morphological data to diagnose and delimit genera in the group. Our primary taxon-naming criteria (Vences *et al.* 2013) are monophyly and stability, in accordance with the International Code of Zoological Nomenclature (the Code hereafter). There is also a clear need to recognize morphologically distinct species-groups as separate genera, with character-based diagnoses.

Within Typhlopidae, 18 genus-level species groups were diagnosed from a new molecular phylogenetic analysis (Hedges *et al.* 2014). Here, we use a species-level matrix of morphological characters to identify character states or unique combinations of characters that diagnose those genera, in comparison with a new molecular phylogenetic analysis of our own. Importantly, many of the morphological characters used to diagnose genera by Hedges *et al.* (2014) are unsuitable (e.g., averages of scale counts) or ambiguous (e.g., body-form ratios), rather than the presence or absence of features that are diagnostic in and of themselves, which we present here. We discuss in detail the characters that support changes in our classification.

The matrix of characters is not conducive to a phylogenetic analysis by itself (see below), but all genera identified from the molecular phylogeny exhibit diagnostic characters or exclusive combinations of states in the morphological dataset. Thus, we can use these characters to support placement of species not sampled in the phylogeny, based on shared combinations of these characters. The majority of species have not been included in molecular phylogenetic analyses, and were thus placed by previous authors such as Hedges *et al.* (2014) based on morphological similarity from a few main characters (e.g., scale rows). Our larger morphological dataset suggests that the assignment of many species should be changed based on character states shared with taxa in the molecular phylogeny. We highlight these below, referring to the placement of such taxa as "provisional". A few species are poorly known (e.g., only from lost type material); these we refer to as being placed "tentatively". We thus generate well-defined genera for species sampled in the molecular phylogenetic analysis, with corroborated assignment of most unsampled species. While the placement of some species may change in future analyses, this provides a robust taxonomy accounting for most of the known, extant species in the superfamily.

Molecular phylogeny. Several recent studies have generated and agglomerated significant amounts of DNA sequence data for typhlopid blindsnakes, including both nuclear and mitochondrial loci (e.g., Rabosky *et al.* 2004; Vidal *et al.* 2010; Kornilios *et al.* 2013; Marin *et al.* 2013; Pyron *et al*. 2013a; Hedges *et al.* 2014). We combine many of these here for a supermatrix estimate of typhlopoid relationships. We include data from 10 genes total: 4 mitochondrial genes (12*S*, 16*S*, cyt-*b*, and COI), and 6 nuclear loci (AMEL, BDNF, BMP2, NT3, PRLR, and RAG1). We searched GenBank by family and locus (stopping in October, 2013), and attempted to include all described species for which sequence data were available. Unfortunately, the new data from Hedges *et al.* (2014) were unavailable to us at the time of this writing. However, the primary dataset used by those authors (Dataset A) contained only 5 genes (BDNF, RAG1, BMP2, NT3, and AMEL) from 83 species. Thus, our dataset contains numerous additional taxa and loci.

We generally included a single representative specimen per species, but in a few cases, the sequence data represent composites of multiple individuals. Moreover, most terminals are represented by vouchered specimens as reported in the original studies (e.g., Vidal *et al.* 2010; Pyron *et al*. 2013a). Most genera and species groups in Typhlopoidea are represented in the matrix, with 95 of 275 currently recognized extant species (Table 1). Genera not sampled are *Cathetorhinus*, *Cyclotyphlops, Grypotyphlops,* or *Asiatyphlops*. We included outgroups from the scolecophidian families Anomalepididae (*Liotyphlops albirostris*) and Leptotyphlopidae (*Rena humilis*). The final matrix is 6290bp long, with a mean sequence length of 2979 (47% complete). GenBank Accession numbers for all sequences are given in Appendix I. The matrix and phylogeny are provided in DataDryad repository doi:10.5061/dryad.180n7.

Most species are represented by multiple nuclear genes, but the sampling was not extensive enough to attempt a coalescent-based species-tree analysis. Rather, we used Maximum Likelihood (ML) inference on the concatenated dataset, partitioned by gene and codon position, as in previous studies (Vidal *et al.* 2010; Pyron *et al*. 2013b). We estimated the ML phylogeny in RAxMLv7.2.8 (Stamatakis 2006), using the rapid-bootstrapping algorithm with final thorough search from 1000 replicates, representing 200 independent ML searches. We assess node confidence using bootstrap proportions plotted on the ML tree, with the traditional cutoff of 70% considered "strong" support (Hillis & Bull 1993; Felsenstein 2004).

Morphological data. Over many years, one of us (V.W.) examined numerous specimens, including 778 dissections from 194 species (Appendix II). This has resulted in a large-scale morphological dataset containing potentially diagnostic characters for species, species groups, and genera (Tables 2, 3). We re-interpret these here for congruence with the molecular phylogeny to produce a robust taxonomy with character-based diagnoses. Note that we choose not to perform a full-scale phylogenetic analysis of the morphological data, as the total number of characters (<50) is insufficient for a robust analysis of 275 species. While a combined-data analysis (molecular + morphological data) might be possible, this is complicated by the difficulty of establishing hypotheses of primary homology for the continuous mensural characters such as organ placement and body-form ratios (Tables 2, 3). Thus, while the morphological data may not support a robust phylogenetic analysis alone (Hedges *et al.*, 2014), they are more than sufficient for identifying membership within genera and species groups (Wallach 1998a).

Morphological diagnoses use the following format, with unique diagnostic characters presented first. Measurements refer to adults; poorly preserved individuals were excluded from measurements requiring structural integrity (e.g., body form). Snout-vent length (= SVL), body size (= total length) is defined as small (< 200 mm), moderate (200–450 mm) or large (> 450 mm); body form is the ratio of midbody diameter to total length as stout (L/W < 40), moderate (L/W 40–70), or slender (L/W > 70); relative tail length is the ratio of tail length divided by total length and can be classed as short (< 2.0%), moderate (2.0–4.0%) and long (> 4.0%); relative tail width is tail length divided by midtail diameter. Scale rows include the total number of rows around the body, counted on the neck, at midbody and in cloacal region (when identical there is no reduction but if one count is at least 2 fewer than another, reduction occurs); total middorsals include all scales in the vertebral row between the rostral and apical spine or tip of tail. Rostral width is defined as mid-rostral diameter divided by interocular head width at the level of the eyes: narrow (< 33%), moderate (33–67%), and broad (> 67%); the inferior nasal suture may contact the second supralabial (most common), first supralabial, or even the preocular; the superior nasal suture may be absent or if present contacting the rostral on ventral surface, but in some species it extends posteriorly onto the dorsum of head. The supralabial imbrication pattern (SIP) of typhlopoids consist of five states, each of which is denoted by the supralabial numbers that overlap the shields dorsal to them: T-I with first supralabial overlapping preocular, T-II with second supralabial overlapping preocular or presubocular, T-III with third supralabial overlapping ocular or subocular, T-V with both second and third supralabials overlapping shields above them, and T-0 with no overlapping supralabials (Wallach 1993b). Here, the supralabial imbrication pattern may be T-III (most common), T-0 (= T-X of Broadley & Wallach 2007, 2009), T-II or T-V (Wallach 1993b). The tracheal lung, cardiac lung and right lung (see Wallach 1998b) may be multicameral (with separate chambers and foramina), paucicameral (with open pockets) or unicameral (with parenchyma lining the lung interior). A vestigial left lung is present (0.7–4.1% SVL) in some basal lineages (Wallach 1998a). Two main hemipenial types are known, typical eversible organs as in higher snakes (with a simple sulcus and usually without ornamentation or only some spines) with the retractor muscle attaching at the distal tip; and a derived protusible organ with the retractor muscle attached midway, resulting in a permanently everted apical papilla, the entire organ retracting into the tail in a corkscrew manner (with 0.5–15 coils). These two types are referred to as eversible and protrusible, respectively. Associated with the protrusible hemipenis are retrocloacal sacs (0.4–7.0% SVL) that originate in the cloacal region but extend anteriorly into the abdominal cavity. A rectal caecum (0.5–7.7% SVL) is usually present, but is lost in some taxa.

These are the characters most commonly used in the past to define, delimit, and diagnose species, species groups, and genera within Typhlopidae (Wallach 1998a). The material examined to generate these data are in most cases listed in previous publications giving the specimens and institutional numbers (Wallach 1993a, b, 1994, 1995, 1996, 1997, 1998a, 1999, 2000, 2001, 2002, 2003, 2005, 2006, 2009; Wallach & Ineich 1996; Broadley & Wallach 2000, 2007, 2009; Shea & Wallach 2000; Franzen & Wallach 2002; Wallach & Pauwels 2004, 2008; Wallach *et al.* 2007a, b; Wallach & Glaw 2009). A summary of the specimens dissected is given in Appendix II. Abbreviations for the museums involved are given elsewhere (Leviton *et al.* 1985; Sabaj Perez 2013; Wallach *et al.* 2014).

Systematic revision. Taxonomic decisions almost invariably require subjective arrangements and judgment calls, in addition to the objective application of the Code (Hedges 2013; Vences *et al.* 2013). The situation is further compounded here—as well as for nearly all groups of snakes—by absence of many species from molecular phylogenetic analyses, requiring imputation of their generic placement based on morphological data and subsequent hypothesized relationships. This is a common practice in snake systematics (e.g., Zaher *et al.* 2009). Thus, we follow simple, basic principles to generate a revised taxonomy that is robust and also follows the Code.

We examine the molecular phylogeny to identify current genera that are non-monophyletic with strong support. For these, we identify the type species associated with that name, and locate the minimally inclusive, morphologically defined species-group that includes that type species. We restrict the genus name to refer only to that strongly supported, morphologically distinct species-group. We then revise the diagnosis and definition of the genus to reflect the updated classification. In all cases, we identify unique character states or combinations thereof to diagnose genera. We also examine recently erected genera to ensure that they are unambiguously diagnosable based on morphology, and if not, synonymize them with a more inclusive group that can be distinguished based on a unique combination of characters. In some cases, species may be poorly known with little extant material for examination, and our hypotheses of relationships are thus more tenuous ("tentative" placement).

Finally, we provide stem-based phylogenetic definitions of all genera, so that un-sampled species can be unambiguously placed in genera in future studies based on the results of phylogenetic analyses. This results in a taxonomy that places all known, extant species in the family into genus-level species groups that are supported both by character-based diagnoses from morphological data, and that are strongly supported as distinct and monophyletic by molecular phylogenetic analyses. Some species may be shifted between these genera in future studies based on additional sampling of taxa and characters. However, we provide a robust, working platform for such future revisions and species descriptions, with available, well-formed taxa.

TABLE 1. A revised classification of 275 species in the superfamily Typhlopoidea, with their original description and general geographic distribution. New combinations (58 species) or emendations (6) different from the most recent classification (Hedges *et al.* 2014) are marked in bold. Full synonymies of all species are available elsewhere (Wallach *et al.* 2014).

New combination	Previous combination	Original description	Reference	Range
GERRHOPILIDAE				
Gerrhopilus andamanensis	*Gerrhopilus andamanensis*	*Typhlops andamanensis*	Stoliczka 1871	Andaman Islands
Gerrhopilus ater	*Gerrhopilus ater*	*Typhlops ater*	Schlegel 1839 *in* 1837–1844	E Indonesia
Gerrhopilus beddomii	*Gerrhopilus beddomii*	*Typhlops beddomii*	Boulenger 1890	S India
Gerrhopilus bisubocularis	*Gerrhopilus bisubocularis*	*Typhlops bisubocularis*	Boettger 1893	Java
Gerrhopilus ceylonicus	*Gerrhopilus ceylonicus*	*Typhlops ceylonicus*	Smith 1943	Sri Lanka
Gerrhopilus depressiceps	*Gerrhopilus depressiceps*	*Typhlops depressiceps*	Sternfeld 1913	Papua New Guinea
Gerrhopilus floweri	*Gerrhopilus floweri*	*Typhlops floweri*	Boulenger *in* Flower 1899	Thailand
Gerrhopilus fredparkeri	*Gerrhopilus fredparkeri*	*Typhlops fredparkeri*	Wallach *in* O'Shea 1996	Papua New Guinea
Gerrhopilus hades	*Gerrhopilus hades*	*Typhlops hades*	Kraus 2005	Papua New Guinea
Gerrhopilus hedraeus	*Gerrhopilus hedraeus*	*Typhlops hedraea*	Savage 1950	Philippines
Gerrhopilus inornatus	*Gerrhopilus inornatus*	*Typhlops inornatus*	Boulenger 1888	Papua New Guinea
Gerrhopilus manilae	*Malayotyphlops manilae*	*Typhlops manilae*	Taylor 1919	Philippines
Gerrhopilus mcdowelli	*Gerrhopilus mcdowelli*	*Typhlops mcdowelli*	Wallach *in* O'Shea 1996	Papua New Guinea
Gerrhopilus mirus	*Gerrhopilus mirus*	*Typhlops mirus*	Jan 1860 *in* Jan & Sordelli 1860–1866	Sri Lanka
Gerrhopilus oligolepis	*Gerrhopilus oligolepis*	*Typhlops oligolepis*	Wall 1909	N India
Gerrhopilus thurstoni	*Gerrhopilus thurstoni*	*Typhlops thurstoni*	Boettger 1890	S India
Gerrhopilus tindalli	*Gerrhopilus tindalli*	*Typhlops tindalli*	Smith 1943	S India
Cathetorhinus melanocephalus	*Ramphotyphlops melanocephalus*	*Cathetorhinus melanocephalus*	Duméril & Bibron 1844	Unknown (Timor/Mauritius?)
XENOTYPHLOPIDAE				
Xenotyphlops grandidieri	*Xenotyphlops grandidieri*	*Typhlops grandidieri*	Mocquard 1905	N Madagascar
TYPHLOPIDAE				
Typhlopinae				
Amerotyphlops amoipira	*Amerotyphlops amoipira*	*Typhlops amoipira*	Rodrigues & Juncá 2002	Brazil

……*continued on the next page*

TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Amerotyphlops brongersmianus	*Amerotyphlops brongersmianus*	*Typhlops brongersmianus*	Vanzolini 1976	South America
Amerotyphlops costaricensis	*Amerotyphlops costaricensis*	*Typhlops costaricensis*	Jiménez & Savage 1963	Central America
Amerotyphlops lehneri	*Amerotyphlops lehneri*	*Typhlops lehneri*	Roux 1926	Venezuela
Amerotyphlops microstomus	*Amerotyphlops microstomus*	*Typhlops microstomus*	Cope 1866	Yucatan Peninsula
Amerotyphlops minuisquamus	*Amerotyphlops minuisquamus*	*Typhlops minuisquamus*	Dixon & Hendricks 1979	Amazonia
Amerotyphlops paucisquamus	*Amerotyphlops paucisquamus*	*Typhlops paucisquamus*	Dixon & Hendricks 1979	Brazil
Amerotyphlops reticulatus	*Amerotyphlops reticulatus*	*Anguis reticulata*	Linnaeus 1758	Amazonia
Amerotyphlops stadelmani	*Amerotyphlops stadelmani*	*Typhlops stadelmani*	Schmidt 1936	Honduras
Amerotyphlops tasymicris	*Amerotyphlops tasymicris*	*Typhlops tasymicris*	Thomas 1974a	Grenada, St. Vincent & Grenadines
Amerotyphlops tenuis	*Amerotyphlops tenuis*	*Typhlops tenuis*	Salvin 1860	S Mexico, Guatemala
Amerotyphlops trinitatus	*Amerotyphlops trinitatus*	*Typhlops trinitatis*	Richmond 1965	Trinidad
Amerotyphlops tycherus	*Amerotyphlops tycherus*	*Typhlops tycherus*	Townsend et al. 2008	Honduras
Amerotyphlops yonenagae	*Amerotyphlops yonenagae*	*Typhlops yonenagae*	Rodrigues 1991	E Brazil
Typhlops agoralionis	*Typhlops agoralionis*	*Typhlops agoralionis*	Thomas & Hedges 2007	Haiti
Typhlops anchaurus	*Cubatyphlops anchaurus*	*Typhlops anchaurus*	Thomas & Hedges 2007	Cuba
Typhlops annae	*Antillotyphlops annae*	*Typhlops annae*	Breuil 1999	Guadeloupe, St. Bartholomew
Typhlops anousius	*Cubatyphlops anousius*	*Typhlops anousius*	Thomas & Hedges 2007	Cuba
Typhlops arator	*Cubatyphlops arator*	*Typhlops arator*	Thomas & Hedges 2007	Cuba
Typhlops biminiensis	*Cubatyphlops biminiensis*	*Typhlops biminiensis*	Richmond 1955	Bahamas
Typhlops capitulatus	*Typhlops capitulatus*	*Typhlops capitulatus*	Richmond 1964	Haiti
Typhlops catapontus	*Antillotyphlops catapontus*	*Typhlops richardi catapontus*	Thomas 1966a	British Virgin Islands
Typhlops caymanensis	*Cubatyphlops caymanensis*	*Typhlops caymanensis*	Sackett 1940	Cayman Islands
Typhlops coecatus	*Letheobia coecata*	*Typhlops coecatus*	Jan 1863	Ghana, Cote d'Ivoire
Typhlops contorhinus	*Cubatyphlops contorhinus*	*Typhlops contorhinus*	Thomas & Hedges 2007	Cuba
Typhlops dominicanus	*Antillotyphlops dominicanus*	*Typhlops dominicana*	Stejneger 1904	Dominica
Typhlops epactius	*Cubatyphlops epactius*	*Typhlops epactius*	Thomas 1968	Cayman Islands
Typhlops eperopeus	*Typhlops eperopeus*	*Typhlops eperopeus*	Thomas & Hedges 2007	Dominican Republic

……*continued on the next page*

TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Typhlops geotomus	*Antillotyphlops geotomus*	*Typhlops monastus geotomus*	Thomas 1966b	Lesser Antilles
Typhlops golyathi	*Cubatyphlops golyathi*	*Typhlops golyathi*	Domínguez & Moreno 2009	Cuba
Typhlops gonavensis	*Typhlops gonavensis*	*Typhlops gonavensis*	Richmond 1964	Haiti
Typhlops granti	*Antillotyphlops granti*	*Typhlops granti*	Ruthven & Gaige 1935	Puerto Rico
Typhlops guadeloupensis	*Antillotyphlops guadeloupensis*	*Typhlops guadeloupensis*	Richmond 1966	Guadeloupe
Typhlops hectus	*Typhlops hectus*	*Typhlops hectus*	Thomas 1974b	Haiti
Typhlops hypomethes	*Antillotyphlops hypomethes*	*Typhlops hypomethes*	Hedges & Thomas 1991	Puerto Rico
Typhlops jamaicensis	*Typhlops jamaicensis*	*Anguis jamaicensis*	Shaw 1802	Jamaica
Typhlops leptolepis	*Typhlops leptolepis*	*Typhlops leptolepis*	Domínguez et al. 2013	Cuba
Typhlops lumbricalis	*Typhlops lumbricalis*	*Anguis lumbricalis*	Linnaeus 1758	Bahamas
Typhlops monastus	*Antillotyphlops monastus*	*Typhlops monastus*	Thomas 1966b	Montserrat
Typhlops monensis	*Antillotyphlops monensis*	*Typhlops monensis*	Schmidt 1926	Puerto Rico
Typhlops naugus	*Antillotyphlops naugus*	*Typhlops richardi naugus*	Thomas 1966a	British Virgin Islands
Typhlops notorachius	*Cubatyphlops notorachius*	*Typhlops notorachius*	Thomas & Hedges 2007	Cuba
Typhlops oxyrhinus	*Typhlops oxyrhinus*	*Typhlops oxyrhinus*	Domínguez & Diaz 2011	Cuba
Typhlops pachyrhinus	*Typhlops pachyrhinus*	*Typhlops pachyrhinus*	Domínguez & Diaz 2011	Cuba
Typhlops paradoxus	*Cubatyphlops paradoxus*	*Typhlops biminiensis paradoxus*	Günther 1875	Bahamas
Typhlops perimychus	*Cubatyphlops perimychus*	*Typhlops perimychus*	Thomas & Hedges 2007	Cuba
Typhlops platycephalus	*Antillotyphlops platycephalus*	*Typhlops platycephalus*	Duméril & Bibron 1844	Puerto Rico
Typhlops proancylops	*Typhlops proancylops*	*Typhlops proancylops*	Thomas & Hedges 2007	Haiti
Typhlops pusillus	*Typhlops pusillus*	*Typhlops pusillus*	Barbour 1914	Hispaniola
Typhlops richardii	*Antillotyphlops richardi*	*Typhlops richardii*	Duméril & Bibron 1844	Puerto Rico, U.S. Virgin Islands
Typhlops rostellatus	*Typhlops rostellatus*	*Typhlops rostellatus*	Stejneger 1904	Puerto Rico
Typhlops satelles	*Cubatyphlops satelles*	*Typhlops satelles*	Thomas & Hedges 2007	Cuba
Typhlops schwartzi	*Typhlops schwartzi*	*Typhlops schwartzi*	Thomas *in* Woods 1989	Dominican Republic
Typhlops silus	*Typhlops silus*	*Typhlops silus*	Legler 1959	Cuba
Typhlops sulcatus	*Typhlops sulcatus*	*Typhlops sulcatus*	Cope 1868	Hispaniola

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Typhlops sylleptor	*Typhlops sylleptor*	*Typhlops sylleptor*	Thomas & Hedges 2007	Haiti
Typhlops syntherus	*Typhlops syntherus*	*Typhlops syntherus*	Thomas 1965	Dominican Republic
Typhlops tetrathyreus	*Typhlops tetrathyreus*	*Typhlops tetrathyreus*	Thomas *in* Woods 1989	Haiti
Typhlops titanops	*Typhlops titanops*	*Typhlops titanops*	Thomas *in* Woods 1989	Hispaniola
Typhlops zenkeri	*Letheobia zenkeri*	*Typhlops zenkeri*	Sternfeld 1908	Cameroon
Afrotyphlopinae				
Afrotyphlops angeli	*Letheobia angeli*	*Typhlops angeli*	Guibé 1952	Guinea
Afrotyphlops angolensis	*Afrotyphlops angolensis*	*Onychocephalus angolensis*	Bocage 1866	East-Central Africa
Afrotyphlops anomalus	*Afrotyphlops anomalus*	*Onychocephalus anomalus*	Bocage 1873	Angola
Afrotyphlops bibronii	*Afrotyphlops bibronii*	*Onychocephalus bibronii*	Smith 1846 *in* 1838–1849	SE Africa
Afrotyphlops blanfordii	*Afrotyphlops blanfordii*	*Typhlops blanfordii*	Boulenger 1889	Eritrea-Ethiopia
Afrotyphlops brevis	*Afrotyphlops brevis*	*Typhlops brevis*	Scortecci 1929	NE Africa
Afrotyphlops congestus	*Afrotyphlops congestus*	*Onychocephalus congestus*	Duméril & Bibron 1844	Central Africa
Afrotyphlops decorosus	*Afrotyphlops decorosus*	*Typhlops decorosus*	Buchholz & Peters *in* Peters 1875	Cameroon, C.A.R.
Afrotyphlops elegans	*Afrotyphlops elegans*	*Typhlops elegans*	Peters 1868	Príncipe Island
Afrotyphlops fornasinii	*Afrotyphlops fornasinii*	*Typhlops fornasinii*	Bianconi 1849	SE Africa
Afrotyphlops gierrai	*Afrotyphlops gierrai*	*Typhlops gierrai*	Mocquard 1897	Tanzania
Afrotyphlops kaimosae	*Afrotyphlops kaimosae*	*Typhlops kaimosae*	Loveridge 1935	Kenya
Afrotyphlops liberiensis	*Afrotyphlops liberiensis*	*Onychocephalus liberiensis*	Hallowell 1848	West Africa
Afrotyphlops lineolatus	*Afrotyphlops lineolatus*	*Typhlops lineolatus*	Jan 1864	West-East Africa
Afrotyphlops manni	*Letheobia manni*	*Typhlops manni*	Loveridge 1941	Liberia
Afrotyphlops mucruso	*Afrotyphlops mucruso*	*Onychocephalus mucruso*	Peters 1854	East Africa
Afrotyphlops nanus	*Afrotyphlops nanus*	*Afrotyphlops nanus*	Broadley & Wallach 2009	Kenya
Afrotyphlops nigrocandidus	*Afrotyphlops nigrocandidus*	*Rhinotyphlops nigrocandidus*	Broadley & Wallach 2000	Tanzania
Afrotyphlops obtusus	*Afrotyphlops obtusus*	*Typhlops obtusus*	Peters 1865	SE Africa
Afrotyphlops punctatus	*Afrotyphlops punctatus*	*Acontias punctatus*	Leach in Bowdich 1819	West & East Africa
Afrotyphlops rondoensis	*Afrotyphlops rondoensis*	*Typhlops tettensis rondoensis*	Loveridge 1942	Tanzania

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Afrotyphlops schmidti	*Afrotyphlops schmidti*	*Typhlops schmidti*	Laurent 1956	Central Africa
Afrotyphlops steinhausi	*Afrotyphlops steinhausi*	*Typhlops steinhausi*	Werner 1909b	Central Africa
Afrotyphlops tanganicanus	*Afrotyphlops tanganicanus*	*Typhlops schmidti tanganicanus*	Laurent 1964	Tanzania
Afrotyphlops usambaricus	*Afrotyphlops usambaricus*	*Typhlops boulengeri usambaricus*	Laurent 1964	Tanzania
Letheobia acutirostrata	*Letheobia acutirostrata*	*Typhlops acutirostratus*	Andersson 1916	Democratic Republic of the Congo
Letheobia caeca	*Letheobia caeca*	*Onychocephalus caecus*	Duméril 1856	Central Africa
Letheobia crossii	*Letheobia crossii*	*Typhlops crossi*	Boulenger 1893	Togo, Nigeria
Letheobia debilis	*Letheobia debilis*	*Rhinotyphlops debilis*	Joger *in* Peters & Hutterer 1990	Central African Republic
Letheobia episcopus	*Letheobia episcopa*	*Rhinotyphlops episcopus*	Franzen & Wallach 2002	Turkey
Letheobia erythraea	*Letheobia erythraea*	*Typhlops erythraeus*	Scortecci 1928	Eritrea
Letheobia feae	*Letheobia feae*	*Typhlops feae*	Boulenger 1906	São Tomé Island
Letheobia gracilis	*Letheobia gracilis*	*Typhlops gracilis*	Sternfeld 1910	SE Africa
Letheobia graueri	*Letheobia graueri*	*Typhlops graueri*	Sternfeld 1913	East Africa
Letheobia jubana	*Afrotyphlops jubanus*	*Letheobia jubana*	Broadley & Wallach 2007	Somalia
Letheobia kibarae	*Letheobia kibarae*	*Typhlops kibarae*	Witte 1953	Democratic Republic of the Congo
Letheobia largeni	*Letheobia largeni*	*Letheobia largeni*	Broadley & Wallach 2007	Ethiopia
Letheobia leucosticta	*Letheobia leucosticta*	*Typhlops leucostictus*	Boulenger 1898a	Liberia
Letheobia lumbriciformis	*Letheobia lumbriciformis*	*Onychocephalus lumbriciformis*	Peters 1874b	Kenya, Tanzania
Letheobia newtoni	*Letheobia newtoni*	*Typhlops newtoni*	Bocage 1890	Príncipe Island
Letheobia pallida	*Letheobia pallida*	*Letheobia pallida*	Cope 1869	Kenya, Tanzania
Letheobia pauwelsi	*Letheobia pauwelsi*	*Letheobia pauwelsi*	Wallach 2005	Gabon
Letheobia pembana	*Letheobia pembana*	*Letheobia pembana*	Broadley & Wallach 2007	Pemba Island
Letheobia praeocularis	*Letheobia praeocularis*	*Typhlops praeocularis*	Stejneger 1894	Central Africa
Letheobia rufescens	*Letheobia rufescens*	*Typhlops rufescens*	Chabanaud 1917	C.A.R., D.R. Congo
Letheobia simoni	*Letheobia simonii*	*Onychocephalus simoni*	Boettger 1879	Middle East

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Letheobia somalica	*Letheobia somalica*	*Typhlops somalicus*	Boulenger 1895a	Ethiopia
Letheobia stejnegeri	*Letheobia stejnegeri*	*Typhlops stejnegeri*	Loveridge 1931	D.R. Congo
Letheobia sudanensis	*Letheobia sudanensis*	*Typhlops sudanensis*	Schmidt 1923	D.R. Congo
Letheobia swahilica	*Letheobia swahilica*	*Letheobia swahilica*	Broadley & Wallach 2007	Kenya, Tanzania
Letheobia toritensis	*Letheobia toritensis*	*Letheobia toritensis*	Broadley & Wallach 2007	South Sudan
Letheobia uluguruensis	*Letheobia uluguruensis*	*Typhlops uluguruensis*	Barbour & Loveridge 1928	Tanzania
Letheobia wittei	*Letheobia wittei*	*Rhinotyphlops wittei*	Roux-Estève 1974	D.R. Congo
Rhinotyphlops ataeniatus	*Rhinotyphlops ataeniatus*	*Typhlops unitaeniatus ataeniatus*	Boulenger 1912	NE Africa
Rhinotyphlops boylei	*Rhinotyphlops boylei*	*Typhlops boylei*	FitzSimons 1932	SW Africa
Rhinotyphlops lalandei	*Rhinotyphlops lalandei*	*Typhlops lalandei*	Schlegel 1839 *in* 1837–1844	S Africa
Rhinotyphlops schinzi	*Rhinotyphlops schinzi*	*Typhlops schinzi*	Boettger 1887	SW Africa
Rhinotyphlops scorteccii	*Rhinotyphlops scortecci*	*Typhlops scorteccii*	Gans & Laurent *in* Gans et al. 1965	Somalia
Rhinotyphlops unitaeniatus	*Rhinotyphlops unitaeniatus*	*Typhlops unitaeniatus*	Peters 1878	E Africa
Grypotyphlops acutus	*Grypotyphlops acutus*	*Onychocephalus acutus*	Duméril & Bibron 1844	India
Madatyphlopinae				
Madatyphlops andasibensis	*Madatyphlops andasibensis*	*Typhlops andasibensis*	Wallach & Glaw 2009	Madagascar
Madatyphlops arenarius	*Madatyphlops arenarius*	*Onychocephalus arenarius*	Grandidier 1872	Madagascar
Madatyphlops boettgeri	*Madatyphlops boettgeri*	*Typhlops boettgeri*	Boulenger 1893	Madagascar
Madatyphlops calabresii	*Afrotyphlops calabresii*	*Typhlops cuneirostris calabresii*	Gans & Laurent *in* Gans et al. 1965	NE Africa
Madatyphlops comorensis	*Afrotyphlops comorensis*	*Typhlops comorensis*	Boulenger 1889	Comoro Islands
Madatyphlops cuneirostris	*Afrotyphlops cuneirostris*	*Typhlops cuneirostris*	Peters 1879	Somalia
Madatyphlops decorsei	*Madatyphlops decorsei*	*Typhlops decorsei*	Mocquard 1901	Madagascar
Madatyphlops leucocephalus	*Rhinotyphlops leucocephalus*	*Typhlops leucocephalus*	Parker 1930	Somalia
Madatyphlops madagascariensis	*Madatyphlops madagascariensis*	*Typhlops madagascariensis*	Boettger 1877	Madagascar
Madatyphlops mucronatus	*Madatyphlops mucronatus*	*Typhlops mucronatus*	Boettger 1880	Madagascar
Madatyphlops ocularis	*Madatyphlops ocularis*	*Typhlops ocularis*	Parker 1927	Madagascar

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Madatyphlops platyrhynchus	*Afrotyphlops platyrhynchus*	*Typhlopos platyrhynchus*	Sternfeld 1910	Tanzania
Madatyphlops rajeryi	*Madatyphlops rajeryi*	*Typhlops rajeryi*	Renoult & Raselimanana 2009	Madagascar
Asiatyphlopinae				
Acutotyphlops banaorum	*Acutotyphlops banaorum*	*Acutotyphlops banaorum*	Wallach et al. 2007a	Philippines
Acutotyphlops infralabialis	*Acutotyphlops infralabialis*	*Typhlops infralabialis*	Waite 1918a	Solomon Islands
Acutotyphlops kunuaensis	*Acutotyphlops kunuaensis*	*Acutotyphlops kunuaensis*	Wallach 1995	Bougainville Island
Acutotyphlops solomonis	*Acutotyphlops solomonis*	*Typhlops solomonis*	Parker 1939	Bougainville Island
Acutotyphlops subocularis	*Acutotyphlops subocularis*	*Typhlops subocularis*	Waite 1897a	E New Guinea, Solomon Islands
Anilios affinis	*Anilios affinis*	*Typhlops affinis*	Boulenger 1889	Australia
Anilios ammodytes	*Anilios ammodytes*	*Typhlops ammodytes*	Montague 1914	Australia
Anilios aspinus	*Anilios aspinus*	*Ramphotyphlops aspinus*	Couper et al. 1998	Australia
Anilios australis	*Anilios australis*	*Anilios australis*	Gray 1845	Australia
Anilios batillus	*Anilios batillus*	*Typhlops batillus*	Waite 1894	Australia
Anilios bicolor	*Anilios bicolor*	*Onychocephalus bicolor*	Schmidt *in* Peters 1858	Australia
Anilios bituberculatus	*Anilios bituberculatus*	*Onychocephalus bituberculatus*	Peters 1863	Australia
Anilios broomi	*Anilios broomi*	*Typhlops broomi*	Boulenger 1898b	Australia
Anilios centralis	*Anilios centralis*	*Ramphotyphlops centralis*	Storr 1984	Australia
Anilios chamodracaena	*Anilios chamodracaena*	*Ramphotyphlops chamodracaena*	Ingram & Covacevich 1993	Australia
Anilios diversus	*Anilios diversus*	*Typhlops diversus*	Waite 1894	Australia
Anilios endoterus	*Anilios endoterus*	*Typhlops endoterus*	Waite 1918b	Australia
Anilios erycinus	*Anilios erycinus*	*Typhlops erycinus*	Werner 1901	New Guinea
Anilios ganei	*Anilios ganei*	*Ramphotyphlops ganei*	Aplin 1998	Australia
Anilios grypus	*Anilios grypus*	*Typhlops grypus*	Waite 1918b	Australia
Anilios guentheri	*Anilios guentheri*	*Typhlops guentheri*	Peters 1865	Australia
Anilios hamatus	*Anilios hamatus*	*Ramphotyphlops hamatus*	Storr 1981	Australia
Anilios howi	*Anilios howi*	*Ramphotyphlops howi*	Storr 1983	Australia

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Anilios kimberleyensis	*Anilios kimberleyensis*	*Ramphotyphlops kimberleyensis*	Storr 1981	Australia
Anilios leptosomus	*Anilios leptosomus*	*Ramphotyphlops leptosoma*	Robb 1972	Australia
Anilios leucoproctus	*Anilios leucoproctus*	*Typhlops leucoproctus*	Boulenger 1889	Australia
Anilios ligatus	*Anilios ligatus*	*Typhlops ligatus*	Peters 1879	Australia
Anilios longissimus	*Anilios longissimus*	*Ramphotyphlops longissimus*	Aplin 1998	Australia
Anilios margaretae	*Anilios margaretae*	*Ramphotyphlops margaretae*	Storr 1981	Australia
Anilios micrommus	*Anilios micrommus*	*Ramphotyphlops micromma*	Storr 1981	Australia
Anilios minimus	*Anilios minimus*	*Typhlops minimus*	Kinghorn 1929	Australia
Anilios nema	*Anilios nema*	*Ramphotyphlops nema*	Shea & Horner 1997	Australia
Anilios nigrescens	*Anilios nigrescens*	*Anilios nigrescens*	Gray 1845	Australia
Anilios nigricaudus	**Not recognized**	*Typhlops nigricauda*	Boulenger 1895b	Australia
Anilios nigroterminatus	*Anilios nigroterminatus*	*Typhlops nigroterminatus*	Parker 1931	Australia
Anilios pilbarensis	*Anilios pilbarensis*	*Ramphotyphlops pilbarensis*	Aplin & Donnellan 1993	Australia
Anilios pinguis	*Anilios pinguis*	*Typhlops pinguis*	Waite 1897b	Australia
Anilios polygrammicus	*Sundatyphlops polygrammicus*	*Typhlops polygrammicus*	Schlegel 1839 *in* 1837–1844	SE Indonesia, Australia
Anilios proximus	*Anilios proximus*	*Typhlops proximus*	Waite 1893	Australia
Anilios robertsi	*Anilios robertsi*	*Ramphotyphlops robertsi*	Couper et al. 1998	Australia
Anilios silvia	*Anilios silvia*	*Ramphotyphlops silvia*	Ingram & Covacevich 1993	Australia
Anilios splendidus	*Anilios splendidus*	*Ramphotyphlops splendidus*	Aplin 1998	Australia
Anilios torresianus	*Anilios torresianus*	*Typhlops torresianus*	Boulenger 1889	Australia
Anilios tovelli	*Anilios tovelli*	*Typhlops tovelli*	Loveridge 1945	Australia
Anilios troglodytes	*Anilios troglodytes*	*Ramphotyphlops troglodytes*	Storr 1981	Australia
Anilios unguirostris	*Anilios unguirostris*	*Typhlops unguirostris*	Peters 1867b	Australia
Anilios waitii	*Anilios waitii*	*Typhlops waitii*	Boulenger 1895c	Australia
Anilios wiedii	*Anilios wiedii*	*Typhlops wiedii*	Peters 1867a	Australia
Anilios yampiensis	*Anilios yampiensis*	*Ramphotyphlops yampiensis*	Storr 1981	Australia
Anilios yirrikalae	*Anilios yirrikalae*	*Typhlops yirrikalae*	Kinghorn 1942	Australia

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Argyrophis bothriorhynchus	*Asiatyphlops bothriorhynchus*	*Typhlops bothriorhynchus*	Günther 1864	India-Java
Argyrophis diardii	*Asiatyphlops diardii*	*Typhlops diardii*	Schlegel 1839 *in* 1837–1844	SE Asia
Argyrophis fuscus	*Asiatyphlops fuscus*	*Ophthalmidion fuscum*	Duméril & Duméril 1851	Indonesia
Argyrophis giadinhensis	*Asiatyphlops giadinhensis*	*Typhlops giadinhensis*	Bourret 1937	Vietnam
Argyrophis hypsobothrius	*Indotyphlops hypsobothrius*	*Typhlops hypsobothrius*	Werner 1917	Sumatra
Argyrophis klemmeri	*Asiatyphlops klemmeri*	*Typhlops klemmeri*	Taylor 1962	West Malaysia
Argyrophis koshunensis	*Asiatyphlops koshunensis*	*Typhlops koshunensis*	Ôshima 1916	Taiwan
Argyrophis muelleri	*Asiatyphlops muelleri*	*Typhlops muelleri*	Schlegel 1839 *in* 1837–1844	SE Asia
Argyrophis oatesii	*Asiatyphlops oatesii*	*Typhlops oatesii*	Boulenger 1890	Andaman & Cocos Islands
Argyrophis roxaneae	*Asiatyphlops roxaneae*	*Typhlops roxaneae*	Wallach 2001	Thailand
Argyrophis siamensis	*Asiatyphlops siamensis*	*Typhlops siamensis*	Günther 1864	Southeast Asia
Argyrophis trangensis	*Asiatyphlops trangensis*	*Typhlops trangensis*	Taylor 1962	Thailand
Cyclotyphlops deharvengi	*Cyclotyphlops deharvengi*	*Cyclotyphlops deharvengi*	Bosch & Ineich 1994	Sulawesi
Indotyphlops albiceps	*Indotyphlops albiceps*	*Typhlops albiceps*	Boulenger 1898a	SE Asia
Indotyphlops braminus	*Indotyphlops braminus*	*Eryx braminus*	Daudin 1803	Cosmopolitan
Indotyphlops exiguus	*Indotyphlops exiguus*	*Typhlops exiguus*	Jan 1864 *in* Jan & Sordelli 1860–1866	S India
Indotyphlops filiformis	*Indotyphlops filiformis*	*Typhlops filiformis*	Duméril & Bibron 1844	Unknown
Indotyphlops jerdoni	*Indotyphlops jerdoni*	*Typhlops jerdoni*	Boulenger 1890	S Asia
Indotyphlops lankaensis	*Indotyphlops lankaensis*	*Typhlops lankaensis*	Taylor 1947	Sri Lanka
Indotyphlops lazelli	*Indotyphlops lazelli*	*Typhlops lazelli*	Wallach & Pauwels 2004	Hong Kong
Indotyphlops leucomelas	*Asiatyphlops leucomelas*	*Typhlops leucomelas*	Boulenger 1890	Sri Lanka
Indotyphlops loveridgei	*Indotyphlops loveridgei*	*Typhlops loveridgei*	Constable 1949	N India
Indotyphlops madgemintonae	*Indotyphlops madgemintonae*	*Typhlops madgemintonae*	Khan 1999	Pakistan
Indotyphlops malcolmi	*Indotyphlops malcolmi*	*Typhlops malcolmi*	Taylor 1947	Sri Lanka
Indotyphlops meszoelyi	*Indotyphlops meszoelyi*	*Typhlops meszoelyi*	Wallach 1999	NE India
Indotyphlops ozakiae	*Indotyphlops ozakiae*	*Ramphotyphlops ozakiae*	Wallach in Niyomwan 1999	Thailand
Indotyphlops pammeces	*Indotyphlops pammeces*	*Typhlops pammexes*	Günther 1864	SE India
Indotyphlops porrectus	*Indotyphlops porrectus*	*Typhlops porrectus*	Stoliczka 1871	S Asia

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Indotyphlops schmutzi	*Indotyphlops schmutzi*	*Typhlops schmutzi*	Auffenberg 1980	Lesser Sundas
Indotyphlops tenebrarum	*Indotyphlops tenebrarum*	*Typhlops tenebrarum*	Taylor 1947	Sri Lanka
Indotyphlops tenuicollis	*Asiatyphlops tenuicollis*	*Onychocephalus tenuicollis*	Peters 1864	NE India
Indotyphlops veddae	*Indotyphlops veddae*	*Typhlops veddae*	Taylor 1947	Sri Lanka
Indotyphlops violaceus	*Indotyphlops violaceus*	*Typhlops violaceus*	Taylor 1947	Sri Lanka
Lemuriatyphlops albanalis	**Not recognized**	*Typhlops albanalis*	Rendahl 1918	Unknown
Lemuriatyphlops domerguei	*Madatyphlops domerguei*	*Typhlops domerguei*	Roux-Estève 1980	Madagascar
Lemuriatyphlops microcephalus	*Madatyphlops microcephalus*	*Typhlops microcephalus*	Werner 1909a	Madagascar
Lemuriatyphlops reuteri	*Madatyphlops reuteri*	*Typhlops reuteri*	Boettger 1881	Madagascar
Malayotyphlops canlaonensis	*Malayotyphlops canlaonensis*	*Typhlops canlaonensis*	Taylor 1917	Philippines
Malayotyphlops castanotus	*Malayotyphlops castanotus*	*Typhlops castanotus*	Wynn & Leviton 1993	Philippines
Malayotyphlops collaris	*Malayotyphlops collaris*	*Typhlops collaris*	Wynn & Leviton 1993	Philippines
Malayotyphlops hypogius	*Malayotyphlops hypogius*	*Typhlops hypogia*	Savage 1950	Philippines
Malayotyphlops koekkoeki	*Malayotyphlops koekkoeki*	*Typhlops koekkoeki*	Brongersma 1934	Borneo
Malayotyphlops kraalii	*Malayotyphlops kraali*	*Typhlops kraalii*	Doria 1875	Kei Islands
Malayotyphlops luzonensis	*Malayotyphlops luzonensis*	*Typhlops luzonensis*	Taylor 1919	Philippines
Malayotyphlops ruber	*Malayotyphlops ruber*	*Typhlops ruber*	Boettger 1897	Philippines
Malayotyphlops ruficaudus	*Malayotyphlops ruficauda*	*Anilios ruficauda*	Gray 1845	Philippines
Ramphotyphlops acuticaudus	*Ramphotyphlops acuticauda*	*Typhlops acuticaudus*	Peters 1877	Palau
Ramphotyphlops adocetus	*Ramphotyphlops adocetus*	*Ramphotyphlops adocetus*	Wynn *et al.* 2012	Ant Atoll
Ramphotyphlops angusticeps	*Ramphotyphlops angusticeps*	*Typhlops angusticeps*	Peters 1877	Solomon Islands
Ramphotyphlops becki	*Ramphotyphlops becki*	*Typhlops becki*	Tanner 1948	Guadalcanal Island
Ramphotyphlops bipartitus	**Not recognized**	*Typhlops bipartitus*	Sauvage 1879	Tidore Island
Ramphotyphlops conradi	*Ramphotyphlops conradi*	*Typhlops conradi*	Peters 1874a	Sulawesi
Ramphotyphlops cumingii	*Ramphotyphlops cumingii*	*Onychophis cumingii*	Gray 1845	Philippines
Ramphotyphlops depressus	*Ramphotyphlops depressus*	*Typhlops depressus*	Peters 1880	New Guinea, Solomon Islands
Ramphotyphlops exocoeti	*Ramphotyphlops exocoeti*	*Typhlops exocoeti*	Boulenger 1887	Christmas Island

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TABLE 1. (Continued)

New combination	Previous combination	Original description	Reference	Range
Ramphotyphlops flaviventer	*Ramphotyphlops flaviventer*	*Typhlops flaviventer*	Peters 1864	E Indonesia
Ramphotyphlops hatmaliyeb	*Ramphotyphlops hatmaliyeb*	*Ramphotyphlops hatmaliyeb*	Wynn et al. 2012	Caroline Islands
Ramphotyphlops lineatus	*Ramphotyphlops lineatus*	*Typhlops lineatus*	Schlegel 1839 *in* 1837–1844	SE Asia, W Indonesia
Ramphotyphlops lorenzi	*Ramphotyphlops lorenzi*	*Typhlops lorenzi*	Werner 1909b	Kalimantan
Ramphotyphlops mansuetus	*Ramphotyphlops mansuetus*	*Typhlops mansuetus*	Barbour 1921	Solomon Islands
Ramphotyphlops marxi	*Ramphotyphlops marxi*	*Typhlops marxi*	Wallach 1993a	Philippines
Ramphotyphlops multilineatus	*Ramphotyphlops multilineatus*	*Typhlops multilineatus*	Schlegel 1839 *in* 1837–1844	New Guinea
Ramphotyphlops olivaceus	*Ramphotyphlops olivaceus*	*Onychophis olivaceus*	Gray 1845	East Indies
Ramphotyphlops similis	*Ramphotyphlops similis*	*Typhlops similis*	Brongersma 1934	E Indonesia
Ramphotyphlops suluensis	*Ramphotyphlops suluensis*	*Typhlops suluensis*	Taylor 1918	Philippines
Ramphotyphlops supranasalis	*Ramphotyphlops supranasalis*	*Typhlops supranasalis*	Brongersma 1934	Salawatti Island
Ramphotyphlops willeyi	*Ramphotyphlops willeyi*	*Typhlops willeyi*	Boulenger *in* Willey 1900	New Caledonia
Xerotyphlops etheridgei	*Xerotyphlops etheridgei*	*Typhlops etheridgei*	Wallach 2002	Mauritania
Xerotyphlops socotranus	*Xerotyphlops socotranus*	*Typhlops socotranus*	Boulenger 1889	Socotra
Xerotyphlops vermicularis	*Xerotyphlops vermicularis*	*Typhlops vermicularis*	Merrem 1820	SE Europe, SW Asia, Egypt
Xerotyphlops wilsoni	*Xerotyphlops wilsoni*	*Typhlops wilsoni*	Wall 1908	W Iran
Typhlopidae *incertae sedis*				
"Typhlops" longissimus	**Not recognized**	*Ophthalmidion longissimum*	Duméril & Bibron 1844	Unknown

TABLE 2. Morphological character states for external morphology used to generate diagnoses. Characters are as follows: LSR = longitudinal scale rows; SRR = scale row reduction present (anterior and/or posterior); TSR = transverse scale rows at midbody; SC = subcaudals; T/LOA = tail length/total length; LOA = total length (mm); TL/TW = tail length/midtail diameter; SIP = supralabial imbrication pattern; L/W = total length/midbody diameter; INS = inferior nasal suture contact with supralabial (1 or 2), preocular (PO) or rostral (R); PO = postoculars; RW/HW = midrostral width/interocular head width; LLng = left lung (O = absent); LTP = lateral tongue papillae; Lng type = tracheal lung–cardiac lung–right lung structure (M = multicameral, P = paucicameral, U = unicameral); TLF = tracheal lung foramina; CLF = cardiac lung foramina; RLF = right lung foramina; TES = testes (U = unsegmented, S = segmented); RC = rectal (or ileocolic) caecum length as % SVL; RCS = retrocloacal sacs (O = absent); HP = retracted hemipenis (S = straight, C = coiled); and HPC = coils in retracted hemipenis.

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Gerrhopilus											
Ge. andamanensis	18	no	390–407	17	3.8	160–165	2.1	T–II	17–47	2	2
Ge. ater	18	no	263–372	13–17	3.3–3.8	110–166	1.6–2.2	T–II	41–70	2	1–2
Ge. beddomii	18	no	190–225	10–13	2.3–3.7	90–140	1.3–1.8	T–II	20–40	2	1
Ge. bisubocularis	18	no	308	16	3.4–3.6	111–131	1.5–2.0	T–II	44–55	2	2
Ge. ceylonicus	18	no	330	12	3.6	140	1.7	T–II	35	2	1
Ge. depressiceps	20–24	yes	631–780	22–29	2.5–3.6	228–331	1.8–4.0	T–V	54–81	2	2–4
Ge. floweri	18	no	478–520	20–23	3.4–4.0	174–230	1.0–3.0	T–V	62–89	2	2–3
Ge. fredparkeri	16	no	539	23	3.7	149	3.7	T–II	85	2	3
Ge. hades	18	no	343	17–19	3.4–4.1	127–143	1.6–2.3	T–V	37–47	2	3
Ge. hedraeus	18	no	332–398	15–17	3.3–5.1	119–134	3	T–II	45–61	2	2–3
Ge. inornatus	20–22	both	295–434	13–17	2.6–4.0	87–227	1.5–2.0	T–V	31–69	2	3–4
Ge. manilae	28	yes		12	1.8	280	1		56	2	3
Ge. mcdowelli	22–24	yes	374–470	15–25	2.3–4.0	74–209	1.4–2.3	T–V	44–53	2	3–4
Ge. mirus	18	no	298–360	12–16	3.3–3.8	99–140	1.5–2.0	T–II	35–60	2	1–2
Ge. oligolepis	16	no		13	3.6	140–145	1.7	T–II	42–60	2	1
Ge. thurstoni	20		550–600	22	1.5–3.1	170–317	1.9	T–II	45–80	2	1
Ge. tindalli	18	no	300	9	1.9	140–175	1	T–II	42-53	PO	1
Cathetorhinus											
Ca. melanocephalus	18	no	525	20	2.7	183	2.5	T–II	92	2	1
Xenotyphlops											
Xen. grandidieri	20	no	469–545	20–23	3.1–3.7	168–284	2.3–3.2	T–0	62–86	2	2–3
Amerotyphlops											
Am. amoipira	18	no	212–242	7–12	1.9–2.6	73–208	1.5	T–III	23–28	2	2
Am. brongersmianus	20	no	195–287	8–14	1.8–4.2	84–325	1.0–1.4	T–III	20–31	2	1
Am. costaricensis	20	no	322–417	7–9	1.2–2.4	177–385	0.8–1.2	T–III	37–56	2–1	1–2

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Am. lehneri	18–20	no	289–337	7–14	0.8–2.0	115–200	0.9–1.2	T–III	31–58	2	1
Am. microstomus	18	no	487–566	5–10	0.7–1.4	144–366	0.8–1.1	T–III	50–77	2	2
Am. minuisquamus	16–18	yes	219–253	6–11	1.9–3.2	152–361	0.9–1.1	T–III	20–37	2	1
Am. paucisquamus	18	no	169–188	8–11	2.6–3.8	133–158	1.3–1.4	T–III	16–22	2	1
Am. reticulatus	20	yes	213–299	7–15	1.6–4.3	38–522	0.9–1.1	T–III	18–34	2	1–2
Am. stadelmani	18	no	298–369	7–12	1.0–2.4	112–310	1.4	T–III	37–70	2	
Am. tasymicris	20	no	422–429	5–7	1.3–1.4	181–196	0.8	T–III	44–48	2	1
Am. tenuis	18	both	361–441	7–14	1.1–2.4	110–326	0.9–1.6	T–III	50–74	2	2–3
Am. trinitatus	20	no	387–389	7–10	1.2–1.3	158–240	1.0–1.1	T–III	31–50	2	1–2
Am. tycherus	22	no	395	8–11	1.5	371	1	T–III	41–46	2	3
Am. yonenagae	18	yes	259–269	9–10	2.0–2.4	96–168	1.3	T–III	25–34	1–2	1–2
Typhlops											
T. agoralionis	20	no	291–310		3.2–3.7	107–193		T–III	31–39	2	2
T. anchaurus	22	yes	514		2.1	240		T–III	63	2	1
T. annae	22	no	400–405	14	1.6	110		T–III	58	2	2
T. anousius	22	yes	465–513		1.8	109–197		T–III	45–55	2	1
T. arator	24	yes	578–579		2.1–2.2	240–460		T–III	51–55	2	1
T. biminiensis	22–24	both	454–537	9–10	1.7–2.3	130–380	1.1–1.8	T–III	39–51	2	1
T. capitulatus	20	no	385–457	11–14	1.1–3.2	130–267	1.5–1.7	T–III	46–57	2	2
T. catapontus	18	yes	362–409	12	2.6–2.8	255–265	2	T–III	36	2	2
T. caymanensis	20	no	351–408	14–16	2.2–3.5	110–256	2.1	T–III	39–45	2	1
T. coecatus	18–20	no	282–334	5	0.9	82–172	0.8	T–III	40–57	2	2
T. contorhinus	22	yes	502		1.9	316		T–III	63	2	1
T. dominicanus	22–24	yes	390–499	12–13	1.5–2.6	170–385	1.3	T–III	38–56	2	2
T. epactius	22	yes	473–505	13	2.1–2.5	129–247	1.7	T–III	53–59	2	2
T. eperopeus	20	yes	305–329		3.2–3.7	140–281		T–III	29–39	2	2
T. geotomus	22	yes	329–367	12–13	2.2–3.3	180–221	1.4–2.0	T–III	38–40	2	2
T. golyathi	22	yes	629	22	3	371	3	T–III	58	2	1
T. gonavensis	20	no	398–426	9–11	2.1–2.5	178–211	1.0–1.5	T–III	46–57	2	1–2
T. granti	16–18	yes	370–421	9–12	1.8–2.3	85–210	1.8–2.0	T–III	51–78	2	2
T. guadeloupensis	24	yes	393-430		2.2	162–385		T–III	37	2	2
T. hectus	20	yes	284–328	10–16	2.3–5.0	90–218	1.3–1.8	T–III	31–46	2	2
T. hypomethes	20–22	yes	363–407	10–13	2.1–2.9	186–270	1.6–1.8	T–III	39–56	2	2
T. jamaicensis	22	no	373–448	11–16	2.8–3.4	106–445	1.3–2.1	T–III	30–45	2	1–2

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
T. leptolepis	18-20	yes	250-308	11-15	2.7-5.6	211		T-III	30-44	2	2
T. lumbricalis	18–20	both	256–271	12–13	2.1–3.2	85–166	1.0–1.6	T–III	32–40	2	2
T. monastus	22	yes	329–394	12–13	2.3–3.4	90–258	1.4–2.0	T–III	35–46	2	2
T. monensis	18–20	yes	299–345	7–9	1.5–2.6	96–207	0.8–0.9	T–III	32–39	2	2
T. naugus	18	yes	345–390		3.3	243		T–III		2	2
T. notorachis	22	yes	475–529		1.3–2.1	282–301		T–III	45–57	2	1
T. oxyrhinus	18–20	both	265–297	10–16	2.7–5.1	150–257	1.7–3.2	T–III	44–55	2	2
T. pachyrhinus	18–20	both	243–257	11–14	3.2–3.3	211–219	1.7–1.8	T–III	47–48	2	2
T. paradoxus	22	no	455–472		2.0–2.1	235–245		T–III	47–49	2	2
T. perimychus	22–24	both	453–496		1.2–2.2	130–280		T–III	41–59	2	1
T. platycephalus	20–22	yes	355–417	11–15	2.6–2.7	90–337	1.5–1.7	T–III	38–50	2	2
T. proancylops	20	no	283–312		3.2–5.0	127–243		T–III	31–46	2	2
T. pusillus	18–22	yes	245–332	9–14	1.8–4.3	70–226	0.9–2.3	T–III	27–37	2	1–2
T. richardii	20–22	yes	312–425	13–15	2.0–3.3	150–342	2.0–2.1	T–III	29–52	2	2
T. rostellatus	18–20	yes	314–358	11–14	1.9–3.0	139–227	1.0–1.6	T–III	32–56	2	2
T. satelles	22	both	514–527		1.6–1.8	307–350		T–III	62–75	2	1
T. schwartzi	18–20	yes	237–282	12–14	1.7–4.5	121–326	1.3–2.4	T–III	23–30	2	1–2
T. silus	18–20	both	247–279	8–16	1.1–4.0	110–175	0.9–2.3	T–III	33–49	2	2
T. sulcatus	20	no	387–452	11–13	2.0–2.4	90–319	1.4–1.8	T–III	37–46	2	1–2
T. sylleptor	20	no	305–324		2.3–3.7	105–214		T–III	33–34	2	2
T. syntherus	22	no	299–353	8–12	1.8–3.7	70–214	1.1–1.6	T–III	25–37	2	1
T. tetrathyreus	18–20	yes	246–285	8–13	2.4–4.3	167–273	1.2–1.6	T–III	25–35	2	2
T. titanops	20	yes	231–264	11	2.9–4.8	166–216	1.4	T–III	25–30	2	1–2
T. zenkeri	18	yes	250–281	9	1.7	130–150	1	T–0	35–43	SO	1–2
Afrotyphlops											
Af. angeli	24	yes	508		1.4	365	1.1	T–0	73	2	2
Af. angolensis	24–36	yes	234–573	8–13	1.3–2.1	148–703	0.8–1.0	T–II(0)	26–49	1	3–4
Af. anomalus	29–32	yes	365–431	9	1.4–2.0	119–540	0.7	T–0	27–45	R	4–5
Af. bibronii	30–34	yes	363–453	7–12	1.3–2.1	111–484	0.6–1.0	T–II	26–42	1	3–5
Af. blanfordii	28–32	yes	320–433	6–10	1.0–2.4	106–355	0.6–0.9	T–0	21–40	1	3–4
Af. brevis	34–38	yes	289–354	6–10	1.2–2.2	164–700	0.6–1.2	T–0/II	20–34	1–2	2–5
Af. congestus	24–30	yes	310–416	6–14	1.5–2.6	266–700	0.7–1.1	T–0/II	17–30	1–R	3–4
Af. decorosus	24	no	460–542	10–12	1.1–1.8	204–505	1.0–1.1	T–0	53–66	1	4
Af. elegans	18–20	yes	315–349	8–13	2.0–2.6	271–420	1.0–1.6	T–0	36–49	1	3
Af. fornasinii	22–26	yes	232–286	6–12	1.4–2.3	87–185	0.7–1.2	T–II	23–45	1	3–5

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Af. gierrai	26–28	yes	398–464	10–13	1.3–1.7	174–480	0.8–0.9	T–II	31–51	1	4–7
Af. kaimosae	28	no	391	9	1.2	208	0.7	T–0	42	1–2	4
Af. liberiensis	24–30	yes	339–435	8	1.6–1.9	135–766	0.8	T–II	22–40	1	3–4
Af. lineolatus	26–30	yes	295–431	6–14	1.3–2.9	103–640	0.6–1.1	T–0(II)	21–47	1	3–5
Af. manni	26	yes	480	8	1.4	343	0.9	T–II	40	2	3
Af. mucruso	30–38	yes	332-518	6–10	0.8–2.1	122–950	0.6–1.1	T–0/II	18–56	1	4–5
Af. nanus	30–32	yes	287–291	10–11	2.1–2.4	118–125	0.8	T–0/II	23–27	1	2–3
Af. nigrocandidus	30–34	yes	464–542	11–13	1.4–2.3	363–460	0.9–1.4	T–II	38–52	1	4–7
Af. obtusus	22–26	yes	406–507	6–10	0.7–1.3	163–372	0.7–0.9	T–II	43–95	1	3–5
Af. punctatus	28–34	yes	374–465	8–16	1.6–2.3	112–660	0.8–1.1	T–0/II	19–43	1	3–5
Af. rondoensis	22–26	yes	314–379	9–11	1.3–2.1	164–370	0.9–1.2	T–II	30–41	1	3–4
Af. schlegelii	32–44	yes	332-624	7–10	1.2–2.2	171–900	0.7–1.2	T–II	23–40	1	3–4
Af. schmidti	22–26	yes	317–374	7–11	1.6–2.4	191–605	0.6–1.2	T–0(II)	22–49	1	3–5
Af. steinhausi	26–28	yes	378–430	5–10	1.1–2.4	236–428	0.7–1.2	T–0	40–51	1	2–3
Af. tanganicanus	22–24	yes	352–425	8	1.4	169–390	0.7	T–0	29–47	1	3
Af. usambaricus	26–28	yes	344–390	8–11	1.4–2.3	798–605	0.7–0.9	T–0	27–31	1	4–5
Rhinotyphlops											
Rh. ataeniatus	24–26	yes	443–531	6–12	0.6–1.3	155–455	0.7–1.0	T–0	39–66	2	3–5
Rh. boylei	29–28	yes	351–377	10	1.4–1.9	106–220	0.8	T–0	35–46	1–2	4–5
Rh. lalandei	26–34	yes	314–442	9–12	1.4–2.0	111–350	0.8–1.3	T–0	35–50	1	3–5
Rh. schinzi	22–26	yes	413–538	12–13	1.8–2.3	160–293	1.2–1.5	T–II	45–57	1	3–4
Rh. scorteccii	23–25	yes	311–405	7–13	1.1–2.2	90–275	0.8–1.5	T–0	27–73	2	2–3
Rh. unitaeniatus	24–26	yes	467–586	7–11	0.6–1.5	164–435	0.5–1.1	T–0	43–88	2	3–4
Letheobia											
Let. acutirostrata	24	no	440–513	9–13	0.9–1.8	320–447	0.8–1.6	T–0	59–96	1–2	3–4
Let. caeca	22	no	417–561	10–12	0.9–1.7	120–443	0.9–1.3	T–0	46–87	R	3–4
Let. crossii	22–24	yes	455–513	8–13	1.0–1.9	238–310	1.0–2.0	T–0	54–85	2	3–5
Let. debilis	18–20	yes	547–668	7–11	0.7–0.9	334–478	0.8–1.0	T–II	99–129	2	3–4
Let. episcopus	20	yes	544–581	11–15	0.9–1.6	250–318	0.8–1.5	T–II	74–90	2	5–6
Let. erythraea	20–21	yes	443–462	11–15	1.7–2.0	205–245	1.1–1.5	T–0	68–82	2	3–4
Let. feae	20–22	yes	407–474	8–12	1.0–1.5	169–330	0.9–1.2	T–0	51–68	1–2	2–3
Let. gracilis	22	no	608–737	8–12	0.7–1.1	237–540	0.7–1.3	T–0	60–105	2	2–4
Let. graueri	24	no	454–622	8–15	0.9–1.8	198–450	0.7–1.0	T–0	60–72	1–2	3
Let. jubana	24	yes	391–435	5–8	1.0–1.4	211–510	0.7–1.0	T–0	48–57	1	3–4

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Let. kibarae	24–26	yes	562–618	7–11	0.7–1.3	191–525	0.6–1.1	T–0	58–87	1–2	3–5
Let. largeni	22	yes	432	10	1.5	274	1.3	T–0	65	1–2	4
Let. leucosticta	22–24	yes	336–396	9	1.0–1.6	222–230	1	T–II	44–45	2	3
Let. lumbriciformis	18	no	465–607	11–17	1.3–1.7	252–445	0.8–1.2	T–0	43–94	2	2–5
Let. newtoni	26–28	yes	446–567	10–12	1.0–2.0	280–400	0.8–1.2	T–0	50–70	2	3–4
Let. pallida	22	yes	418–429	7–10	0.9–2.3	113–192	0.8–1.5	T–0	53–98	1–2	3–4
Let. pauwelsi	22	no	483	11	1.6	310	1.2	T–0	82	2	3
Let. pembana	24	yes	353	10	1.6	158	0.8	T–0	53	2	4
Let. praeocularis	24–28	yes	423–544	7–11	0.9–1.9	337–438	0.9–1.0	T–II	44–85	1	3–5
Let. rufescens	20	yes	585–656	7–9	0.7–0.8	296–490	0.8–1.0	T–II	69–90	2	3–4
Let. simoni	20–22	no	403–488	9–14	1.0–2.2	160–239	0.9–1.7	T–0	53–91	2	2–3
Let. somalica	24–30	yes	555–656	11–15	0.7–1.5	220–550	1.0–1.2	T–0/II	44–90	1–2	3–6
Let. stejnegeri	25–30	yes	479–548	10–12	1.0–1.5	296–465	0.8–1.1	T–II	42–56	1	2–3
Let. sudanensis	24–26	yes	569–660	8–13	0.9–1.9	172–520	0.8–1.7	T–0(II)	57–95	1–2	4–6
Let. swahilica	22	yes	376–396	8–12	1.1–2.2	123–191	0.8–1.5	T–0	49–62	2	3–4
Let. toritensis	22	yes	427–487	7–13	0.9–1.8	106–268	0.9–1.6	T–0	56–81	1–2	3–5
Let. uluguruensis	22	yes	376–416	8–13	1.2–2.6	214–245	1.1	T–II	48–57	2	3
Let. wittei	20	no	488–505	5–6	0.7–0.8	285–310	0.8	T–II	68–85	2	3–4
Grypotyphlops											
Gr. acutus	24–34	yes	448–526	7–13	0.8–1.9	115–631	0.8–1.5	T–0	38–79	1–2	3–4
Madatyphlops											
Mad. andasibensis	26	yes	381	8	1.9	320	0.9	T–V	28	2	3
Mad. arenarius	20–24	yes	339–465	7–11	1.2–2.4	80–211	0.9–2.0	T–V	46–85	2	2 (3)
Mad. boettgeri	20–22	yes	346–456	7–12	1.2–2.6	92–226	0.8–1.6	T–V	36–58	2	2
Mad. calabresii	22	no	239-304	8–12	1.6–2.8	62–183	0.8–2.0	T–V	21–37	2	2
Mad. comorensis	22	yes	414–485	12–15	2.0–3.0	117-245	1.4–2.0	T–III	42–61	2	2–3
Mad. cuneirostris	22	yes	196–257	7–11	1.7–2.8	64–189	0.9–2.1	T–V	17–42	2	2
Mad. decorsei	26–28	yes	346–465	9–11	1.3–2.1	187–600	0.7–1.5	T–III	35–57	2	2–3
Mad. leucocephalus	24	yes	369		1.4	212–220		T–V	42–43	2	3
Mad. madagascarensis	24	yes	576–580	14–15	2	408–410		T–III	46	2	2
Mad. mucronatus	24–26	yes	491–577	13–17	1.7–2.8	202–378	0.9–2.0	T–V	42–64	2	2–3
Mad. ocularis	20	yes	523–579	16–18	2.3–2.7	331–404	1.5–2.6	T–III	55–67	2	2–3
Mad. platyrhynchus	24	yes	400–425	7	1.3	245–273	1	T–III	50–60	2	2–3
Mad. rajeryi	24	yes	412	12	2.5	272	1.3	T–V	37	2	2

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Argyrophis											
Ar. bothriorhynchus	22–24	yes	283–330	9–11	2.3–3.0	180–279	1.1	T–V	26–30	2	2–3
Ar. diardii	24–28	yes	260–348	8–12	1.3–3.4	96–430	0.8–1.7	T–V	29–48	2	2
Ar. fuscus	26	yes	364	9	1.7	210	1.2	T–III/V	49	2	2–3
Ar. giadinhensis	22	yes	319–340	7–10	2.1–2.3	237–238	0.8	T–V	26	2	2
Ar. hypsobothrius	20					285	1	T–V	52-71	2	
Ar. klemmeri	24	yes	292	11	1.7	151	0.9	T–V	28	2	2
Ar. koshunensis	22		246	26	1.0–2.4	273–290	2	T–V	39–48	2	2
Ar. muelleri	22–30	yes	298–402	6–13	1.2–3.6	143–540	0.4–1.1	T–V	24–45	2	2–3
Ar. oatesii	24–25	yes			1	75–200	1.0–1.2	T–II	31–33	2	3
Ar. roxaneae	20	yes	329	5	1.3	231	0.6	T–V	39	2	2
Ar. siamensis	20–22	yes	306–368	5–13	1.3–3.5	120–305	0.6–1.6	T–V	25–42	2	2
Ar. trangensis	24	yes	324–370	8–12	1.8–2.3	155–257	0.8–1.0	T–V	31–32	2	2
Xerotyphlops											
Xer. etheridgei	24	yes	424	10	1.1	220	1	T–III	55	2	2
Xer. socotranus	26–30	yes	370–435		3.1	200–255	1	T–V	37–50	2	2–3
Xer. vermicularis	20–24	both	346–410	7–13	1.8–2.5	92–405	1.3–1.5	T–III	34–56	2	2
Xer. wilsoni	24	yes				338–345			38	2	
Lemuriatyphlops											
Lem. albanalis	20	no	499–520	15–16	1.8–2.2	183–276	2.0–2.2	T–III	78–94	2	2
Lem. domerguei	22	no	252–262	6–7	2.8–4.0	150–176	1.0–1.1	T–V/III	34–39	2	1
Lem. microcephalus	20–22	no	313–365	7–11	1.6–2.8	77–266	0.9–1.7	T–V	34–51	2	2–3
Lem. reuteri	20	no	344–359	8–9	1.8	198–222	1.0–1.1	T–III	40–49	2	2
Malayotyphlops											
Mal. canlaonensis	30	yes			2	122	0.8	T–III	29	2	2–3
Mal. castanotus	26–28	yes	299–345	8–14	2.0–3.6	109–253	1.3–1.6	T–III	32–37	2	2–4
Mal. collaris	26–28	yes	408–460	7–13	1.4–2.4	203–255		T–III	41–54	2	2–3
Mal. hypogius	24	yes	323	18	2.3	176	1.1	T–III	39	2	2
Mal. koekkoeki	26	yes	280	7	2.1	336–445	0.9	T–III	26–40	1	2–3
Mal. kraalii	24–28	yes	325–397	9–12	1.5–1.8	195–362	1	T–III	36–49	2	3
Mal. luzonensis	20		338	10	1.5	260	1	T–III	58	2	2
Mal. ruber	26	yes	338–378	9–11	2.5–3.1	200–260	1.4–1.6	T–III	38–44	2	3
Mal. ruficaudus	26–30	yes	335–417	10–13	1.6–3.0	122–367	1.2–1.4	T–III	28–55	2	3

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Indotyphlops											
I. albiceps	20	both	301–424	8–25	1.3–6.7	117–302	0.9–3.0	T–III	51–104	2	1–4
I. braminus	20	no	261–368	8–15	1.5–3.5	35–203	0.7–2.0	T–III	30–60	PO	1
I. ductuliformes	18	no	412–461	10	1.2–2.3	92–206	2.3	T–V	57–108	2	1
I. exiguus	18	no	348	12	1.5	135–196	1.6	T–III/V	60–78	2	1
I. filiformis	18	no	389	8	1.7	135	1.3	T–III	61	1	1
I. jerdoni	20–22	no	260–313	9–15	2.1	130–280	1.3	T–III	35–47	2	1–2
I. lankaensis	20	no	229–261	11–15	4.4	67–130	1.5	T–III	27–35	PO	1
I. lazelli	18	no	409–427	9–10	1.1–1.9	92–158	1	T–V	63–74	2	1
I. leucomelas	22	no	234–235	12–13	4.3	128–130	1.6	T–III	23–32	2	2
I. loveridgei	18	no	430	11	1.9	208	1.4	T–III	83	2	1
I. madgemintonae	18	no	336–342	7–10	1.3–2.3	120–200	1.4–2.9	T–V	62–130	2	1
I. malcomi	20	no	261–308	9–12	2.5–4.2	81–135	1.2	T–III	30–32	2	1
I. meszoelyi	18	no	414–421	9–10	2.0–2.2	162–179	1.6–1.8	T–III	54–71	2	1
I. ozakiae	20	no	291–327	7–12	1.8–2.9	154–176	1.1–1.8	T–III	38–53	2	1
I. pammeces	20	no	328–400	12–13	1.9–3.1	119–195	1.3–1.6	T–III	54–75	2	1–2
I. porrectus	18	yes	388–468	7–12	1.4–2.3	65–285	1.0–2.0	T–V	50–90	2	1
I. schmutzi	18–20	no	403–413	9–12	1.9–2.0	58–140	1.8–2.0	T–V	63–93	2	1
I. tenebrarum	20	no	300–339	11–14	2.1–3.0	65–144	1.7	T–III	43–72	2	1
I. tenuicollis	22	no	480–523	12–26	1.0–4.2	346–365	0.7–3.7	T–III	64–82	2	2–3
I. veddae	20	no	295–309	14	3	93		T–III	60	2	1
I. violaceus	20	no	245–269	10–13	2.3–3.1	65–135		T–III	30–43	PO	1
Ramphotyphlops											
Ra. acuticaudus	22–24	yes	337–412	15–17	3.3–3.8	226–256	1.9–2.9	T–III	37–52	2	2
Ra. adocetus	22	no	447–474	27–34	3.3–5.5	154–390	2.8	T–III	38	2	2–4
Ra. angusticeps	20	both	593–709	20–29	2.3–3.9	243–350	3.2–3.9	T–III	64–95	1	2
Ra. becki	22	no	209-241	8–15	2.3–5.4	62–149	1.0–1.6	T–III	17–31	2	2–3
Ra. bipartitus	22				3.2–3.4	175–250	2	T–III			
Ra. conradi	20	no	398	8	1.2–1.5	165–175	1	T–III	58–66	2	1–2
Ra. cumingii	24–28	yes	430–497	26–45	5.1–9.0	180–412	3.1–7.2	T–III	45–59	1–2	2–4
Ra. depressus	22–24	both	289–439	13–25	2.0–5.6	101–314	1.8–3.3	T–III	31–76	2	2–3
Ra. exocoeti	20	no	466–508	17–20	2.2–2.9	230–398	1.8–2.7	T–III	52–73	2	2
Ra. flaviventer	22	both	324–398	12–21	2.9–4.8	92–383	1.3–2.7	T–III	35–52	2	2–3
Ra. hatmaliyeb	22	no	452–472	21–27	2.9–4.4	178–416	1.9	T–III	41	2	2–3

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
Ra. lineatus	22–24	yes	315–430	8–11	1.7–1.8	152–480	0.8–1.1	T–III	36–60	1	2–4
Ra. lorenzi	22	no				337	1.2	T–0	56	1	
Ra. mansuetus	18	no	333–397	16–18	2.9–3.8	154–159	2.0–2.4	T–III	59–64	2	2
Ra. marxi	30	yes	525	36	5.8	180	3.5	T–0	45	2	3
Ra. multilineatus	20	no	491–585	20–22	2.7–4.3	220–427	2.6–2.9	T–III	46–73	1	2
Ra. olivaceus	20–22	no	510–544	16–31	2.6–4.1	175–430	2.5–2.8	T–III	42–85	1–2	2–3
Ra. similis	20	yes	234–235	9–12	3.2–3.9	165–235	1.0–1.2	T–III	18–27	2	1
Ra. suluensis	22	yes	405–435	23–28	2.4–6.1	170–345	2.0–3.7	T–III	26–53	1–2	2–3
Ra. supranasalis	22	yes	340–346	16–18	4.1–4.4	183–295	2.0–2.4	T–III	45–52	2	2–3
Ra. willeyi	20	no	369–375	14–15	2.2–2.6	166–190	1.5	T–III	37–55	2	2
Acutotyphlops											
Ac. banaorum	26	yes	352–361	16–19	3.6–4.0	125–333	2.7–3.1	T–III	32–51	2	3–4
Ac. infralabialis	26–28	yes	418–526	13–24	1.0–5.3	115–372	1.0–2.3	T–III	38–53	1–2	3–5
Ac. kunuaensis	30–36	yes	360–542	14–30	1.8–6.7	101–373	1.0–2.4	T–III	28–58	2	3–5
Ac. solomonis	30–34	yes	334–424	16–28	2.9–7.7	164–487	1.3–3.1	T–III	18–39	2	3–5
Ac. subocularis	32–36	yes	363–472	12–26	3.0–6.3	191–394	1.2–3.3	T–0/III	24–39	2	3–5
Cyclotyphlops											
Cy. deharvengi	22	yes	299	15	3.1	146	1.5	T–III	32	2	3
Anilios											
An. affinis	18	no	473–503	11–16	1.2–1.5	144–320	1.1–1.2	T–III	45–62	2	2
An. ammodytes	20		397–506	8–18	1.2–5.1	97–352		T–III	58	PO	2
An. aspina	18	no	403–428	10–16	1.1–2.3	232–276	2.2	T–III	64–75	2	2
An. australis	22	both	278–401	10–20	1.6–5.2	60–460	1.1–2.0	T–III	20–50	1–2	2–3
An. batillus	24	yes	557	21	2.2	320	1.4	T–III	53	2	1
An. bicolor	22		300–380		2.0–5.0	220–420	1.3	T–III	30–34	2	1
An. bituberculatus	20	no	432–589	11–27	1.3–3.3	111–450	1.2–2.8	T–III	40–90	2	2
An. broomi	20	no	445–510	10–16	1.9–2.5	173–250	1.1–1.7	T–III	30–55	2	2
An. centralis	20	no	425–494	12–20	2.0–2.6	165–320	1.2–2.0	T–III	60–69	2	1–3
An. chamodracaena	18	no	450–537	14–16	1.0–3.0	114–210	1.8	T–III	64	2	2–3
An. diversus	20	no	403–465	8–18	1.4–5.1	97–352	1.3–1.8	T–III	40–70	PO	1–3
An. endoterus	22	no	422–447	9–16	1.3–2.9	109–376	0.9–2.1	T–III	40–60	PO	2–3
An. erycinus	20	no	315–349	13–23	3.2–7.7	230–297	2.2–2.5	T–III	29–40	1	2

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TABLE 2. (Continued)

	LSR	SRR	TSR	SC	T/LOA	LOA	TL/TW	SIP	L/W	INS	PO
An. ganei	24	no	430–448	12–19	1.7–3.0	237–340		T–III	37–46	2	1
An. grypus	18	no	561–690	13–36	1.1–4.4	124–415	1.5–2.4	T–III	60–120	1–2	2–4
An. guentheri	18	no	564–620	10–15	1.1–2.7	120–288	0.9–1.0	T–III	45–80	2	2
An. hamatus	22	no	342–408	11–22	1.8–4.1	90–418	1.2–4.1	T–III	29–60	2	1–3
An. howi	18	no	450	16	2.9	210		T–III		2	2
An. kimberleyensis	22		508–516	12–20	1.7–2.2	220–296		T–III		2	1
An. leptosomus	16–18	no	583–736	16–29	1.5–3.8	125–375	4.4	T–III	70–88	2	1–2
An. leucoproctus	20		386–426	14–17	2.0–2.4	170–220		T–III	40–73	2	2–3
An. ligatus	24	no	314–446	11–17	2.7–3.9	111–485	1.5	T–III	20–40	1	2–3
An. longissimus	16	no	750	15	0.9	268		T–III	122	2	2
An. margaretae	18	no	571	12	1.1	306		T–III		2	3
An. micrommus	18	no	493	15	2.4	205		T–III		2	3
An. minimus	16	no	455-466	9–17	1.5–1.9	110–215	1.1–1.3	T–III	47–70	2	2
An. nema	16	no	534–598	9–14	2.1	120–268	2	T–III	78–80	1–2	2
An. nigrescens	22	no	396-407	11–20	2.0–6.4	103–750	1.1–2.4	T–III	30–80	1–2	2
An. nigricaudus	18	no	464–547	8–17	1.0–1.1	120–315	0.9–1.0	T–III	70–80	2	2
An. nigroterminatus	18	no	600–647	17–29	1.3–4.1	270–320	1.6–3.3	T–III	55–102	2	2–3
An. pilbarensis	22	no	389–445	15–22	2.4–4.0	118–370	1.4–2.1	T–III	36–58	PO	1–2
An. pinguis	20	no	296–343	10–19	2.6–5.7	131–485	0.9–1.1	T–III	20–30	2	2–3
An. polygrammicus	22	no	453–496	10–19	1.9–5.6	103–502	1.1–3.2	T–III	42–66	2	2–3
An. proximus	20	no	321–360	10–17	1.4–4.1	194–700	0.9–1.7	T–III	20–40	1	2–3
An. robertsi	22	no	556	12	1.6	290	1.5	T–III	66	2	2
An. silvia	20	no	286–334	14–21	2.0–5.3	72–175	2.2–2.3	T–III	34	2	3
An. splendidus	20	no	377	13		512		T–III	48	2	3–4
An. torresianus	22	no	345–407	10–23	2.3–5.1	181–502	0.8–2.3	T–III	32–42	1–2	2–3
An. tovelli	20	no	263–265	10–12	2.6–3.6	71–122	1.5–1.7	T–III	30–47	PO	2
An. troglodytes	22		655	14	1.3	402		T–III		2	2
An. unguirostris	24	no	403–498	10–21	1.2–3.9	245–610	1.1–2.1	T–III	38–70	1	2–3
An. waitii	20	no	561–680	13–26	1.0–3.1	127–614	1.3–2.1	T–III	57–80	2	2–3
An. wiedii	20	no	381–439	9–17	1.6–4.0	153–315	1.1–3.0	T–III	30–80	2	2
An. yampiensis	18	no	491	11	1.8	128		T–III		PO	2
An. yirrikalae	24		447–450			182–205		T–III	60–70	1	2–3
incertae sedis											
"T." longissimus	22	yes	523	14	1.5	346	1	T–III	63	2	2–3

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Gerrhopilus												
Ge. andamanensis	0.34											
Ge. ater	0.35–0.46	O		P-U-U	8–20	0	0	U	0.9–1.4	O	S	—
Ge. beddomii	0.26–0.41	O		P-U-U	8–10	0	0	U	0.5–0.6	O	S	—
Ge. bisubocularis	0.5	O		U-U-U	0	0	0	U	1.4	O	S	—
Ge. ceylonicus	0.45											
Ge. depressiceps	0.34–0.60	O	O/LTP	U-U-U	0	0	0	U	0.3			
Ge. floweri	0.40–0.60	O		M-U-U	17–20	0	0	U	0.8–1.2	O	S	—
Ge. fredparkeri	0.46–0.55	O		P-U-U	35	0	0		O			
Ge. hades	0.42											
Ge. hedraeus	0.40–0.41	O		U-U-U	0	0	0	U	0.4	O	S	—
Ge. inornatus	0.43–0.60	O	O	P-U-U	21–29	0	0		0.2–0.7	O	S	—
Ge. manilae	0.35											
Ge. mcdowelli	0.47–0.53	O		P-U-U	24	0	0	U	0.5–0.6	O	S	—
Ge. mirus	0.40–0.63	O	LTP	U-U-U	0	0	0	U	1.5–4.4	O	S	—
Ge. oligolepis	0.32											
Ge. thurstoni	0.44–0.60											
Ge. tindalli	0.42											
Cathetorhinus												
Ca. melanocephalus	0.71										—	
Xenotyphlops												
Xen. grandidieri	0.76–0.91	O	LTP	U	—	—	0		2.2–2.5			
Amerotyphlops												
Am. amoipira	0.29											
Am. brongersmianus	0.22–0.40	O		M-M-P	25–37	3–8	2–4	U	0.9–3.1	O	S	—
Am. costaricensis	0.35–0.56	O		M-U-M	24	0	3	U	2.4	O	S	—
Am. lehneri	0.42–0.52	O		P-P-U	13–19	4	0	U	1.2–1.7	O	S	—
Am. microstomus	0.29–0.40	O		M-P-P	27–37	1–7	3–4	U	1.0–1.4	O	S	—
Am. minuisquamus	0.33–0.41	O		M-M-M	16	2	2		3.3			
Am. paucisquamus	0.33											

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Am. reticulatus	0.26–0.48	O		M-M-M	28–39	8–9	3–5	U	1.5–4.6	O	S	—
Am. stadelmani	0.33											
Am. tasymicris	0.46–0.50	O		M-M-P	28	3	2					
Am. tenuis	0.33–0.44	O	O	P-U-U	21–37	0	0	U	0.9–1.6	O	S	—
Am. trinitatus	0.37–0.48	O		P-P-P	22	4	3		1.3			
Am. tycherus												
Am. yonenagae	0.27–0.38	O		M-U-U	22	0	0		1.5	O	S	—
Typhlops												
T. agoralionis	0.18									O	S	—
T. anchaurus	0.43											
T. annae	0.35–0.39											
T. anousius	0.33											
T. arator	0.33											
T. biminiensis	0.41–0.49	O		M-M-P	26–27	2–3	7–9	U	1.8–2.3	O	S	—
T. capitulatus	0.24–0.36	O	O	P-P-P	12–16	1	4	U	1.3–2.0	O	S	—
T. catapontus	0.24–0.27	O	O	M-M-M	28	2	10	U	2	O	S	—
T. caymanensis	0.34–0.38	O	O	M-M-M	20–24	2–7	6	U	1.7–1.8	O	S	—
T. coecatus	0.33–0.39	O		U-U-U	0	0	0					
T. contorhinus	0.38											
T. dominicanus	0.29–0.41	O	O	M-M-P	20–24	1–3	4–9	U	1.5–1.6	O	S	
T. epactius	0.39–0.48	O	O	M-M-M	23	1	13		1.7	O	S	
T. eperopeus	0.23–0.29	O		P-U-U	33	0	0			O	S	
T. geotomus	0.34	O	O	P-P-P	18–21	3	3–6	U	1.7–2.8	O	S	
T. golyathi	0.44											
T. gonavensis	0.23–0.33	O	O	P-U-U	17–20	0	0	U	1.0–1.2	O	S	—
T. granti	0.36–0.44	O	O	M-U-U	14–17	0	0	U	1.2–1.3	O	S	—
T. guadeloupensis	0.31–0.33		O									
T. hectus	0.18–0.29	O	O	U-U-U	0	0	0	U	0.6–1.7	O	S	—
T. hypomethes	0.25–0.32	O	O	M-P-M	20–26	4–6	7	U	1.1–1.5	O	S	—
T. jamaicensis	0.38–0.49	O	O	M-M-M	12–28	3–5	5–10	U	1.0–2.5	O	S	—
T. leptolepis												
T. lumbricalis	0.22–0.35	O	O	M-M-M	18–38	1–6	1–10	U	0.8–1.8	O	S	—
T. monastus	0.33–0.36	O	O	M-M-M	21–25	2	5	U	1.6–2.1	O	S	—
T. monensis	0.24–0.35	O	O	U-U-U	0	0	0		2.3–3.0	O	S	—

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
T. naugus	0.2									O	S	—
T. notorachis	0.31											
T. oxyrhinus	0.25											
T. pachyrhinus	0.32											
T. paradoxus	0.39									O	S	—
T. perimychus	0.36											
T. platycephalus	0.27–0.34	O	O	M-P-P	25–26	4–6	5–7	U	2.0–2.3	O	S	—
T. proancylops	0.23									O	S	—
T. pusillus	0.20–0.29	O	O	U-U-U	0	0	0	U	O	O	S	—
T. richardii	0.22–0.35	O	O/LTP	M-M-M	19–23	2–3	4–9	U	3.1–4.0	O	S	—
T. rostellatus	0.17–0.29	O	O	U-U-U	0	0	0	U	O	O	S	—
T. satelles	0.47									O	S	—
T. schwartzi	0.23–0.28	O	O	M-M-M	32	3–4	3–7	U	1.5–2.0	O	S	—
T. silus	0.19–0.28		O									
T. sulcatus	0.26–0.33	O	O	M-P-P	22–28	4–6	4–8	U	2	O	S	—
T. sylleptor	0.24									O	S	—
T. syntherus	0.20–0.24	O	O	P-U-U	7–17	0	0	U	2.2–2.8	O	S	—
T. tetrathyreus	0.26–0.28	O		M-M-M	22–23	2–5	4–7	U	1.1–3.2	O	S	—
T. titanops	0.24–0.29	O		M-U-U	15	0	0		1.7	O	S	—
T. zenkeri	0.3	O		U-U-U	0	0	0		O			
Afrotyphlops												
Af. angeli	0.56											
Af. angolensis	0.45–0.67	LLng	O	M-M-M	37–51	6–13	4–12	U	2.4–2.6	O	S	—
Af. anomalus	0.69	LLng		M-P-P	25	6	4		3.1			
Af. bibronii	0.53–0.70	LLng	LTP	M-M-M	27–33	2–6	2–8	U	1.0–3.0	O	S	—
Af. blanfordii	0.57–0.67	O		M-M-M	25–36	1–5	1–4	U	3.9	O	S	—
Af. brevis	0.42–0.63	O		M-M-M	38–51	5–7	1–5	U	2.2–3.8	O	S	—
Af. congestus	0.51–0.61	LLng		M-M-M	39–51	4–10	3–7	U	4.8–5.6	O	S	—
Af. decorosus	0.59–0.67	LLng		M-M-M	21	3	2	S	1.6	O	S	—
Af. elegans	0.43–0.50	O		M-M-M	33–39	3–5	5–7	U	1.3–1.9	O	S	—
Af. fornasinii	0.42–0.58	LLng	O/LTP	M-M-M	21–27	2–6	1–4	U	2.1–3.7	O	S	—
Af. gierrai	0.53–0.64	O		M-P-P	42–49	3–5	1–6	S	2.5–2.9	O	S	—
Af. kaimosae	0.61											
Af. liberiensis	0.40–0.57	O		M-M-M	32	7	6					

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Af. lineolatus	0.54–0.73	LLng	LTP	M-M-M	31–35	3–5	2–5	U	2.0–4.7	O	S	—
Af. manni	0.55–0.57											
Af. mucruso	0.41–0.60	LLng		M-M-M	33–48	2–8	1–6	U	0.5–4.0	O	S	—
Af. nanus	0.57–0.63	O		M-M-M	18–30	5–6	1–2	U	2.0–4.3	O	S	—
Af. nigrocandidus	0.59–0.62	O		M-M-M	39–43	4	4	S	2.5–2.6	O	S	—
Af. obtusus	0.54–0.73	O		M-M-M	27–28	6–7	11–12	U	1.3–1.4	O	S	—
Af. punctatus	0.55–0.75	LLng		M-M-M	32–38	5–11	4–6	U	4.2–5.7	O	S	—
Af. rondoensis	0.59–0.62	LLng		M-M-M	28–29	1–3	2–5	U	2.2–2.5	O	S	—
Af. schlegelii	0.50–0.64	LLng		M-M-M	32–37	4–7	1–4	U	2.4–3.6	O	S	—
Af. schmidti	0.57–0.71	LLng	O	M-M-M	32–36	4–7	2–3	U	4.4–4.7	O	S	—
Af. steinhausi	0.55–0.67	LLng		M-M-P	27	7–9	3	U	3.0–4.3	O	S	—
Af. tanganicanus	0.58–0.71	LLng		M-M-M	52	4	1	U	4.7	O	S	—
Af. usambaricus	0.59–0.65	LLng		M-M-M	40	6	2					
Rhinotyphlops												
Rh. ataeniatus	0.61–0.83	O		M-M-M	31–46	4–8	3–8	U	1.5	O	S	—
Rh. boylei	0.55–0.60	O		M-M-M	24	5	6	U	3.8	O	S	—
Rh. lalandei	0.56–0.69	O	LTP	M-M-M	25–30	2–7	3–9	U	1.7–2.5	O	S	—
Rh. schinzi	0.54–0.57	O		M-M-M	24–29	4–6	2–4	U	1.4–2.8	O	S	—
Rh. scorteccii	0.70–0.85	O		M-M-M	25–28	1–3	3–5	U	2.0–3.0	O	S	—
Rh. unitaeniatus	0.67–0.77	O		M-M-M	32–47	2–4	4–10	U	1.9–2.4	O	S	—
Letheobia												
Let. acutirostrata	0.62–0.75	O	O	M-M-M	32–37	3	3–4	S	3.0–3.8	O	S	—
Let. caeca	0.56–0.68	O		M-M-M	25–29	3–5	2–5	S	6.3	O	S	—
Let. crossii	0.52–0.71	O		M-U-U	30–35	0	0	U	0.7	O	S	—
Let. debilis	0.62–0.77	O		M-M-M	38	5	5	S	2.9	O	S	—
Let. episcopus	0.52–0.65	O		M-U-U	27–30	0	0	U	0.5–1.0	O	S	—
Let. erythraea	0.53–0.61	O		M-P-U	23	3	0	U	0.8	O	S	—
Let. feae	0.42–0.57	O		M-U-U	20–32	0	0	U	0.6	O	S	—
Let. gracilis	0.59–0.76	O		M-M-M	30–41	3–4	2–5	U	3.0–4.0	O	S	—
Let. graueri	0.59–0.64	O		M-M-M	20–28	4–6	3–6	S	2.4–3.5	O	S	—
Let. jubana	0.65–0.74	O		M-M-M	17–29	4–7	3–6	S	1.3–2.0	O	S	—
Let. kibarae	0.67–0.79	O		M-M-M	35	4	8	S	1.1	O	S	—
Let. largeni	0.59–0.61	O		M-U-U	28	0	0		1.9			

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Let. leucosticta	0.36–0.38	O		M-U-U	24	0	0	U	1.4			
Let. lumbriciformis	0.61–0.76	O		M-M-M	33–36	4–8	18–21	U	1.6–2.3	O	S	—
Let. newtoni	0.50–0.58	O		M-P-U	29–34	7–9	0		O			
Let. pallida	0.67–0.83	O		M-U-U	26	0	0	S	1.6–2.0	O	S	—
Let. pauwelsi	0.66	O		M-M-U	29	6	0	S	3.9	O	S	—
Let. pembana	0.56	O		M-U-U	22	0	0	S	1.3	O	S	—
Let. praeocularis	0.70–0.81	O		M-M-M	33–41	7	8	U	1.1–3.8	O	S	—
Let. rufescens	0.60–0.78	O		M-M-M	43	7	6	S	1.8	O	S	—
Let. simoni	0.50–0.67	O	LTP	M-U-U	22–28	0	0	S	0.5–1.0	O	S	—
Let. somalica	0.53–0.66	O		M-M-M	34–45	3–4	6–10		0.7–1.7			
Let. stejnegeri	0.64–0.71	O		M-M-M	22	4	16		O			
Let. sudanensis	0.55–0.73	O		M-U-U	42	0	0	S	2.9	O	S	—
Let. swahilica	0.52–0.65	O		M-P-U	24–28	1–2	0	S	1.8–1.9	O	S	—
Let. toritensis	0.67–0.80	O		M-P-P	21–26	3–5	2–5	S	1.6–2.0	O	S	—
Let. uluguruensis	0.48–0.54	O		M-U-U	21	0	0		O			
Let. wittei	0.61–0.66	O		M-U-U	29	0	0					
Grypotyphlops												
Gr. acutus	0.61–0.80	O	LTP	M-M-M	32–38	4–7	3–8	U	2.5–2.8	O	S	—
Madatyphlops												
Mad. andasibensis	0.42								2.6–3.0	O	S	—
Mad. arenarius	0.42–0.50	O	O/LTP	M-M-M	26–37	3–4	6–7	U	0.6–1.1	O	S	—
Mad. boettgeri	0.48–0.52	O	O/LTP	M-M-M	19–44	2–8	2–11	U	0.5–2.8	O	S	—
Mad. calabresii	0.29–0.41	O		M-U-U	13–24	0	0		1.6–2.4			
Mad. comorensis	0.44–0.48	O		M-M-P	35–42	5–7	7–12	S	2.4–4.3	O	S	—
Mad. cuneirostris	0.26–0.46	O		M-U-U	14–21	0	0	S	2.2–3.8	O	S	—
Mad. decorsei	0.35–0.50	LLng	LTP	M-M-M	24–28	1–5	8–9	U	2.6–3.0	O	S	—
Mad. leucocephalus	0.48											
Mad. madagascarensis	0.34											
Mad. mucronatus	0.35–0.47	O	LTP					S	3.2–5.0	O	S	—
Mad. ocularis	0.37–0.48	O		M-M-M	33–34	3–8	3–10	U	3.0–4.5			
Mad. platyrhynchus	0.38–0.54	O		M-M-M	23	1	5		2			
Mad. rajeryi	0.35–0.42	O	O	M-M-M	22–26	2–3	3–7	S	1.4–2.5	O	S	—

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Argyrophis												
Ar. bothriorhynchus	0.33		LTP							O	S	—
Ar. diardii	0.30–0.44	LLng		M-M-M	28–43	3–5	3–11	U	3.0–4.0	O	S	—
Ar. fuscus	0. 4											
Ar. giadinhensis	0.29	O	LTP									
Ar. hypsobothrius	0.38-0.50											
Ar. klemmeri	0.43											
Ar. koshunensis	0.31–0.33											
Ar. muelleri	0.36–0.47	LLng	LTP	M-M-M	30–38	3–10	4–8	U	2.4–4.8	O	S	—
Ar. oatesii	0.21–0.25											
Ar. roxaneae	0.33	O		M-M-M	25	2	12		1.5			
Ar. siamensis	0.25–0.40	LLng		M-M-P	23–24	3	2	U	1.2–5.0	O	S	—
Ar. trangensis	0.37											
Xerotyphlops												
Xer. etheridgei	0.41	O		M-M-M	26	5	5		1.8	O	S	—
Xer. socotranus	0.30–0.35	O										
Xer. vermicularis	0.27–0.41	O	LTP	M-M-M	22–29	5–9	2–9	S	1.4–2.2	O	S	—
Xer. wilsoni												
Lemuriatyphlops												
Lem. albanalis	0.54–0.61	O		M-U-U	32	0	0	U	2.5	O	S	—
Lem. domerguei	0.26–0.30	O		M-U-M	11	0	2		1.5	O	S	—
Lem. microcephalus	0.35–0.51	O	LTP	M-M-M	15–21	2–4	3–4	U	0.8–2.3	O	S	—
Lem. reuteri	0.36	O										
Malayotyphlops												
Mal. canlaonensis	0.4											
Mal. castanotus	0.34–0.41	O	O	P-P-P	14–17	2–10	3–6	U	O	O	S	—
Mal. collaris	0.39–0.42	O	O	M-P-U	7–21	3	0	U	O	O	S	—
Mal. hypogius	0.36											
Mal. koekkoeki	0.59–0.61	O		M-M-M	48	3	5		8.2			
Mal. kraalii	0.31–0.38	O	O	M-M-M	8	2	5		O	O	S	—
Mal. luzonensis	0.45	O										
Mal. ruber	0.35–0.42	O		M-M-M	25–29	4–6	5–10	U	0.5	O	S	—

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Mal. ruficaudus	0.35–0.44	O		M-M-M	21–29	5–9	4–7	U	O	O	S	—
Indotyphlops												
I. albiceps	0.30–0.44	O		M-U-U	15–32	0	0	U	1.6–2.8	RCS	C	3.5
I. braminus	0.22–0.36	O	LTP	M-U-U	17–24	0	0	—	2.4–7.4	—	—	
I. ductuliformes	0.33	O		P-U-U	34	0	0		1.5			
I. exiguus	0.25–0.33	O		U-U-U	0	0	0		1.3			
I. filiformis	0.35											
I. jerdoni	0.23–0.40	O		M-U-U	25	0	0		5. 1			
I. lankaensis	0.34	O		P-U-U	16	0	0	U	3.6	O	S	—
I. lazelli	0.33	O	LTP	U-U-U	0	0	0	U	0.8–1.6	O	S	—
I. leucomelas	0.29–0.33											
I. loveridgei	0.4											
I. madgemintonae										RCS	S	—
I. malcomi	0.35	O		M-M-U	21	3	0		5			
I. meszoelyi	0.37	O		P-U-U	32	0	0	U	0.9–1.3	O	S	—
I. ozakiae	0.35–0.36	O	LTP	M-U-U	16–22	0	0	U	3.2–5.2	RCS	C	0.5
I. pammeces	0.30–0.33	O	LTP	M-U-U	24–25	0	0	U	3.8–3.9	O	S	—
I. porrectus	0.25–0.50	O	LTP	M-U-U	17–26	0	0	U	0.7–1.0	O	S	—
I. schmutzi	0.33	O		P-U-U	21–26	0	0		1.9–2.6			
I. tenebrarum	0.27–0.35	O		M-U-U	22–23	0	0	U	2.8–3.6	O	S	—
I. tenuicollis	0.44–0.66											
I. veddae	0.27–0.39											
I. violaceus	0.33	O	LTP	M-U-U	15	0	0	U	3.2	O	S	—
Ramphotyphlops												
Ra. acuticaudus	0.33–0.36	O		M-M-M	19–34	4–5	7–8	U	1.3–2.0	RCS	C	2.5
Ra. adocetus	0.47									RCS	C	
Ra. angusticeps	0.43–0.50	O	LTP	M-M-M	48–52	2–6	1–10	U	1.3–2.7	RCS	C	1.5–2
Ra. becki	0.27–0.33	O		P-U-U	11–14	0	0	U	O	RCS	C	3.5–5
Ra. bipartitus												
Ra. conradi	0.38–0.40											
Ra. cumingii	0.33–0.45	O	LTP	M-M-M	47–52	7–12	3–8	U	3.2–5.4	RCS	S	0
Ra. depressus	0.32–0.44	O		M-P-U	24–36	3–6	0	U	3.0–4.0	RCS	C	1.5–2
Ra. exocoeti	0.39–0.47	O		M-P-M	28–39	2–6	2–8	U	2	RCS	C	5.5

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TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
Ra. flaviventer	0.33–0.41	O	O	M-M-M	34–42	2–7	4–15	U	1.2–2.1	RCS	C	2
Ra. hatmaliyeb	0.39									RCS	C	
Ra. lineatus	0.50–0.65	O	O	M-M-P	28–33	6–8	2–8	U	1.3–1.5	RCS	C	1–2
Ra. lorenzi	0.45											
Ra. mansuetus	0.50–0.67	O		P-U-U	33	0	0					
Ra. marxi	0.45	O	O	M-U-U	37	0	0		3.6			
Ra. multilineatus	0.46–0.52	O	LTP	M-M-M	36	5	5	S	4.3	RCS	C	3–5
Ra. olivaceus	0.39–0.55	O	LTP	M-M-M	39–52	2–9	2–3		3.7–3.9	RCS	C	9–15
Ra. similis	0.33											
Ra. suluensis	0.38											
Ra. supranasalis	0.36–0.39											
Ra. willeyi	0.31–0.33	O	O	M-U-U	21	0	0	U	O	RCS	C	6
Acutotyphlops												
Ac. banaorum	0.18–0.26											
Ac. infralabialis	0.15–0.24	O		M-M-M	80	3	8	S	1.7	RCS	C	7.5
Ac. kunuaensis	0.21–0.26	O		M-M-M	21–33	2–9	7–14	S	O	RCS	C	3–9
Ac. solomonis	0.12–0.21	O		M-M-M	25–42	3–12	12–17	S	O	RCS	C	5.5
Ac. subocularis	0.10–0.25	O	O	M-M-M	35–36	2–4	5–10	S	O	RCS	C	6-6.5
Cyclotyphlops												
Cy. deharvengi	0.48	O		M-U-U	16	0	0		3.6			
Anilios												
An. affinis	0.30–0.59	O		M-M-P	28–46	3–4	2–5	U	2.7–3.7	RCS	C	2–3.5
An. ammodytes	0.30–0.36											
An. aspina	0.35–0.37											
An. australis	0.49–0.55	O	LTP	M-M-M	23–33	1–4	1–3	U	3.9–5.6	RCS	C	3.5–6
An. batillus	0.38											
An. bicolor												
An. bituberculatus	0.49–0.54	O	LTP	M-M-M	29–43	2–10	3–15	U	1.2–3.6	RCS	C	1.5–2
An. broomi	0.50–0.59	O		M-M-M	23–27	0	0	U	3.9–4.3	RCS	C	1
An. centralis	0.53–0.55	O		M-M-M	34–42	4–6	3–4	U	3	RCS	C	5
An. chamodracaena	0.6	O		M-M-M	31–32	5	5	U	1.0–3.0	RCS	C	4–5
An. diversus	0.40–0.50	O		M-M-P	27–35	2–6	2	U	4.4–4.6	RCS	C	3.5

……*continued on the next page*

TABLE 2. (Continued)

	RW/HW	LLng	LTP	Lng type	TLF	CLF	RLF	Tes	RC	RCS	HP	HPC
An. endoterus	0.61–0.67	O		M-M-M	32–37	3–5	3–6	U	2.4–5.5	RCS	C	4
An. erycinus	0.25–0.40	O	LTP	M-M-M	29–34	4–5	5–6	U	5.1–7.7	RCS	C	7–8
An. ganei	0.24											
An. grypus	0.60–0.66	O		M-M-M	27–47	2–3	2–4	U	1.8–3.1	RCS	C	0.5–2/6
An. guentheri	0.47–0.49	O		M-M-P	31–37	2–9	2	U	3.5–3.9	RCS	S	0
An. hamatus	0.49–0.59	O		M-M-M	33–37	6–7	1	U	5.9	RCS	C	5
An. howi	0.45											
An. kimberleyensis	0.33–0.36											
An. leptosomus	0.60–0.75	O		M-U-U	34	0	0	U	2.8	RCS	C	10
An. leucoproctus	0.33–0.43		O/LTP							RCS	C	
An. ligatus	0.23–0.34	O	LTP	M-P-P	19–23	2	4		7	RCS	C	2
An. longissimus	0.58											
An. margaretae	0.56											
An. micrommus	0.5											
An. minimus	0.63–0.70	O		M-U-U	26	0	0	U	3	RCS	C	0.5
An. nema	0.63	O		M-U-U	41	0	0	U	1.6	RCS	S	0
An. nigrescens	0.42–0.48	O		M-M-M	26–37	1–8	3–6	U	3.2–5.7	RCS	C	0.5–2.5
An. nigricaudus	0.45–0.55	O		M-U-U	32	0	0		3.2–4.2	RCS	C	
An. nigroterminatus	0.46	O		M-P-P	27–48	2–13	2–6	U/S	2.5–3.0	RCS	C	8.5–10
An. pilbarensis	0.53–0.60	O	LTP	M-M-M	25–27	3–4	1	U	3.5–3.7	RCS	C	5
An. pinguis	0.45–0.52	O		M-M-M	37–38	4–7	2–7		3.9–4.6	RCS	C	
An. polygrammicus	0.42–0.45	O	LTP	M-M-M	32–34	1–5	2–5	U	2.1–5.1	RCS	C	3–4
An. proximus	0.52–0.61	O	LTP	M-M-M	20–29	4–6	1–5	U	4.4–7.0	RCS	C	4.5–8.5
An. robertsi	0.56–0.58											
An. silvia	0.48	O		M-M-M	18	1	3	U	2.4	RCS	C	7.5
An. splendidus	0.52											
An. torresianus	0.33–0.38	O		M-M-M	29–36	4–6	5–8	U	4.3–5.3	RCS	C	2.5–3
An. tovelli	0.37	O		M-U-U	26	0	0	U	5.1	RCS	C	2
An. troglodytes	0.47											
An. unguirostris	0.52–0.60	O		M-M-M	35–43	3–6	5–7	U	2.2–5.9	RCS	C	0.5–1/7
An. waitii	0.51–0.57	O		M-M-M	37–42	5–6	4	S	2.5–3.0	RCS	C	5
An. wiedii	0.45–0.63	O		M-P-P	26–32	3–4	2	U	2.3–5.3	RCS	C	2–6
An. yampiensis	0.47											
An. yirrikalae	0.53											
incertae sedis												
"T." longissimus	0.6											

TABLE 3. Morphological character states for visceral topology of 18 typhlopoid genera (*GER* = *Gerrhopilus, XEN* = *Xenotyphlops, AME* = *Amerotyphlops, TYP* = *Typhlops, AFR*, = *Afrotyphlops, RHI* = *Rhinotyphlops, LET* = *Letheobia, GRY* = *Grypotyphlops*, *MAD* = *Madatyphlops, ARG* = *Argyrophis, XER* = *Xerotyphlops, LEM* = *Lemuriatyphlops, MAL* = *Malayotyphlops, IND* = *Indotyphlops, CYC* = *Cyclotyphlops, RAM* = *Ramphotyphlops, ACU* = *Acutotyphlops,* and *ANI* = *Anilios*), based on measurement of the specimens in Appendix II (part). Note that this does not include all species in each genus (see Appendix II), and data were unavailable for *Cathetorhinus*. Characters are as follows: data in sections **(A)**-**(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**.

Genus	*GER*	*XEN*	*AME*	*TYP*	*AFR*	*RHI*	*LET*	*GRY*	*MAD*
Sample size	*n* = 24	*n* = 2	*n* = 24	*n* = 119	*n* = 150	*n* = 29	*n* = 90	*n* = 3	*n* = 52
(A)									
Hyoid PT	10.5	8.7	11.3	11.6	12.4	10.1	6.3	5.8	12.9
Tracheal lung	18.4	—	20.3	19.9	22.1	19.5	16.6	19.7	18.3
Right lung	17.8	21.9	18.6	17.1	17.6	26.5	17.5	18	20.6
Right bronchus	12.9	6.5	8.4	11.3	3.4	6.8	7.2	5.3	9.3
Right lung PT	51.2	47	53.6	55.5	53.6	58.4	46.6	51.2	52.8
Right liver	26.5	25.5	25.8	23.7	23.1	28	26.8	26.8	28.3
Total (left + right) liver	52.7	45.4	50.7	47	43.9	54.6	50	51.4	53.9
Total (left + right) gonad	6	4.2	8.9	8.7	8.3	9	6	6.2	11
Total (left + right) kidney	9	8.2	9.2	8	7.8	6.9	6.6	8	9.8
Rectal caecum	1	1.8	2	1.4	2.9	2.2	2.2	2.6	2.6
(B)									
Heart MP	31.2	23.6	32.8	36.2	33.7	29.7	27.3	31.1	29.9
Total liver MP	47.9	46	48.8	50.9	49	47.9	43.7	48.2	47.9
Gall bladder MP	69.1	65.5	69	67.8	64.2	70.9	65.9	67	66.8
Total (left + right) gonad MP	83	82.8	79	79.1	72	9	82.3	82.4	78.2
Total (left + right) adrenal MP	84.3	84.8	82.7	82.3	74.4	88	86.7	87.7	71.4
Total (left + right) kidney MP	90.1	93.2	87.9	88.1	81.5	93.6	91.7	95	89.4
Tracheal lung MP	19.9	—	20.3	24.1	20.2	17.9	17.1	19.2	18.4
Right lung MP	42.3	36	44.3	47	44.8	45.1	37.8	42.2	42.5
(C)									
Heart-liver GAP	3.5	10.2	2.1	1.9	2.1	3.5	2	2.5	2.4
Heart-liver INT	34	38.5	32.3	30	29.7	35.7	32.4	33.5	35.3
Liver-gall bladder GAP	5.2	4.1	5.3	2.9	2.1	6.9	7.4	3.9	2.9
Liver-gall bladder INT	33	31.1	32.7	28.4	27	36.3	35.5	31.9	33.1
Liver-kidney GAP	23.5	29.8	22.2	19.9	17.2	27.6	26	29.3	22.8
Liver-kidney INT	60.9	64.8	57.3	53.1	47.7	63.6	59.3	63.9	59.7
Kidney-vent GAP	6.4	4	8	9.2	9.4	3.9	5.6	2.2	6.9
Kidney-vent INT	13.5	9.7	14.9	16.1	16.1	9	11	8.1	14.3
Rectal caecum-vent INT	8.4	10.4	10.3	8.8	10.2	8.8	7.6	7.6	9.4
(D)									
Heart MP-Right lung MP INT	11.1	12.4	12.3	10.7	11.1	15.4	11	11	12.5
Heart MP-Liver MP INT	18.8	24.4	17.2	15.9	16.3	19.6	17.2	18	19.7
Trachea MP-Liver MP INT	32.8	35	31.8	32.2	31.3	32.9	30.9	32.1	33
Right lung MP-Adrenal MP INT	41.2	48.9	35.8	35.4	29.3	42.9	38.2	45.6	28.5

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TABLE 3. (Continued)

Genus	*GER*	*XEN*	*AME*	*TYP*	*AFR*	*RHI*	*LET*	*GRY*	*MAD*
Sample size	*n* = 24	*n* = 2	*n* = 24	*n* = 119	*n* = 150	*n* = 29	*n* = 90	*n* = 3	*n* = 52
Liver MP-Kidney MP INT	40.1	45.3	38.6	35.2	31.7	44.2	47.3	45.9	44
Trachea/bronchus MP-Kidney MP INT	45.3	49.3	46.6	42.5	44.2	51.1	48.8	47.4	46.6
Heart MP-Gonad MP INT	50.4	57	42.1	40.8	36	53.1	53.4	49.9	45.8
Heart MP-Kidney MP INT	58.9	69.7	55.8	51.1	48.5	63.8	64.4	63.9	60.2
Trachea MP-Adrenal MP INT	66.8	71.9	61.9	62.5	55.6	71.5	62.2	70.7	54.4
Trachea/bronchus MP-Kidney MP INT	66.1	77	66.2	62.6	61.8	73.7	67.1	75.4	68.4
(E)									
Total testis segments	2	—	8	13	3.1	2.2	8.8	2	8.9
Total liver segments	18.5	2	10.8	12.8	8	17.9	14.4	41	14.7
Total tracheal rings	248	260	288	276	274	305	347	405.2	237
Tracheal rings/10 mm	77.7	107.8	86.8	74.8	79.8	99.2	117.8	126.4	75.1

continued.

Genus	*ARG*	*XER*	*LEM*	*MAL*	*IND*	*CYC*	*RAM*	*ACU*	*ANI*
Sample size	*n* = 16	*n* = 8	*n* = 7	*n* = 16	*n* = 46	*n* = 1	*n* = 43	*n* = 56	*n* = 92
(A)									
Hyoid PT	13.5	10.9	10.1	7.1	10.7	13.7	9.1	15	11.5
Tracheal lung	19.7	19.5	17.3	22.9	19.8	21.2	22.8	22	21.1
Right lung	21.2	21.7	18.1	19.4	16.1	16.2	19.4	17	20.8
Right bronchus	5.2	7.1	6.7	12.4	8.8	11.9	11.9	12	8.2
Right lung PT	57.6	54.8	51.3	57.7	49	51.8	56	56.9	53.5
Right liver	25.8	25.1	26	26.8	24.1	24.5	24.4	15.9	24.9
Total (left + right) liver	50.2	47.9	52.8	55	47.9	50	49.7	38.1	47.6
Total (left + right) gonad	10.4	13.2	8	6.4	6.6	5.4	7	10.8	9.1
Total (left + right) kidney	9	9.6	8.9	11.2	8.4	9.4	8.1	8.8	7.7
Rectal caecum	3.3	1.7	1.6	0	3.1	3.6	2.9	0	3.6
(B)									
Heart MP	34	30.8	30.9	35.8	30.8	33.3	34.4	37.3	30.6
Total liver MP	50.2	46.7	48	52.8	45.6	48.9	50.2	52	46.3
Gall bladder MP	71	65.4	68.3	73	68.4	66.5	69.7	68.7	67.3
Total (left + right) gonad MP	80.2	79	82.7	83.6	80	84.1	82.3	78.3	81.8
Total (left + right) adrenal MP	71.6	84.9	85.6	76.4	84.7	86.2	84.4	81.8	85.6
Total (left + right) kidney MP	89.1	93.7	91	91.3	90.6	92.1	89	89.7	91.1
Tracheal lung MP	21.8	18.9	19.9	21.9	18.9	20.3	20.9	23.4	17.9
Right lung MP	47	43.9	42.3	48	41	43.7	46.3	48.4	43.1
(C)									
Heart-liver GAP	3	1.9	3.2	2.7	2.3	2.5	3.2	8.2	2.6
Heart-liver INT	33.5	31.5	33.8	34.5	30.7	31.7	32	29.4	31.8
Liver-gall bladder GAP	4.8	4.5	5.1	4.1	8.3	3.2	4.7	3.8	6.3
Liver-gall bladder INT	32.7	31.3	32.8	33.2	34	29.1	30.6	21.4	32.7

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TABLE 3. (Continued0

Genus	*ARG*	*XER*	*LEM*	*MAL*	*IND*	*CYC*	*RAM*	*ACU*	*ANI*
Sample size	*n* = 16	*n* = 8	*n* = 7	*n* = 16	*n* = 46	*n* = 1	*n* = 43	*n* = 56	*n* = 92
Liver-kidney GAP	20.5	30	25.4	19.7	27.7	25.5	21.4	22	27.7
Liver-kidney INT	54.9	63.7	60.6	57.3	62.2	60.8	56.2	53.5	61.8
Kidney-vent GAP	7.4	3	5.8	5	5.9	4	7.6	6.6	5.8
Kidney-vent INT	14.4	10	12.2	12.5	13	11.9	14.4	14	12
Rectal caecum-vent INT	10.5	10.5	7.4	—	9.7	10.1	10.6	—	10.2
(D)									
Heart MP-Right lung MP INT	13	13.1	11.4	12.2	10.2	10.4	11.9	11.1	12.6
Heart MP-Liver MP INT	18.3	16.7	18.5	18.6	16.4	17.1	17.6	18.8	17.2
Trachea MP-Liver MP INT	33.2	30.4	32.3	34.6	30.2	32.1	33.1	35.6	30.9
Right lung MP-Adrenal MP INT	30.1	41	43.3	29.4	43.4	42.5	38.2	33.2	42.3
Liver MP-Kidney MP INT	36.9	46.2	41.6	36.9	43.3	41.7	37	33.6	44.3
Trachea/bronchus MP-Kidney MP INT	49.1	44.8	47.5	47.4	47.8	42.2	44.8	42.2	46.3
Heart MP-Gonad MP INT	44.2	45.8	49.8	46.4	47.4	49.4	46.4	39.4	48.9
Heart MP-Kidney MP INT	55.1	62.8	60.1	55.5	59.8	58.8	54.6	52.4	61.5
Trachea MP-Adrenal MP INT	52.6	67.8	68.5	56.7	67.3	67.9	66.5	61.3	68.6
Trachea/bronchus MP-Kidney MP INT	67.4	73	70.5	65.3	69.1	67.8	64.1	63.2	71.1
(E)									
Total testis segments	2	10.7	2	2	2	—	3	3.9	2.6
Total liver segments	7.1	13.6	17.8	13.1	22.2	10	18.7	2	17.6
Total tracheal rings	228	237.8	272	327	243	176	324.2	319.2	296
Tracheal rings/10 mm	66.1	73.8	84.1	90.4	76.9	51	92.3	81.9	94.3

Results

Molecular and morphological data

The results of the molecular phylogeny (Fig. 1) are similar to many recent studies (Vidal *et al.* 2010; Pyron *et al*. 2013b; Hedges *et al.* 2014). Overall, the tree is highly resolved and well-supported, with numerous groups corresponding to morphologically and biogeographically distinct species-groups recognized as genera by Hedges *et al.* (2014). However, some are inconsistent with the current genus-level assignments of many species. In particular, the type species of *Cubatyphlops* (*C. biminiensis*) is strongly supported as the sister-group to the remaining *Cubatyphlops*, *Antillotyphlops,* and *Typhlops*. Additionally, *Madatyphlops* is rendered non-monophyletic by *Mad. microcephalus*, which is strongly supported in a separate Palearctic and Asian clade. Finally, examination of our morphological dataset in comparison with the classification of Hedges *et al.* (2014) revealed many apparently misplaced species (Table 1).

The higher-level relationships among typhlopids also differ between our results (Fig. 1) and those of Hedges *et al.* (2014; their Figure 1). The four subfamilies (Typhlopinae, Afrotyphlopinae, Madatyphlopinae, and Asiatyphlopinae) are strongly supported as monophyletic. In our phylogeny, Typhlopinae is the sister-group to a strongly supported clade consisting of Afrotyphlopinae, Madatyphlopinae, and Asiatyphlopinae. In contrast, Hedges *et al.* (2014) found that Asiatyphlopinae was weakly supported as the sister-group to (Madatyphlopinae + (Typhlopinae + Afrotyphlopinae). Thus, our results strongly support a basal divergence between the New World and Old World groups, while the results of Hedges *et al.* (2014) weakly support the New World species nested within the African species.

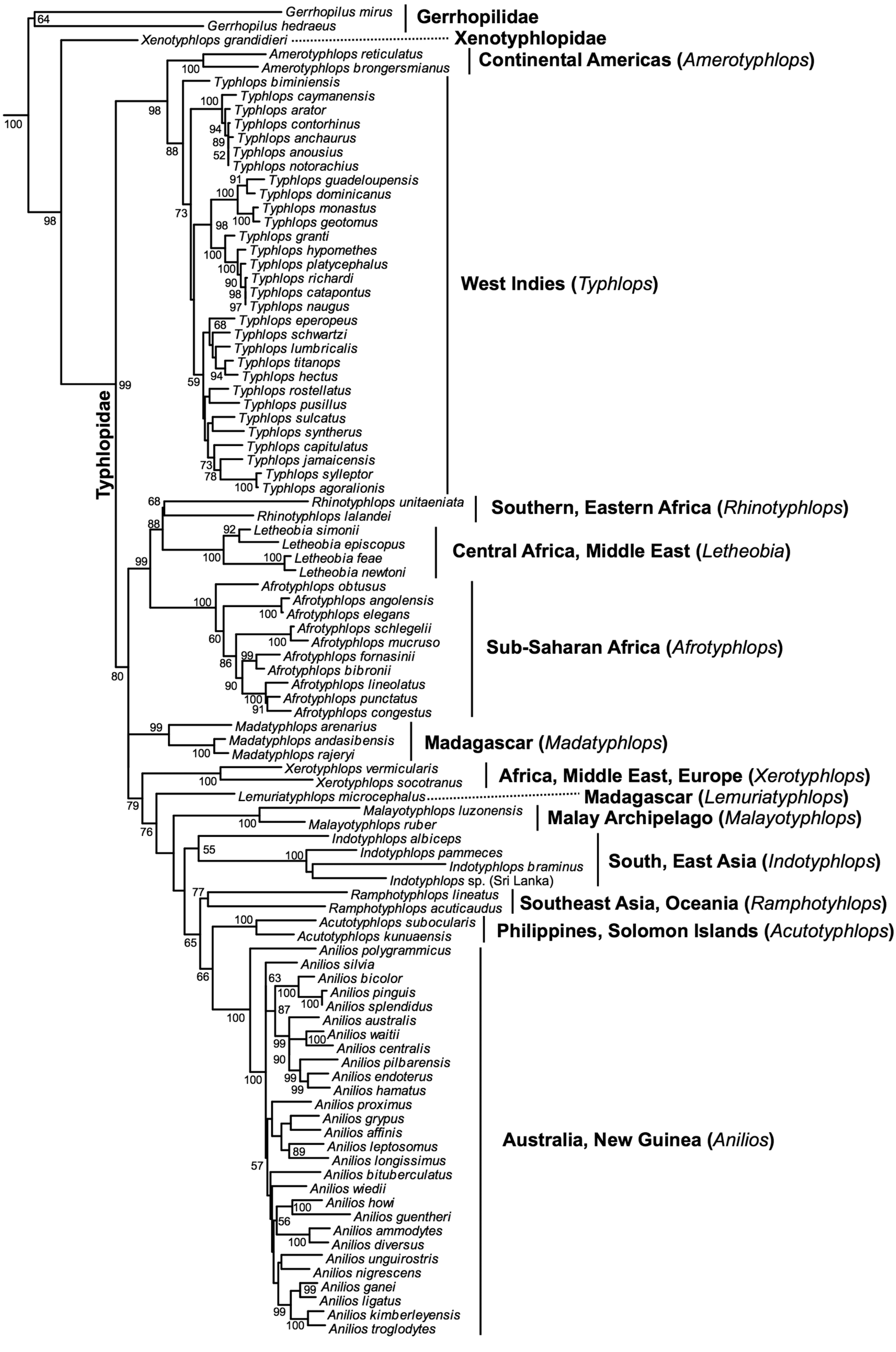

FIGURE 1. Results from a molecular phylogenetic analysis of 95 of the 275 known, extant species of typhlopoid blindsnakes. Tree represents the ML estimate from a concatenated matrix of 4 mitochondrial and 6 nuclear genes (6290bp total), inferred using 200 independent searches in RAxMLv7.2.8, with support estimated from 1000 non-parametric BS replicates (>50% shown).

Typhlopoidea: a revised taxonomy

According to the principles laid out above, we present a revised taxonomy for typhlopoids. The genus *Gerrhopilus* was resurrected for the phylogenetically distinct *Typhlops ater* species group, and placed in a new family Gerrhopilidae (Vidal *et al.* 2010). Our results support this, and the placement of *T. thurstoni* with this group (Hedges *et al.* 2014), on the basis of a T-II supralabial imbrication pattern, a character common in other South Indian *Gerrhopilus* (e.g., *G. tindalli*), and only found in a few other morphologically distinctive African groups (*Afrotyphlops* [part], *Letheobia* [part], and *Rhinotyphlops* [part]; see Table 2). Previous authors also noted the likely placement of *T. thurstoni* in the *T. ater* group (Wallach & Pauwels 2004). In contrast, Hedges *et al.* disagreed with the suggestion of Taylor (1919) that *T. manilae* was also allied with the *T. ater* species group based on the presence of a subocular, and placed this species in *Malayotyphlops*. However, no other *Malayotyphlops* has a subocular, and no known character unambiguously allies it with *Malayotyphlops*. Thus, we follow Taylor's suggestion, placing *T. manilae* in *Gerrhopilus* (Gerrhopilidae). Visceral data are unfortunately lacking for these species.

Additionally, the poorly known but morphologically distinct genus *Cathetorhinus* is likely allied with Gerrhopilidae on the basis of a T-II supralabial imbrication pattern and 18/18/18 scale row formula, a combination of characters common in *Gerrhopilus*, but found only in some individuals of one other typhlopid species (*Letheobia debilis*; Table 2). The genus *Cathetorhinus* was revalidated by Wallach & Pauwels (2008) based on a number of characters, but Hedges *et al.* (2014) synonymized it with *Ramphotyphlops* with little discussion. We resurrect it here, based on the characters described above, and transfer it to Gerrhopilidae. The family Gerrhopilidae thus now includes two genera, *Cathetorhinus* and *Gerrhopilus*.

We note a lapsus by Hedges *et al.* (2014) in determining priority of genus-group names for the genus *Asiatyphlops*. The genus *Argyrophis* was originally described by Gray (1845) containing *Ar. bicolor* (=*Asiatyphlops muelleri*), *Ar. horsfieldii* (=*As. diardii*), *Ar. vermicularis* (=*Xerotyphlops vermicularis*), *Ar. reticulatus* (=*Amerotyphlops reticulatus*), *Ar. lumbricalis* (=*T. lumbricalis*), *Ar. truncatus* and *Ar. bramicus* (=*Indotyphlops braminus*), and *Ar. polygrammicus* (*Anilios polygrammicus*; synonymies after Wallach *et al.* 2014). Günther (1864) placed *Ar. bicolor* in the synonymy of *As. muelleri* based on geographic distribution and morphology (McDiarmid *et al.* 1999; Wallach *et al.* 2014). Stejneger (1907) validly designated *Ar. bicolor* as the type species of *Argyrophis* under the principle of the first reviser (Article 24.2 of the ICZN 1999). Hedges *et al.* (2014) then designated *As. muelleri* as the type species of *Asiatyphlops*, but the name *Argyrophis* is a senior synonym, and thus has priority. Therefore, we replace the name *Asiatyphlops* with *Argyrophis*, which includes additional species transferred to that genus based on morphology (see below).

Based on our expanded sampling of characters and taxa, we re-evaluate the generic designations and diagnoses of Hedges *et al.* (2014), and provide revised accounts. Some species without detailed morphological data (e.g., known only from lost type material) are placed provisionally (indicated with a "?"), and the contents of some genera may change in future revisions based on addition sampling of taxa and characters. We describe this revision below, referencing species groups in more-or-less descending phylogenetic order on the tree (Fig. 1). We decrease the number of typhlopoid genera from 20 to 19, and provide approximate geographic distributions and range maps for these genera (Table 1; Figs. 2, 3).

In summary, we make the following modifications to the classification of Hedges *et al.* (2014), with additional detail given below: (i) the monotypic genus *Sundatyphlops* is synonymized with its larger sister-group *Anilios*, as it cannot be unambiguously diagnosed morphologically; (ii) *Antillotyphlops* and *Cubatyphlops* are synonymized with *Typhlops* as they are not reciprocally monophyletic or unambiguously diagnosable morphologically; (iii) a phylogenetically distinct subgroup of *Madatyphlops* is recognized as a new genus; (iv) 58 species change genera, three additional species are recognized as distinct, four are noted to be junior synonyms, and one is designated as Typhlopidae *incertae sedis*; and (v) the genus *Argyrophis* replaces *Asiatyphlops* based on priority. Unless otherwise noted, coloration is in life. Species marked in bold in "species content" are included in the phylogeny, those that are not bold are placed provisionally, and those marked "?" are placed tentatively.

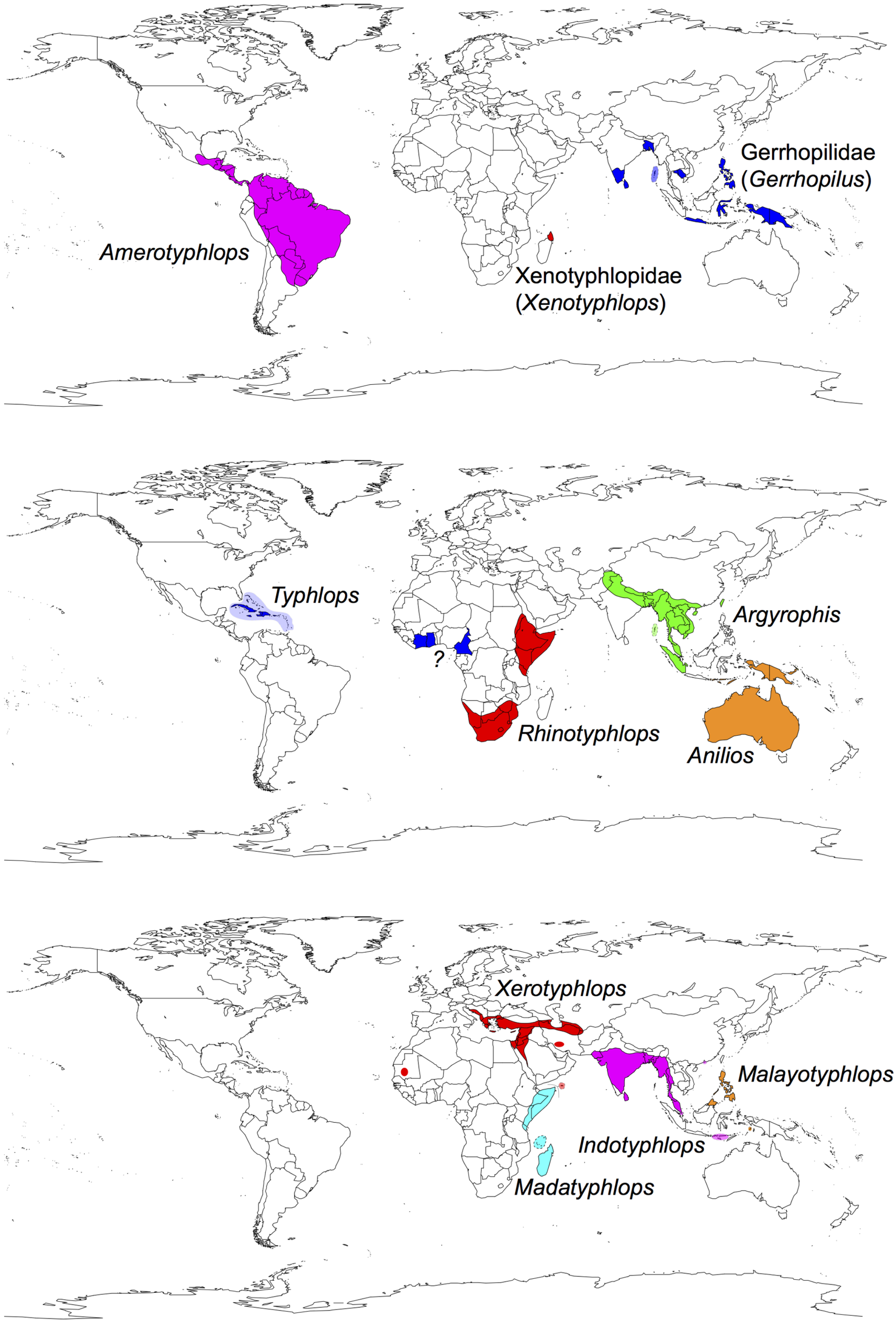

FIGURE 2. Approximate distribution maps for species from 11 of 19 typhlopoid genera; *Amerotyphlops,* Xenotyphlopidae (*Xenotyphlops*)*,* Gerrhopilidae (*Gerrhopilus*), *Typhlops, Rhinotyphlops, Anilios, Xerotyphlops, Indotyphlops, Madatyphlops, Argyrophis,* and *Malayotyphlops*. Seven other genera are pictured in Figure 4. Note that *I. braminus* has an essentially cosmopolitan distribution, and is not factored into the range for *Indotyphlops* (see Wallach 2009 for a recent summary of known localities).

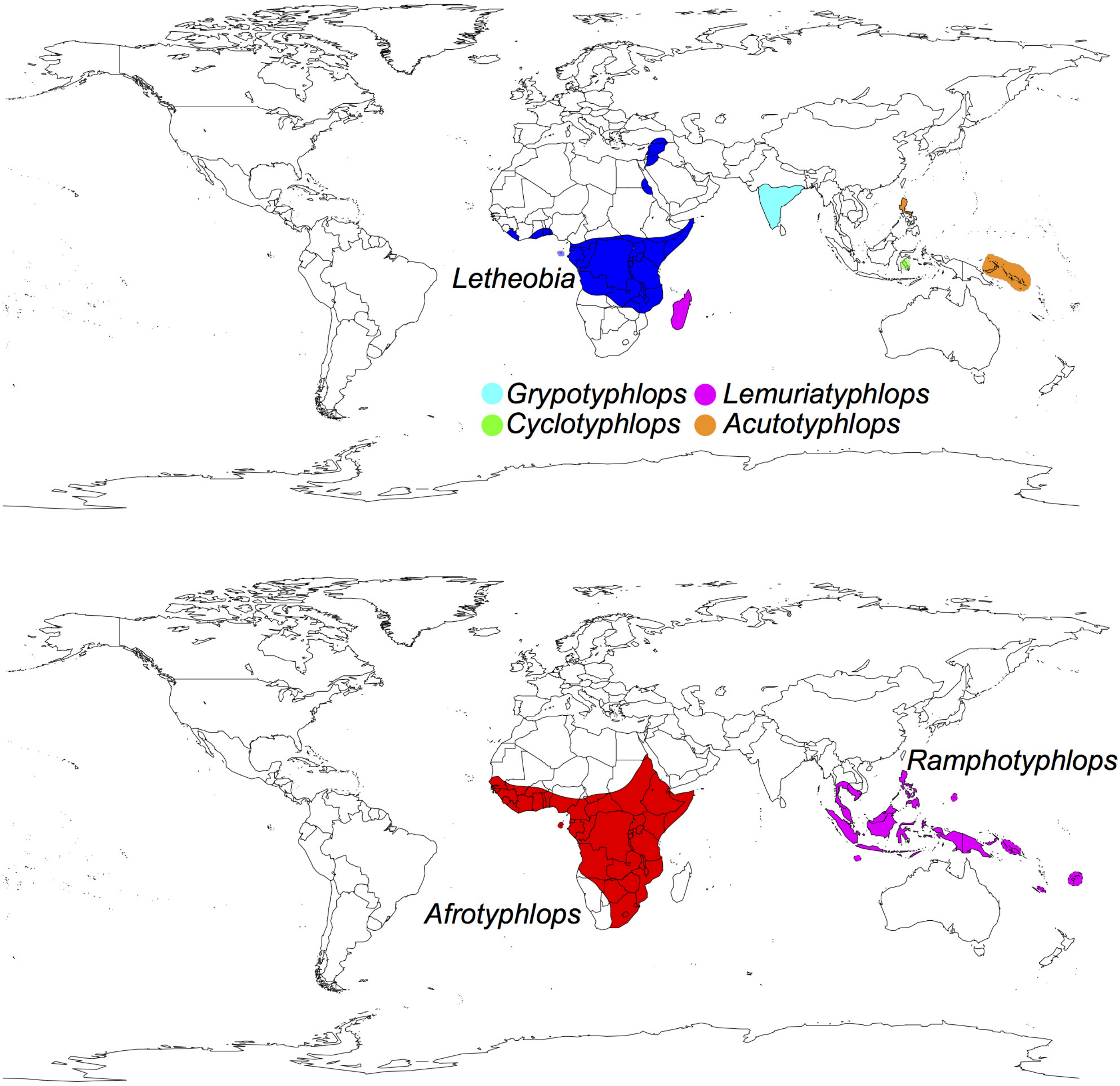

FIGURE 3. Approximate distribution maps for species from 7 of 19 typhlopoid genera: *Grypotyphlops, Letheobia, Lemuriatyphlops, Cyclotyphlops, Acutotyphlops, Afrotyphlops*, and *Ramphotyphlops*.

Superfamily Typhlopoidea Merrem, 1820

Family Gerrhopilidae Vidal, Marin, Morini, Donnellan, Branch, Thomas, Vences, Wynn, Cruaud & Hedges, 2010

Gerrhopilus Fitzinger, 1843

Type species. *Typhlops ater* Schlegel, 1839

Species content. *Gerrhopilus andamanensis, Ge. ater, Ge. beddomii, Ge. bisubocularis, Ge. ceylonicus, Ge. depressiceps, Ge. floweri, Ge. fredparkeri, Ge. hades*, ***Ge. hedraeus***, *Ge. inornatus, Ge. manilae, Ge. mcdowelli*, ***Ge. mirus***, *Ge. oligolepis, Ge. thurstoni,* and *Ge. tindalli.*

Diagnosis. *Gerrhopilus* can be distinguished from all other typhlopoids by the numerous distinct sebaceous glands (cephalic papillae) covering the head shields (not just beneath the sutures at the base of head shields as in all other typhlopoids). Small to moderate-sized (total length 87–331 mm), moderate-bodied (length/width ratio 17–89) snakes with 16–28 scale rows (usually without reduction), total middorsals 190–780, short to long tail (1.5–5.1% total length) with 9–29 subcaudals (length/width ratio 1.0–4.0), and with or without an apical spine. Dorsal and lateral head profile either rounded or pointed, sometimes with a ventral beak, sagittate rostral narrow to moderate (0.26–0.63 head width), nasals usually in contact behind rostral or overlapping one another, preocular in contact with subocular or second and third supralabials, eye present as a dark spot or small eye with distinct pupil, subocular often present, T-II or T-V SIP, and postoculars 1–4. Lateral tongue papillae present; left lung absent, tracheal lung unicameral or paucicameral (with 8–35 pockets), cardiac and right lungs unicameral; testes unsegmented; hemipenis eversible, lacking retrocloacal sacs; rectal caecum small (0.2–4.4% SVL), and rarely absent. Coloration of dorsum uniformly brown, reddish-brown, chocolate-brown or black; venter normally lighter, usually golden brown, light brown or tan; snout, supralabials, chin, cloacal region and/or tail tip white or yellow.

Phylogenetic definition. Includes the Most Recent Common Ancestor (MRCA hereafter) of *Gerrhopilus hedraeus* and *Ge. mirus* and all descendants thereof, and all species more closely related to *Ge. ater* than to *Cathetorhinus melanocephalus*.

Etymology. Possibly from the Greek for reed *(gerrhon)*, referring to the slender body, and the Latin for hairlike appendage *(pilus)*, referring to the cephalic papillae.

Distribution. India (plus Andaman & Cocos Islands), Sri Lanka, Thailand and the East Indies (Philippines, Indonesia, Papua New Guinea).

Remarks. Taylor (1919) suggested that the Philippine species *Typhlops manilae* was allied with *Gerrhopilus* based on the presence of a subocular, a character common in *Gerrhopilus* (Table 2). However, Hedges *et al.* (2014) argued that it was more similar to *Malayotyphlops*. Given that the subocular is common in *Gerrhopilus* but absent in *Malayotyphlops*, and no other character unambiguously allies it with *Malayotyphlops* (Table 2), we follow Taylor's suggestion and move it to *Gerrhopilus*. Hedges *et al.* (2014) corroborated Wallach & Pauwels (2004) in moving the south Indian *T. thurstoni* to *Gerrhopilus* on the basis of a T-II SIP, a common characteristic of other south Indian *Gerrhopilus* (Table 2).

Cathetorhinus Duméril & Bibron, 1844

Type species. *Cathetorhinus melanocephalus* Duméril & Bibron, 1844

Species content. *Cathetorhinus melanocephalus.*

Diagnosis. *Cathetorhinus* can be distinguished from all other typhlopoids by the combination of a T-II SIP and absence of preocular (fused with nasal). Small-sized (total length 183 mm), slender-bodied (length/width ratio 92) snakes with 18 scale rows throughout, 525 total middorsals, moderate tail (2.7% of total length) with 20 subcaudals (length/width ratio 2.5), and minute apical spine. Dorsal head profile bluntly rounded, lateral profile pointed with a ventral rostral keel that terminates in a blunt point, large oval rostral (0.71 head width), eye discernible as a faint eyespot, and postocular single. Coloration of head in preservative is blackish-brown, dorsum tan with lighter venter.

Phylogenetic definition. This genus is currently monotypic, but would include any newly discovered species more closely related to *Cathetorhinus melanocephalus* than to *Gerrhopilus ater*.

Etymology. Unclear; likely refers to keeled, pointed condition of snout, from the Greek for perpendicular *(cathetos)* and having such a nose *(rhinus)*.

Distribution. Unknown. Collected during the Baudin voyage (1800–1804), which made landfall at the Azores, Cape of Good Hope (South Africa), Mauritius, W Australia, and Timor. Timor seems the most likely origin based upon these possible localities and their ophiofaunas, though one author suggested a potential origin from Mauritius (Cheke 2010).

Remarks. The genus *Cathetorhinus* is resurrected here from the synonymy of *Ramphotyphlops* (Hedges *et al.* 2014). Previous authors considered *Typhlops melanocephalus* Typhlopidae *incertae sedis*, including Dixon & Hendricks (1979), Hahn (1980), and McDiarmid *et al.* (1999). The type and only known specimen (MNHN 138), which is in poor condition, has been re-examined by Wallach & Pauwels (2008), and does not fit the definitions of any other typhlopoid genera. Those authors resurrected *Cathetorhinus*. The combination of a T-II SIP and 18 dorsal scale rows clearly allies it with Gerrhopilidae, as this is a common combination of characters in *Gerrhopilus*, and only found in some individuals of one other African typhlopid species (*Letheobia debilis*; Table 2). Thus, we transfer *Cathetorhinus* to Gerrhopilidae (Table 1).

Family Xenotyphlopidae Vidal, Marin, Morini, Donnellan, Branch, Thomas, Vences, Wynn, Cruaud & Hedges, 2010

Xenotyphlops Wallach & Ineich, 1996

Type species. *Typhlops grandidieri* Mocquard, 1905

Species content. *Xenotyphlops grandidieri.*

Diagnosis. *Xenotyphlops* can be distinguished from all other typhlopoids by its very broad, oval-shaped rostral with a nearly vertical lateral profile that terminates in an acute point and a single, large cloacal shield, rather than 4 or 5 as in most other scolecophidians. Small- to moderate-sized (total length 168–284 mm), moderate- to slender-bodied (length/width ratio 62–86) snakes with 20 scale rows (without reduction), 469–545 total middorsals, cloacal shield transversely enlarged, moderate tail (3.1–3.7% total length) with 20–23 subcaudals (length/width ratio 2.3–3.2), and lacking apical spine. Dorsal head profile tapered, rostral very broad and oval (0.76–0.91 head width), terminating in an acute point, lateral head profile with nearly vertical rostral, frontal transversely enlarged (3–4 times as wide as long), subocular present, T-0 SIP, postoculars 2–3. Lateral tongue papillae present; left, tracheal and cardiac lungs absent, right lung unicameral; rectal caecum moderate (2.2–2.5% SVL). Coloration is uniformly pink (pigmentless, without other marks).

Phylogenetic definition. This genus is currently monotypic, but would include any newly discovered species more closely related to *Xenotyphlops grandidieri* than to *Gerrhopilus ater* or *Typhlops lumbricalis*.

Etymology. From the Greek for strange *(xenos),* blind *(typhlos)* and eye *(ops).*

Distribution. Northeastern Madagascar.

Remarks. A second species (*Xenotyphlops mocquardi*) was described by Wallach *et al.* (2007b), but has been shown to be a synonym of *Xen. grandidieri* (Wegener *et al.* 2013).

Family Typhlopidae Merrem, 1820

Subfamily Typhlopinae Merrem, 1820

Amerotyphlops Hedges, Marion, Lipp, Marin & Vidal, 2014

Type species. *Typhlops brongersmianus* Vanzolini, 1976 (= *T. brongersmai*; Vanzolini, 1972)

Species content. *Amerotyphlops amoipira,* ***Am. brongersmianus****, Am. costaricensis, Am. lehneri, Am. microstomus, Am. minuisquamus, Am. paucisquamus,* ***Am. reticulatus****, Am. stadelmani, Am. tasymicris, Am. tenuis, Am. trinitatus, Am. tycherus,* and *Am. yonenagae.*

Diagnosis. *Amerotyphlops* can be distinguished from all other typhlopoids by the following combination of characters: small- to large-sized (total length 38–522 mm), stout- to slender-bodied (length/width ratio 16–77 but average 20–50) snakes with 16–22 scale rows (with or without reduction), 169–566 total middorsals, and short to long tail (0.7–4.3% total length) with 5–15 subcaudals (length/width ratio 0.8–1.6). Dorsal and lateral head profiles rounded, narrow to moderate oval rostral (0.22–0.56 head width), preocular in contact with second and third supralabials, eye small with distinct pupil or faint eyespot, T-III SIP, and postoculars 1–3. Lateral tongue papillae absent; left lung absent, tracheal lung paucicameral (with 13–37 pockets) or multicameral (with 16–39 chambers and foramina), cardiac lung unicameral, paucicameral (with 1–7 pockets) or multicameral (with 2–9 chambers) and right lung unicameral, paucicameral (with 3 pockets) or multicameral (with 2–5 chambers); testes unsegmented; hemipenis eversible, lacking retrocloacal sacs, and rectal caecum small (0.9–4.6% SVL). Coloration yellowish-brown to black dorsally (sometimes uniform or else in the form of darker lines over a light background), usually with immaculate yellow venter, snout and tail often bright yellow, sometimes with a light rostral spot or yellow or white tail ring.

Phylogenetic definition. Includes the MRCA of *Amerotyphlops brongersmianus* and *Am. reticulatus* and all descendants thereof, and all species more closely related to *Am. reticulatus* than to the type species of the 15 other typhlopid genera listed here.

Etymology. From the geographic distribution of the group in the continental Americas.

Distribution. Latin America, from Mexico to northern Argentina.

Remarks. Includes the primarily South American continental radiation of typhlopid blindsnakes. These are morphologically and biogeographically distinct from the West Indian radiation (see below).

Typhlops Oppel, 1811

Type species. *Anguis lumbricalis* Linnaeus, 1758

Species content. ***Typhlops agoralionis, T. anchaurus****, T. annae,* ***T. anousius, T. arator, T. biminiensis, T. capitulatus, T. catapontus, T. caymanensis****, T. coecatus* (?), ***T. contorhinus, T. dominicanus****, T. epactius,* ***T. eperopeus, T. geotomus****, T. golyathi, T. gonavensis,* ***T. granti, T. guadeloupensis, T. hectus, T. hypomethes, T. jamaicensis****, T. leptolepis,* ***T. lumbricalis, T. monastus****, T. monensis,* ***T. naugus, T. notorachius****, T. oxyrhinus, T. pachyrhinus, T. paradoxus, T. perimychus,* ***T. platycephalus****, T. proancylops,* ***T. pusillus, T. richardii, T. rostellatus****, T. satelles,* ***T. schwartzi****, T. silus,* ***T. sulcatus, T. sylleptor, T. syntherus****, T. tetrathyreus,* ***T. titanops***, and *T. zenkeri* (?).

Diagnosis. *Typhlops* can be distinguished from all other typhlopoids by its subtriangular preocular with an anterior extension that is only in contact with the third supralabial. Small- to large-sized (total length 70–460 mm), stout- to slender-bodied (length/width ratio 23–78 but average 30–50) snakes with 16–24 scale rows (with or without reduction), 231–629 total middorsals, short to long tail (0.9–5.6% total length) with 5–22 subcaudals (length/width ratio 0.8–3.2), and apical spine usually small and spike-like, occasionally thorn-like or even a reduced nubbin. Dorsal and lateral head profiles bluntly rounded or tapered, narrow to moderate oval, sagittate, parallel or waisted rostral (0.17–0.49 head width), preocular in contact with third supralabial, eye small to moderate, with or without a pupil, T-III SIP (T-0 in *T. zenkeri*, tentatively placed here), and postoculars 1–2. Lateral tongue papillae absent; left lung absent, tracheal lung, cardiac and right lungs usually multicameral (with 18–38 chambers and 1–7 pockets), but also paucicameral (with 1–33 pockets), and unicameral; testes unsegmented; hemipenis eversible, lacking retrocloacal sacs; rectal caecum usually small (0.6–4.0% SVL), and rarely absent. Coloration sometimes pink (pigmentless), but usually light or golden-brown to brown dorsally, fading to an immaculate golden-yellow venter, sometimes snout and cloacal region light.

Phylogenetic definition. Includes the MRCA of *Typhlops lumbricalis* and *T. biminiensis* and all descendants thereof, and all species more closely related to *T. lumbricalis* than to the type species of the 15 typhlopid genera listed here.

Etymology. From the Greek for blind *(typhlos)* and eye *(ops).*

Distribution. The West Indies (most species) and West Africa (*T. coecatus* and *T. zenkeri*).

Remarks. Note that Hedges *et al.* (2014) transferred two West African species (*Typhlops coecatus* and *T. zenkeri*) to *Letheobia* based on a nasal suture originating at the second labial and a subocular scale, respectively. However, these species appear to be strongly allied to *Typhlops* based on the preocular shape, 18–20 scale rows, narrow rostral, unicameral tracheal lung, T-III SIP in *T. coecatus,* and absence of rectal caecum in *T. zenkeri* (Table 2). Both West African species have a primitive unicameral lung system, as do several of the examined Caribbean *Typhlops* (*T. hectus, T. monensis, T. pusillus,* and *T. rostellatus*). In contrast, all Afrotyphlopinae have a multicameral tracheal lung, while the unicameral condition is only found in *Gerrhopilus, Typhlops*, and *Indotyphlops* (Table 2). Visceral anatomy also strongly links the species to *Typhlops*, being markedly different from *Letheobia* (Table 4). Thus, we restore these species to *Typhlops*, giving that genus a small range in West Africa (Table 1, Fig. 1).

This genus includes the Caribbean Arc Radiation (Dixon & Hendricks 1979) and the Major Antillean Radiation (Thomas 1989), reclassified by Hedges *et al.* (2014) to place *T. annae, T. catapontus, T. dominicanus, T. geotomus, T. granti, T. guadeloupensis, T. hypomethes, T. monastus, T. monensis, T. naugus, T. platycephalus,* and *T. richardi* in *Antillotyphlops*, and *T. anchaurus, T. anousius, T. arator, T. biminiensis, T. caymanensis, T. contorhinus, T. epactius, T. golyathi, T. notorachius, T. paradoxus, T. perimychus,* and *T. satelles* in *Cubatyphlops.* However, the type species of *Cubatyphlops* (*C. biminiensis*) is strongly supported as the sister group to the remaining *Cubatyphlops, Antillotyphlops,* and *Typhlops* (Fig. 1). Thus, we formally propose to synonymize *Cubatyphlops* and *Antillotyphlops* with *Typhlops*, as they also cannot be unambiguously diagnosed morphologically (Table 2). The only alternative would be to restrict *Cubatyphlops* to *C. biminiensis*, and erect another new genus for the remaining former species of *Cubatyphlops*. This group contains additional undescribed species (Hedges *et al.* 2014).

TABLE 4. Visceral character states comparing *Typhlops coecatus* and *T. zenkeri* with African *Letheobia (LET)* and American *Amerotyphlops (AME)* and *Typhlops (TYP),* based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)-(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**.

Taxon	*LET*	*AME*	*coecatus*	*zenkeri*	*TYP*
Sample size	*n* = 90	*n* = 24	*n* = 1	*n* = *1*	*n* = 119
(A)					
Tracheal lung	16.6	19.2	19.4	25.9	19.9
Right lung	26.8	25.8	21.8	23.8	23.8
Total kidney	6.6	9.2	8.2	9.6	8
Trachea	28.3	33.7	32.9	39.5	36.7
Right lung PT	46.6	53.6	50	53.1	55.5
Right bronchus PT	36.3	43.4	41.2	46.9	49.4
Trachea + bronchus	35.6	42.1	40.6	45.6	48
(B)					
Heart MP	27.3	32.8	31.5	38.1	35.9
Left liver MP	41.2	47.2	45	54.8	49
Total gonad MP	74.5	76.8	84	81.4	79.3
Total adrenal MP	77.9	80	—	83.2	81
Total kidney MP	86.4	88.6	92.9	90.5	87.5
Trachea MP	14.9	18.2	17.1	21.1	19.8
Trachea/bronchus MP	18.6	22.4	20.9	24.1	25.4
Tracheal lung MP	17.1	20.3	19.7	22.4	24.1
Right lung MP	37.8	44.3	41.8	46.9	46.8
(C)					
Heart-gall bladder GAP	36.2	33.2	28.8	29.9	29
Liver-gall bladder GAP	7.4	5.3	4.1	2.7	3.2
Liver-gall bladder INT	35.5	32.7	27.1	27.9	28.8
Gonad-kidney GAP	6.2	4.5	3.5	3.4	0.9
Kidney-vent GAP	11	8	4.7	6.1	9.1
(D)					
Systemic arches/heart	0.19	0.18	0.5	0.44	0.37
Left liver/right liver	0.86	0.97	1.11	1.17	0.98
Anterior liver extension/liver	0.05	0.1	0.16	0.14	0.11
Kidney-vent INT/right liver	0.36	0.7	0.43	0.54	0.57
(E)					
Total tracheal rings	347	288	247	247	280
Tracheal rings/10 mm	117.8	86.8	73.7	63.7	76.8

Subfamily Afrotyphlopinae Hedges, Marion, Lipp, Marin & Vidal, 2014

Afrotyphlops Broadley & Wallach, 2009

Type species. *Acontias punctatus* Leach *in* Bowdich, 1819

Species content. *Afrotyphlops angeli* (?), ***Af. angolensis***, *Af. anomalus*, ***Af. bibronii***, *Af. blanfordii*, *Af. brevis*, ***Af. congestus***, *Af. decorosus*, ***Af. elegans***, ***Af. fornasinii***, *Af. gierrai*, *Af. kaimosae*, *Af. liberiensis*, ***Af. lineolatus***, *Af. manni* (?), ***Af. mucruso***, *Af. nanus*, *Af. nigrocandidus*, ***Af. obtusus***, ***Af. punctatus***, *Af. rondoensis*, ***Af. schlegelii***, *Af. schmidti*, *Af. steinhausi*, *Af. tanganicanus*, and *Af. usambaricus*.

Diagnosis. *Afrotyphlops* can be distinguished from all other typhlopoids by the combination of a T-0 or T-II SIP, snout either rounded in profile or pointed with a keratinized edge, broad rostral, scale row reduction (except in *Af. kaimosae*), large body size, pigmented dorsum and (presumably vestigial) left lung. Small- to large-sized (total length 87–950 mm), stout- to slender-bodied (length/width ratio 17–95, but usually 20–40) snakes with 18–44 scale rows (usually with reduction), 232–624 total middorsals, short to moderate tail (0.7–2.9% total length) with 5–16 subcaudals (length/width ratio 0.6–1.6), and apical spine minute. Moderate to broad rostral (0.40–0.75 head width), inferior nasal suture in contact with first supralabial (or rarely the rostral), preocular in contact with second, second and third, or third supralabial, eye moderate with distinct pupil, and postoculars 2–7. Lateral tongue papillae present; vestigial left lung present in most species, tracheal, cardiac and right lungs multicameral (with 18–52 + 1–13 + 1–12 chambers, respectively); testes usually unsegmented; hemipenis eversible, lacking retrocloacal sacs, and rectal caecum large (0.5–5.7% SVL). Coloration variable with three main dorsum types: uniformly brown to black, with lineate effect due to darkened scale edges, or with a dark mottled or blotched pattern on a lighter background color; venter usually cream or yellow and immaculate; supralabials, lower snout, chin, cloacal region and subcaudals may be light.

Phylogenetic definition. Includes the MRCA of *Afrotyphlops punctatus* and *Af. obtusus* and all descendants thereof, and all species more closely related to *Af. punctatus* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Name refers to the African distribution of all species.

Distribution. Most of sub-Saharan Africa.

Remarks. Note that we include in *Afrotyphlops* several species placed in other genera by Hedges *et al.* (2014). These are *Af. angeli* and *Af. manni*, which are tentatively allied with *Afrotyphlops* based on stout body form and dorsal pigmentation. These species are very poorly known, and without molecular data they cannot be unambiguously placed in any afrotyphlopine genus, but we suggest they more closely resemble *Afrotyphlops*. This follows recent classifications placing these species in *Afrotyphlops* (Wallach *et al.* 2014).

Additionally, Hedges *et al.* (2014) placed *Madatyphlops calabresii, Mad. comoroensis, Mad. cuneirostris*, and *Mad. platyrhynchus* in *Afrotyphylops*, but they are clearly allied with *Madatyphlops* based on a number of characters (Tables 2, 3, 5). The species *Mad. calabresii* and *Mad. cuneirostris* exhibit a T-V SIP, a condition otherwise unknown in Afrotyphlopinae but common in Madatyphlopinae (Table 2). Similarly, *Mad. comoroensis* and *Mad. platyrhynchus* have a T-III SIP, common in Madatyphlopinae but otherwise unknown in Afrotyphlopinae (Table 2). Unlike *Afrotyphlops,* none of these species exhibit a vestigial left lung, the nasal suture contacts the second supralabial instead of the first, the supralabials increase in size posteriorly instead of being low and flat, they exhibit 2–3 postoculars instead of 3–5, the rostral is <50% of head width instead of 50–75%, and they are less than 275mm TL, rather than >300mm (Tables 2, 3). Additionally, the visceral anatomy of these species is very similar to *Madatyphlops*, but markedly different from *Afrotyphlops* (Table 5).

Rhinotyphlops Fitzinger, 1843

Type species. *Typhlops lalandei* Schlegel, 1839

Species content. *Rhinotyphlops ataeniatus*, *Rh. boylei*, ***Rh. lalandei***, *Rh. schinzi*, *Rh. scorteccii,* and ***Rh. unitaeniatus***.

TABLE 5. Visceral character states comparing Malagasy *Lemuriatyphlops (LEM)* with Malagasy *Madatyphlops* (Malagasy *MAD*) and African *Madatyphlops* (African *MAD*), based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)-(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**; ratios of two characters listed in **(F)**.

Taxon	*LEM*	*Malagasy MAD*	*African MAD*
Sample size	*n* = 7	*n* = 36	*n* = 16
(A)			
Right liver	25.2	27.1	31.5
Right gonad	4.4	5.6	7.2
Total gonad	8.5	10.1	13.5
Rectal caecum	1.8	2.5	2.8
Right lung	17.4	21.1	19.7
Right lung PT	50.5	52.7	53.3
Tracheal lung	17.3	18.7	17.6
Right bronchus	6.9	9.1	9.7
(B)			
Total gonad MP	81.9	76.6	77.7
Right lung MP	41.9	42.1	43.4
(C)			
Snout-heart INT	33.2	31.6	31.2
Heart-liver GAP	2.8	2.3	2.5
Heart-liver INT	32.6	34	38.8
Heart-gall bladder GAP	32.6	33.4	34.9
Liver-gall bladder GAP	4.6	3.9	1
Liver-gall bladder INT	31.4	32.6	34.6
Liver-kidney GAP	26.6	24.6	18.8
Gall bladder-gonad GAP	10.4	4.2	3.6
Gall bladder-kidney GAP	20.4	19.1	15.6
Gonad-kidney GAP	1.8	3.7	6.1
Kidney-vent INT	12.3	14.3	13.6
Rectal caecum-vent INT	7.8	9	10
Tracheal lung MP	19.9	18.5	18.2
(D)			
Heart MP-Right lung MP INT	11	12.8	12.2
Heart MP-Liver MP INT	17.7	18.2	20.7
Liver MP-Kidney MP INT	42.5	41.6	38.9
Heart MP-Gonad MP INT	49	44.2	46.8
Trachea/bronchus MP-Kidney MP INT	70.6	68.2	68.2
(E)			
Right liver segments	9.8	8.4	6.4
Right testis segments	1	5.5	4
Left testis segments	1	4.8	3.7
Total testis segments	2	10.3	7.7
(F)			
Posterior liver tail/liver	0.08	0.12	0.17
Left liver/right liver	1.04	0.89	0.94

Diagnosis. *Rhinotyphlops* can be distinguished from all other typhlopoids by the combination of the following characters: snout with sharply pointed lateral profile, T-0 SIP (T-II in *Rh. schinzi*), 22–34 midbody scale rows, pigmented dorsum and absence of left lung. Small- to large-sized (total length 90–455 mm), stout- to slender-bodied (length/width ratio 27–88) snakes with 22–34 scale rows (with reduction), 311–586 total middorsals, short to moderate tail (0.6–2.3% total length) with 6–13 subcaudals (length/width ratio 0.5–1.5), and apical spine minute. Moderate to broad rostral (0.54–0.85 head width), inferior nasal suture in contact with first or second supralabial, preocular in contact with second or second and third supralabials, and postoculars 2–5. Lateral tongue papillae present; left lung absent, tracheal, cardiac and right lungs multicameral (with 24–47 + 1–8 + 2–10 chambers, respectively); testes unsegmented, hemipenis eversible, lacking retrocloacal sacs; and rectal caecum moderate (1.4–3.8% SVL). Coloration dark brown to blackish-brown above and below (with or without a yellow vertebral stripe) or dorsum light with irregular dark pigmentation and light venter.

Phylogenetic definition. Includes the MRCA of *Rhinotyphlops lalandei* and *Rh. unitaeniata* and all descendants thereof, and all species more closely related to *Rh. lalandei* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Likely refers to enlarged rostral (Greek *rhinos* for nose) of the type species, *R. lalandei*.

Distribution. Range includes much of sub-Saharan Africa.

Remarks. The species *Rhinotyphlops lalandei* is also the type species of *Onychocephalus* described by Duméril & Bibron (1844), which is in the synonymy of several other genera listed here (McDiarmid *et al.* 1999; Wallach *et al.* 2014), but *Rhinotyphlops* has priority over *Onychocephalus*. Note that Hedges *et al.* (2014) included *Madatyphlops leucocephalus* in *Rhinotyphlops*, but it is apparently allied with *Madatyphlops* based on SIP (T-V vs. T-0 or T-II in *Rhinotyphlops*), fourth supralabial and its orientation (high and vertical vs. low and horizontal in *Rhinotyphlops),* and rostral width (<50% of head width vs. 54%–85% in *Rhinotyphlops*).

Letheobia Cope, 1869

Type species. *Onychocephalus caecus* Duméril, 1856

Species content. *Letheobia acutirostrata, Let. caeca, Let. crossii, Let. debilis,* ***Let. episcopus****, Let. erythraea,* ***Let. feae****, Let. gracilis, Let. graueri, Let. jubana, Let. kibarae, Let. largeni, Let. leucosticta, Let. lumbriciformis,* ***Let. newtoni****, Let. pallida, Let. pauwelsi, Let. pembana, Let. praeocularis, Let. rufescens,* ***Let. simoni****, Let. somalica, Let. stejnegeri, Let. sudanensis, Let. swahilica, Let. toritensis, Let. uluguruensis,* and *Let. wittei.*

Diagnosis. *Letheobia* can be distinguished from all other typhlopoids by the combination of the following characters: T-0 or T-II SIP, lateral snout profile rounded, gracile body form, eye invisible or reduced to faint spot, and coloration pink (pigmentless). Small- to large-sized (total length 106–550 mm), moderate- to slender-bodied (length/width ratio 42–129) snakes with 18–30 scale rows (with or without reduction), 336–737 total middorsals, short to moderate tail (0.7–2.6% total length) with 5–17 subcaudals (length/width ratio 0.6–2.0), and apical spine absent or bare nubbin. Dorsal and lateral head profiles rounded, moderate to broad rostral (0.36–0.83 head width), inferior nasal suture in contact with first or second supralabial (and rarely, rostral), preocular in contact with second or second and third supralabials, subocular present or absent, and postoculars 2–6. Lateral tongue papillae absent; left lung absent, tracheal lung multicameral (with 17–45 chambers), cardiac lung multicameral (with 3–8 chambers), paucicameral (with 1–9 pockets) or unicameral and right lung unicameral, paucicameral (with 2–5 pockets) or multicameral (with 2–21 chambers); testes segmented or unsegmented; hemipenis eversible, lacking retrocloacal sacs; rectal caecum small to large (0.5–6.3% SVL) or absent.

Phylogenetic definition. Includes the MRCA of *Letheobia episcopus* and *Let. feae* and all descendants thereof, and all species more closely related to *Let. caeca* than to the type species of the 16 other typhlopid genera listed here.

Etymology. Possibly a reference to the river Lethe in Hades, associated with the Greek spirit of forgetfulness and oblivion.

Distribution. Ranges across most of the central and eastern portion of sub-Saharan Africa, with some species in Turkey (*Letheobia episcopus*) and the Middle East (*Let. simoni*).

Remarks. Note that the West African species *Typhlops coecatus* and *T. zenkeri* were moved to *Letheobia* by Hedges *et al.* (2014), but we suggest they are not allied with this group. They resemble *Typhlops* based on the preocular shape, 18–20 scale rows, narrow rostral, and primitive unicameral lung system, as do several of the examined Caribbean *Typhlops* (*T. hectus, T. monensis, T. pusillus,* and *T. rostellatus*). We thus restore them to *Typhlops*. Those authors also placed *Let. jubana* in *Afrotyphlops*, but this species is clearly allied with *Letheobia* on the basis of faint or absent eyespot, absence of left lung and other visceral measurements (Table 6).

TABLE 6. Visceral character states comparing *Letheobia jubana* and *Let. leucosticta* with *Afrotyphlops (AFR)* and *Letheobia (LET),* based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)-(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**; ratios of two characters listed in **(F)**.

Taxon	*AFR*	*jubana*	*LET*	*leucosticta*
Sample size	*n* = 150	*n* = 5	*n* = 84	*n* = 1
(A)				
Hyoid PT	12.4	8	6.3	8.7
Heart	4.5	4	3.6	5.5
Right kidney	4	3.5	3.3	3.9
Left kidney	3.8	3.3	3.2	4.6
Total (left + right) kidney	7.8	6.9	6.6	8.5
Rectal caecum	2.9	1.6	1.9	1.4
Trachea	34.6	27.8	28.7	33
Tracheal lung	22.1	11.8	16.8	20.6
Right lung PT	53.6	43.6	47.2	45.3
Right bronchus	3.4	7.1	7.3	4.1
Right bronchus PT	39.4	35.8	36.8	38.4
Trachea + bronchus	38	34.9	36	37.1
(B)				
Heart MP	33.7	26.7	27.7	31.6
Total (left + right) liver MP	49	41.3	44.4	45.4
Right kidney MP	80.3	83.8	85.6	89.4
Left kidney MP	82.6	87.4	87.4	90.6
Total (left +right) kidney MP	81.5	85.6	86.5	90
Trachea MP	18.7	14.8	15.1	17.8
Right lung MP	44.8	36.2	38.4	39.8
Trachea + bronchus MP	20.4	18.3	18.8	37.1
Tracheal lung MP	20.2	13.8	17.3	19.9
(C)				
Snout-heart INT	36	28.7	29.5	34.3
Heart-gall baldder GAP	27.3	33.5	36.8	32
Liver-gall bladder GAP	2.1	9.1	7.5	7.3
Liver-gall bladder INT	27	33.9	36	31.6
Liver-kidney GAP	17.2	29.5	25.2	28.4
Liver-kidney INT	46.5	58.8	57.5	61.1
Gall bladder-kidney GAP	13.3	18.3	16.5	19.5
Kidney-vent GAP	15.4	11	11	7.1
Kidney-vent INT	21.6	17.9	16	12.6

......continued on the next page

TABLE 6. (Continued)

Taxon	*AFR*	*jubana*	*LET*	*leucosticta*
Sample size	*n* = 150	*n* = 5	*n* = 84	*n* = 1
Rectal caecum-vent INT	10.6	8.2	7.6	10.3
(D)				
Liver MP-Kidney MP INT	37.6	44.2	41.4	42.3
Heart MP-Gonad MP INT	41.5	49.2	44.7	49.4
Heart MP-Kidney MP INT	53.6	59.3	58.8	58.4
(E)				
Right liver segments	4.1	5.8	7.5	8
Left liver segments	3.9	5.3	7.1	6
Total (left + right) liver segments	8	11	14.6	14
Right testis segments	1.6	5	4.5	—
Left testis segments	1.5	4	4.3	—
Total (left + right) testis segments	3.1	9	8.8	—
Total tracheal rings	274	346	348	288
Tracheal rings/10 mm	79.8	122.9	117.9	87.4
(F)				
Left liver/right liver	0.9	0.85	0.86	1.05
Right bronchus/right lung	0.21	0.51	0.42	0.38

Grypotyphlops **Peters, 1881**

Type species. *Onychocephalus acutus* Duméril & Bibron, 1844

Species content. *Grypotyphlops acutus.*

Diagnosis. *Grypotyphlops* can be distinguished from all other typhlopoids by the combination of a T-0 SIP, dorsal and lateral snout profiles acutely pointed, and subocular present. Large-sized (total length 115–631 mm), stout- to slender-bodied (length/width ratio 38–79) snakes with 24–34 scale rows (with reduction), 448–526 total middorsals, short tail (0.8–1.9% total length) with 7–13 subcaudals (length/width ratio 0.8–1.5), and apical spine absent. Broad rostral (0.61–0.80 head width), inferior nasal suture in contact with first or second supralabial, preocular in contact with second and third supralabials, small eyespot present under nasal shield, T-0 SIP, and postoculars 3–4. Lateral tongue papillae present; left lung absent, tracheal, cardiac and right lungs multicameral (with 32–38 + 4–7 + 3–8 chambers, respectively); testes unsegmented; hemipenis eversible, lacking retrocloacal sacs; and rectal caecum moderate (2.5–2.8% SVL). Coloration brown, light brown, tan or golden-brown dorsally with immaculate gold to yellow venter, and rostral gold to yellow, lighter than dorsum.

Phylogenetic definition. This genus is currently monotypic, but would include any newly discovered species more closely related to *Grypotyphlops acutus* than to any of the 15 type species of the other typhlopid genera listed here.

Etymology. Likely from the Greek for hooked nose *(grypos)*, referring to the "beaked" appearance of *Grypotyphlops acutus.*

Distribution. Peninsular India.

Remarks. The genus *Grypotyphlops* was resurrected for *Onychocephalus acutus* (Wallach 2003), and is thus the currently recognized, valid genus for the species, which was previously placed in *Rhinotyphlops* (McDiarmid *et al.* 1999). The species *Onychocephalus unilineatus* Duméril & Bibron, 1844 was considered *incertae sedis* by Dixon & Hendricks (1979) and McDiarmid *et al.* (1999), who questioned the locality of Cayenne, French Guiana. The type (MNHN 1064) has been re-examined and shown to be a synonym of *Gr. acutus* (Wallach 2003). The same is true for the type (IRSNB 2017) of *Typhlops psittacus*, another species described with erroneous locality data (Werner 1903; Wallach 1994). This genus bears a resemblance, both internal and external, to some species of

Letheobia (Tables 2, 3; Wallach 1994, 2003), and may thus form part of an Africa-India clade, reflecting the shared Gondwanan biogeographic history of typhlopids (Vidal *et al.* 2010). We thus place it in Afrotyphlopinae.

Subfamily Madatyphlopinae Hedges, Marion, Lipp, Marin & Vidal, 2014

Madatyphlops Hedges, Marion, Lipp, Marin & Vidal, 2014

Type species. *Onychocephalus arenarius* Grandidier, 1872

Species content. ***Madatyphlops andasibensis*, *Mad. arenarius***, *Mad. boettgeri, Mad. calabresii, Mad. comorensis, Mad. cuneirostris, Mad. decorsei, Mad. leucocephalus, Mad. madagascariensis, Mad. mucronatus, Mad. ocularis, Mad. platyrhynchus,* and ***Mad. rajeryi***.

Diagnosis. *Madatyphlops* can be distinguished from all other typhlopoids by the combination of the following characters: small- to large-sized (total length 62–600 mm), stout- to slender-bodied (length/width ratio 17–85) snakes with 20–28 scale rows (with reduction, except in *Mad. calabresii*), 196–580 total middorsals, short to moderate tail (1.2–3.0% total length) with 7–18 subcaudals (length/width ratio 0.7–2.6), and apical spine small to minute. Dorsal and lateral head profiles rounded, moderate rostral (0.29–0.54 head width), inferior nasal suture in contact with second supralabial, preocular in contact with second and third supralabials, eye small to moderate with distinct pupil, T-III or T-V SIP, and postoculars 2–3. Lateral tongue papillae present; left lung absent, tracheal, cardiac and right lungs normally multicameral (latter unicameral in continental African species); testes segmented or unsegmented; hemipenis eversible, lacking retrocloacal sacs; and rectal caecum usually large (0.5–5.0% SVL). Coloration brown to black dorsally with lighter venter (light brown to yellow) or entirely pink (pigmentless) in a few species (yellow in preservative).

Phylogenetic definition. Includes the MRCA of *Madatyphlops arenarius* and *Mad. andasibensis* and all descendants thereof, and all species more closely related to *Mad. arenarius* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Name refers to the primarily Malagasy distribution of the species, similar to the skink genus *Madascincus* (see Whiting *et al.* 2004).

Distribution. Most species are endemic to Madagascar (Table 1), though a few are found in northeastern Africa (*Madatyphlops calabresii, Mad. cuneirostris, Mad. leucocephalus*, and *Mad. platyrhynchus*), and one in the Comoro Islands (*Mad. comorensis*).

Remarks. Some species were placed in *Afrotyphlops* (*Madatyphlops calabresii, Mad. comorensis, Mad. cuneirostris,* and *Mad. platyrhynchus*) and *Rhinotyphlops* (*Mad. leucocephalus*) by Hedges *et al.* (2014), but are likely allied with *Madatyphlops* based on several characters. These include a T-V SIP (*Mad. calabresii, Mad. cuneirostris,* and *Mad. leucocephalus*) or a T-III SIP (*Mad. comoroensis* and *Mad. platyrhynchus*), both of which are common in Madatyphlopinae but otherwise unknown in Afrotyphlopinae (Table 2). Also, the supralabials of these species increase in size posteriorly, instead of being low and flat as in *Afrotyphlops* and *Rhinotyphlops*. At least five new undescribed species are known from Madagascar (Wallach unpubl. data) based on new UMMZ material.

Subfamily Asiatyphlopinae Hedges, Marion, Lipp, Marin & Vidal, 2014

Argyrophis Gray, 1845

Type species. *Typhlops muelleri* Schlegel, 1839

Species content. *Argyrophis bothriorhynchus, Ar. diardii, Ar. fuscus, Ar. giadinhensis, Ar. hypsobothrius, Ar. klemmeri, Ar. koshunensis, Ar. muelleri, Ar. oatesii, Ar. roxaneae, Ar. siamensis, Ar. trangensis.*

Diagnosis. *Argyrophis* can be distinguished from all other typhlopoids by the combination of the following characters: T-II, T-III, or T-V SIP and scale row reduction, and left lung present in *Ar. diardii, Ar. muelleri*, and *Ar. siamensis*. Small- to large-sized (total length 75–540 mm), stout- to slender-bodied (length/width ratio 24–71) snakes with 20–30 scale rows (with reduction), 246–402 total middorsals, short to moderate tail (1.0–3.6% total length) with 5–26 subcaudals (length/width ratio 0.4–2.0), and apical spine small or thorn-like. Dorsal and lateral head profiles rounded, moderate rostral (0.25–0.40 head width), preocular in contact with second and third supralabials, eye moderate with distinct pupil, and postoculars 2–3. Lateral tongue papillae present; vestigial left lung present, tracheal, cardiac and right lungs multicameral (with 23–38 + 3–10 + 2–12 foramina, respectively); testes unsegmented; hemipenis eversible, lacking retrocloacal sacs, and moderate rectal caecum (1.2–5.0% SVL). Coloration brown, reddish-brown, purplish-black or black dorsally, transiting to a lighter venter (beige, cream or white) or bicolored (with a sharp midlateral demarcation between dark dorsum and light venter), snout, labials, and chin sometimes light.

Phylogenetic definition. Includes the MRCA of *Argyrophis diardii* and *Ar. muelleri* and all descendants thereof, all species more closely related to *Ar. muelleri* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Unclear. Many names erected by J.E. Gray were apparently chosen for euphony but lack any substantial etymology (A.M. Bauer, pers. comm.).

Distribution. Occurs in Southeast Asia, primarily Vietnam, Thailand, and West Malaysia.

Remarks. The species *Argyrophis fuscus* was considered Typhlopidae *incertae sedis* by Hahn (1980) and McDiarmid *et al.* (1999), who suspected the type locality of Java to be in error. The type (MNHN 1062) of *Ar. fuscus* has been examined and reveals a relationship to the *Ar. diardii* group (Table 2), so the locality may be correct. The species *Ar. hypsobothrius* is known only from a briefly described and now lost ZMH holotype destroyed in July 1943 (during WW II; *fide* Hallermann 1998), and *Ar. koshunensis* from Taiwan is also poorly known. However, these species are all clearly allied with *Argyrophis* on the basis of morphology (Table 2). Note that this genus is not included in our molecular phylogenetic analysis, but was analyzed by Hedges *et al.* (2014), who found weak support for a sister-group relationship between *Argyrophis* and *Xerotyphlops.* Those authors also included *Indotyphlops leucomelas* and *I. tenuicollis* in *Asiatyphlops* (=*Argyrophis*), but those species seem to be allied with *Indotyphlops* on the basis of a T-III SIP, caudal spine reduced to nubbin, and invisible eye. They also included *Ar. hypsobothrius* in *Indotyphlops*, though it is likely allied with *Argyrophis* on the basis of head shield pits or grooves as in *Ar. bothriorhynchus.* As noted above, *Argyrophis* is the objective senior synonym for *Asiatyphlops*, as *Ar. muelleri* is the type species of both genera.

Xerotyphlops Hedges, Marion, Lipp, Marin & Vidal, 2014

Type species. *Typhlops vermicularis* Merrem, 1820

Species content. *Xerotyphlops etheridgei,* ***Xer. socotranus, Xer. vermicularis,*** and *Xer. wilsoni* (?).

Diagnosis. *Xerotyphlops* can be distinguished from all other typhlopoids by the combination of the following characters: small- to moderate-sized (total length 92–405 mm), stout- to moderate-bodied (length/width ratio 34–56) snakes with 20–30 scale rows (usually with reduction), 346–435 total middorsals, short to moderate tail (1.1–3.1% total length) with 7–13 subcaudals (length/width ratio 1.0–1.5), and apical spine. Dorsal and lateral head profiles bluntly rounded, narrow rostral (0.27–0.41 head width), inferior nasal suture in contact with second supralabial, preocular in contact with second and third supralabials, eye moderate with distinct pupil, T-III or T-V SIP, and postoculars 2–3. Lateral tongue papillae present; left lung absent, tracheal, cardiac and right lungs multicameral (with 22–29 + 5–9 + 2–9 chambers, respectively); testes segmented; hemipenis eversible, lacking retrocloacal sacs; and rectal caecum moderate (1.4–2.2% SVL).

Phylogenetic definition. Includes the MRCA of *Xerotyphlops vermicularis* and *Xer. socotranus* and all descendants thereof, and all species more closely related to *Xer. vermicularis* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Named after the desert (xeric) habitats of the species.

Distribution. The type species (*Xerotyphlops vermicularis*) occurs from southeastern Europe through the Middle East. The other three species are more localized, with *Xer. etheridgei* in Mauritania, *Xer. socotranus* on Socotra, and *Xer. wilsoni* in southwestern Iran.

Remarks. Assignment of *Xerotyphlops wilsoni* is tentative, as it is only known from the lost holotype, which has not been examined, though other putative specimens have been sighted near the type locality (B. Safaei, pers. comm.). Little morphological data is known for this species from the brief description (Table 2). This group likely contains additional cryptic species (Kornilios *et al.* 2012).

***Lemuriatyphlops* gen. nov.**

Type species. *Typhlops microcephalus* Werner, 1909a

Species content. *Lemuriatyphlops albanalis, Lem. domerguei,* ***Lem. microcephalus,*** and *Lem. reuteri.*

Diagnosis. *Lemuriatyphlops* can be distinguished from all other typhlopoids by lack of scale row reduction, and by the combination of the following characters: small-to moderate-sized (total length 77–276 mm), stout- to slender-bodied (length/width ratio 34–94) snakes with 20–22 scale rows (without reduction), 252–520 total middorsals, short to moderate tail (1.6–4.0% total length) with 6–16 subcaudals (length/width ratio 0.9–2.2), and apical spine small or nubbin. Dorsal and lateral head profiles rounded, narrow to moderate rostral (0.26–0.61 head width), inferior nasal suture in contact with second supralabial, preocular in contact with second and third supralabials, eye small with distinct pupil or eyespot, T-III or T-V SIP, and postoculars 1–3. Lateral tongue papillae present; left lung absent; tracheal lung multicameral (with 11–32 chambers), cardiac lung multicameral (with 2–4 chambers) or unicameral, and right lung multicameral (with 2–4 chambers); testes unsegmented; hemipenis eversible, lacking retrocloacal sacs; and rectal caecum small (0.8–2.5% SVL). Coloration light brown to black, venter lighter; and ventral snout, chin, cloacal region, and subcaudals yellow or white.

Phylogenetic definition. Includes all species more closely related to *Lemuriatyphlops microcephalus* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Name is a masculine noun, and refers to the mythical lost continent of Lemuria, which connected Madagascar to India and Oceania.

Distribution. Available data suggest this genus is endemic to Madagascar; *Lemuriatyphlops albanalis* is of uncertain origin, though Madagascar is a possibility.

Remarks. Note that we also include *Typhlops albanalis* in *Lemuriatyphlops* here, based on 20 dorsal scale rows lacking reduction (Rendahl 1918). The species was synonymized with *Madatyphlops ocularis* by Roux-Estève (1974), but examination of the types (NHR 3351 and 2574) by V.W. found it to be distinct from that species based upon numerous external and internal characters (Tables 2, 3), including the following (*L. albanalis* data first, followed by *M. ocularis* data): dorsal head profile (tapered vs. ogival), lateral head profile (blunt vs. pointed), rostral shape (sagittate vs. parallel), anterior rostral (convex vs. concave with anterodorsal pocket behind dorsally projecting point), superior nasal suture (vertical, parallel to rostral vs. oblique), pupil of eye (invisible vs. visible), occipital shields (absent vs. present), color pattern (bicolored vs. uniform), length/width ratio (80–92 vs. 55–67), cardiac and right lungs (unicameral vs. multicameral), and significant differences between the lengths and midpoints of the liver, gonads, adrenals, kidneys and lungs plus most of the gaps and intervals between all the viscera. Therefore we ressurect the former species here under the combination of *Lemuriatyphlops albanalis*. Its distribution is unknown (purported to be from South Africa or Madagascar). This species was originally described from "Kapland" (=South Africa) but was supposedly corrected by FitzSimons (1962) to Madagascar based upon a label by W. Kaudern from November 1906. However, this species was not mentioned by either Andersson (1911), who reported on Kaudern's Malagasy snake collection of 1906–1907, nor by Kaudern (1922), who reported on his own collections of 1906–1907 and 1911–1912. Similar to other *Lemuriatyphlops,* this species is small- to moderate-sized (total length 183–276 mm) and slender-bodied (length/width ratio 78–94) with 20 scale rows throughout, 499–520 total middorsals, short to moderate tail (1.8–2.2% total length) with 15–16 subcaudals (length/width ratio 2.0–2.2), broad oval rostral (0.54–0.61 head width), inferior nasal in contact with second supralabial, T-III SIP, postoculars two, tracheal lung multicameral, cardiac and right lungs unicameral, and a large rectal caecum. Note that these species were all included in *Madatyphlops* by Hedges *et al.* (2014) without inclusion in their phylogenies, but are clearly morphologically distinct (Tables 2, 3), and strongly supported outside of *Madatyphlops* in the phylogeny, in a separate Palearctic and Asian clade (Fig. 1).

***Malayotyphlops* Hedges, Marion, Lipp, Marin & Vidal, 2014**

Type species. *Typhlops luzonensis* Taylor, 1919

Species content. *Malayotyphlops canlaonensis, Mal. castanotus, Mal. collaris, Mal. hypogius, Mal. koekkoeki, Mal. kraalii,* ***Mal. luzonensis***, ***Mal. ruber***, and *Mal. ruficaudus.*

Diagnosis. *Malayotyphlops* can be distinguished from all other typhlopoids by a T-III SIP and eversible hemipenis lacking retrocloacal sacs, and by the following combination of characters: small- to moderate-sized (total length 109–445 mm), moderate to stout-bodied (length/width ratio 26–58) snakes with 20–30 scale rows (with reduction), 280–460 total middorsals, short to moderate tail (1.4–3.6% total length) with 7–18 subcaudals (length/width ratio 0.8–1.6), and apical spine small. Dorsal and lateral head profiles rounded, narrow to moderate rostral (0.31–0.61 head width), inferior nasal suture in contact with first or second supralabial, preocular in contact with second and third supralabials, eye small with distinct pupil, and postoculars 2–4. Lateral tongue papillae absent; left lung absent, tracheal, cardiac and right lungs multicameral (with 8–29 + 2–9 + 4–10 chambers); testes unsegmented; and rectal caecum usually absent (but 0.5–8.2% SVL in *Mal. koekkoeki* and *Mal. ruber*). Coloration of dorsum brown, reddish-brown, or blackish-brown, venter yellow, gold or orangish-brown; a light nuchal collar may be present as well as light supralabials.

Phylogenetic definition. Includes the MRCA of *Malayotyphlops ruber* and *Mal. luzonensis* and all descendants thereof, and all species more closely related to *Mal. ruber* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Name refers to the distribution of species in the Malay archipelago.

Distribution. Species are primarily found in the Philippines, though some occur on Borneo and the Maluku Islands (Table 1).

Indotyphlops Hedges, Marion, Lipp, Marin & Vidal, 2014

Type species. *Typhlops pammeces* Günther, 1864

Species content. ***Indotyphlops albiceps***, ***I. braminus***, *I. exiguus, I. filiformis, I. jerdoni, I. lankaensis, I. lazelli, I. leucomelas, I. loveridgei, I. madgemintonae, I. malcolmi, I. meszoelyi, I. ozakiae,* ***I. pammeces***, *I. porrectus, I. schmutzi, I. tenebrarum, I. tenuicollis, I. veddae,* and *I. violaceus.*

Diagnosis. *Indotyphlops* can be separated from all other typhlopoids by a T-III or T-V SIP and the following combination of characters: small to moderate-sized (total length 35–365 mm), stout- to slender-bodied (length/width ratio 23–130) snakes with 18–22 scale rows (usually without reduction), 229–523 total middorsals, short to long tail (1.1–6.7% total length) with 7–26 subcaudals (length/width ratio 0.7–3.7), and small apical spine. Dorsal and lateral head profiles rounded, narrow to moderate rostral (0.22–0.66 head width), inferior nasal suture in contact with first or second supralabial or preocular, superior nasal suture visible dorsally in some species, preocular in contact with second and third supralabials, postocular usually single. Lateral tongue papillae present; left lung absent, tracheal lung unicameral, paucicameral (with 16–34 pockets) or multicameral (with 15–26 chambers), cardiac and right lungs unicameral; testes unsegmented; hemipenis usually eversible, lacking retrocloacal sacs (but protrusible with 0.5–3.5 coils with retrocloacal sacs in some species); and rectal caecum usually small (0.7–7.4% SVL). Coloration of dorsum light brown to black with gradual transition to a lighter venter; labials, chin, cloacal region and/or tail tip white (some species pigmentless and pink or yellow and some have light head).

Phylogenetic definition. Includes the MRCA of *Indotyphlops albiceps* and *I. braminus* and all descendants thereof, and all species more closely related to *I. pammeces* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Name refers to the Indian to Indonesian distribution of the species.

Distribution. Species occur from the Indian subcontinent in South Asia, primarily India, Pakistan, and Sri Lanka, through parts of Southeast Asia and Indonesia. One species, *Indotyphlops braminus*, has achieved a cosmopolitan distribution (Wallach 2009), partly due to its parthenogenetic nature (with each individual able to found a new colony) and partly as a result of human activities (transported in the soil of plants and ballast of ships). Speculation of its origin as southern India or Sri Lanka (Wallach 2009) is supported by its relationship with Indian and Sri Lankan taxa (Fig. 1).

Remarks. Includes the former *Typhlops pammeces* (except *T. conradi*; see below) and *T. porrectus/ Ramphotyphlops braminus* species groups (Wallach & Pauwels 2004), though some species may be re-assigned in the future. Diversity in this group is known to be much higher than currently recognized, with numerous newly discovered species in Sri Lanka (Fig. 1; Pyron *et al.* 2013a; M. Wickremasinghe, pers. comm.). Hedges *et al.* (2014) recognized some species that are actually junior synonyms of other valid species (Wallach *et al.* 2014).

These are *Indotyphlops ahsanai* (Khan 1999), a synonym of *I. madgemintonae*; and *I. fletcheri* (Wall 1919) and *I. khoratensis* (Thomas 1962), synonyms of *I. braminus*.

Ramphotyphlops Fitzinger, 1843

Type species. *Typhlops multilineatus* Schlegel, 1839

Species content. ***Ramphotyphlops acuticaudus***, *Ra. adocetus, Ra. angusticeps, Ra. becki, Ra. bipartitus* (?), *Ra. conradi* (?), *Ra. cumingii, Ra. depressus, Ra. exocoeti, Ra. flaviventer, Ra. hatmaliyeb,* ***Ra. lineatus***, *Ra. lorenzi* (?), *Ra. mansuetus* (?), *Ra. marxi* (?), *Ra. multilineatus, Ra. olivaceus, Ra. similis* (?), *Ra. suluensis* (?), *Ra. supranasalis* (?), and *Ra. willeyi.*

Diagnosis. *Ramphotyphlops* can be distinguished from all other typhlopoids by a protrusible hemipenis, retrocloacal sacs, absence of frontorostral, and paired prefrontals. Small- to large-sized (total length 62–480 mm), slender to stout-bodied (length/width ratio 17–95) snakes with 18–30 scale rows (with or without reduction), 209–709 total middorsals, short to long tail (1.2–9.0% total length) with 8–45 subcaudals (length/width ratio 0.8–7.2), and apical spine small. Dorsal and lateral head profiles usually rounded (sometimes pointed in lateral view), narrow to moderate rostral (0.27–0.67 head width), inferior nasal suture in contact with first or second supralabial, preocular in contact with second and third supralabials, eye moderate with distinct pupil or reduced to an eyespot, T-III or T-0 SIP, and postoculars 1–4. Lateral tongue papillae present; left lung absent, tracheal lung multicameral (with 19–52 chambers) or paucicameral (with 11–33 pockets), cardiac lung unicameral, paucicameral (with 3–6 pockets) or multicameral (with 2–12 chambers), and right lung; testes usually unsegmented; hemipenis protrusible (retracted hemipenis with 0–15 coils) with retrocloacal sacs; rectal caecum moderate to large (1.2–5.4% SVL), and rarely absent. Coloration of dorsum brown to dark brown, lighter ventrally (gray, gold or yellow), with either a gradual transition or sharp demarcation between dorsal and ventral color; supralabials, chin, cloacal region and tail tip occasionally light.

Phylogenetic definition. Includes the MRCA of *Ramphotyphlops acuticaudus* and *Ra. lineatus* and all descendants thereof, and all species more closely related to *Ra. multilineatus* than to the type species of the 15 other typhlopid genera listed here.

Etymology. Likely from the Greek for beak *(rhamphos).*

Distribution. Species in this genus have a broad distribution throughout Sundaland and Oceania, including the Philippines, Papua New Guinea, and the Solomon Islands.

Remarks. The following species are only tentatively allocated to *Ramphotyphlops*, as hemipenial data are lacking to confirm their affinities: *Ra. bipartitus, Ra. conradi, Ra. lorenzi, Ra. mansuetus, Ra. marxi, Ra. similis, Ra. suluensis* and *Ra. supranasalis.* Inclusion of these species in a molecular phylogenetic analysis will be desirable to confirm or reject this placement. Note that Hedges *et al.* (2014) did not recognize the apparently valid species *Ramphotyphlops bipartitus* (Wallach *et al.* 2014; Table 1), and synonymized *Cathetorhinus* with *Ramphotyphlops*. As described above, we resurrect *Cathetorhinus* and transfer it to Gerrhopilidae.

Acutotyphlops Wallach, 1995

Type species. *Acutotyphlops kunuaensis* Wallach, 1995

Species content. *Acutotyphlops banaorum, Ac. infralabialis,* ***Ac. kunuaensis***, *Ac. solomonis,* and ***Ac. subocularis***.

Diagnosis. *Acutotyphlops* can be distinguished from all other typhlopoids by its inverted V-shape lower jaw or frontorostral and paired prefrontals shields. Small- to large-sized (total length 101–487 mm), stout- to moderate-bodied (length/width ratio 18–58) snakes with 26–36 scale rows (with reduction), 334–542 total middorsals, short to long tail (1.0–7.7% total length) with 12–30 subcaudals (length/width ratio 1.0–3.3), and apical spine small to thorn-like. Dorsal and lateral head profiles usually pointed (rarely tapered), very narrow rostral (0.10–0.26 head width), inferior nasal suture in contact with first or second supralabial, preocular or subocular in contact with second and third supralabials, eye small, without visible pupil, or reduced to faint eyespot, T-III SIP, and postoculars 3–5. Lateral tongue papillae absent; left lung absent, tracheal, cardiac and right lungs multicameral (with 21–80 + 2–12 + 5–17 chambers, respectively); testes segmented; hemipenis protrusible (retracted organ with 3–9 coils), retrocloacal sacs present; and rectal caecum absent. Coloration usually bicolored with dark brown dorsum and pale yellow or gold venter (with sharp demarcation between them), one species golden orange with numerous, irregular black spots on dorsum.

Phylogenetic definition. Includes the MRCA of *Acutotyphlops kunuaensis* and *Ac. subocularis* and all descendants thereof, and all species more closely related to *Ac. kunuaensis* than to the type species of the 15 other typhlopid genera listed here.

Etymology. From the Latin for pointed *(acutos)*, referring to the rostral.

Distribution. Primarily eastern Papua New Guinea, the Solomon Islands and Louisiade Archipelago, but one species (*Acutotyphlops banaorum*) occurs in the Philippines, ~ 4000 km away.

Remarks. This group apparently contains additional undescribed species (Hedges *et al.* 2014).

Cyclotyphlops in den Bosch & Ineich, 1994

Type species. *Cyclotyphlops deharvengi* in den Bosch & Ineich, 1994

Species content. *Cyclotyphlops deharvengi.*

Diagnosis. *Cyclotyphlops* can be distinguished from all other typhlopoids by its head shields, fragmented in a unique pattern with dorsum of head exhibiting a round frontal surrounded by circular arrangement of scales and lateral head shields divided into 3 rostrals, 4 nasals, 5 preoculars, 3 suboculars, and 3 temporals. Small-sized (total length 146 mm), stout-bodied (length/width ratio 32) snakes with 22 scale rows (with reduction), 299 total middorsals, moderate tail (3.1% total length) with 15 subcaudals (length/width ratio 1.5), and apical spine minute. Dorsal and lateral head profiles rounded, moderate circular rostral (0.48 head width), inferior nasal suture in contact with second supralabial, preocular in contact with second and third supralabials, eye invisible, T-III SIP, and postoculars 3. Left lung absent, tracheal lung multicameral (with 16 chambers), cardiac and right lungs unicameral, and rectal caecum large (3.6% SVL). Coloration of dorsum light brown with golden-brown venter.

Phylogenetic definition. Monotypic as currently defined, but would include all species more closely related to *Cyclotyphlops deharvengi* than to the type species of the 16 other typhlopid genera listed here.

Etymology. Likely from the Greek for round or circular *(cyclos)*, referring to the condition of the frontal and surrounding scales.

Distribution. Sulawesi, Indonesia (Fig. 2).

Remarks. This genus is not included in the molecular phylogeny, but is clearly distinct morphologically, so we continue to recognize it. We suggest that is is allied with the *Anilios* clade based on 22 scale rows and unicameral right lung (Tables 2, 7), but hemipenial and molecular data will be needed to confirm or reject this preliminary hypothesis.

TABLE 7. Visceral character states comparing *Cyclotyphlops (CYC)* with *Ramphotyphlops (RAM)* and *Anilios (ANI),* based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)**-**(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; ratios of two characters listed in **(E)**.

Taxon	*RAM*	*CYC*	*ANI*
Sample size	*n* = 43	*n* = 1	*n* = 92
(A)			
Rectal caecum	2.9	3.6	3.6
Trachea	35.5	34.5	31.6
Tracheal lung	22.8	21.2	21.1
Right lung PT	56	51.8	53.6
Right bronchus	11.9	11.9	8.1
Right bronchus PT	48.6	47.5	40.9

......continued on the next page

TABLE 7. (Continued)

Taxon	*RAM*	*CYC*	*ANI*
Sample size	*n* = 43	*n* = 1	*n* = 92
Trachea + bronchus	47.4	46.4	39.7
(B)			
Heart MP	34.4	33.3	30.6
Right liver MP	52	50.4	47.8
Left liver MP	48.8	48	43.7
Total (left + right) liver MP	50.2	48.9	46.4
Gall bladder MP	69.7	66.5	67.3
Right gonad MP	75.2	82.7	77.9
Left gonad MP	77.9	85.4	82.3
Total (left + right) gonad MP	76.5	84.1	80.1
Right kidney MP	87.6	90.5	90
Left kidney MP	90.4	93.7	92.3
Total (left + right) kidney MP	89	92.1	91.2
Trachea MP	18.9	18.3	17
Right lung MP	46.3	43.7	43.2
Trachea + bronchus MP	24.8	24.3	21
(C)			
Snout-heart INT	36.6	35.6	32.8
Heart-liver GAP	3.2	2.5	2.6
Liver-gall bladder INT	30.6	29.1	32.7
Liver-kidney GAP	21.5	25.5	27.7
Liver-kidney INT	52.5	57.9	58.9
Gall bladder-kidney GAP	15.1	20.9	20
Gall bladder-kidney INT	23.5	30.2	27.7
Gall bladder-gonad GAP	2.9	14	7.2
Gonad-kidney GAP	6.3	1.4	3.8
Kidney-vent INT	14.4	11.9	12
Rectal caecum-vent INT	23.1	10.1	14.2
(D)			
Liver MP-Kidney MP INT	37	41.7	43.4
Heart MP-Gonad MP INT	40.7	49.4	47.3
Heart MP-Kidney MP INT	54.6	58.8	60.6
Trachea MP-Adrenal MP INT	57.7	67.9	63.5
Trachea/bronchus MP-Kidney MP INT	64.1	67.8	70.1
(E)			
Hyoid PT/Snout-heart GAP	0.28	0.44	0.4
Systemic Arches/Heart	0.78	0.31	0.26
Left liver/Right liver	1.04	1.04	0.91
Anterior liver extension/Liver	0.16	0.12	0.12
Kidney overlap/Total kidney length	0.19	0.18	0.27
Rectal caecum/lLeft kidney	0.76	0.77	0.97
Right bronchus/Right lung	0.63	0.73	0.4

TABLE 8. Visceral character states comparing *Anilios ("Sundatyphlops") polygrammicus* with *Anilios (ANI),* based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)-(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**; ratios of two characters listed in **(F)**.

Taxon	*polygrammicus*	*ANIL*
Sample size	*n* = 2	*n* = 92
(A)		
Heart	4.3	4.3
Gall bladder	1.5	1.5
Total (left + right) gonad	9.7	9.1
Trachea	31.5	31.6
Tracheal lung	19.1	21.1
(B)		
Heart MP	30.2	30.6
Total (left + right) liver MP	46.1	46.4
Gall bladder MP	67.7	67.3
Total (left + right) gonad MP	81	80.1
Right kidney MP	89.7	90
Left kidney MP	92.2	92.3
Total (left + right) kidney MP	90.9	91.2
Trachea MP	16.7	17
Tracheal lung MP	18.6	17.9
(C)		
Snout-heart INT	32.4	32.8
Heart-liver GAP	2.7	2.6
Liver-gall bladder GAP	6.6	6.2
Liver-kidney GAP	27.7	27.7
Liver-kidney INT	58.8	58.9
Gall bladder-kidney GAP	19.6	20
Gall bladder-gonad GAP	7.4	7.2
Kidney-vent GAP	6.2	5.8
Kidney-vent INT	12	12
(D)		
Heart MP-Liver MP INT	17.5	17.2
Trachea MP-Liver MP INT	31	30.8
Liver MP-Kidney MP INT	43.2	43.4
Trachea/bronchus MP-Kidney MP INT	45.3	46.2
Heart MP-Kidney MP INT	60.7	60.6
(E)		
Total tracheal rings	301	295
Tracheal rings/10 mm	95.2	94.2
(F)		
Systemic arches/heart	0.22	0.26
Left liver/right liver	0.99	0.91
Right liver MP–Left liver MP/liver	0.06	0.07
Anterior liver extension/liver	0.13	0.12

Anilios Gray, 1845

Type species. *Anilios australis* Gray, 1845

Species content. ***Anilios affinis*, *An. ammodytes*,** *An. aspina*, ***An. australis*,** *An. batillus*, ***An. bicolor*, *An. bituberculatus*,** *An. broomi*, ***An. centralis*,** *An. chamodracaena*, ***An. diversus*, *An. endoterus*,** *An. erycinus*, ***An. ganei*, *An. grypus*, *An. guentheri*, *An. hamatus*, *An. howi*, *An. kimberleyensis*, *An. leptosomus*,** *An. leucoproctus*, ***An. ligatus*, *An. longissimus*,** *An. margaretae*, *An. micrommus*, *An. minimus*, *An. nema*, ***An. nigrescens*,** *An. nigricaudus*, *An. nigroterminatus*, ***An. pilbarensis*, *An. pinguis*, *An. polygrammicus*, *An. proximus*,** *An. robertsi*, ***An. silvia*, *An. splendidus*,** *An. tovelli*, ***An. troglodytes*, *An. unguirostris*, *An. waitii*, *An. wiedii*,** *An. yampiensis*, and *An. yirrikalae.*

Diagnosis. *Anilios* can be distinguished from all other typhlopoids by a protrusible hemipenis, retrocloacal sacs, absence of frontorostral, and paired prefrontals. Small- to large-sized (total length 60–750 mm), stout to slender-bodied (length/width ratio 20–122) snakes with 16–24 scale rows (usually without reduction), 263–750 total middorsals, short to long tail (0.9–7.7% total length) with 8–36 subcaudals (length/width ratio 0.8–4.4), and apical spine small. Dorsal head profile rounded or tapered, lateral head profile rounded to acutely pointed, narrow to broad rostral (0.23–0.75 head width), inferior nasal suture in contact with first or second supralabial or preocular, preocular in contact with second and third supralabials, eye moderate with distinct pupil or reduced to eyespot, T-III SIP, and postoculars 1–4. Lateral tongue papillae present; left lung absent, tracheal lung multicameral (with 18–48 chambers), cardiac lung multicameral (with 1–10 chambers) or paucicameral (with 2–10 pockets) and right lung multicameral (with 1–15 chambers), paucicameral (with 2–13 pockets) or unicameral; testes usually unsegmented; hemipenis protrusible (retracted organ with 0–10 coils), retrocloacal sacs present; and rectal caecum small to large (1.0–7.7% SVL). Coloration usually light brown, brown, reddish-brown, purplish-brown or black above and cream, white or yellow below but some species are pink (pigmentless).

Phylogenetic definition. Includes the MRCA of *Anilios australis* and *An. polygrammicus* and all descendants thereof, and all species more closely related to *An. australis* than to the type species of the 16 other typhlopid genera listed here.

Etymology. Name refers to the fossorial habits of most species, from the Greek for without sun *(an-helios)*.

Distribution. Australia (with several species extending into southern New Guinea).

Remarks. The Australian members of this genus have been previously referred to as *Austrotyphlops* (Wallach 2006), but this name is a junior synonym of *Anilios* (Wallach & Glaw, 2009; Savage & Boundy 2012). Species richness in this group is known to be underestimated by a large amount, based on molecular dataset examining 27 nominal species in *Ramphotyphlops* finding at least 54 potential species (Marin *et al.* 2013). Note that Hedges *et al.* (2014) did not recognize the clearly valid species *An. nigricaudus* (Wallach *et al.* 2014; Table 1). Those authors separated *An. polygrammicus* into a separate, monotypic genus *Sundatyphlops*, forming the sister group of *Anilios*. However, *Sundatyphlops* cannot be unambiguously diagnosed morphologically (Table 2, 8), and this naming scheme does not increase the phylogenetic informativeness of the taxonomy due to monotypy. Thus, we formally propose to synonymize *Sundatyphlops* with *Anilios.* Visceral anatomy does support the conclusion of Hedges *et al.* (2014) that Australo-Papuan populations of *An. "polygrammicus"* are actually a separate species, *An. torresianus* (Table 9).

Typhlopidae *incertae sedis*

The species "*Typhlops*" *longissimus* was described from North America by Duméril & Bibron (1844), but Dixon & Hendricks (1979), Hahn (1980), and McDiarmid *et al.* (1999) all considered it *incertae sedis* with erroneous locality data. The type (MNHN 1061) has been re-examined and shows a possible relationship to *Indotyphlops tenuicollis* of northern India based on scale counts and proportion of head shields (Table 2). We continue to consider it Typhlopidae *incertae sedis*, though it is considered a valid species (Wallach *et al.* 2014). This taxon is also the type species of the genus *Opthalmidion* (Duméril & Bibron, 1844), by subsequent designation of Peters (1881). Thus, if this species is found to be placed in *Indotyphlops* (or any other genus erected after 1844), *Ophthalmidion* will assume priority for that taxon. A number of other species of indeterminate or ambiguous origin have been described in Typhlopidae (see Wallach *et al.* 2014), but we have no further evidence to bear on their status at this time.

TABLE 9. Visceral character states separating *Anilios polygrammicus (An. poly.)* from *Anilios torresianus (An. torr.),* based on measurement of the specimens in Appendix II (part). Characters are as follows: data in sections **(A)-(D)** represent sample means as % SVL; organ lengths (PT = posterior tip) are included in section **(A)**; organ midpoints (MP) are listed in section **(B)**; organ gaps (GAP) and intervals (INT) are compiled in section **(C)**; organ midpoint intervals (MP-MP INT) are included in section **(D)**; meristic values are listed in section **(E)**; ratios of two characters listed in **(F)**.

Taxon	*polygrammicus*	*torresianus*
Sample size	*n* = 2	*n* = 3
(A)		
Right liver	25.4	23.5
Left liver	25.1	23.5
Total (left + right) liver	50.4	47
Right kidney	3.3	4.8
Left kidney	3.3	4.5
Total (left + right) kidney	6.6	9.3
Rectal caecum	2.5	4.9
Trachea	31.5	36
Tracheal lung	19.1	24.3
Right lung	17.4	20.6
Right lung PT	49.8	57.5
Right bronchus	11.6	7.3
(B)		
Heart MP	30.2	34.8
Right liver MP	47.7	50.8
Left liver MP	44.3	48.9
Total (left + right) liver MP	46.1	49.9
Right gonad MP	78.7	76.9
Left gonad MP	83.4	81.4
Total (left + right) gonad MP	81	79.1
Left adrenal MP	86	84.2
Total (left + right) adrenal MP	84.6	82.3
Right kidney MP	89.7	86.4
Left kidney MP	92.2	89.9
Total (left + right) kidney MP	90.9	88.1
Trachea MP	16.7	18.9
Tracheal lung MP	18.6	20.6
Right lung MP	41.1	47.2
(C)		
Snout-heart INT	32.4	36.9
Heart-liver INT	32.3	29.9
Heart-gall bladder GAP	34.6	31.3
Liver-gall bladder INT	33.4	30.7
Liver-kidney GAP	27.7	21.4
Liver-kidney INT	58.8	53
Gall bladder-kidney GAP	19.6	14.2
Gall bladder-kidney INT	26.9	23.9

……continued on the next page

TABLE 9. (Continued)

Taxon	*polygrammicus*	*torresianus*
Sample size	*n* = 2	*n* = 3
Gall bladder-gonad GAP	7.4	4.4
Gonad-kidney GAP	2.7	1
Kidney-vent GAP	6.2	7.9
Kidney-vent INT	12	16
Rectal caecum-vent INT	8.5	13.1
(D)		
Liver MP-Kidney MP INT	43.2	37.3
Right lung MP-Adrenal MP INT	43.5	35.1
Heart MP-Gonad MP INT	48.5	42.1
Heart MP-Kidney MP INT	60.7	53.3
Trachea MP-Adrenal MP INT	67.9	63.4
Trachea/bronchus MP-Kidney MP INT	68.5	65.6
(E)		
Tracheal rings/10 mm	95.2	83.6
(F)		
Rectal caecum/left kidney	0.75	1.13
Right bronchus/right lung	0.66	0.36

Discussion

Typhlopoid classification. Our phylogeny of 95 of the 275 currently recognized species of typhlopoid blindsnakes is fairly well resolved and strongly supported overall (Fig. 1). Most of the species groups also correspond to morphologically and biogeographically distinct clusters of taxa (Vidal *et al.* 2010; Pyron *et al.* 2013b; Hedges *et al.* 2014). Our molecular phylogeny also disagrees with some previous phylogenetic hypotheses based on morphology (e.g., Wallach 1998a).

However, considering these characters with respect to our new phylogeny reveals clear diagnoses for most recently described genera (Hedges *et al.* 2014) after several genera are synonymized (*Antillotyphlops* and *Cubatyphlops* with *Typhlops*, and *Sundatyphlops* with *Anilios*). We also correct an issue of priority, replacing *Asiatyphlops* with *Argyrophis*. After examining the revised diagnoses and names, we re-allocate 58 species. All genera (including those not in the molecular phylogeny) can be diagnosed by unique character states or combinations thereof, and form biogeographically distinct clusters (e.g., South America, West Indies, Africa, Madagascar, South Asia, Southeast Asia, and Australasia; Table 1; Figs. 2, 3). These genera account for nearly all known, extant species. Those species not sampled in the tree (e.g., *"Typhlops" longissimus*) should be a priority for future phylogenetic studies.

Our revision maintains 17 of the 20 previously recognized typhlopoid genera, while resurrecting one genus (*Cathetorhinus*) and erecting another (*Lemuriatyphlops*). This satisfies several conservative criteria for naming new taxa, including priority (under the Code), monophyly, historical stability, and phenotypic diagnosability (Vences *et al.* 2013). There may be an element of 'revision shock' for the classification introduced by Hedges *et al.* (2014) and our update here, with many new generic names introduced with complex synonymies, but this should ultimately subside and provide a robust basis for future revisions and species descriptions (Hedges 2013). Importantly, 16 of 19 genera are placed in at least one molecular phylogeny, either here or by Hedges *et al.* (2014), and most are strongly supported as monophyletic (Fig. 1), and have robust diagnoses based on internal and external morphology (Tables 2, 3).

Biogeographic history. The geographic distribution of typhlopoids supports previous hypotheses of an early Gondwanan origin of typhlopoids (Vidal *et al.* 2010), as most basal lineages are distributed across the southern hemisphere, primarily in South America, Africa, and South Asia (Table 1; Figs. 2, 3). Our phylogeny (which samples more species and loci than any previous study), shows a strongly supported basal division between the species from the New World tropics and the Old World (Fig. 1), in contrast to Hedges *et al.* (2014), who found the New World species nested in the African radiation. There are two interesting biogeographic scenarios implied by our phylogeny and revised classification. First, the placement of *Lemuriatyphlops* in a primarily Palearctic and tropical Asian clade (Fig. 1) implies a more recent, secondary colonization of Madagascar, after *Madatyphlops*. While we named the genus after the fictional lost continent of Lemuria, it would most likely represent an overseas dispersal, rather than a land bridge or vicariant event.

Second, the African species *Typhlops coecatus* and *T. zenkeri* are very similar to the West Indian *Typhlops* radiation (Table 1). These species are not included in the phylogeny, but cannot be diagnosed from *Typhlops* or clearly placed in another (specifically, African) genus based on morphology. As pointed out by Thomas (1989), *T. coecatus* shares two character-states with West-Indian *Typhlops*, having a subtriangular preocular in contact with third supralabial (and *T. zenkeri* shares morphological similarities to *T. coecatus*). If these species were actually allied with the African radiation, this would potentially imply a trans-Atlantic dispersal event between the West Indies and Africa. Such an event is not unprecedented in squamates (Gamble *et al.* 2008) and has been documented in amphisbaenians during the Eocene (Vidal *et al.* 2008). The similar Early Dispersal model of Adalsteinsson *et al.* (2009) from Africa to South America during late Cretaceus (~78Ma) could explain these relationships. These hypotheses can be tested in future studies sampling these species in a temporally calibrated phylogeny with biogeographic reconstructions. Other African species formerly placed in *Typhlops* that are not allied with *Afrotyphlops, Rhinotyphlops,* or *Letheobia* are *Madatyphlops calabresii, Mad. cuneirostris* and *Mad. platyrhynchus,* and *Xerotyphlops etheridgei* (Table 1).

Additional considerations. Three genera (*Cathetorhinus, Cyclotyphlops,* and *Grypotyphlops*) have been diagnosed without inclusion in any molecular phylogenetic analysis (Fig. 1; Hedges *et al.* 2014). To our knowledge, tissue samples are not readily available for these taxa, and they should be a priority for future collection efforts. Their morphological distinctiveness renders it unlikely that they are nested within any of the other genera as defined here. Based on the characters examined, we can make preliminary hypotheses as to the placement of these taxa. The genus *Cyclotyphlops* appears to be allied with the *Ramphotyphlops+Acutotyphlops+Anilios* clade, on the basis of both external and visceral morphology. Examination of the hemipenis will confirm or deny this relationship, as will inclusion in a molecular phylogenetic analysis. The species *Cathetorhinus melanocephalus* exhibits a combination of characters (T-II supralabial imbrication pattern and 18 dorsal scale rows) common in *Gerrhopilus*, but found only in some individuals of one typhlopid species (*Letheobia debilis*). It thus seems to be allied to Gerrhopilidae. This taxon is known only from its holotype; hopefully new material will be discovered in the future. The genus *Grypotyphlops* seems to be allied with the African genus *Letheobia* based on internal anatomy (Wallach 2003).

An additional consideration to guide future taxonomic studies and natural history expeditions is the existence of additional new species in many genera. This includes both numerous recently discovered but undescribed species, such as those in Sri Lanka and Australia (Marin *et al.* 2013; Pyron et al. 2013a), as well as potential cryptic phylogeographic diversity in broadly distributed taxa such as *Xerotyphlops vermicularis* (Kornilios *et al.* 2012). The rate at which newly discovered species are described from tropical regions suggests that the diversity of the genera described here is probably much higher than currently known. Similarly, only a few studies have examined phylogeographic patterns in blindsnakes, but most species are likely to be heavily influenced by phylogeographic barriers due to their small size and low vagility. Given the rarity of many species (often known from a single specimen), blindsnakes are also likely to be under-represented in conservation planning and land usage and management decisions.

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APPENDIX I. GenBank accession numbers for all species included in the molecular phylogeny. Species names are as originally listed on GenBank (previous taxonomy).

Species	12S	16S	cytb	COI	RAG1	AMEL	NT3	BDNF	BMP2	PRLR
Acutotyphlops kunuaensis	--	--	--	--	GU902669	GU902339	GU902590	GU902419	GU902499	--
Acutotyphlops subocularis	--	--	JQ910524	--	GU902668	GU902338	GU902589	GU902418	GU902498	JQ910414
Afrotyphlops angolensis	--	--	--	--	GU902639	GU902312	GU902562	GU902389	GU902469	--
Afrotyphlops bibronii	--	--	--	--	GU902696	GU902370	GU902620	GU902450	GU902528	--
Afrotyphlops congestus	--	--	--	--	GU902694	GU902368	GU902618	GU902448	GU902526	--
Afrotyphlops fornasinii	--	--	--	--	GU902693	GU902367	GU902617	GU902447	--	--
Afrotyphlops lineolatus	--	--	--	--	GU902697	GU902371	GU902621	GU902451	GU902529	--
Afrotyphlops punctatus	HQ113893	--	--	--	GU902645	GU902318	GU902567	GU902395	GU902475	--
Gerrhopilus hedraeus	--	--	--	--	GU902642	GU902315	GU902565	GU902392	GU902472	--
Gerrhopilus mirus	AM236345	AM236345	AM236345	AM236345	GU902644	GU902317	GU902566	GU902394	GU902474	JQ910411
Letheobia episcopus	--	--	--	--	--	KC848446	KC848457	KC848450	--	--
Letheobia feae	--	--	--	--	GU902635	GU902308	GU902558	GU902385	GU902465	--
Letheobia newtoni	--	--	--	--	GU902638	GU902311	GU902561	GU902388	GU902468	--
Letheobia obtusa	--	--	--	--	GU902700	GU902375	GU902625	--	GU902548	--
Letheobia simoni	HQ113894	--	--	--	--	KC848447	KC848459	KC848448	--	JQ045265
Letheobia unitaeniata	--	--	--	--	--	GU902372	--	GU902452	GU902530	--
Liotyphlops albirostris	Z46487	Z46461	AF544672	--	FJ433886	FJ434039	--	FJ433960	EU402705	--
Megatyphlops mucruso	--	--	--	--	GU902637	GU902310	GU902560	GU902387	GU902467	--
Megatyphlops schlegelii	--	--	--	--	GU902695	GU902369	GU902619	GU902449	GU902527	--
Ramphotyphlops acuticaudus	--	--	JQ910543	--	GU902631	GU902304	GU902554	GU902381	GU902461	JQ910412
Ramphotyphlops affinis	--	--	JQ910526	--	--	--	--	--	--	JQ910417
Ramphotyphlops albiceps	--	--	--	--	GU902632	GU902305	GU902555	GU902382	GU902462	--
Ramphotyphlops ammodytes	AY442890	AY442841	JQ910532	--	--	--	--	JQ910310	JQ910208	JQ910418
Ramphotyphlops australis	AY442891	AM236346	JQ910536	AM236346	GU902659	GU902331	GU902580	JQ910311	GU902489	JQ910427
Ramphotyphlops bicolor	AY442900	AY442836	JQ910632	--	GU902660	GU902332	GU902581	JQ910401	JQ910298	JQ910509
Ramphotyphlops bituberculatus	AY442893	AY442831	JQ910541	--	GU902653	GU902325	GU902574	JQ910317	JQ910215	JQ910429
Ramphotyphlops braminus	AF544751	AF544823	AY099990	JQ909572	AY487410	GU902306	GU902556	GU902383	JQ910217	JQ910434
Ramphotyphlops centralis	--	--	JQ910549	--	--	--	--	JQ910403	JQ910299	JQ910521
Ramphotyphlops diversus	--	--	JQ910554	--	GU902661	GU902333	GU902582	GU902411	JQ910225	JQ910436
Ramphotyphlops endoterus	--	--	JQ910560	--	GU902649	--	GU902570	JQ910330	JQ910229	JQ910445
Ramphotyphlops ganei	--	--	JQ910563	--	GU902662	GU902334	GU902583	JQ910332	JQ910232	JQ910449
Ramphotyphlops grypus	AY442898	AY442835	JQ910564	--	GU902663	--	GU902584	GU902413	JQ910293	JQ910450
Ramphotyphlops guentheri	--	--	JQ910579	--	GU902654	GU902326	GU902575	JQ910347	JQ910248	JQ910460
Ramphotyphlops hamatus	AY442894	AY442832	JQ910580	--	GU902651	GU902323	GU902572	JQ910355	JQ910249	JQ910467

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APPENDIX 1. (Continued)

Species	12S	16S	cytb	COI	RAG1	AMEL	NT3	BDNF	BMP2	PRLR
Ramphotyphlops howi	--	--	JQ910587	--	GU902664	GU902335	GU902585	GU902414	JQ910256	JQ910474
Ramphotyphlops kimberleyensis	--	--	JQ910590	--	GU902656	GU902328	GU902577	JQ910357	JQ910257	JQ910475
Ramphotyphlops leptosomus	AY442889	AY442830	JQ910592	--	--	--	--	JQ910394	JQ910264	JQ910479
Ramphotyphlops ligatus	--	--	JQ910600	--	GU902655	GU902327	GU902576	JQ910367	JQ910266	JQ910484
Ramphotyphlops lineatus	--	--	--	--	GU902634	GU902307	GU902557	GU902384	GU902464	--
Ramphotyphlops longissimus	AY442901	AY442838	JQ910525	--	GU902658	GU902330	GU902579	GU902408	GU902488	JQ910416
Ramphotyphlops nigrescens	--	--	JQ910603	--	--	--	--	JQ910376	JQ910276	JQ910488
Ramphotyphlops pilbarensis	AY442896	AY442834	JQ910611	--	GU902650	GU902322	GU902571	JQ910397	JQ910294	JQ910498
Ramphotyphlops pinguis	--	--	JQ910627	--	GU902665	GU902336	GU902586	GU902415	GU902495	JQ910520
Ramphotyphlops polygrammicus	--	--	JQ910612	--	GU902671	GU902341	GU902591	GU902421	GU902501	JQ910408
Ramphotyphlops proximus	--	--	JQ910630	--	--	--	--	JQ910398	JQ910295	JQ910516
Ramphotyphlops silvia	--	--	--	--	--	--	--	JQ910382	JQ910283	JQ910501
Ramphotyphlops splendidus	--	--	--	--	GU902666	GU902337	GU902587	GU902416	GU902496	--
Ramphotyphlops troglodytes	--	--	JQ910614	--	GU902667	--	GU902588	JQ910383	JQ910284	JQ910466
Ramphotyphlops unguirostris	AY442902	AY442837	JQ910615	--	GU902657	GU902329	GU902578	JQ910385	JQ910287	JQ910502
Ramphotyphlops waitii	AY442892	AY442840	JQ910620	--	GU902652	GU902324	GU902573	JQ910405	JQ910290	JQ910507
Ramphotyphlops wiedii	--	--	JQ910631	--	--	--	--	JQ910400	JQ910291	JQ910518
Rena humilis	AB079597	AB079597	AB079597	AB079597	EU402851	--	--	EU402648	EU402703	--
Rhinotyphlops lalandei	--	--	--	--	GU902636	GU902309	GU902559	GU902386	GU902466	--
Typhlopidae sp. (Sri Lanka)	KC347337	KC347375	KC347488	--	KC347450	--	--	--	--	--
Typhlops agoralionis	--	--	--	--	GU902672	GU902342	GU902592	GU902422	GU902502	--
Typhlops anchaurus	--	--	--	--	GU902673	GU902343	GU902593	GU902423	GU902503	--
Typhlops andasibensis	--	--	--	JQ909605	JQ073249	GU902373	GU902622	GU902453	GU902545	--
Typhlops anousius	--	--	--	--	GU902691	GU902365	GU902615	GU902445	GU902524	--
Typhlops arator	--	--	JQ910546	--	GU902674	GU902344	GU902594	GU902424	GU902504	JQ910406
Typhlops arenarius	--	--	--	JQ909606	GU902699	GU902374	GU902624	GU902455	GU902547	--
Typhlops biminiensis	AF366743	AF366812	--	--	--	--	--	--	--	--
Typhlops brongersmianus	--	--	--	--	GU902640	GU902313	GU902563	GU902390	GU902470	--
Typhlops capitulatus	AF366701	AF366770	--	--	GU902675	GU902345	GU902595	GU902425	GU902505	--
Typhlops catapontus	--	--	--	--	GU902676	GU902346	GU902596	GU902426	GU902506	--
Typhlops caymanensis	--	--	--	--	GU902677	GU902347	GU902597	GU902427	GU902507	--
Typhlops contorhinus	--	--	--	--	GU902692	GU902366	GU902616	GU902446	GU902525	--
Typhlops dominicanus	AF366725	AF366794	--	--	--	GU902348	GU902598	GU902428	GU902508	--
Typhlops elegans	--	--	--	--	GU902641	GU902314	GU902564	GU902391	GU902471	--
Typhlops eperopeus	--	--	--	--	GU902690	GU902364	GU902614	GU902444	GU902523	--

……*continued on the next page*

APPENDIX 1. (Continued)

Species	12S	16S	cytb	COI	RAG1	AMEL	NT3	BDNF	BMP2	PRLR
Typhlops geotomus	AF366723	AF366792	--	--	--	GU902349	GU902599	GU902429	GU902509	--
Typhlops granti	AF366713	AF366782	--	--	GU902678	GU902350	GU902600	GU902430	GU902510	--
Typhlops guadeloupensis	AF366724	AF366793	--	--	--	--	--	--	--	--
Typhlops hectus	AF366732	AF366795	--	--	--	--	--	--	--	--
Typhlops hypomethes	AF366717	AF366786	--	--	GU902679	GU902351	GU902601	GU902431	GU902511	--
Typhlops jamaicensis	AF366695	AF366764	JQ910545	--	AY487387	GU902352	GU902602	EU402664	GU902512	JN880887
Typhlops lumbricalis	AF544759	AF366769	--	--	GU902680	GU902353	GU902603	FJ433958	GU902513	--
Typhlops luzonensis	AF366694	AF366763	--	--	GU902643	GU902316	--	GU902393	GU902473	--
Typhlops microcephalus	--	--	--	JQ909607	--	--	--	--	--	--
Typhlops monastus	AF366719	AF366787	--	--	--	GU902354	GU902604	GU902434	GU902514	--
Typhlops naugus	--	--	--	--	GU902681	GU902355	GU902605	GU902435	GU902515	--
Typhlops notorachius	--	--	--	--	GU902682	GU902356	GU902606	GU902436	GU902516	--
Typhlops pammeces	--	--	--	--	GU902703	GU902378	GU902628	GU902458	GU902551	--
Typhlops platycephalus	AF366714	AF366783	AY099992	--	GU902683	GU902357	GU902607	GU902437	GU902517	--
Typhlops pusillus	AF366756	AF366819	--	--	--	--	--	--	--	--
Typhlops rajeryi	--	--	--	JQ909608	--	--	--	--	--	--
Typhlops reticulatus	EU747730	EU747730	EU747730	EU747730	GU902646	GU902319	GU902568	GU902396	GU902476	--
Typhlops richardii	AF366715	AF366784	--	--	GU902684	GU902358	GU902608	GU902438	GU902518	--
Typhlops rostellatus	AF366708	AF366777	--	--	GU902685	GU902359	GU902609	GU902439	--	--
Typhlops ruber	AF512728	AF512728	--	--	--	--	--	--	--	--
Typhlops schwartzi	AF366710	AF366779	--	--	GU902686	GU902360	GU902610	GU902440	GU902519	--
Typhlops socotranus	--	--	--	--	--	KC848444	KC848455	KC848452	--	--
Typhlops sulcatus	AF366702	AF366771	--	--	GU902687	GU902361	GU902611	GU902441	GU902520	--
Typhlops sylleptor	--	--	--	--	GU902688	GU902362	GU902612	GU902442	GU902521	--
Typhlops syntherus	AF366705	AF366772	--	--	GU902689	GU902363	GU902613	GU902443	GU902522	--
Typhlops titanops	AF366709	AF366778	--	--	--	--	--	--	--	--
Typhlops vermicularis	JQ045185	--	JQ910544	--	GU902647	GU902320	GU902569	GU902397	GU902477	JQ045263
Xenotyphlops grandidieri	--	--	JQ910547	JQ909623	JQ073250	GU902377	GU902627	GU902457	GU902550	--

APPENDIX II . Specimens examined.

Institutional numbers for 778 typhlopoid voucher specimens from 194 species, dissected for visceral topology (Table 3). Taxonomy is updated to the revision presented here.

Gerrophilidae

Gerrhopilus ater (FMNH 142108, MCZ 33505, ZMA 17737); *Gerrhopilus beddomii* (FMNH 217694, MCZ 3913, MCZ 3929, MCZ 175867); *Gerrhopilus bisubocularis* (USNM 43455); *Gerrhopilus depressiceps* (MCZ 145954); *Gerrhopilus floweri* (MCZ 181198, NMBA 328); *Gerrhopilus fredparkeri* (MCZ 142651); *Gerrhopilus hedraeus* (MCZ 17578, USNM 229285, USNM 498958); *Gerrhopilus inornatus* (MCZ 140724, MCZ 140728, MCZ 175100); *Gerrhopilus mcdowelli* (PNGM 24604, UPNG 5978); *Gerrhopilus mirus* (MCZ 18377, MCZ 18378, FMNH 123533, FMNH 123534)

Xenotyphlopidae

Xenotyphlops grandidieri (MNHN 1905.272, MRSN 3208)

Typhlopidae

Acutotyphlops infralabialis (MCZ 65991); *Acutotyphlops kunuaensis* (MCZ 66012, MCZ 66013, MCZ 72108, MCZ 72132, MCZ 76206, MCZ 76682, MCZ 76683, MCZ 76684, MCZ 76685, MCZ 76686, MCZ 76687, MCZ 76690, MCZ 76691, MCZ 76692, MCZ 76693, MCZ 76694, MCZ 76695, MCZ 76697, MCZ 76699, MCZ 76705, MCZ 76707, MCZ 76708, MCZ 76710, MCZ 76712, MCZ 76718, MCZ 76720, MCZ 76722, MCZ 76723, MCZ 76724, MCZ 76726, MCZ 76926, MCZ 76926, MCZ 76930, MCZ 76959, MCZ 76960, MCZ 76961, MCZ 76967, MCZ 76969, MCZ 76971, MCZ 76980, MCZ 76990, MCZ 77000, MCZ 77001, MCZ 77005, MCZ 77007, MCZ 77016, MCZ 77021, MCZ 124473); *Acutotyphlops solomonis* (MCZ 65996, MCZ 145955, MCZ 175090, MCZ 175099); *Acutotyphlops subocularis* (MCZ 175091, NMBA 11706, NMBA 11710); *Afrotyphlops angolensis* (IRSAC uncat. [9 specimens], MCZ 57454, MCZ 170384, MCZ 170385, MZUSP 8165, ZMUC 96061); *Afrotyphlops anomalus* (MCZ 25870); *Afrotyphlops bibronii* (FMNH 224414, MCZ 21438, TM 33718, TM 68956, TM 69018, TM 71072, TM 75744, TM 75745); *Afrotyphlops blanfordii* (ZSM 1001920, ZSM 1001920, MCZ 84329); *Afrotyphlops brevis* (CAS 147886, MCZ 51296, FMNH 58313, FMNH 62350, FMNH 62351, FMNH 62352); *Afrotyphlops congestus* (CAS 16954, MNHG 1453.13, MNHG 1453.14, BMNH 1980.31, IRSAC uncat. [7 specimens]); *Afrotyphlops decorosus* (MCZ 14996); *Afrotyphlops elegans* (CAS 219176, CAS 219221, MCZ 25871, UMMZ 187897); *Afrotyphlops fornasinii* (MCZ 41947, PEM 12119, PEM 12120, PEM 12121, PEM 12123, PEM 12173, PEM 12176, PEM 12177, PEM 12177, PEM 12177, TM 4836, TM 46001, TM 46022); *Afrotyphlops gierrai* (MCZ 23088, MCZ 23089, ZMUC 52191); *Afrotyphlops liberiensis* (CAS 147663); *Afrotyphlops lineolatus* (ANSP 20500, BMNH 1980.29, BMNH 1980.3, MCZ 84331, CAS 148005, ZFMK 26061, BMNH 1976.2294); *Afrotyphlops mucruso* (MCZ 12626, MCZ 52549, MCZ 52551, MCZ 52554, MCZ 52555, MCZ 52556, MCZ 52557, MCZ 52558, MCZ 52559, MCZ 52560, MCZ 52562, MCZ 52565, MCZ 52568, MCZ 52569, MCZ 52572, MCZ 52575, MCZ 52578, MCZ 52579, MCZ 52584, MCZ 52587, MCZ 52594, MCZ 52595, MCZ 52609, MCZ 52612, MCZ 52613, MCZ 52614, MCZ 52616, MCZ 52617, MCZ 52618, MCZ 52619, MCZ 52620, MCZ 52621, MCZ 52622, MCZ 44457, SDSU uncat.); *Afrotyphlops nanus* (BMNH 1897.1117, BMNH 1897.1117); *Afrotyphlops nigrocandidus* (MCZ 23084, NMZB 9914); *Afrotyphlops obtusus* (UM 20614, FMNH 203728, NMZB-UM 23667, UM 32924, UM 33681); *Afrotyphlops punctatus* (FMNH 212323, CAS 125541, CAS 136316, FMNH 58314, BMNH 1933.981); *Afrotyphlops rondoensis* (MCZ 48067, MCZ 57184, MCZ 57185); *Afrotyphlops schlegelii* (NMZB-UM 18090, NMZB-UM 24164, FMNH 190714, FMNH 200283, NMZB uncat. [2 specimens], FMNH 224413, TM 4903, TM 13832, TM 13950, TM 80530, TM 80551); *Afrotyphlops schmidti* (MCZ 57462, MCZ 55479, NMZB 10692, NMZB-UM 9445, NMZB-UM 10530, NMZB-UM 10650); *Afrotyphlops steinhausi* (FMNH 4034, ZMB 30686); *Afrotyphlops tanganicanus* (FMNH 81011); *Afrotyphlops usambaricus* (UDSM 1271); *Afrotyphlops sp. nov.* (BMNH 1933.9.8.1, CAS 16099); *Anilios affinis* (FMNH 97878, FMNH 97880, MCZ 35020, QM 11631, QM 46706); *Anilios australis* (BYU 38834, FMNH 97876, SAM 39175, SAM 40981, SAM 41666, SAM 42472, WAM 36567, WAM 49164); *Anilios bituberculatus* (CAS 74317, NMV 12160, NMV 12723, NMV 61739, NMV 66876, SAM 12796, SAM 29513, SAM 38082, SAM 38362, SAM 42321); *Anilios broomi* (AM 128848, MCZ 175104, QM 20315); *Anilios centralis* (NTM 5459, NTM 14316, SAM 40480); *Anilios chamodracaena* (MCZ 175101, QM 31963); *Anilios diversus* (WAM 54027, WAM 75828); *Anilios endoterus* (SAM 18868, SAM 26647, SAM 38481, SAM 39746); *Anilios erycinus* (MCZ 49396, MCZ 49619); *Anilios grypus* (MCZ 35019, QM 27510, QM 39487); *Anilios guentheri* (MCZ 48843, NMV 10777, WAM 26635, WAM 70361); *Anilios hamatus* (WAM 66323, WAM 69242); *Anilios leptosomus* (MCZ 32809); *Anilios ligatus* (CAS 135108); *Anilios minimus* (AM 40918); *Anilios nema* (NTM 16047); *Anilios nigrescens* (CAS 84090, MCZ 129883, NMV 55375, NMV 60871, SDSU uncat.); *Anilios nigroterminatus* (MCZ 67926, WAM 44820, WAM 47784); *Anilios pilbarensis* (WAM 10897, WAM 83772); *Anilios pinguis* (MCZ 32813, NMV 7173); *Anilios polygrammicus* (FMNH 97892, FMNH 154852, MCZ 25289, MCZ 74162, MCZ 135506); *Anilios proximus* (CAS 84075, NMV 61647, NMV 61667, NMV 64910, ZMUC 52175); *Anilios silvia* (QM 27386); *Anilios tovelli* (MCZ 48845); *Anilios unguirostris* (FMNH 97884, FMNH 97885, NMV 4515, QM 29747); *Anilios waitii* (NMV 7196, WAM 89295, WAM 104279); *Anilios wiedii* (CAS 84079, CAS 84086, FMNH 73853, FMNH 97882, FMNH 97883, MCZ 10224, QM 23329, QM 36914, QM 43373); *Xerotyphlops etheridgei* (MHNG 1326.62); *Xerotyphlops vermicularis* (FMNH 74392, FMNH 233386, CAS 185206, CAS 185210, CAS 185218, CAS 185220, CAS 185225); *Amerotyphlops brongersmianus* (FMNH 35590, FMNH 35591, FMNH 161601, FMNH 195928); *Amerotyphlops costaricensis* (SMF 78875); *Amerotyphlops lehneri*

(MCZ 48923, MCZ 48924, MCZ 48925); *Amerotyphlops microstomus* (CM 45287, FMNH 26975, FMNH 26976, FMNH 36346); *Amerotyphlops minuisquamus* (TCWC 42791); *Amerotyphlops reticulatus* (MCZ 48962, FMNH 165551, FMNH 5699, FMNH 11174, RMNH 3725); *Amerotyphlops tenuis* (FMNH 70687, FMNH 105181, FMNH 105182); *Amerotyphlops trinitatus* (MCZ 55670); *Amerotyphlops yonenagae* (MZUSP 10541); *Argryophis diardii* (CAS 13982, MCZ 2284, FMNH 180008, FMNH 252064); *Argryophis muelleri* (FMNH 161275, FMNH 180023, TNRC 3788, TNRC 7336, TNRC 7337, TNRC uncat. [3 specimens], FMNH 252063); *Argryophis roxaneae* (MCZ 177982); *Argryophis siamensis* (MCZ 16655, TCWC 29356); *Cyclotyphlops deharvengi* (MNHN 1990.4279); *Grypotyphlops acutus* (CAS 12515, FMNH 8651, UF 19900); *Indotyphlops albiceps* (SLS 196, MCZ 177983, MCZ 181196, ZMUC 52204); *Indotyphlops braminus* (MCZ 172796, MCZ 175924, CAS 94443, FMNH 18283, UMMZ -44297, UMMZ -41400, UMMZ -41279, FMNH 53251, UMMZ 167976, UMMZ 167977, FMNH 189933, MCZ 182607, MCZ 182609, MCZ uncat., AHS 1614); *Indotyphlops exiguus* (ZMB 50030); *Indotyphlops jerdoni* (ZMUC 52121); *Indotyphlops lankaensis* (FMNH 100134); *Indotyphlops lazelli* (MCZ 173290, MCZ 183578); *Indotyphlops malcolmi* (ZMH 3967); *Indotyphlops meszoelyi* (FMNH 191888, FMNH 191889); *Indotyphlops ozakiae* (ZMUC 52174, FMNH 180003, FMNH 180004, FMNH 180005, FMNH 180006, FMNH 180007); *Indotyphlops pammeces* (CM 90600, MCZ 5229); *Indotyphlops porrectus* (MCZ 3702, FMNH 60645, MCZ 4082, MCZ 165023, MCZ 165024, UMMZ 123429); *Indotyphlops schmutzi* (UF 29452, UF 29528); *Indotyphlops tenebrarum* (FMNH 120237, FMNH 167012); *Indotyphlops violaceus* (FMNH 124231); *Lemuriatyphlops albanalis* (NHRM 3351); *Lemuriatyphlops domerguei* (UMMZ 197249); *Lemuriatyphlops microcephalus* (MRSN uncat., UMMZ 209701, UMMZ 209703, UMMZ 209705, UMMZ 209712); *Letheobia acutirostrata* (BMNH 1980.28, CM 90395, FMNH 212324, IRSAC uncat. [2 specimens], MCZ 13600, MZUF 32387, USNM 515944); *Letheobia caeca* (MNHN 1992.4621, ZMB 6320, ZMH 1485); *Letheobia crossii* (BYU 18075, FMNH 25055, MCZ 49012, PEM 4901); *Letheobia debilis* (MNHN 1991.378); *Letheobia episcopus* (ZSM uncat. [4 specimens]); *Letheobia erythraea* (NMW 16949); *Letheobia feae* (CAS 218907, CAS 219310, CAS 219335, CAS 219337, ZMUC 527); *Letheobia gracilis* (IRSNB 15391, MCZ 42896, CM 90396, MCZ 54051, MCZ uncat. [2 specimens], MCZ 54052, MCZ 54054); *Letheobia graueri* (MCZ 30034, MCZ 48052, MCZ 48053, MCZ 48054, MCZ 54812, ZFMK 63138); *Letheobia jubana* (CAS 209, CAS 72231, CAS 151201, MZUF 27181, MZUF 27182); *Letheobia kibarae* (IRSNB 2198, IRSNB 2199, IRSNB 2200, IRSNB 2202, MCZ 54379); *Letheobia largeni* (BMNH 1974.5162); *Letheobia leucosticta* (MNHG 722.93); *Letheobia lumbriciformis* (MCZ 48045, MCZ 48047, MCZ 46115); *Letheobia newtoni* (CAS 218908, UMMZ 187932); *Letheobia pallida* (BMNH 1950.1534, MCZ 5723); *Letheobia pauwelsi* (IRSNB 806); *Letheobia pembana* (SMF 16688); *Letheobia praeocularis* (FMNH 75088, USNM 167001, ZMUC 52197); *Letheobia rufescens* (MNHN 1995.9606); *Letheobia simoni* (FMNH 69219, USNM 336231, MCZ 22083); *Letheobia somalica* (MCZ 126236, ANSP 4692, ANSP 4693); *Letheobia stejnegeri* (BMNH 1980.32); *Letheobia sudanensis* (AMNH 11678, AMNH 11680, AMNH 11682, IRSNB 11515, IRSNB 11516, IRSNB 11517, IRSNB 11520, MCZ 13599); *Letheobia swahilica* (MCZ 40076, ZMB 25866); *Letheobia toritensis* (FMNH 62344, FMNH 62345, FMNH 62346, MCZ 53324, MCZ 53332); *Letheobia uluguruensis* (MCZ 23081); *Letheobia wittei* (IRSNB 2512); *Letheobia sp. nov.* (PEM 4643); *Madatyphlops andasibensis* (FN 6296, ZFMK 59787, ZSM 2287); *Madatyphlops arenarius* (MNHN 1933.83, UMMZ 220621); *Madatyphlops boettgeri* (FMNH 73112, FMNH 73114, FMNH 73115, MNHN 1901.177, UMMZ 192031, UMMZ 192032, UMMZ 197245, UMMZ 220622); *Madatyphlops calabresii* (MCZ 51294, MCZ 51295); *Madatyphlops comorensis* (BMNH 1946.1119, MNHN 1889.25, MNHN 1902.391); *Madatyphlops cuneirostris* (CAS 131682, CAS 131687, MCZ 74451, MCZ 74452, MCZ 74464, MZUF 5793, MZUF 6891, MZUF 6910, MZUF 6911, MZUF 6918); *Madatyphlops decorsei* (MNHN 1950.21, UADBA 8368, UMMZ 220669); *Madatyphlops mucronatus* (MCZ 33504, UMMZ 209718, UMMZ 209719, ZMB 9877, ZMH 3970, ZMH 3972); *Madatyphlops ocularis* (UMMZ 197250, UMMZ 209717); *Madatyphlops platyrhynchus* (MCZ 39798); *Madatyphlops rajeryi* (FN 7665, FN 7665, UMMZ 192037, UMMZ 202049); *Madatyphlops sp. nov.* (MRSN 1799, UMMZ 220671, UMMZ 209728–30, CAS 66188, UMMZ 222399, UADBA 8367, CAS 142915); *Malayotyphlops castanotus* (CAS 27942, CAS 127973, MCZ 25594); *Malayotyphlops collaris* (UF 54186, UF 68443); *Malayotyphlops koekkoeki* (FMNH 71579); *Malayotyphlops kraalii* (ZMA 14225); *Malayotyphlops ruber* (CAS 182566, FMNH 53223, MCZ 79698); *Malayotyphlops ruficaudus* (CAS 19517, CAS 21066, CAS 26815, CAS 135667, UF 54652); *Malayotyphlops sp. nov.* (FMNH 259604, FMNH 262249); *Ramphotyphlops acuticaudus* (CAS 19079, CAS 19080, FMNH 42453, SDSNH 68437); *Ramphotyphlops angusticeps* (FMNH 41968, FMNH 41354, ZMUC 52220); *Ramphotyphlops becki* (MCZ 110252, MCZ 110256, MCZ 110258); *Ramphotyphlops cumingii* (CAS 25483, CAS 169878, FMNH 41092, FMNH 53221); *Ramphotyphlops depressus* (MCZ 90994, MCZ 90998, MCZ 92508, MCZ 140722, MCZ 153106, MCZ 153107, ZMH 4167); *Ramphotyphlops exocoeti* (NRM 30222A, NRM 30222B, CAS 16867, MCZ 28643); *Ramphotyphlops flaviventer* (BPBM 3127, FMNH 42352, FMNH 73846, MCZ 7571, MCZ 171562, MCZ 171563, USNM 216003); *Ramphotyphlops lineatus* (FMNH 131235, RMNH 5788, FMNH 158645, FMNH 197951); *Ramphotyphlops mansuetus* (MCZ 92527); *Ramphotyphlops marxi* (FMNH 96520); *Ramphotyphlops multilineatus* (ZMA 17765, BSFS 11672); *Ramphotyphlops olivaceus* (FMNH 131588, MCZ 45757); *Ramphotyphlops willeyi* (NHMB 7088); *Rhinotyphlops ataeniatus* (CAS 44, CAS 110, CAS 218, CAS 72234, CAS 151200, CAS uncat., MZUF 27172); *Rhinotyphlops boylei* (NMZB 15184); *Rhinotyphlops lalandei* (CAS 160747, MCZ 29418, MCZ 43020, PEM 8227); *Rhinotyphlops schinzi* (FMNH 187111, FMNH 233343, TM 48347, TM 48928); *Rhinotyphlops scorteccii* (MCZ 74456, MCZ 74458, MZUF 21977, MZUF 29695); *Rhinotyphlops unitaeniatus* (MCZ 18175, MCZ 40080, ZMB 21154, ZMB 21154, ZMB 29080, CAS 217, CAS 72122, CAS 151202, MZUF 27167); *Typhlops biminiensis* (KU 269656, KU 269657, MCZ 68944); *Typhlops capitulatus* (KU 269674, KU 269675, MCZ 121901); *Typhlops catapontus* (KU 269705, MCZ 182039); *Typhlops caymanensis* (KU 269714, MCZ 79177); *Typhlops coecatus* (MCZ 55381); *Typhlops dominicanus* (KU 269715, MCZ 57815, MCZ 10694); *Typhlops epactius* (KU 269726); *Typhlops eperopeus* (MZUF uncat.); *Typhlops geotomus*

(MCZ 12641, USNM 236411); *Typhlops gonavensis* (KU 269773, KU 269774, KU 269775); *Typhlops granti* (KU 269780, MCZ 38301); *Typhlops hectus* (KU 288580, MCZ 167775, VW uncat., KU 288542, KU 288544, KU 288553); *Typhlops hypomethes* (KU 269851, KU 269852, MCZ 78762); *Typhlops jamaicensis* (KU 269898, KU 269900, KU 269917, MCZ 7372, MCZ 26669, MCZ 127852, USNM 252320); *Typhlops lumbricalis* (KU 288502); *Typhlops monastus* (KU 274089, KU 274094); *Typhlops monensis* (MCZ 38307, MCZ 38308); *Typhlops pachyrhinus* (FMNH 22854); *Typhlops platycephalus* (KU 273816, KU 273817, MCZ 38333); *Typhlops pusillus* (KU 272805, KU 272806, KU 272807, KU 272808, KU 272809, KU 272810, KU 272811, KU 288567, KU 288568, KU 288569, MCZ 176367, MCZ 123716); *Typhlops richardii* (MCZ 176827, MCZ 166983, MZUF uncat. [2 specimens]); *Typhlops rostellatus* (MCZ 38357, MCZ 38362, MCZ 165036); *Typhlops schwartzi* (KU 273850, KU 273852); *Typhlops* cf. *lumbricalis* (CAS 71689, MCZ 10824, MCZ 10826, MCZ 10828, MCZ 10829, MCZ 10831, MCZ 10832, MCZ 18116, MCZ 19924, MCZ 21826, MCZ 22279, MCZ 22280, MCZ 22283, MCZ 22284, MCZ 22285, MCZ 22676, MCZ 22678, MCZ 32607, MCZ 32613, MCZ 32615, MCZ 32616, MCZ 32619, MCZ 32620, MCZ 32621, MCZ 32624, MCZ 32626, MCZ 32627, MCZ 32628, MCZ 32629, MCZ 32631, MCZ 32637, MCZ 84953, MCZ 84954, MCZ 84957, MCZ 84959); *Typhlops sulcatus* (KU 273920, KU 273936, KU 273937, MCZ 121897); *Typhlops syntherus* (CM 39610, KU 274048, KU 274049, KU 274050, TCWC 51296); *Typhlops tasymicris* (MVZ 84060); *Typhlops tetrathyreus* (KU 208798, KU 208799, KU 208800, MCZ 81150); *Typhlops titanops* (MCZ 68571); *Typhlops zenkeri* (MCZ 13242)