

The taxonomic rank of *Aplonis metallica circumscripta*

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The Metallic Starling *Aplonis metallica* on the Tanimbar Islands and Damar, east Indonesia, is generally treated as a subspecies *circumscripta*, but one world list gives it species rank, a judgement that can be traced to the claim that it has ‘the whole head to the upper back and chest a bright reddish violet’, which is evidently in this case considered a species-level difference. A trawl through the literature and an assessment of 24 specimens in four museums demonstrates that the colour distinction in this claim is mistaken. However, *circumscripta* is consistently diagnosed from *metallica* by its (1) short-feathered clear-cut inverted-U-shaped purple chin-patch, (2) large purple mantle-patch and correspondingly very narrow green hind-collar, and (3) average shorter bill and wings but, in males, notably longer central rectrices, strongly indicating that species rank is indeed appropriate for the taxon, for which the vernacular name Purple-chinned Starling is proposed.

INTRODUCTION

Three of the four major world lists of bird species treat the Metallic or Shining Starling *Aplonis metallica* as consisting of five subspecies: the nominate, distributed among the Moluccas and Aru Islands, east Indonesia, Misool, one of the four Raja Ampat Islands, West Papua province, Indonesia, the island of New Guinea and the Australian state of Queensland; *circumscripta* on the Tanimbar Islands (also known as Timor Laut or Timorlaut) and Damar island in the Barat Daya Islands group, Maluku province, Indonesia; and *inornata*, *nitida* and *purpureiceps* on Papuan islands around New Guinea (Dickinson & Christidis 2014, del Hoyo & Collar 2016, Clements *et al.* 2018). One list, however, treats the form *circumscripta*, without explanation, as a full species, ‘Violet-hooded Starling’ (Gill & Donsker 2018). A mismatch of this kind requires investigation and resolution, particularly as there is interest in attempting to merge these world lists into one (Collar 2018).

Adult Metallic Starlings have glossy dark green body plumage (repeatedly but mistakenly described in field guides and handbooks as ‘black’), with glossy dark purplish blurry patches on the crown, upper back and breast, elongate nape feathers, blackish wings, rather long tapering pointed blackish tails, and red irides (Coates & Bishop 1997, Feare & Craig 1998, Craig & Feare 2009, Dutton 2011, Beehler & Pratt 2016, Eaton *et al.* 2016, Gregory 2017).

The momentum to separate *circumscripta* as a species was first provided by White & Bruce (1986), who wrote that it ‘has the whole head to the upper back and chest a bright reddish violet, only a little green on the lower throat and the upper mantle’ and ‘is... a distinctive isolated form that may represent an allospecies of *A. metallica*’. This suggestion was not mentioned by Sibley & Monroe (1990, 1993) or Coates & Bishop (1997), but Inskipp *et al.* (1996) referred to it and noted that ‘B. King (pers. comm. 1994) suggested that *A. circumscripta* Violet-hooded Starling from the Timor-Laut and Damar islands should be treated as a separate species from *metallica*, based on the different plumage gloss’. A year later King (1997) himself treated *circumscripta* as a species without comment.

The split was not followed by Clements (2000), despite the fact that J. F. Clements published King’s book and (in conversation in the 1990s told me that he) was generally inclined to follow splits made in print by others; nor was it followed or even referred to by Feare & Craig (1998), Dickinson (2003) or Craig & Feare (2009). However, it was adopted by the World Bird Names taxonomic project at or soon after its inception (it is in ‘ioc3.5’, dated 29 September 2013: Gill & Donsker 2013). The form *circumscripta* was given ‘subspecies group’ status by del Hoyo & Collar (2016) and by Clements *et al.* (2018), the former adding a descriptive comment in its taxonomic note that ‘Form *circumscripta* distinctive, with purple gloss of head, mantle and breast tinged reddish’ and providing an illustration, which mistakenly shows a bird very similar to *metallica* but with a more extensive purple breast, albeit with no reddish tinge.

This use of the word ‘distinctive’ in relation to *circumscripta*, also found in Bishop & Brickle (1998), despite their not seeing the bird in the field themselves, must go back to the assertion in White & Bruce (1986) about its ‘whole head to the upper back and chest [being] a bright reddish violet’. The diagnosis was repeated in Feare & Craig (1998) and Craig & Feare (2009) (‘glossed reddish-purple on [the] head, mantle and breast’) as well as in Eaton *et al.* (2016) (‘head and breast glossed reddish-purple’).

Curiously, however, there is no evidence to support White & Bruce’s categorical assertion about the colour of the head, back and chest. The form was first found by H. O. Forbes, whose specimens collected in the Tanimbar Islands (‘Timor Laut’) in 1882 were documented by the ornithologist P. L. Sclater, Secretary of the Zoological Society of London and one of the great systematic zoologists and biogeographers of the nineteenth century; yet, in the same paper on ‘Timor Laut’ birds in which he established the Tanimbar Starling *Aplonis crassa* as a species, Sclater (1883a: 51) merely listed the one other *Aplonis* (then *Calornis*) specimen which he examined as *A. metallica* (and again in Sclater 1883b: 200), clearly failing to be struck by anything obviously different about it.

It fell to Meyer (1884) to give the name *circumscripta* to this *metallica*-like form. His primary diagnosis, in Latin, rather curiously addressed the difference between *circumscripta* and the form *inornata* that Salvadori (1880) had described from Biak (Mysori) rather than from the geographically closer *metallica*: ‘Like *Calornis inornata* but brighter, and chin, throat and cheek sharply defined [“*circumscriptis*”] by green and purple’ (my translation). He then reverted to German and began a longer diagnosis (my liberal translation, with points of clarification in square brackets):

The markings of the chin, throat and cheeks are clearly delineated [‘sehr circumscript’]. Cheeks green, bordered above and below by violet. Chin violet, extending backwards to the right and left of the throat, which thus forms a green wedge broadening back to join the green of the narrow collar. Compared to *C. metallica* the violet of the upper breast is narrow and the same colour as the nape, whereas *metallica* has a broad, more yellowish-green nuchal collar. Moreover, the violet of the mantle is almost uniform and not intermixed with blue-green, as in *metallica*. Timorlaut birds approach *C. inornata* of Mysori [Biak], but are more vividly coloured, and in *inornata* the markings of the chin and throat are diffuse. Salvadori says that the green collar is completely lacking in *C. inornata*, but this is not so: it is present, but weak and less sharply defined than in *circumscripta*. Mysori and Timorlaut specimens are similar in size, while 22 specimens of *C. metallica* in the Dresden Museum from Halmahera, Aru, Kei, Jobi [Yapen], New Guinea and Duke of York [Bismarck Archipelago] are on average larger than either.

Meyer finished this description by observing that the validity of *circumscripta* might be called into doubt since it is based on ‘slight

differences', but he nevertheless affirmed that the characters involved consistently allowed him to pick out specimens from Tanimbar when mixed with *metallica* from other islands.

Forbes (1884), working with 'a large series of skins in my collection' (albeit, as he admitted, not including birds from Halmahera—for the possible relevance of which see below), agreed with Meyer about being able 'unhesitatingly' to pick out specimens of *circumscripta* 'by the coloration of the throat'. He also noted a new character, that 'the throat-plumes in *C. metallica* are prominently longer and more mucronate than those in the Timor-Laut specimens'. However, he disagreed with Meyer about the absence of greenish colouring ('not intermixed with blue-green') in the centre of the purple mantle-patch, finding it 'quite distinct in most of my specimens'. Most surprisingly, he concluded by claiming that the taxon *gularis*, named by G. R. Gray based on a Wallace specimen from Misool but synonymised with *metallica* by Salvadori, was identical to *circumscripta* and that the name *gularis* should stand and be used for birds from the Tanimbar Islands.

In a commentary on Forbes (1884), Salvadori (1884) emphatically rejected this last proposition:

I cannot agree to this identification. The type of *C. gularis*, which I have carefully examined, is only an individual variation of *C. metallica* with more purple on the throat, like other specimens from Halmahera and Cape York, examined by me... I do not think it possible that the same species can be found in Mysol [Misool] and in Timor-Laut, so wide apart one from the other, while true *C. metallica* lives in so many islands lying between them.

However, he found himself 'inclined to recognize *C. circumscripta* as a good species, more allied to *C. metallica* than to my *inornata* from Mysore [Biak]'. He distinguished it from nominate *metallica* especially on account of the two violet lines which run along the branches of the under mandible on the sides of the throat and meet at the chin, so that they describe a V; besides, it has the green collar on the back of the neck narrower and the upper back is violet, with the green triangular spot in the middle, generally so conspicuous in *C. metallica*, wanting, or scarcely perceptible.

He did not comment on the length of the 'throat-plumes', but seems to resolve the point about whether the purple mantle-patch is or is not centrally infused with green or greenish-blue.

It is not clear how much rivalry between Britain and Germany existed at this stage in ornithological history (it certainly arose well before the end of the 1880s: Collar 1999), but Forbes (1884) seemed to take undue satisfaction in pronouncing in a postscript to his paper that 'no species not hitherto described... has been brought to light by Dr Meyer's collectors'. However, pinning taxonomic judgement on a single specimen is always a risk. Hartert (1901), a German working for Lord Rothschild in Britain and evidently above nationalist bias, rejected Forbes's new arrangement, 'principally on account of [his] not having [seen] a series from Mysol [Misool]' (the emphasis here intended to fall on the word 'series'):

The name *gularis* is based on a bird from Mysol... with an exceptionally purple throat, but the Mysol form is like typical *metallica*, and certainly not like the Timorlaut and Dammer [Damar] bird, which has the upper throat beautiful purple, separated by a green band from the purple chest-patch, a very narrow green neck-band above (narrower than in typical *metallica*), and a much shorter wing than typical *metallica*. The birds from Mysol are not, in my opinion, separable from *metallica*.

Forbes had picked a hole in Meyer's description by noting that one character was not typical, and here Hartert picks one in Forbes's

analysis on the same basis (by 'an exceptionally purple throat' Hartert evidently meant 'with, exceptionally, a purple throat'). These corrections of each other's work are evidence that Metallic Starlings are individually rather variable, rendering conclusive judgement on taxonomic limits unsafe without good samples.

METHODS

I took advantage of visits to several museums to assess the number, strength and consistency of the characters by which birds from Tanimbar and Damar can be discriminated from those in the rest of the Indonesian archipelago and beyond. I examined and measured 24 specimens of *A. m. circumscripta* (6 males, 7 females, 1 possible female in AMNH [museum names stated in full in the Acknowledgements]; 2 males, 3 unsexed in MTD; 2 males, 2 females in NHMUK; and 1 male in ZMB), 40 specimens of *A. m. metallica* (11 males, 12 females, 12 unsexed in NHMUK from representative parts of Wallacea plus New Guinea and Australia; 5 males and 1 female from Misool in AMNH), and 5 specimens of *A. m. inornata* (3 males, 2 females in AMNH). I also checked labels to see if there was any record of the iris colour of *circumscripta* (as noted above, it is known to be blood-red in *metallica*). Also I employ the word 'purple' to cover the colour that others have often rendered as 'violet'.

To gauge the degree of difference between taxa in plumage and size I made use of the system of scoring proposed by Tobias *et al.* (2010), in which an exceptional character (radically different colouration, pattern, size or sound) scores 4, a major character (pronounced difference in body part colour or pattern, measurement or sound) 3, medium character (clear difference, e.g. a distinct hue rather than different colour) 2, and minor character (weak difference, e.g. a change in shade) 1; a threshold of 7 is set to allow species status, species status cannot be triggered by minor characters alone, and only three plumage characters, two vocal characters, two biometric characters (assessed for effect size using Cohen's *d* where 0.2–2 is minor, 2–5 medium and 5–10 major) and one behavioural or ecological character (allowed 1) may be counted.

RESULTS

The irides of *circumscripta* are red, according to the labels on all four specimens in NHMUK (confirmed by observations and photographs of birds taken by J. A. Eaton in 2018), and therefore similar to those of *metallica*. The taxon is, however, unique in its possession of a clear-cut inverted-U-shaped purple chin-patch (Plate 1), whose outer edges extend backwards as lines bordering the green-glossed throat below and green-glossed 'cheeks' above (the latter actually a broad patch covering the moustachial and malar areas, as the purple of the crown extends below the eye and onto the ear-coverts). All 24 adult specimens examined in this review show this character clearly. A small proportion of representatives of nominate *metallica* and races *nitida* and *purpureiceps*—in NHMUK 11/105, 1/30 and 1/4 respectively, totalling 13/139 (9.4%); see also the first quotation above from Salvadori (1884)—have purple on the normally all-green throat, but as an ill-defined blur, never delineated as sharply or in the same diagnostic shape as in *circumscripta* (Plate 2). In a typically dark *Aplonis* starling this diagnostic character is difficult to assess for its distinctiveness, but it cannot be considered minor (i.e. a 'slight difference', as Meyer described it), because it is such a consistent and clear plumage pattern, and merits a score of at least 2 (even against birds with a smudged purple throat); indeed, if the colour contrast was stronger—as it might well appear to the starlings themselves given the ultraviolet sensitivity of passerine birds, including the Sturnidae (Ödeen *et al.* 2011)—a score of 3 would be justified.



Plate 1. Purple chin-patch with backward jawline extensions on *Aplonis metallica circumscripta* NHMUK 83.5.30.17.



Plate 2. Purple chin and throat on *A. m. metallica* NHMUK 73.5.12.1926, from 'Gilolo' (= Halmahera). Note longer feathers and indistinct shape of this throat-patch.



Plate 3. Head and lower back of (above) *A. m. circumscripta* (NHMUK 83.5.30.17, Tanimbar Islands) and *A. m. metallica* (NHMUK 73.5.12.1921, 'Matabello' = Watubela Islands). Note how the angle of light reflects the 'bright reddish violet' on the mantle-patch of the *circumscripta* specimen (compare with Plate 4), but that this is also seen in the hindcrown of the *metallica* specimen.



Plate 4. Head to lower back of (above) *A. m. circumscripta* (MTD C7271, Tanimbar Islands) and *A. m. metallica* (MTD 42858, Duke of York Islands).

The purple crown in *circumscripta* extends back onto the nape at least as far as in other taxa, but the purple area forming the mantle-patch is much the largest of any form, extending over the back of the bird and constricting the width of the green hind-collar or neck-band, rendering it 'very narrow', as Hartert (1901) reported. I checked all 139 adult specimens of *metallica* in NHMUK (races *metallica*, *nitida* and *purpureiceps*) as well as five adult *inornata* in AMNH, and confirm that this combination of narrow hind-collar and large mantle-patch is unique to, and therefore diagnostic of, *circumscripta*. Owing to its size, this mantle-patch draws considerable attention to itself when reflecting light, producing an obvious rosy effect at certain angles (Plate 3). The same effect is present but much less obvious when the area of purple, on mantle, crown or breast, is smaller, and I believe that it is this that misled White & Bruce (1986) into reporting the 'upper back' (plus 'head' and 'chest') as 'bright reddish violet', which mistakenly implies a different shade of purple from the equivalent area on other taxa of *Aplonis metallica*. I combine a score for the narrow hind-collar and the large mantle-patch by allowing the first 1 and the second 2, making a total, for this area of plumage, of 3 (Plates 3 & 4).

Other plumage characters that have been thought to distinguish *circumscripta* do not appear to be valid. Whether there is green or greenish-blue colouration within the purple mantle-patch, denied

by Meyer (1884) but averred by Forbes (1884), with Salvadori (1884) on the fence between the two, does not seem particularly important; but from my review of specimens I align with Salvadori, although the whereabouts of Forbes's 'large series' (there is just one in the Liverpool Museum: C. T. Fisher *in litt.* 2018), which might shed light on the issue, are unknown. Meanwhile, Forbes's sharp-eyed perception that the feathers of the throat and breast are shorter and less pointed ('mucronate') in *circumscripta* than in nominate *metallica* appears only to hold in the absence of specimens of the latter from Waigeu (Waigeo) and Batanta; this character is therefore doubtfully diagnostic (but note the contrast in the feather structure revealed in Plates 1 and 2). Similarly, Meyer's (1884) view that the purple breast-patch in *circumscripta* is smaller only holds in the absence of specimens from Misool and the Aru Islands. (These minor variations between insular populations appear too trivial and inconstant to warrant pursuit of taxonomic subdivision, but a thorough study might yield identifiable geographic patterns.)

Meyer (1884) thought that *circumscripta* was at least 'on average' smaller than nominate *metallica*, and this claim is supported by measurements of bill and wing in Tables 1 and 2, but only by small margins, thereby contradicting Hartert's (1901) assertion that the wing of *circumscripta* is 'much shorter'. Strikingly, however, male *circumscripta* prove to have consistently longer central rectrices than

Table 1. Mean measurements in millimetres, with standard deviations and ranges, of male *Aplonis metallica circumscripta* and *A. m. metallica*, plus effect sizes. ¹ = sample size 15.

	n	bill	wing	tail
<i>Aplonis m. circumscripta</i>	11	21.1±0.92 (19.7–22.8)	106.5±2.66 (101–110)	110.2±5.25 (102–121)
<i>Aplonis m. metallica</i>	16	22.0±0.77 (21.0–23.6)	109.6±2.03 (106–112)	94.9±5.97 ¹ (85–104)
Effect size		–1.06	–1.31	2.72

Table 2. Mean measurements in millimetres, with standard deviations and ranges, of female *A. m. circumscripta* and *A. m. metallica*, plus effect sizes and with measurements of the type of *Calornis gularis* below. ¹ = sample size 7; ² = sample size 11.

	n	bill	wing	tail
<i>Aplonis m. circumscripta</i>	9	20.7±0.42 (20.1–21.4)	101.8±1.86 (98–104)	94.7±2.43 (92–99) ¹
<i>Aplonis m. metallica</i>	12	22.1±0.93 (20.9–23.7)	105.1±3.30 (100–110) ²	90.7±3.17 (83–96) ²
Effect size		–1.94	–1.23	1.28
<i>Calornis (Aplonis) gularis</i>	1	20.1	102	98

males of nominate *metallica*. The effect size for wing difference is –1.31 (score 1) and for tail difference 2.72 (score 2); that for female bill size almost reaches –2, which would score 2. Added to the scores of 2 for the purple chin-patch and 3 for the narrow neck-band and large mantle-patch, these mensural scores result in a total of 8 and lift *circumscripta* to species rank.

DISCUSSION

This review was initiated in the full expectation that the assembled evidence would result in the conclusion that *circumscripta* represents a subspecies rather than an allospecies of Metallic Starling. The fact that the original stimulus to treat the form as a species, its reported ‘bright reddish violet’ crown to back, is a mistaken character, adds to the surprise at this outcome. In a species where strongly reflectant greens and purples produce shifting colours with the light, it may be that a neat little throat feature, a redistributed upperpart pattern and appreciably more elongate rectrices do not constitute a species-level distinctiveness. On the other hand, it would be extremely unusual to continue to regard a taxon as a subspecies when it possesses three strong diagnostic characters, and given this consideration I propose to stand by the verdict which my use of the Tobias criteria produces.

But is *circumscripta* in fact the correct name for it? In the course of this investigation I examined the female type of Gray’s *Calornis gularis* (NHMUK 1873.5.12.1901) from Mysol (Misool) and, like Forbes (1884), found that it *exactly* matches female specimens of *circumscripta*. It has the same diagnostic purple chin-patch with jawline extensions, the same very narrow green hind-collar (the original description mentions ‘less green on the nape’: Gray 1861), the same large purple mantle-patch, the same reduced purple breast-patch and the same lack of elongate breast feathers. Its dimensions in relation to female *circumscripta* and female *metallica* are given in Table 2, and place it within the ranges of *circumscripta* on all three variables measured and outside the ranges for bill and tail in *metallica*. How both Salvadori (1884) and Hartert (1901) could have considered this specimen and missed its conformity with *circumscripta* is a matter for conjecture.

An investigation into the history and provenance of this baffling individual is under way (involving D. Zuccon, R. P. Prys-Jones and

myself), but in the meantime the name *Aplonis circumscripta* should surely continue to be used for the *metallica*-like species endemic to the Tanimbar Islands and Damar in the Banda Sea. Since the main range of the species already possesses the endemic Tanimbar Starling *A. crassa*, an English name for the newly elevated species might be Purple-chinned Starling, to replace the uninformative ‘Violet-hooded Starling’ of King (1997) and Gill & Donsker (2018). Somewhat troublingly, the species was not found on Damar during 30 days of fieldwork in 2001, when rats, possibly ship rats *Rattus rattus*, were found to be abundant in forest and suspected of involvement in the ‘decline of colonial-nesting species such as Metallic Starling’ (Trainor 2007); five visits between 2011 and 2018 also failed to produce any records (J. A. Eaton *in litt.* 2018). Moreover, three visits (one in 2009, two in 2011) yielded no reports of the species on the larger island of Babar, which lies midway between Damar and the Tanimbar Islands (Trainor & Verbelen 2013). Fortunately, despite the failure to find it on Yamdena 20 years ago, prompting the consideration that it might be confined to one or a small number of outlying islands in the Tanimbar group (Bishop & Brickle 1998), it has been seen there on all five visits between 2011 and 2018, usually in groups of up to 30, although it appears to be less widespread than Tanimbar Starling, which tends to form smaller groups of fewer than 10 (J. A. Eaton *in litt.* 2018). Nevertheless, research to clarify its conservation status and in particular its vulnerability to rats is clearly a pressing need.

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