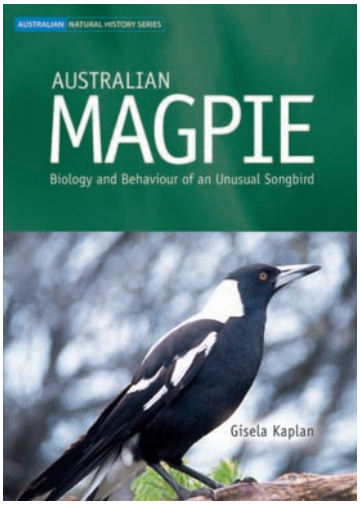

Australian Magpie

Biology and Behaviour of an Unusual Songbird

Gisela Kaplan

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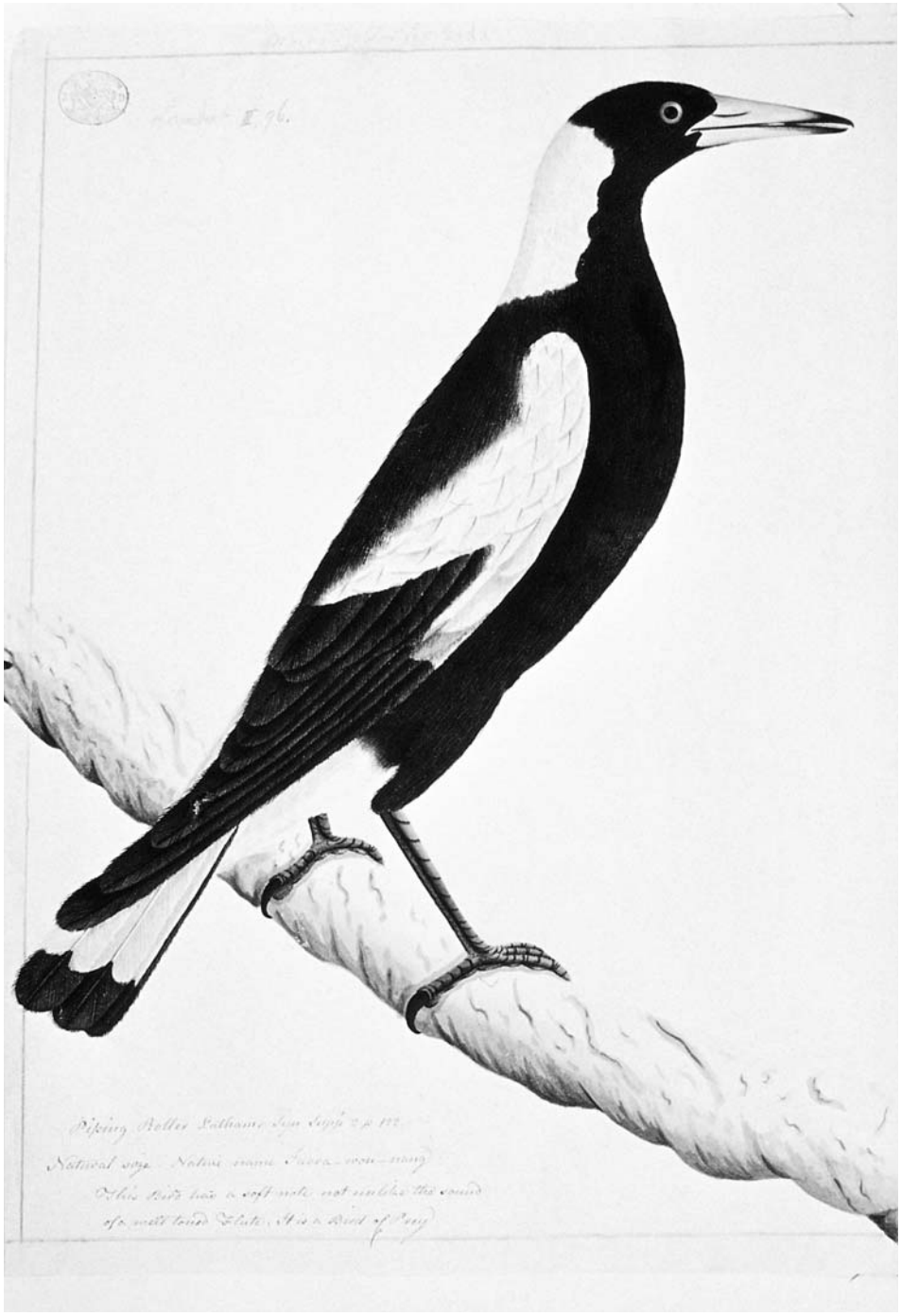
1
Origin and classification

We know that true songbirds generally began to evolve during the late Oligocene epoch (35 million years ago) and radiated during the Miocene epoch that followed. However, some evidence now suggests that the first songbirds evolved in the southern hemisphere even earlier than this—around 50 million years ago—and migrated later to the northern hemisphere.[1] Fossil bones found in south-eastern Queensland have been identified by Walter Boles of the Australian Museum as those of a songbird. These bones have been dated to be 54 million years old and this discovery represents the world's oldest songbird known so far.[2] The oldest avian fossil in Australia is 110 million years old and feather deposits in southern Victoria show that ancient birds were present in the Cretaceous period. It has been suggested that the mass extinction at the end of the Cretaceous period around 65 million years ago that wiped out dinosaurs may not have affected the landmass that was to become Australia and that some avian lineages may have been maintained. It seems entirely possible, therefore, that songbirds arose in the landmass of Australia, rather than being migrants from the northern hemisphere.

DNA hybridisation studies[3] have shown clearly that many Australian bird species (the honeyeaters in particular), previously thought to be relatives of Eurasian species, are originals and that their relatives in the northern hemisphere may have derived from them. Other species did migrate from the north



Source: Natural History Museum, London

Figure 1.1 Possibly the earliest painting of the Australian Magpie, this watercolour was done in 1788–1792 by the 'Port Jackon Painter'. The artist called the bird the 'Piping Roller' and described it as a 'Bird of Prey'.

but at a much later time. According to Walter Boles, the Corvoidea, to which magpies belong, also originated in Australia, where they radiated in the Tertiary period and much later dispersed to the northern hemisphere, as the Australian landmass drifted northwards.[4]

No doubt, new findings may alter theories of evolution of songbirds in Australia again but it seems very unlikely that the families now identified as Australian original birds will have been on this continent for less than 35 million years. The family of artamids, to which the Australian magpie belongs, derives from an ancient stock. Australia is the magpie's very longstanding home.

When European settlers and scientists first arrived in Australia, they attempted to fit the species they found into the European classifications. Even the vernacular names of Australian birds generally reflected European origins. The magpie is no exception. The black-billed magpie of Europe is black and white and so the Australian magpie was named in accordance with the familiar. A good deal of mythology and guesswork often caused confusion. A charming example comes from possibly the earliest European painting of a magpie (Figure 1.1), produced by Thomas Watling, who belonged to the group of painters called, in the singular, 'Port Jackson Painter' and these are dated 1788–1792. The painting, now held at the Natural History Museum in London, names the bird as a 'Piping Roller' as is inscribed: 'This bird has a soft note not unlike the sound of a well tuned flute. It is a Bird of Prey'. We know differently today.

Originally, the taxonomy of Australian birds encountered difficulties for a number of reasons. Similarities with European birds, either by appearance or feeding habits, could be more misleading than helpful in placing a native Australian bird within a group or family. Then, increasingly, there were prevailing 19th century attitudes that considered Australian fauna derivative or inferior. But the problems arose also within taxonomy itself.

First, it was not just a matter of satisfying an existing system of (northern hemisphere) classifications, but also of persistent claims or implied assumptions that birds arrived late in Australia. Birds were presumed to have originated in the northern hemisphere and then dispersed as far a field as Australia. Interest was particularly centred on passerines, the perching birds and, within this group, on the so-called true songbirds, the oscines, to which the magpie belongs.

Second, main family groups within passerines were based merely on form and appearance and European species were taken as a benchmark to argue each case in point.

Third, behavioural data and physiology were latecomers in the taxonomical task and therefore important evidence helpful for classification might have been ignored.

However, the science of taxonomy has developed rapidly over recent years because many more (and more precise) scientific tests can be applied today than, say, 100 years ago. The technique of DNA hybridisation revolutionised bird taxonomy in the 1980s and gave increased certainty in establishing relatedness. Further data, derived from proteins (protein electrophoresis), bones (osteological data) and immunology together also helped to clarify taxonomical hierarchy. Techniques such as mitochondrial DNA sequencing have become even more sophisticated since the 1980s so that accuracy in these studies is being improved all the time.

The taxonomy of Australian birds is in a state of flux—species and subspecies are still being identified to this day. While this work, at times, may seem distant and abstract to the uninitiated, it has vast implications for the management of species alive today. It may mean, for example, that a species, suddenly declared to fall into several subspecies, is numerically subdivided and may reveal that one of its subspecies is critically underrepresented and thus endangered, an important consideration for conservation management plans.

To which family do magpies belong?

Magpies have been considered an interesting group within these very large and complex taxonomical and evolutionary discussions. One issue is the question of relatedness—to which family does it belong?

Leach's anatomical study, published in 1914 in the ornithology journal *Emu*, posed that magpies, butcherbirds and currawongs belong into one family, Cracticidae. Indeed, some writers regard the magpie as the largest butcherbird (*Cracticus*), rather than as a separate genus (*Gymnorhina*) set apart from the butcherbird. However, at the turn of the 21st century magpies have emerged as Artamidae because woodswallows (Artamids) have been lumped together with the group of Cracticids. Although Artamids had once been considered divergent from the cracticine species, they have been found to have many important similarities. So, from advanced and ongoing study of magpies for over 100 years, the Australian magpie is now grouped in the family of Artamidae with four genera in Australia (and two outside and north of Australia) comprising a total of 15 species: five species of butcherbird, three species of currawong, six species of woodswallow, and one species of magpie.

Magpies: one species or several?

There has been ongoing debate about the status of the magpie as a single or several species for as long as the task of classifications of Australian birds has been actively undertaken. Magpies, first classified by Latham in 1802, started out as one species and slowly grew in the 19th and early 20th centuries into

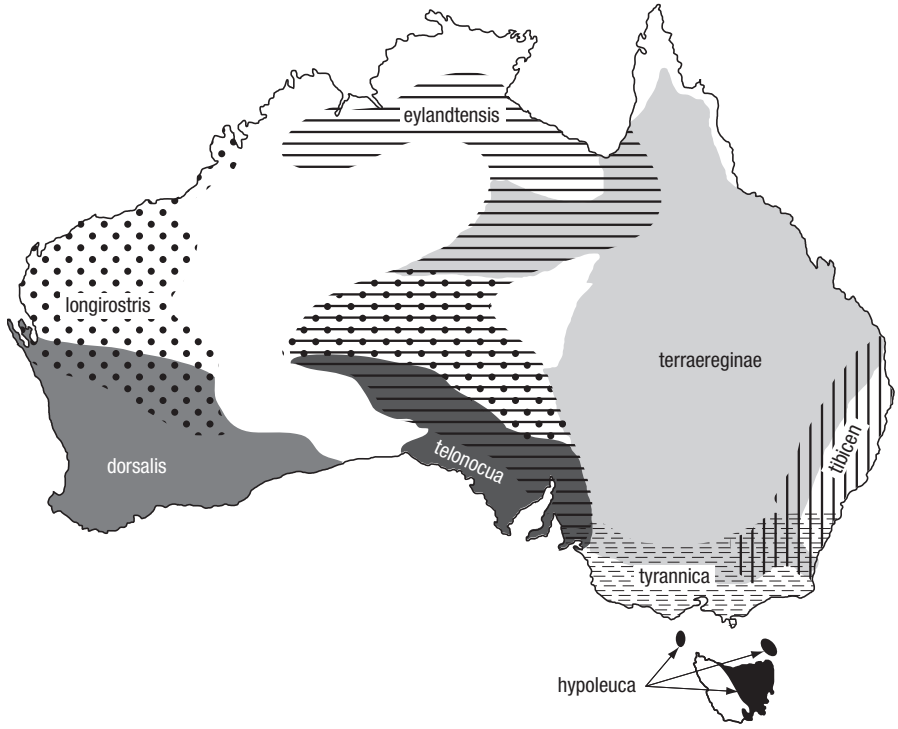


Figure 1.2 Distribution of magpies in Australia.

several: Latham (1802) for *Gymnorhina tibicen*, Gould (1837) for *Gymnorhina. hypoleuca*, A.J. Campbell for *Gymnorhina dorsalis* (1895), Milligan for *Gymnorhina longirostris* (1903), Mathews for *Gymnorhina terraereginae* (1912), and H.L. White for *Gymnorhina eylandtensis* (1922).

Today, although the question is still not entirely settled, taxonomists have reintegrated all the magpie variations into one species by reassigning those of former separate species status to subspecies status. However, the number of separate subspecies has grown from six to eight to include two new subspecies *Gymnorhina tibicen tyrannica* and *G.t. telonocua*.[5] These subspecies are not sharply divided in most regions because mixed forms may occur in adjoining regions from one subspecies to another (see Figure 1.2).

The different subspecies vary considerably in size and shape depending on the region and the geographical conditions.[6] The largest magpies live at the east coast from Melbourne to Brisbane. Top-end magpies (*G.t. eylandtensis*) have long and slender bills, Tasmanian magpies (*G.t. hypoleuca*) have the shortest and most compact. The differences, so Alex Milligan explained in 1903, were explicable in the different soil and climatic conditions and that these conditions led to different adaptations. In addition, one suspects that the

long and slender bill of top-end magpies (for both *G.t. eylandtensis* in the Northern Territory and *G.t. longirostris* in the north-west of Western Australia) is not only related to soil conditions, as Milligan argued, but also to the type of food found above the ground. Northern and north-western magpies in long periods of very dry weather may encounter many scorpions and other poisonous fare (e.g. spiders) and may have added these to their menu. The very short and compact beak of the Tasmanian magpie, on the other hand, may be more suitable for cracking the body armour of hard-shelled beetles and cockroaches. However, this is speculation as we have no data so far to confirm Milligan's conjectures.

However, body size differences between subspecies of magpies are not so easily explained by climate alone. If all tropical and subtropical magpies were small and all temperate climate magpies medium and large we would be tempted to infer climatic reasons for the size differences. While the tropical ones are small and medium in size (*G.t. eylandtensis, terraereginae* and *longirostris*), the size differences between subspecies at the southern tip of the continent do not conform to a climatic model. In Tasmania (*G.t. hypoleuca*) magpies are small, while those facing Tasmania from the mainland are particularly large (*G.t. tyrannic*a), meaning that climatic conditions, although not identical but very similar between southern Victoria and Tasmania, cannot account for the most substantial differences between magpies almost anywhere on the continent.

Table 1.1 Australian magpie subspecies: morphology and distribution.

Subspecies	Size	Beak length (mm)		Wing span (mm)		Geographical area
		Male	Female	Male	Female	
G.t. eylandtensis	small	56–62	51–57	230–255	225–245	NT
G.t. terraereginae	small–medium	48–58	47–53	245–265	235–255	Qld, inland NSW, Vic. and SA
G.t. tibicen	large	48–55	45–50	260–385	255–270	Brisbane–Vic. border
G.t. tyrannica	very large	52–57	47–53	270–290	260–280	Vic. and into SA
G.t. hypoleuca	small	43–47	38–43	248–258	235–245	Tas.
G.t. telonocua	medium	50–56	45–50	255–265	245–255	coastal SA
G.t. dorsalis	medium	56–60	48–54	258–270	240–255	south-western WA
G.t. longirostris	medium	60–65	55–60	245–260	235–250	north-western WA

Source: Schodde & Mason 1999

If climate does have an effect, it would have to be, at best, indirect. One could argue that climate affects food choices and these, in turn, might affect body size. Environmental pressures might also play a part and favour increase or reduction in body size. Competition for food resources, or social organisation, particularly mate choice, might also influence body size. We know since Darwin's work that island populations of birds may differ markedly from mainland populations as a result of isolation and genetic drift.

Taxonomists devise current classifications on the basis of a number of criteria in order to arrive at their conclusions. Over time, these may hold or be overthrown. Some of the difficulties are well demonstrated in magpies.

How important are the differences in the magpie subspecies?

In these taxonomical debates one may distinguish between primary, secondary and trivial differences but sometimes it may be difficult to tease out the causes of the differences and determine their relative importance. What, for instance, could be the reason for the variations of the markings of the plumage, particularly on the back? We can roughly divide the magpie into black-backed and white-backed magpies. The black-backed form, with some intermediate forms, dominates throughout Australia while the white-backed form is largely confined to western and southern Australia (see Figure 1.3). Richard Schodde and Ian Mason argue that all magpies are probably derived from two forms: the white-backed form as Bassian (southern/temperate) in origin and the black-backed form originally Torresian (top-end/tropical and subtropical) but there are now suggestions that eastern and western magpies show larger differences than black and white forms.

Size and bill length may also not be explicable solely by geographical variables. Other differences may include colour or pattern differences as these are found in tail and wing patterns. For instance, in magpies tail-bands may vary in size, be this by subspecies (e.g. in *G.t. eylandtensis*, the black terminal tail band is narrow while in *G.t. tyrannica* it is very broad), by age (broader in young birds) and sex (females have broader tail bands). Finally, the black versus white backs of magpies, although the most dramatic and obvious of all differences (at least to the casual observer), may be a minor difference in terms of species designation (but not necessarily 'minor' for individual magpies).

Behavioural criteria are usually not included in taxonomical descriptions (although some are considered important such as nest building and nest type). In this regard, the study of magpie behaviour could be cause for further questions of the magpie's species status. Foraging strategies and nest-building type are the same for magpies across the continent but social organisation is not. There are other behavioural indices, such as song, to be discussed in Chapter 9, that magpies have similar skills but use them in different ways.

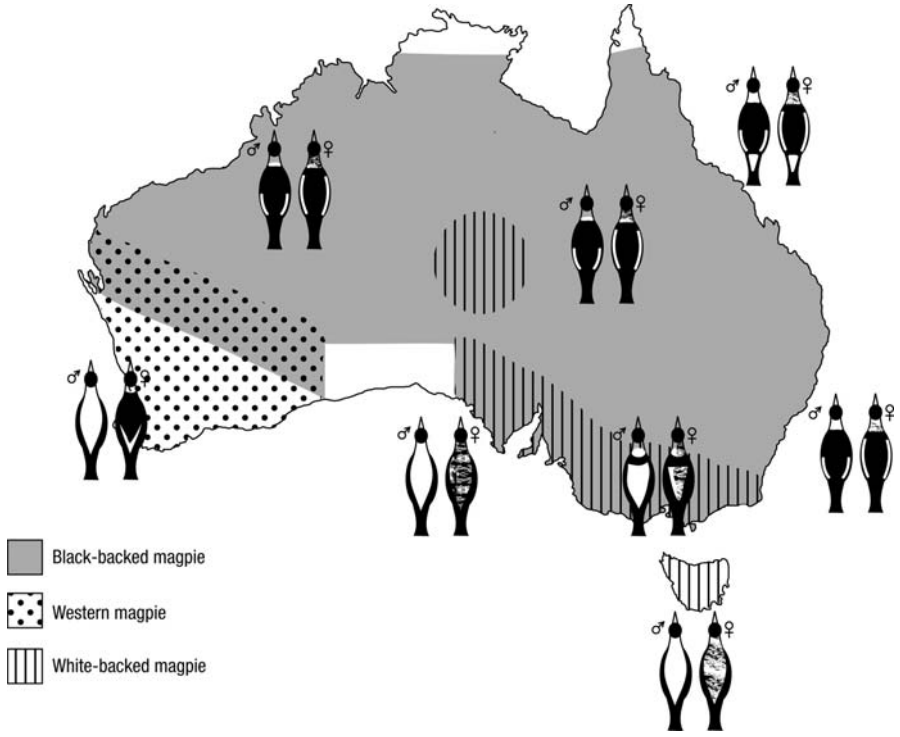


Figure 1.3 In plumage, magpies fall into two large groups, the black-backed and the white-backed magpie. White-backed magpies are sexually more dimorphic—males have white backs and females have shades of motley black and white on their back.

Presentation of avian species

The other taxonomically important question is in which order to present the species. In earlier field guides to Australian birds, the convention was to place the Artamidae (woodswallows), Cracticidae (butcherbirds, currawongs and magpies) and Corvidae (ravens and crows) as the last entries.[7] However, Schodde and Mason introduced a different format and one with which, for historical reasons, I thoroughly agree. In the Schodde and Mason arrangement, Artamidae, including Australian magpies, are listed as the 17th family of a total of 22 families of Australo-Papuan origin, while a further 13 families of Eurasian/North American origin follow. This may seem a minor consideration but it signals a new attitude to the importance of origin of Australian birds.

To explain this further, it is assumed today that Australian songbirds have around six supra-familial lineages which fall into two clusters: one the

Table 1.2 Families of Australian songbirds by clusters of origin.

AUSTRALO-PAPUAN CENTRED CORVIDA	
FAMILY	**SPECIES**
Pittidae	red-bellied, rainbow and noisy pittas
Menuridae	Albert's and superb lyrebirds
Atrichornithidae	rufous and noisy scrubbird
Climacteridae	white-throated, red-browed, rufous, brown and black-tailed treecreeper
Maluridae	all fairy-wren, emu-wren and grasswren species
Pardalotidae	spotted, forty-spotted, red-browed and striated paradalotes, grassbirds
Acanthizidae	bristlebirds, piolotbird, scrubtit, heathwrens, fieldwrens, scrubwrens, speckled warbler, weebill, geryones, thornbills, whitefaces
Meliphagidae	56 species of honeyeaters, friarbirds, wattlebirds, spinebills, chats, gibberbird
Petroicidae	robins, flycatchers, jacky winter, scrub-robins
Orthonychidae	longrunner, chowchilla
Pomatostomidae	babblers
Eupetidae	whipbirds, wedgebills, quailthrushes
Neosittidae	varied sitella
Pachycephalidae	whistlers, shrike-thrushes, shrike-tits, bell bird
Dicruridae	fantails, wagtail, drongo, monarchs, some flycatchers (see also Petroicidae), magpielark, boatbill
Paradisaeidae	manucode, riflebirds
Artamidae	butcherbirds, Australian magpies, currawongs, woodswallows
Campephagidae	cicadabird, cuckoo-shrikes, trillers
Oriolidae	figbird, orioles
Corvidae	crows, ravens
Corcoracidae	chough, apostlebird
Ptilonorhynchidae	catbird, bowerbirds

EURASIAN/NORTH AMERICAN CENTRED PASSERIDA	
FAMILY	**SPECIES**
Muscicapidae	thrushes, blackbird
Sturnidae	starlings, myna
Hirundinidae	swallows, martins
Pycnonotidae	bulbul
Zosteropidae	white-eyes, silvereye
Sylviidae	reed-warblers, spinifexbird, songlarks, cisticolas
Alaudidae	bushlark, skylark
Dicaeidae	mistletoebird
Nectariniidae	sunbird
Passeridae	sparrows
Motacillidae	wagtails, pipit
Estrildidae	finches, firetails, mannikin, java-sparrow
Fringillidae	greenfinch, goldfinch, redpoll

Eurasian/North American cluster (of about 65 species) and a much larger one that is Australo-Papuan centred (of about 273 species). It is clear that the latter are the true Australian songbirds. To these belong the lyrebirds, bowerbirds and treecreepers (Menuroidea), the fairy-wrens, honeyeaters and pardalotes (Meliphagoidea) and a diverse group from robins, fantails to butcherbirds, birds of paradise and orioles (Corvoidea). Hence the bowerbirds, magpies, and birds of paradise that previously came last in most bird field-guides actually belong to the clusters that are very old Australian lineages.

The Eurasian cluster, including thrushes and starlings (Muscicapoidea), swallows, babblers and tits (Sylvioidea) and larks, finches, pipits etc. (Passeroidea), on the other hand, only arrived in Australia a few million years ago (at the end of the Tertiary period), and a number of species within each of these latter lineages, such as common starlings, sparrows, mynahs, were introduced to Australia in recent history. It makes sense to place these three lineages last, at least in terms of their evolutionary status in Australia (see Table 1.2).