

Magpies Similar to the White-Backed Magpie in Inland Western Australia

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Three females and one male of *Gymnorhina* recently collected near Wiluna, Western Australia, are described. Two females are exactly like the White-backed Magpie *G. hypoleuca leuconota*. The other specimens are possibly hybrids between the Black-backed Magpie *G. tibicen longirostris* and the Western Magpie *G. dorsalis*, hybrids between *longirostris* and *leuconota* or hybrids between all three forms. The presence of *leuconota* or partly *leuconota* phenotypes may be caused by escaped pets introduced by pastoralists in mid-Western Australia or by *leuconota* having a range that extends westwards from Eyre Peninsula through the Nullarbor Plain and Great Victoria Desert. Alternatively, some hybrids between *longirostris* and *dorsalis* resemble *leuconota*.

Serventy and Whittell (1976) listed only two taxa of the magpie genus *Gymnorhina* for Western Australia: the Western Magpie *G. dorsalis* and the western or long-billed form of the Black-backed Magpie *G. tibicen longirostris*. They gave the distribution of *dorsalis* as generally north to the mulga-eucalypt line and sparsely beyond it and east to about Eucla near the border between South Australia and Western Australia; that of *longirostris* as south to Onslow and the middle Gascoyne and (presumably) east to the Warburton Range and the Great Victoria Desert. However, magpies occur throughout mid-Western Australia (Ford 1969, 1971), so presumably *dorsalis* and *longirostris* are in contact. Likewise on the Nullarbor Plain, *dorsalis* possibly meets the White-backed Magpie *G. hypoleuca leuconota* which ranges throughout coastal south-eastern Australia westwards to the edge of the Nullarbor Plain (Black 1975). Because *leuconota* extends close to the Nullarbor Plain, *tibicen* breeds south to the Birkgate Range (Ford, pers. obs.) and *dorsalis* ranges generally northwards to the mulga-eucalypt line, magpies that occur in the Great Victoria Desert could be either taxon or a hybrid form. Hybridization between *dorsalis* and *longirostris* and between *dorsalis* and *leuconota* has not been reported.

Species limits in *Gymnorhina* have not been adequately determined. Amadon (1951), who carried out the last major taxonomic review, recognized two species, *tibicen* and *hypoleuca* (the later including *dorsalis*) but Campbell

(1928), Carrick (1963) and Rowley (1975) accepted *dorsalis* as specifically distinct, whereas Schodde (1975) combined all taxa. The New Guinean Magpie *G. papuana* has been allied with *tibicen* (Amadon 1951) but it is very distinctive compared with Australian forms. Clearly, before the number of species is unequivocally resolved, the nature of interactions at zones of secondary contact need thorough investigation. This has only been accomplished for the contact between *tibicen* and *leuconota* in northern Victoria where Burton and Martin (1976) demonstrated extensive hybridization but their conclusion that the two taxa had produced a zone of overlap and hybridization rather than a hybrid zone (see Short 1969 and Ford 1974 for explanation of these terms) indicated some uncertainty as to whether the forms were species or subspecies. However, Hughes (1982) suggested that *tibicen* and *leuconota* were merely morphs because their difference in back coloration can be explained by a system of unlinked gene loci, each with alleles coding for black (the dominant trait) and white. Here we report on four specimens recently collected near Wiluna (26°35'S., 120°14'E.) because they indicate the presence of (a) some individuals resembling *leuconota* and (b) morphological intermediates between *dorsalis*, *longirostris* and possibly *leuconota* in inland Western Australia.

Morphological Characteristics of Tax

1. White-backed Magpie (a) *hypoleuca* of Tasmania and (b) *leuconota* of south-eastern

Australia. The Tasmanian form is the smallest taxon in body size and in bill length. The mainland form is the largest of all taxa in body size but has a bill of moderate length. The immature dorsal pattern is retained in adult females, the back from the nape to the rump being grey; each feather is pale grey with a central dark streak and sometimes with white tips. The tail is white with a moderately wide terminal black band; on the outer vane of the outermost rectrix black extends for almost the full length. The back is entirely white in mature males.

Measurements of wing, tail, culmen and length of bill are shown in Table 1.

2. Western Magpie *dorsalis* of south-western Australia. This is also a large form, averaging only slightly less than *leuconota* in body size and slightly more in bill length. Adult males have a pure white back and are indistinguishable in the field from those of *leuconota*. Adult females have a dark back which extends from the nape to the rump; each back feather is black, blackish or very dark grey and may be tipped white. The general appearance of the adult female is similar to that of *leuconota* but its dorsal feathers have more pigment. The coloration of the tail is similar to that of

leuconota, though the amount of black on the outer vane of the outer-most rectrix is more variable. There is some evidence that *dorsalis* differs from other forms in behaviour (Carrick 1963; Rowley 1975) and in size and coloration of eggs (Serventy and Whittell 1976).

3. Black-backed Magpie *tibicen* of inland South Australia, northern Victoria and most of New South Wales and Queensland. In body size nominate *tibicen* averages slightly smaller than *leuconota* and may decrease clinally from south to north (cf. Amadon 1951). The coloration of its tail is similar to that of *leuconota*. At all ages the white or grey back is crossed by a broad, well-defined pure black band; adult males have no grey on the dorsum and have a pure white nape and rump but adult females retain the juvenile characteristic of grey on the lower nape and upper rump. The bill length of *tibicen* averages slightly less than that of *leuconota* but there is much overlap.

4. Black-backed Magpie *longirostris* of north-western Australia. This form is similar to *tibicen* in body size but its bill averages much more in length than those of other mainland forms except perhaps *dorsalis*. Its coloration is generally similar to that of *tibicen* but the width

TABLE 1

Measurements (mm) of wing, tail, culmen and width of bill for five forms of *Gymnorhina*.

Species	Sex	Location	Wing	Tail	Culmen	Depth of Bill
<i>hypoleuca</i>	♂	Tas	245-255	129-133	45-50	—
	♀	Tas	235	—	43	—
<i>leuconota</i>	♂	SA	263-284	136-153	50-60	20-22
		Vic	252-300	137-164	45-59.5	—
	♀	SA	237-272	129-165	47-55	18-22
		Vic	233-282	135-164	44-61	—
<i>dorsalis</i>	♂	SWA	251-275	126-134	54-62	19-21.5
	♀	SWA	234-263	131-143	50-63	19-21.5
<i>tibicen</i>	♂	Qld	228-265	128-141	49-57	17.5-20
		ACT	252-282	144-168	47-57	—
	♀	Qld	230-251	125-155	43-56	17.5-18.5
		ACT	250-282	138-163	43-57	—
<i>longirostris</i>	♂	NWA & NNT	225-258	127-153	55-63	19-21.5
		CA	243-265	126-143	55-61	18.5-20.5
	♀	NWA & NNT	232-250	123-137	49-58	18.5-20
		CA	240-251	125-137	51-55	19
<i>papuana</i>	♂	SNG	230-255	121-130	63-68	21.5-24
	♀	SNG	228	121-134	61-62	21.5-22.5

SWA — South Western Australia

NWA & NNT — North Western Australia and North Northern Australia

CA — Central Australia

SNG — South New Guinea

of the black dorsal band is variable (see discussion on hybridization), its thighs are white rather than black as in other mainland forms and the black terminal band on the tail extends only moderately along the outermost rectrix.

5. New Guinean Magpie *papuana* of coastal lowlands of south-western Papua and south-eastern Irian Jaya. Adult males have a white back with a very narrow band of black on the mantle. In adult females, the nape is narrowly white, the rump is white with some white tipped feathers, and the back is black with some proximal grey and terminal white on the feathers except across the middle of the back. The thighs are white. Immature males resemble the adult female on the nape and back but are grey, sooty grey or grey with white speckles on the rump. This form is easily distinguished from other forms by its very large bill, the upper edge of which is strongly decurved.

Only one character may be used in the field to distinguish between mainland black-backed and white-backed taxa: the presence or absence of a well defined black band on the back (which should not be confused with the more extensive black or black and white on the back of juveniles and adult females of *dorsalis*).

Depigmentation with Age

In all forms of *Gymnorhina*, increasing age is accompanied by increasing whiteness in parts of the plumage and with paling of the bill. The black terminal tail-band becomes narrower in both sexes but in males the shafts of the tail feathers become narrowly black and in old males, pure white (Robinson 1956; Black pers. obs.). The grey or dark back of immatures becomes paler in adult females and entirely white in adult males of *leuconota* and *dorsalis*. Depigmentation is most striking in *dorsalis* because its juveniles have very dark grey or blackish feathers on the back but, nevertheless, the change to white in males is quite similar to that in other forms, taking four years (Robinson 1956).

The process of depigmentation on maturation led Storr (1967), Mees (1964) and Parker (1969) to suggest that black-backed magpies might become white-backed in advanced age. However, the dorsal black band on the back in adult males of *tibicen* is a permanent feature

and there is no evidence that it becomes narrower or less pigmented. Storr (1967) and Parker (1969) suggested that males with pure white backs in central Australia may be old *tibicen* males. From central Australia we examined two female specimens with pale grey backs as in pure *leuconota* (the same two reported on by Parker 1969); we also studied a range of males and females of *tibicen*, confirming that the width of the pure black band is comparable in both sexes at any age. The dorsal areas that become white in adult males of *tibicen* correspond to those that are grey in adult females. The change from black to completely white on the back with age apparently occurs in males of only *dorsalis* and *papuana*.

Morphological Characteristics of Hybrids

Burton and Martin (1976) studied the interaction between *tibicen* and *leuconota* in south-eastern Australia. They recognised hybrids by the presence of a black back-band of reduced width and magpies were scored with a hybrid index scale ranging from H0 (pure white-backed birds) to H5 (pure black-backed birds); H1 hybrids had a partial band, H2 a very narrow band, H3 a narrow band and H4 a band of moderate width and often asymmetric shape.

In most other areas where distinctive forms meet, observations are few. In the Northern Territory birds intermediate in body size, bill length and thigh coloration (grey or mottled) between *tibicen* and *longirostris* have been collected (Black, pers. obs.). In central Australia there is a population of magpies that includes males and females indistinguishable in coloration from *leuconota* as well as black-backed individuals but the black band on the back is usually greatly reduced in width (Condon 1951). In this population, the bill is intermediate in length between the bills of *longirostris* and *leuconota*, the thighs are black or mottled and the tail pattern is variable. Possibly the variation in central Australian birds has been caused by black-backed birds invading the range of an isolated population of white-backed birds; for, *tibicen* may have evolved in northern Australia and expanded southwards.

Intermediates between *dorsalis* and forms contiguous with it have not hitherto been described. However, Black (1975) suggested that some females on the southern edge of the

Nullarbor Plain appeared to be dark grey instead of either blackish (as in *dorsalis*) or pale grey (as in *leuconota*) on the back.

Description of Specimens

WAM A13999. Female with small gonads and fully pneumatized skull, collected by J. R. Ford near Mount Bryan, about 85 km south of Wiluna on 16 July 1975. Wing 227, tail 124, culmen length 53 and bill depth at base 19 mm. Underparts essentially dark grey (feathers blackish tipped grey), throat slightly brown, thighs blackish, back (lower nape to rump) pale grey with feather shafts showing a well defined yet narrow black streak, and bill entirely blackish. The grey-black underparts and non-whitened bill indicate that the specimen is immature, presumably just under one year old; the pneumatized skull might suggest a two year old individual but the all black bill does not support this. The pale grey dorsal plumage of a bird of this age and sex is quite characteristic of *leuconota* but not *longirostris* and *dorsalis* seem more likely on geographical grounds.

CSIRO 19646. Adult male with testes 16 x 9 and 16 x 10 and fully pneumatized skull collected by R. Schodde about 20 km east-south-east of Wiluna on 10 October 1977. Wing 251, tail 126, culmen length 58 and bill depth at base 20 mm. The underparts are glossy black and the back is pure white except for one feather on the upper back which is black and, on the terminal half, white. This feather does not necessarily suggest hybridization between *dorsalis* and *longirostris* because it is like two to four year old males of *dorsalis* on the back. The bill is whitish on the basal 70% and blackish tipped; the thighs are pure white. Judged on dorsal coloration and bill length, this specimen appears to be *dorsalis* but the pure white thighs are characteristic of *longirostris*.

CSIRO 19651. Adult female with gonads 2.0 and 0.5 mm long, collected by J. McKean about 15 km south-east of Wiluna on 11 October 1977. Wing 246, tail 124, culmen length 54 and bill depth at base 19.5 mm. The pure black underparts and bone coloured (for 70%), black-tipped bill confirm that this female is adult. Its dorsal plumage is very worn but the upper-back

is pale grey, nape and lower back white and rump greyish; its thighs are black except for greyish tips on some feathers. This female also has a dorsal pattern as in *leuconota*. Interestingly, it was with a broadly black-backed male.

CSIRO 19703. Adult female collected by R. Schodde about 20 km west of Wiluna on 18 October 1977 in eucalypt woodland along a creek. Wing 245, tail 129, culmen length 54 and bill depth at base 20 mm. The underparts are black, the basal 80% of the bill is bone coloured and the tail shafts have some whitening, an uncommon occurrence in females, so it is probably very old. Its dorsal coloration is unique among specimens seen by us. Most back feathers are grey with a dark central streak as is normal for *leuconota* but some on the lower back have slightly more black adjacent to the shaft; additionally, the upper back shows a rather irregular partial black band, such as occurs in hybrids of *leuconota* and *tibicen* and would be expected in hybrids between *dorsalis* and *longirostris*. Therefore, its general coloration and size suggests that it is an intermediate between *dorsalis* and *longirostris* or possibly between *leuconota* and *longirostris* but the slightly blackened lower back suggests that *dorsalis* genes have contributed to its coloration.

In summary, the first and third specimens show plumages typical of *leuconota* females; they do not correspond to *dorsalis* which is never pale grey on the dorsum though some females have backs that are not entirely black. Although these specimens might be hybrids between *dorsalis* and *longirostris* they are quite indistinguishable from *leuconota* females in all respects. However, because hybridization between *dorsalis* and *longirostris* has not been studied, possibly some hybrids resemble *leuconota*. The third specimen was apparently mated to a normal black-backed male of *longirostris*. The second specimen is a male with a white back but it has white thighs as in *longirostris* and, therefore, is possibly a hybrid between either *dorsalis* and *longirostris* or *leuconota* and *longirostris*. The fourth specimen is probably a hybrid judging by its partial black dorsal band and its feathers on the lower back having more black than in *leuconota* and *longirostris*; it could have resulted from a cross between *dorsalis* and *longirostris* or between *dorsalis*, *leuconota* and *longirostris*.

If indeed *leuconota* is involved in the production of these strange phenotypes, it must range westwards from South Australia through the Great Victoria Desert. White-backed males have been observed in the Great Victoria Desert, Western Australia (Ford pers. obs.), but they might have been *dorsalis*. However, Serventy and Whittell (1976) and McColl (1929) reported that white-backed magpies (? *leuconota*) were released by pastoralists in mid-Western Australia and about the Hampton Escarpment, south-western Nullarbor Plain, so possibly these birds have multiplied and interbred with local magpies. The situation in inland central Western Australia appears to be similar to that in central Australia (cf. Parker 1969). Hughes and Mather (1980) have also reported the occurrence of partly black-backed magpies within the range of *tibicen* in South-eastern Queensland and in the northern part of the Northern Territory.

Conclusions

Specimens of female magpies with a pale grey back from inland Western Australia suggest the possibility of the White-backed Magpie (*G. hypoleuca leuconota*) as occurring in that State, either in the parental (pure) form or as individuals showing intermediacy with the Western Magpie (*G. dorsalis*) and Black-backed Magpie (*G. tibicen longirostris*). It is probable, however, that hybridization between *dorsalis* and *longirostris* sometimes produces unexpected phenotypes, some of which resemble *leuconota*.

The variable width of the black dorsal band in specimens from Wiluna suggests that at least some hybridization is taking place between *longirostris* and forms with white-backed males (*dorsalis* and *leuconota*). The presence of white thighs on a male with a full white back supports this suggestion. If *leuconota* does occur in inland Western Australia, either it ranges from South Australia through the Great Victoria Desert or it has multiplied from birds introduced by pastoralists.

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