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# Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

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## CLUB ANNOUNCEMENTS

### Chairman's Message

I am delighted to announce that, after a long gap, we are about to publish the latest volume in the highly regarded Checklist series, and the first under the editorship of David Wells. Checklist no. 25 will cover the birds of the Falkland Islands. This authoritative volume by Robin W Woods covers all 205 species that have been reliably recorded in the Falklands, plus another 54 species whose presence is unconfirmed. This comprehensive checklist will undoubtedly become the definitive work on the status of birds in the Falklands. The publication details will be placed online as soon as they become available.

Chris Storey

The 985th meeting of the Club was held on Monday 13 March 2017 in the upstairs room at the Barley Mow, 104 Horseferry Road, Westminster, London SW1P 2EE. Eleven members and six non-members were present. Members attending were: Miss H. Baker, Mr P. Belman, Mr M. Earp, Dr J. Hume (*Speaker*), Mr R. Langley, Dr C. F. Mann, Mr. D. J. Montier, Dr R. Prŷs-Jones, Dr P. Rudge, Dr A. Simmons and Mr C. W. R Storey (*Chairman*).

Non-members attending were: Ms A. H. Belman, Mrs M. Montier, Mr D. Prŷs-Jones, Mr O. Prŷs-Jones, Ms Z. Varley and Ms J. White.

Julian Hume gave a talk entitled *In search of the dwarf emu: extinct emus of Australian islands*. King Island, in the Bass Strait, and Kangaroo Island, off South Australia, were once home to endemic species of dwarf emu that became extinct in the early 19th century. The King Island Emu *Dromaius minor* is known from subfossil remains and a unique skin, whereas the Kangaroo Island Emu *D. baudinianus* is known from subfossil bones, a unique egg, and a contemporary illustration. A further subspecies of emu, *D. novaehollandiae diemenensis*, formerly inhabited Tasmania, from where it is represented by two skins and a number of eggs, but is virtually unknown in the fossil record. An emu egg shell has also been found on another Bass Strait island, Flinders Island, which suggests that yet another emu species may have formerly occurred there.

Despite the comparatively large number of emu subfossil remains collected on King and Kangaroo Islands, virtually no contextual data concerning the fossil depositional environments have been obtained. Furthermore, and because of the introduction of mainland emus *D. n. novaehollandiae* to the Australian islands after the endemic forms became extinct, the reliability of the known skins and eggs, especially those from Tasmania, have been placed in doubt.

To overcome this shortfall, Julian travelled to all of the Australian islands to search for palaeontological evidence of emus. On King Island in 1906, J. A. Kershaw undertook the first paleontological survey, and found emu bones in sand dunes in the south of the island. The available results included a photograph of the locality, but Kershaw gave no further information as to its whereabouts. This photograph proved decisive, as Julian and his colleagues discovered the exact site where Kershaw had been 110 years before. Furthermore, other fossil localities were discovered in the west and north of the island, which are the first in-situ recorded examples of emu remains. The visit to Kangaroo Island also proved successful, with in-situ emu subfossils discovered in two cave localities, and one in particular proved to be especially productive; this included beautifully preserved cranial material. Flinders Island was also surveyed, but despite searching the few cave systems and extensive sand dunes, not a single piece of evidence was found to support the presence of emus on the island. It is likely, therefore, that the aforementioned egg shell was probably derived from an imported mainland emu. Finally, and probably most exciting of all, was the discovery of an almost complete, associated *D. novaehollandiae diemenensis* in a cave by a colleague, Roland Eberhard. This is the first known, and its study should resolve the taxonomic status of this most mysterious of all emus.

Results from the field work, presently being written up, should finally shed light on some of the long confusing issues concerning these enigmatic, extinct island forms.

# First field observation of Karimui Owlet-Nightjar *Aegotheles bennettii terborghi*

by Markus Lagerqvist, Ashley Banwell & Roger McNeill

Received 18 September 2016; revised 4 May 2017; published 18 June 2017

<http://zoobank.org/urn:lsid:zoobank.org:pub:E2EAC3D3-100E-4928-9AFA-1C9D8E6DDF9D>

**SUMMARY.**—The owlet-nightjar *Aegotheles bennettii terborghi* was described from a single male specimen given by a local man to Jared Diamond, while he was collecting in the Karimui Basin in the Eastern Highlands of Papua New Guinea, in 1964. There has been no further observation of the taxon, despite extensive field work in 2011–12. In July 2016 we travelled to Karimui with the explicit aim of searching for this taxon, which resulted in the first-ever field observation, including photographs and a possible sound-recording of its call.

Originally described as a subspecies of Barred Owlet-Nightjar *Aegotheles bennettii terborghi*, based on its similarity to the two mainland races—the nominate in southern New Guinea and *wiedenfeldi* in northern New Guinea—*A. b. terborghi* differs mainly in its much larger size—male wing 154 mm vs. 114–128 mm, and tail 142 mm vs. 99–110 mm in the other two subspecies of *A. bennettii* (del Hoyo *et al.* 2017). It is also described as having much darker, blacker upperparts, with the white speckling on the back and upperwing-coverts being somewhat more distinctly organised into a regular transverse (barred) pattern (Diamond 1967, Holyoak 1999). However, there is considerable variation within the other subspecies of *A. bennettii* so any significant plumage differences require confirmation.

The holotype (MCZ 286269, see Acknowledgements; Fig. 1) and only specimen was found by a local man, who stated that he had found it roosting on a branch during the day and had caught it by hand (Diamond 1967). The exact location and altitude where the specimen was caught is unknown, but Karimui station is at c.1,100 m. The other races of *A. bennettii* inhabit mainly lowland forest and the nominate subspecies is only rarely recorded to 800 m; *A. b. plumifer* on the D'Entrecasteaux archipelago is mainly found above 500 m (Beehler & Pratt 2016) and has been recorded to 1,100 m (Coates & Peckover 2001).

Dumbacher *et al.* (2003) published the first comprehensive molecular phylogeny of the Aegothelidae based on mitochondrial DNA. Their results reported *A. b. terborghi* to be most closely related to Allied Owlet-Nightjar *A. affinis*, a taxon known only from the Arfak Mountains of the Bird's Head Peninsula in West Papua. *A. affinis* was previously considered a race of *A. bennettii*, but most current authorities treat it as a monotypic species endemic to the Arfak Mountains; the notable exception being del Hoyo & Collar (2014), who included *terborghi* as a subspecies of *affinis*, following the results of Dumbacher *et al.* (2003). This classification yields an odd distribution pattern, with two disjunct populations separated by c.1,400 km. However, Beehler & Pratt (2016) retained *terborghi* in *A. bennettii*, pending future studies, and noted that the possible species status of *terborghi* should be investigated.

## Rediscovery

On the morning of 18 July 2016 we flew into Karimui from Goroka, with the Mission Aviation Fellowship. During the afternoon and evening we explored the vicinity of Karimui village, where habitat consists mainly of coffee plantations and small patches of secondary forest. The only nightbirds identified were Papuan Boobook *Ninox theomacha*, Papuan



Figure 1. The holotype (MCZ 286269) of *Aegotheles bennettii terborghi* in ventral and dorsal views (© Museum of Comparative Zoology, Harvard Univ., Cambridge, MA)

Frogmouth *Podargus papuensis* and Marbled Frogmouth *P. ocellatus*. The following morning we set off towards Mount Karimui, with the intention of establishing a camp in the primary forest on the mountain's lower slopes. Both previous expeditions to the area, by Diamond (1964–65) and Freeman & Class Freeman (2011–12), conducted field work along a transect on the north-west ridge of the mountain.

Diamond (1967) did not make any field observations of *terborghi* and in more than 12 weeks of field work Freeman & Class Freeman (2014) had no definite records, although they did hear an *Aegotheles* sp. below 1,500 m which they did not identify to species. Vocalisations heard at 1,420 and 1,910 m were attributed to Feline Owlet-Nightjar *A. insignis*, and an *Aegotheles* sp. heard at 2,520 m was presumed to be Mountain Owlet-Nightjar *A. albertisi*.

Our intention was to concentrate on searching for and identifying *Aegotheles* along the same transect as previous expeditions. However, due to alleged landowner issues, we instead worked the previously unexplored north-east ridge of Mount Karimui. Negotiations with landowners were handled by our local guide, Daniel Wakra. We were not permitted to establish a camp inside the forest, but were instead allowed to stay in a small hut at the edge of primary forest at c.1,380 m (06°33.672'S, 144°49.436'E). The different landowner councils were highly suspicious of our motives, and we were initially given permission to remain just one night, but eventually negotiated to stay for two nights.

Forest clearance for small-scale subsistence farming and coffee plantations was rampant in the area, and only smaller forest fragments remain below c.1,380 m; above this elevation primary forest was more or less intact. During the first afternoon we searched the trail following the ridge above our camp. We were accompanied by five villagers, among them a hunter with bow and arrow, who without prompting had pointed out both *A. b. terborghi* and *A. insignis* on the plates in our field guide (Pratt & Beehler 2015). At c.1,570 m he spotted an old tree with a nest hole and after pulling at a rattan growing by the tree, a large, greyish owlet-nightjar flew from the hole and landed above us (at 06°34.035'S, 144°49.177'E).





Figure 2A–B. Karimui Owlet-Nightjar *Aegotheles bennettii terborghi*, Mount Karimui, Papua New Guinea, July 2016, showing the darker, less mottled upperparts, compared to other subspecies of Barred Owlet-Nightjar *A. bennettii* (Markus Lagerqvist)

The bird flew after a few seconds, but was immediately identified as *A. b. terborghi*. Fortunately, it only flew a short distance and was swiftly relocated (Fig. 2A). We watched the bird for c.1 hour, during which time it moved between different perches in the area and for a short period also entered a second tree hole. When the light started to wane, we left the bird, still perched in the open. We all possess previous field experience of Barred Owlet-Nightjar at Varirata National Park (Central Province, Papua New Guinea), from which the most striking differences to us were the bird's larger size and the less patterned, more blackish, back of the *A. b. terborghi* (Fig. 2B). It is also notable that the record is almost 400 m above the presumed location of the only previous record, and much higher than other races of *A. bennettii*. It is also just above the known upper altitudinal limit for *A. affinis*, which occurs at 80–1,500 m.

The following day was spent along the same ridge, following it to 2,050 m, where the trail ended. One Mountain Owlet-nightjar *Aegotheles albertisi* was seen in a tree hole at 1,980 m (06°34.750'S, 144°48.578'E). No further observations of *A. b. terborghi* were made. At dusk we positioned ourselves close to the tree hole from which the *A. b. terborghi* had been initially disturbed on 18 July 2016, in an attempt to make sound-recordings. As it became dark an owlet-nightjar-like call was heard, and RN made a short sound-recording (Fig. 3) of it before the intensifying sound of cicadas rendered further efforts all but impossible. The call did not emanate from the roost tree, but c.15 m away at the forest edge. The bird could

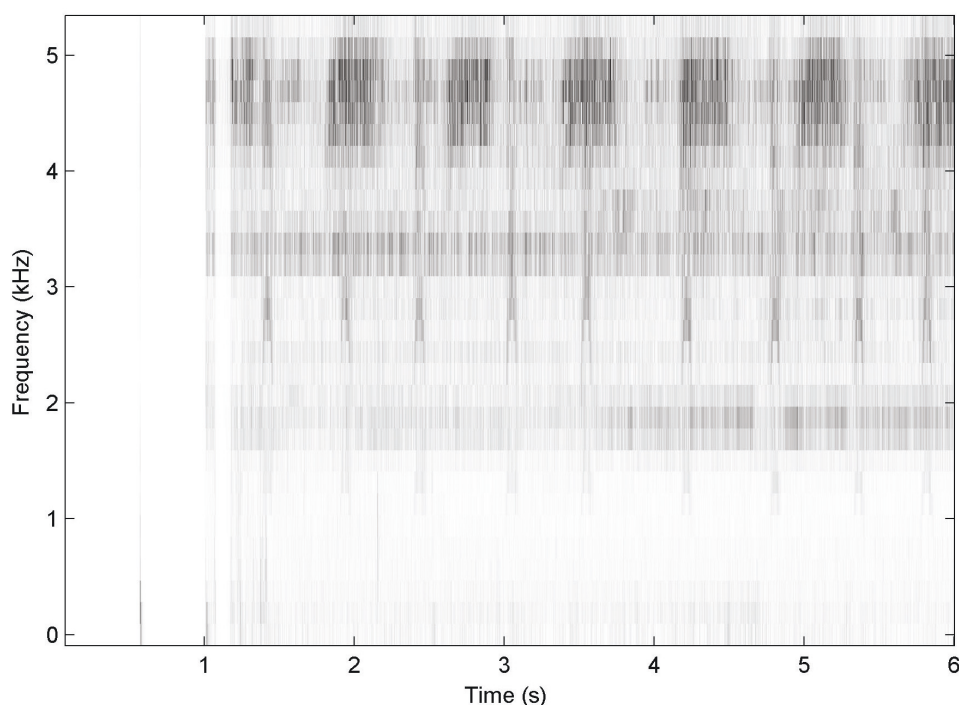


Figure 3. Sonogram of possible Karimui Owlet-Nightjar *Aegotheles bennettii terborghi* vocalisation, recorded at Mount Karimui, Papua New Guinea, July 2016, by Roger McNeill, using a Marantz PMD661 MKII recorder and Sennheiser ME67 shotgun microphone; sonogram produced using Raven Lite v. 2.0.0.

be heard vocalising as it flew off into the distance, and there was no response to playback as it was probably too far away. The recording will be made available at Cornell's Macaulay Library archive; however as the vocalising bird was not observed, definitive identification is impossible under present knowledge.

Other nightbirds recorded around and above our campsite were Sooty Owl *Tyto tenebricosa*, Papuan Boobook, Marbled Frogmouth, Papuan Frogmouth and an unidentified owlet-nightjar.

The next day, 20 July 2016, we had to leave the area in the morning as we were not given permission to stay longer by the local landowners. On reaching the first village en route to Karimui we were interrogated for approximately one hour by the village magistrate and police, supported by the villagers, who were still highly suspicious of our motives. Initial demands for substantial financial compensation and seizure of our photographs were eventually abandoned due to Daniel Wakra's ability to explain the purpose of our visit. In the end all issues were settled amicably, with the villagers stating that they would permit future visits to the area, but nevertheless potential visitors should factor flexibility and possible access issues into their plans. It is our hope that the rediscovery of *A. b. terborghi* will encourage further research into this enigmatic taxon, including its population size, distribution and vocalisations, including qualitative comparisons with *A. b. bennettii* and *A. affinis*.

#### Acknowledgements

We thank Daniel Wakra for help with on-the-ground logistics, Thane Pratt for his valuable comments on the submitted text, and the Museum of Comparative Zoology, Harvard Univ., Cambridge, MA, for providing photographs of the holotype of *Aegotheles bennettii terborghi* (MCZ 286269, collector no. 281).

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# ***Zosterops* white-eyes in continental South-East Asia. 1: proposed refinements to the regional definition of Oriental White-eye *Z. palpebrosus***

by D. R. Wells

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**SUMMARY.**—Grounds exist for accepting that the previously unrecognised paratypes of *Zosterops (palpebrosus) auriventer* Hume in Hume & Davison, 1878, from a population inhabiting the coastal lowlands of the Malacca Straits, are all still held by the Natural History Museum, Tring, and that the overall type series is a taxonomic composite. Comparative morphology and a re-reading of original collecting details combine to revise Hume's identification of his paratypes. Their population is re-named and its geographical range redefined, with suggested outcomes for species limits. The term 'continental' here includes the islands of South-East Asian shelf waters, i.e., as far the Greater Sundas and their satellites.

In a report on collections from Tenasserim (modern Thanintharyi state), south-east Myanmar (Hume & Davison 1878), A. O. Hume, leading Indian empire ornithologist of his day, announced the collection near Tavoy (modern Dawei) town (14°N), 'of a *Zosterops*, which I believe should be referred to *palpebrosus*, as an accidental variety, but which may indicate a new species. It is the same size as [Indian Subcontinent, ?including nominate] *palpebrosus*, but is greener and more olive above, and beneath, instead of having only the lower tail-coverts yellow has the whole of the feathers of the vent and a broad band right up the middle of the abdomen on to the lower breast, of this same yellow .... Should other similar specimens be hereafter obtained, the bird will of course require to be specifically separated, and might then stand as *auriventer*.' This Hume soon claimed to have managed: 'I now find that I have five similar specimens from different parts of the Malay Peninsula' (Hume 1878), and (Hume 1879b) duly confirmed a species *Zosterops auriventer*.

Less than a decade later, Hume's vast skin collection was acquired by the British Museum (Natural History) (BMNH; now the Natural History Museum, NHMUK) (Collar & Prŷs-Jones 2012). Nothing in his writings identifies these additional specimens individually, but his collectors in the Thai-Malay Peninsula had worked just its western edge, and NHMUK still holds five expedition skins dated 1878 or earlier, all from west coast localities. NHMUK 1886.12.1.1727, labelled Malacca (town at 02°12'N), is typical of the Malacca Straits mangrove and deforested subcoastal strip population of *Z. palpebrosus* but has the regional trade specimen make-up of the time and is guessed to have been market-purchased. The rest are from 'Penang', meaning at that time just the island off the west side of the Peninsula (05°N). Three of these, NHMUK 1886.12.1.1728–1730, match the same southern population; the fourth, NHMUK 1886.12.1.1745, unexpectedly, shows most of the characters of the north-east Peninsular / Gulf of Thailand coastal subspecies *Z. p. williamsoni* Robinson & Kloss, 1919. Whatever may have been intended by 'different parts' of the Peninsula, it is the case that Malacca and Penang are the only localities that Hume himself (Hume 1879a) published, and no other critically dated white-eyes were accessioned from his collection. Dates and the match in numbers thus make it a reasonable assumption that these are the



specimens Hume referred to in his description, forming the balance of the *Z. auriventer* type series.

## Background

BMNH curator R. B. Sharpe (Sharpe 1887a) was the first to apply Hume's combination *Zosterops auriventer*, to a white-eye collected by local museum curator L. Wray in montane forest of the Bintang (Larut) range, on the mainland of the Peninsula south-east of Penang. Hume's material in its entirety would by then have been available to Sharpe in London, and might have excited comment had Wray sent a specimen (none found or registered) rather than, as suspected, just a description. Nor could Sharpe have known that Wray's collecting ground lay outside the habitat range of Hume's paratype population. In fact, nothing from the literature implies any awareness of more than one white-eye taxon in the Thai-Malay Peninsula prior to Ogilvie-Grant (1905) distinguishing *Z. aureiventer* [sic] on inland forested Kala Kiri (Besar) peak (06°37'N), Yala / Pattani provincial border, from birds taken in the same month on the nearby coast of Pattani, east side of the Peninsula—identified by him as *Z. palpebrosa* [sic] and which in an appended note the collector H. C. Robinson aligned with mangrove-zone breeders of the Malacca Straits. A year later, Ogilvie-Grant (1906) introduced a third name, *Z. tahanensis*, for specimens from Mount Tahan, 250 km south-southeast of Kala Kiri.

Having himself been the source of most of this new material, Robinson was quick to adopt a two-species (one inland, one coastal) arrangement for the Peninsula. Evidently having realised that Kala Kiri and Tahan birds were one and the same (cf. Robinson & Kloss 1911), however, he (Robinson 1907, 1909, 1910) chose to revert the name *auriventer* to coastal birds, replacing Ogilvie-Grant's *palpebrosus*. In London, Sharpe (1909) did the same despite having earlier (Sharpe 1887b, 1889) described inland forest white-eyes collected by J. Whitehead on Mount Kinabalu, north-west Borneo, as '*Z. aureiventer* [sic] Hume ... Not to be separated from a Tenasserim type specimen'. Like Ogilvie-Grant, he should also have been aware of Hartert's prior determination of Tahan white-eyes, as '*auriventer* Hume: Tavoy, Tenasserim' (Hartert 1902).

Robinson's views continued to waver. He and C. B. Kloss (Robinson & Kloss 1919) returned coastal forms to *Z. palpebrosus*, including as subspecies their Gulf of Thailand mangrove bird *williamsoni* and western *auriventer*, although characterisation of 'the true *Z. auriventer*' as having bright, yellowish-toned upperparts and 'extremely pale' flanks (Robinson & Kloss 1918), implied they had knowledge only of southern populations, not of the holotype itself (see below). A next, more radical step (Robinson & Kloss 1924) then decided that whereas *williamsoni* remained a subspecies of *Z. palpebrosus*, Malacca Straits and inland forest white-eyes together joined Hume's Tavoy type as members of species *auriventer*, by then with three subspecies recognised: coastal Tenasserim and Malacca Straits nominate, *tahanensis* inland in the Peninsula, and *medius* Robinson & Kloss, 1923, inland in Borneo. Robinson's ultimate tweak to this arrangement (Robinson 1927) appeared after he had retired to London (and to the BMNH collections). With it, he removed *williamsoni* from *Z. palpebrosus* and imposed a single-species concept whereby all of the above taxa, independent of habitat, became subspecies of *Z. auriventer*.

Following up in the 1930s, F. N. Chasen (Chasen 1931, 1935, 1939) maintained Robinson's one-species arrangement, but took the ultimate step of returning everything to species *palpebrosus*. Over the same period, Stresemann (1931) first considered there to be two species, re-recognising *palpebrosus* on Peninsular and Gulf coasts and leaving inland populations aligned with Hume's holotype as *Z. auriventer*. This insight he (Stresemann 1939) then overturned (a) by removing *tahanensis* and Bornean *medius* from the equation and

making them subspecies of *Z. atricapilla* (Black-capped White-eye, otherwise endemic to the montane forests of Sumatra and Borneo), and (b) by reverting the Tavoy type to species *palpebrosus*, re-deploying *auriventer* as a subspecies name to cover populations through to the Malacca Straits.

In re-assigning *tahanensis* and *medius*, it is assumed that Stresemann would have been unaware of the overlap in altitudinal ranges of *medius* and *atricapilla* on Borneo (cf. Mann 2008). It must be doubted also whether he or Chasen, any more than Kloss or (before his retirement to London) Robinson, had personally examined Hume's holotype (Stresemann appears to have relied on information sent from London by N. B. Kinnear). In his monograph on Asia-Pacific white-eyes (Mees 1957), however, G. F. Mees stated that he had seen it and, although he brought himself to believe that it belonged with species *palpebrosus* only after 'ample consideration and re-examination', to date (cf. Mayr 1967, Medway & Wells 1976, Wells 2007, van Balen 2008, Dickinson & Christidis 2014, Gill & Donsker 2016) the name *auriventer* (original spelling) has been maintained where Stresemann settled it.

### The facts—a closer look

Some of the reasoning applied by Stresemann and Mees (see also Mayr 1967), and perhaps by earlier investigators, may have resulted from Tavoy's position on the lower reaches of a large river running south just inland of the Andaman Sea coast, allowing the 'near the town' of the holotype's field label to imply that it had been collected close to the coast. This alignment with habitats occupied by Oriental White-eyes in the Thai-Malay Peninsula (see Mees 1957: 73) nevertheless overlooked what Hume & Davison (1878, Appendix 1) had reported concerning the collector W. R. Davison's visit to Tavoy district in March–April 1878. In this account, they reported forest evidently continuous with that of the interior as reaching near the town; also, and more directly to the point, that a fledgling Maroon-breasted Philentoma *Philentoma velata*—a vangid strictly dependent on the interior of closed-canopy rainforest—was taken 'in the neighbourhood of Tavoy' on the same day (19 April) as the holotype. Hume's holdings at NHMUK in fact include three other bird species collected 'at', 'near' or 'in the neighbourhood of' Tavoy on that day, 11 more if a day either side is added, all of them typical of inland evergreen forest or forest edge, vs. only one or two near these dates that could have come from any other habitat. It follows that expedition collectors had visited inland forest over the period in question, shifting probability towards *auriventer* having itself come from this habitat, which is one that Hume's paratype population in the Thai-Malay Peninsula routinely avoids (Wells 2007).

Inquiry into why, even without that information, there had been such uncertainty about applying species-group names began with a fresh examination of the entire re-assembled *auriventer* type series, plus additional Malacca Straits coast material. Recorded as a male, by its relatively dull yellow chin and throat, and only slight tonal contrast between uppertail-coverts and rump / back possibly not fully adult (although it has black lores), apart from tail damage (rr1–4 lost bilaterally) the holotype is still in fair condition, as are all five claimed paratypes. Max. (flattened) chord wing and tail length measurements (Table 1) of the holotype and a Malacca Straits coast sample ( $n = 29$ ), paratypes included (LKCNHM, NHMUK, RMNH, USNM; see Acknowledgements for museum acronym definitions), overlapped totally, whereas tail / wing ratios did so only narrowly: 68 vs. 59–68 (mean 64.3), with just one Malacca Straits representative at 68. Wingtip shape (cf. Mees 1957) also differed: shortfall of the holotype's outermost large primary (p9 descendant) behind the tip 1.2 mm, vs. 2.3–4.1 mm (mean 3.1), and wingtip p7 = 8 whereas nearly 70% of the Malacca Straits sample had p6, 7 and 8 sub-equal.

TABLE 1  
Morphometrics (in mm; range and mean) of the *Zosterops* populations discussed herein. Wing and tail lengths, and primary shortfall behind wingtip measured as max. (flattened) chord, tarsus from tarso-tarsometatarsal notch to third toe flexure point, bill from anterior edge nasal groove to tip; sexes combined (label determinations discounted). With the exception of data on Borneo coastal specimens in the WFVZ collection supplied by R. Corado, all measurements by the author.

Taxon	n	Wing	Tail	Tail / wing ratio (×100)	P9 < wingtip	Tarsus	Bill
<i>auriventer</i> (Tenasserim)	2	52, 52	35.6, 36.7	68, 71	1.2, 1.2	14.3, 14.7	6.8, 7.1
<i>erwini</i> (South Natuna Islands)	14	50–56 (52.7)	31.5–35.5 (33.5)	60–66 (63.0)	3.6 (n = 1)	13.8–15.8 (14.6)	6.9–8.0 (7.3)
<i>erwini</i> (Malacca Straits)	29	50–54 (52.2)	30.4–35.6 (33.6)	59–68 (64.3)	2.3–4.1 (3.2)	14.2–16.0 (14.9)	6.5–7.7 (7.2)
Unidentified (Borneo coast)	8	48.0–50.5 (49.5)	28.1–33.8 (32.0)	59–69 (64.8)	2.3, 5.5	12.0–14.9 (13.6)	6.2–7.0 (6.7)
<i>buxtoni</i> (Sumatra)	3	50–52 (51)	31.2–34.4 (32.8)	62–66 (64.0)	3.6–4.0 (3.8)	13.2–14.5 (13.8)	5.7–6.3 (6.0)

Hume had focused mainly on the development of mid-ventral yellow. A more inclusive colour comparison covering all specimens from the Malacca Straits sample that share the holotype’s curatorial history, made by eye against colour standards (Smithe 1975) on a non-reflective, neutral ground in uniform-intensity ‘artificial daylight’, on the other hand, produced consistent differences.

Upper body, measured at mantle level: in all Malacca Straits specimens bright, yellowish green, nearest to Smithe’s Citrine (no. 51), cap the same except at least the base of feathers bordering the dark loreal streak and variably onto lower forehead, clear yellow; vs. in the holotype: olive-tinged mid green, between Smithe’s Greenish Olive (no. 49) and Yellowish Olive-Green (no. 50), paling only slightly on cap, uniformly to bill base and above lores, with no evidence of frontal or supra-loreal yellow.

Anterior flanks, representing grey of flanks to sides of breast, narrowly linked across upper breast: in all Malacca Straits birds distinctly pale, silvery tinged, between Smithe’s Light Neutral Gray (no. 85) and Pale Neutral Gray (no. 86); vs. in the holotype, opaque lead grey, between Smithe colours Medium Plumbeous (no. 87) and Pratt’s Payne’s Gray (no. 88).

Underwing-coverts: washed pale yellow in Malacca Straits birds, but, excluding leading edge, white in the holotype.

A second Tenasserim specimen (MSNG 16990) of the same era (see Figs. 1–2 in Wells 2017), collected by L. Fea in the interior c.190 km north of Tavoy on 13 March 1887 and identified as *auriventer* by Salvadori (1888), is a black-lored adult, also sexed as a male, with chin to throat brighter yellow and uppertail-coverts slightly brighter vs. rump/back. Otherwise, apart from being soiled, it is a fair match for Hume’s holotype in all respects, including extent of green on outer webs of the latter’s surviving rectrices. Wing and tail lengths (52 mm and 36.7 mm, ratio 71) along with shortfall of p9 only 1.2 mm and wingtip p7 = 8 descendant affirm the proportional shape divergence from Malacca Straits birds. If this eliminates Hume’s ‘accidental variant’ option, it follows that Oriental White-eyes of the Malacca Straits and neighbouring coasts (Fig. 1) cannot reasonably be identified as *auriventer* (cf. Fig. 2)—given also that the potentially interposed (see below) *Z. p. williamsoni*, characterised by its fuller yellow supra-loreal to frontal stripe but less, individually to hardly any, mid-ventral yellow, diverges even further. As such, independent of possible species-limit issues, the Malacca Straits population needs a replacement name.





Figure 1. *Zosterops (palpebrosus) 'auriventer'* (= *erwini*), mangrove zone, Khlong Thom district, Krabi Province, peninsular Thailand, i.e., at the proven end-point of *erwini* range closest to the type locality of nominate *auriventer* (© P. D. Round / Wetlands Trust)



Figure 2. *Zosterops 'tahanensis'*, Keledang Sayong Forest Reserve, inland Perak state, Peninsular Malaysia; differs from nominate *auriventer* (which is unknown in life) only by average measurements (see Wells 2017, this issue) (© Amar-Singh HSS)

## Outcomes for taxonomy

A search of synonymies in Mees (1957) found one appropriate alternative for Malacca Straits birds: *erwini* (honouring Stresemann) Chasen, 1934, from the South Natuna archipelago, South China Sea. Chasen's text failed to record where his comparative material came from, but the type series of *erwini* (holotype and 13 paratypes: LKCNHM, NHMUK)



displays the characters understood to separate Malacca Straits birds from north-east Peninsular / Gulf of Thailand *williamsoni*. On some Natuna specimens, yellow of the mid-ventral stripe suffuses slightly further onto the breast, and those still safely measurable show a marginally broader range of wing lengths, up to 56 mm although with nearly the same sample mean, 52.4 mm vs. 52.7 mm. However, these variables (others claimed by Chasen himself not confirmed) hardly warrant introduction of another name. As such, the Oriental White-eye of coastal and non-forested subcoastal habitats of the south-west and southern Thai-Malay Peninsula, the eastern seaboard of Sumatra (where recorded up to 48 km inland in lowland plantation country of Utara province: RMNH 15957–958), and on associated islands south to Bangka (but see below for mainland Borneo), hitherto known as *Z. p. auriventer*, is re-named:

***Zosterops palpebrosus erwini*** Chasen, 1934: holotype NHMUK 1947.60.60, adult male (label data), collected by P. M. de Fontaine on Panjang Island (02°45'N, 108°54'E), South Natuna archipelago, South China Sea, on 19 August 1931. Described on pages 96–97 of Chasen, F. N. 1934. Nine new races of Natuna birds. *Bull. Raffles Mus.* 9: 92–97.

Uncoupling the name *auriventer* from Malacca Straits coastal-zone white-eyes forces the northern limit of the population now to be called *erwini* to retreat south by c.800 km, to Khlong Thom district, Krabi province, on the west side of the Thai-Malay Peninsula (based on mangrove-zone birds photographed in the hand at 07°43'N by P. D. Round). North of Malaysia, west-coast *Z. palpebrosus* specimens are very few, but one (USNM 154055) from Libong Island, near to the Khlong Thom range limit, is typical *erwini*. A second (NHMUK 1936.4.12.2544), from Ra Island close to 09°N, Mees (1957) identified as *auriventer* (= *erwini*) but Robinson & Kloss (1924) had been sufficiently confused by this same individual that in the one publication they also identified it as *Z. p. williamsoni*. A fresh identification exercise conducted 'blind' (without benefit of labels) keyed it as *williamsoni*, albeit with less than the usual extent of yellow on the forehead and above the lores, but not dissimilar to some *williamsoni* at this subspecies' southern limit in Pattani province, east coast of the Thai-Malay Peninsula. Given that white-eyes have been seen in west-coast mangrove forest north to near 10°N in Ranong province, opposite the southern tip of Tenasserim, it is possible that *williamsoni* replaces *erwini* northward on both coasts, rather than on the east side of the Peninsula alone. The 'out-of-place' individual (NHMUK 1886.12.1.1745) from Penang Island presents a potential difficulty, but its exceptionally pointed wing (p8) suggests dispersal mobility. Where, or indeed whether, the ranges of *williamsoni* and *erwini* meet north to south along the east coast of the Peninsula also remains to be ascertained as the thin scatter of sight records (Wells 2007, Round 2008) south of the southernmost confirmed *williamsoni* locality identified white-eyes only to species level.

The still-surprising upshot is that no white-eye has been reported reliably from anywhere on the long Andaman Sea coastline of Tenasserim (continuous with that of the Thai-Malay Peninsula) until virtually its northern limit near the head of the Gulf of Martaban (Mottama). There, near 17°N in December 1876, W. R. Davison (Hume & Davison 1878; NHMUK) collected several yellow-bellied *Z. p. siamensis* in mangrove forest, through which they may have been transient, as this is not regular habitat (P. D. Round *in litt.* 2011). East into the Gulf of Thailand and Cambodia, *Z. p. williamsoni* has barely emerged out of the mangrove zone (P. D. Round *in litt.* 2015, F. Goes *in litt.* 2016). As such, the combined breeding range of the *erwini* / *williamsoni* subspecies pair appears separated (a) from now-restricted *auriventer* and (b) from other conventionally accepted, mostly upland, *Z.*

*palpebrosus* populations on the continent by a latitude gap that, coupled with other classes of evidence, habitat selection included, could indicate a species boundary.

The situation on Sumatra, where *erwini* and inland forest and forest edge *Z. (p.) buxtoni* are described as being partitioned by altitude (Mees 1957, van Marle & Vooos 1988) but, at least until recently, are more likely to have been directly parapatric by habitat, also invites attention. Particularly so as a molecular survey that included nominate *palpebrosus* from Nepal and Indonesian *Z. p. unicus*, from Flores, in the Lesser Sundas (very similar morphologically to *Z. p. melanurus* of Bali and Java, into which, in far-western Java, *buxtoni* grades), recovered these two within separate, apparent species-level clades (Moyle *et al.* 2009).

Attention is also drawn to Borneo. Mangrove coasts at least on the western side of the island have long been presumed to be occupied by *auriventris* (= *erwini*) (e.g., Mees 1957, Smythies & Davison 1999, Mann 2008), but Baker (1922) and Stresemann (1931, 1939) had both claimed that a form identifiable as, or similar to, *buxtoni* occurred. Chasen (1935) was aware of this and acknowledged having examined 'old and faded' specimens from the lowlands near Kuching, south-west Sarawak, but made no final identification. What appears to have been at least Stresemann's evidence has been re-examined: specimens NHMUK 1893.6.24.18 and 1893.7.4.14 collected by A. H. Everett at 'Poeh' (Pueh) (habitats not recorded), in far south-west Sarawak in 1892. Colour tones and pattern are non-Bornean *erwini*-like, except that the underwing-coverts are white, rather than lemon-tinged, with uppertail-coverts slightly too brightly and contrastingly yellow-tinged. They also average shorter winged: 48 mm and 50 mm (vs. 50–56 mm, mean 52.3 mm in *erwini*). Two other apparent adults, YPM ORN 063503–504, dated 20 September 1951 from a lowland inland locality, Stapok road, close to Kuching town (around which Fogden 1966 reported regular evening flights of white-eyes in the direction of nearby mangroves) are similar, except that the underwing-coverts are *erwini*-like pale lemon, rather than white, and neither shows any contrasting supra-loral yellow. They too are small: wings 48 mm and 50 mm. Another four individuals, WFVZ 41715–718, collected from foraging flocks in a sea-level woodland / buffalo pasture mosaic on the Klias Peninsula, south-west Sabah state in May 1983 (Sheldon *et al.* 2001), were measured, described and photographed by R. Corado. They are



Figure 3. Unidentified coastal white-eye, Damai, Santubong Peninsula, south-west Sarawak, western Borneo (© D. N. Bakewell)

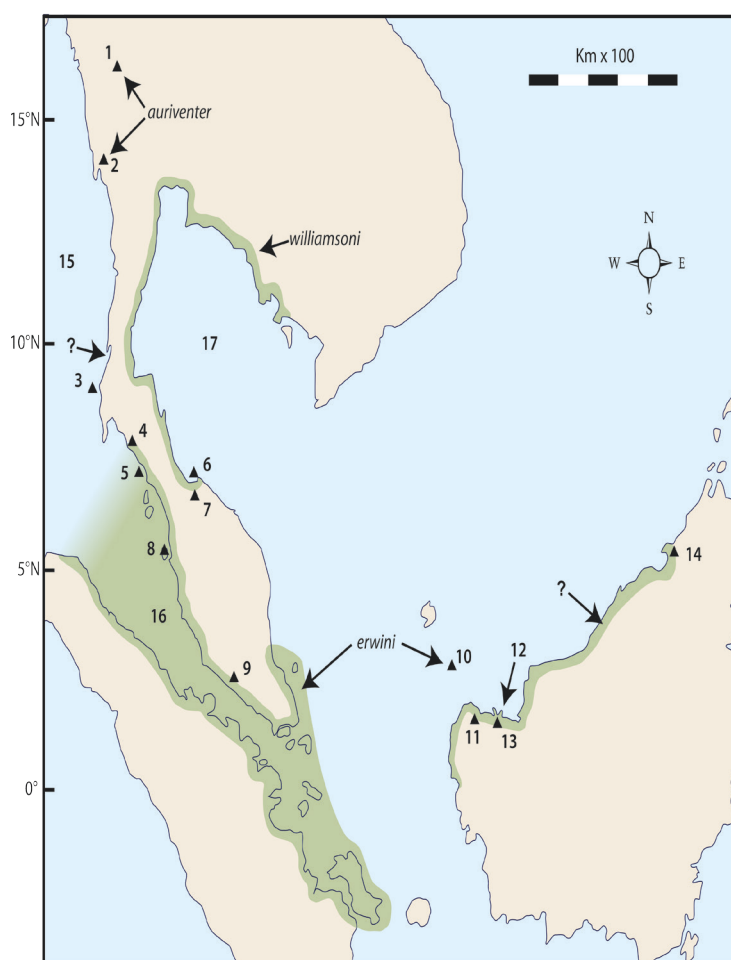


Figure 4. Currently understood range limits of western South-East Asian white-eye taxa conventionally grouped in *Zosterops palpebrosus*. Key: 1—Mount Mulayit; 2—Tavoy; 3—Ra Island; 4—Khlomg Thom district; 5—Libong Island; 6—Pattani Bay; 7—Mount Kala Kiri; 8—Penang Island; 9—Malacca; 10—Panjang Island; 11—Pueh Range; 12—Santubong Peninsula; 13—Kuching; 14—Klias Peninsula; 15—Andaman Sea; 16—Malacca Straits; 17—Gulf of Thailand.

in the same size category (wing 49.0–50.5 mm) and a fair match for Pueh specimens (with white underwing-coverts), except that two of the four appear to approximate a *buxtoni* amount of supra-loral yellow, more than in *erwini*. Finally, close-range photographs ([www.orientalbirdimages.org](http://www.orientalbirdimages.org)) taken by D. N. Bakewell in a coastal garden at Damai, Santubong Peninsula, also near Kuching, in December 2004, show a white-eye (Fig. 3) with bold yellow mid-ventral stripe and pale grey lateral body, but otherwise unlike any non-Bornean *erwini* specimen handled during this work. Full yellow supra-loral streak, all-yellow uppertail-coverts merging with rump and back but strongly contrasting with green of mantle and entirely black upperside of the tail, and slender bill are all characters of Indonesian *buxtoni* / *melanurus* / *unicus*.

Eight decades after Chasen dropped the issue, it is still safe only to conclude that mainland Bornean populations supposedly of *Z. palpebrosus*, despite being separated by only a short stretch of sea from the type locality of *erwini* (Fig. 4), are not true *erwini*. The current best provisional choice appears to be between (a) variable intergradation of *erwini* and a *buxtoni*-like taxon, implying (recent?) double invasion of Borneo from different sources, or (b), given that Bornean birds average shorter-winged than either hypothetical parent (Table 1), a separate, as yet un-named form in which definitive plumage characters develop apparently over more than one moult.

## Conclusion

Moyle *et al.* (2009) published genetic evidence of one or more species boundaries between the Indian Subcontinent and Lesser Sundas range extremes of conventionally identified *Z. palpebrosus*. One proposal draws on morphology and habitat-based arguments for uncoupling the name *auriventer* from supposed Oriental White-eyes inhabiting the Malacca Straits and neighbouring coasts, and the consequent retraction of the re-named population's mainland range southward. This opens a large, terrestrial range gap between inner tropical, mangrove-haunting *erwini* and *williamsoni*, and northern, mainly upland forest *siamensis*. Attention is also drawn to likely habitat-based parapatry between mainly coastal *erwini* and inland forest *buxtoni* 'subspecies' in eastern Sumatra, and to previously undescribed morphological differences between *erwini* and the neighbouring coastal white-eye population of western mainland Borneo.

These potential taxonomic boundaries all require more data from the field, particularly on vocalisations, especially song; also sampling for more phylogenetic analysis—to be undertaken before degradation of habitats that could be crucial to understanding finally eliminates such opportunities. It is proposed that sampling be broad enough to address at least: (1) the level of relatedness of coastal *erwini* and *williamsoni*, and of this pair with *siamensis*, the nearest neighbouring mainland taxon currently accepted as part of true western and northern continental *Z. palpebrosus*, against the proposition that they are not conspecific; (2) relatedness of *erwini* and *buxtoni* on Sumatra, against the proposition that they are not conspecific; and (3) status of the coastal Bornean population, relative to both *erwini* and *buxtoni*.

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## ***Zosterops* white-eyes in continental South-East Asia. 2: what is *Zosterops auriventer* Hume?**

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**SUMMARY.**—An accompanying paper (Wells 2017, this issue) presented reasons for treating the type series of *Zosterops auriventer* Hume, 1878, type locality Tavoy, south-east Myanmar, as a taxonomic composite, and for re-naming its (distantly allopatric) paratypes. Conventionally classified as a subspecies of Oriental White-eye *Z. palpebrosus*, the de-coupled *auriventer* is now known solely from its holotype and one other Myanmar specimen. Among provisional contenders, it is shown to be less convincingly related to *Z. palpebrosus* (as currently defined) than with the morphology of regionally widespread, inland forest-dwelling Everett's White-eye *Z. everetti*—and to become the species name of the latter's continental Asian populations should, as suggested, *everetti* be returned to the status of Philippine endemic. As before, the term 'continental' includes islands in South-East Asian shelf waters, i.e., out to the Greater Sundas and their satellites.

The de-coupling via morphology and habitat of *Z. (palpebrosus) auriventer* from its Malacca Straits paratype population (re-named *Z. p. erwini*) (Wells 2017) invites a re-opening of the century-old question of where, at species level, taxon *auriventer* actually belongs. A. O. Hume's type description of *Z. auriventer* (Hume & Davison 1878) emphasised a bold yellow stripe running from vent to mid-breast level, fronted and flanked by grey. Additional to *erwini*, however, at least six other white-eye taxa breeding in continental South-East Asia show some evidence of this character. *Z. p. williamsoni* and *Z. p. buxtoni*, respectively, of mangrove forest from the north-east (north?) Thai-Malay Peninsula to Cambodia, and inland, mainly slope-land forests of Sumatra and far western Java, are both more similar to *erwini* than to *auriventer*, especially in tones of upperparts green. They also show a yellow supra-loral stripe, which is actually broader and more prominent than in *erwini*, whereas the cap of *auriventer* is uniformly green with no stripe. In addition, *buxtoni* has uppertail-coverts, merging onto rump, conspicuously yellow, and an all-black tail (lacking any green on outer webs). These characters reappear in an unidentified Bornean coastal white-eye (Wells 2017) but otherwise are unshared.

The third contender (Figs. 1–2) comprises intermediates between the yellow- and grey-bellied morphs of *Z. p. siamensis* of more northerly, mainly upland forests, e.g., USNM 534535 and 535703 from montane forest edge on Doi Inthanon, north-west Thailand. Mees (1957) may have had such grey-flanked individuals in mind when he maintained the link between *auriventer* and species *Z. palpebrosus*. Over most of its range, however, *siamensis* shows contrasting yellow above the lores and bill base and, irrespective of underparts colour and pattern, aligns with other northern and western subspecies of *Z. palpebrosus* in being at least as bright Citrine Green (Smithe 1975) above as *erwini*, *williamsoni* and *buxtoni*, *contra* the more olive-toned, mid-green *auriventer*. It also differs from *auriventer* in wingtip shape (Table 1), and the outer webs of the rectrices of *siamensis* are broadly green-edged virtually to their tips, as in northern nominate *palpebrosus*, whereas green edging on the

TABLE 1

Morphometrics (mm; range and mean) of the *Zosterops* taxa discussed in this paper. Wing, tail and shortfall of p5 and p9 (descendant) behind wingtip measured as max. chord; tarsus from tarso-tarsometatarsal notch to third toe flexure point; bill from anterior edge nasal groove to tip. Sexes combined (label determinations discounted).

Taxon	n	Wing	Tail	Tail / wing ratio (×100)	P5 <wingtip	P9 < wingtip	Tarsus	Bill
<i>auriventer</i>	2	52, 52	35.6, 36.7	68, 71	4.1, 5.4	1.2, 1.2	14.3, 14.7	6.8, 7.1
<i>wetmorei</i>	16	51.0–54.5 (52.7)	30.6–36.1 (34.6)	59–70 (65.7)	1.9–3.3 (2.5)	2.1–3.4 (2.8)	14.1–14.5 (14.3)	7.0–8.1 (7.3)
<i>tahanensis</i>	12	49.5–54.0 (51.9)	27.0–35.1 (33.2)	55–70 (64.1)	2.3–4.5 (3.7)	1.1–2.4 (2.0)	13.1–14.5 (13.8)	6.4–6.8 (6.6)
<i>medius</i>	12	48–51 (48.9)	29.3–33.6 (31.2)	60–69 (63.7)	1.7–3.8 (2.9)	1.7–3.4 (2.3)	12.8–14.2 (13.5)	6.0–6.8 (6.4)
<i>siamensis</i> (Mount Mulayit)	8	52.0–54.5 (53.0)	34.0–38.4 (36.1)	65–71 (68.0)	0.7–2.6 (1.8)	2.8–4.6 (3.9)	14.2–16.6 (15.0)	5.2–7.2 (6.4)
<i>basilanicus</i>	7	53–56 (54.7)	37.3–40.1 (38.4)	68–72 (70.0)	0.0–2.6 (1.7)	2.7–5.3 (4.4)	14.3–15.5 (14.9)	6.1–7.9 (6.9)

tail of *auriventer* is no more than a fine fringe reaching not more than halfway towards the feather tips.

The museum record offers a further, distributional clue to relatedness, centred on Mount Mulayit (2,100 m) in the Dawna Range of Tenasserim (south-east Myanmar), c.200 km north of the Tavoy district type locality of *auriventer*. L. Fea collected the more northerly of the two accepted specimens of *auriventer* at 300–400 m elevation just south-west of this peak, whereas on the mountain itself he, and a few years before him Hume’s curator W. R. Davison, collected yellow-bellied *siamensis*, and only *siamensis*, from the summit zone down to 1,200 m (Hume & Davison 1878, Salvadori 1888). Based on March and April collection dates, potentially, in this area at least, the breeding season ranges of *auriventer* and *siamensis*, two different-looking birds, might have approached one another closely. E. C. S. Baker (NHMUK egg collection records) implied actual overlap, arising from nests of *siamensis* and *auriventer* both reported at Tavoy itself, but this must be rejected as Baker had acquired his clutches from other collectors without full data. Their identity has not been verified independently below genus level (D. G. D. Russell pers. comm.).

Other, as far as is known entirely allopatric, yellow-striped candidates form what Mees (1954) chose to lump with Everett’s White-eye *Zosterops everetti* Tweeddale, 1878, widespread in the Philippines and (see below) accepted by him as represented by subspecies *tahanensis* in inland forests of Borneo and the southern Thai-Malay Peninsula, and *wetmorei* Deignan, 1943, in the northern half, north to 11°40’N on the Thailand / Tenasserim upland divide (Meyer de Schauensee 1946). During mid-March 1966, B. F. King collected three additional *wetmorei* (USNM 535707–709) in montane forest on Khao Soi Dao Tai, Chanthaburi province, south-east Thailand, and in July 2004 (Pierce & Round 2006) two *Z. everetti* were mist-netted at 14°26’N in upland Khao Yai National Park, east-central Thailand, on a latitude with confirmed *auriventer* localities (Fig. 3), but a published photograph of the wingtip of one of the two captures showing disposition of the tips of its outer primaries indicates *wetmorei* (see below).

In ventral view (Fig. 1), on colour pattern—allowing for some plumage soiling—the two Tenasserim *auriventer*, Soi Dao Tai specimens, representative *wetmorei* from the Thai-Malay Peninsula including topotypes, representative *tahanensis* from the Peninsula and



Figures 1–2. The *Zosterops auriventer* grouping and neighbours, in ventral and dorsal views. Top row in each, left to right: *auriventer* (Tavoy, Tenasserim; holotype); *auriventer* (Mulayit, Dawna Range, Tenasserim); two *wetmorei* (Soi Dao Tai peak, south-east Thailand); two *wetmorei* (Trang, Peninsular Thailand); bottom row: two *tahanensis* (Main Range, Peninsular Malaysia); *medius* (Sadong peak, south-west Sarawak, Borneo; holotype); *medius* (Mount Kinabalu, Sabah, Borneo; holotype of *parvus*); *Z. palpebrosus siamensis* (Doi Inthanon peak, north-west Thailand); *Z. palpebrosus williamsoni* (Ra Island, Peninsular Thailand) (Harry Taylor, © The Natural History Museum, Tring)



Borneo including the types of its synonyms *medius* (south-west Sarawak) and *parvus* (Mount Kinabalu, Sabah) are inseparable. All have white lower wing-coverts, one common tone and distribution of lead grey on breast and flanks, a common extent of ventral yellow, and similar dorso-ventral merging of colours behind the jaw. Dorsally (Fig. 2), all show the



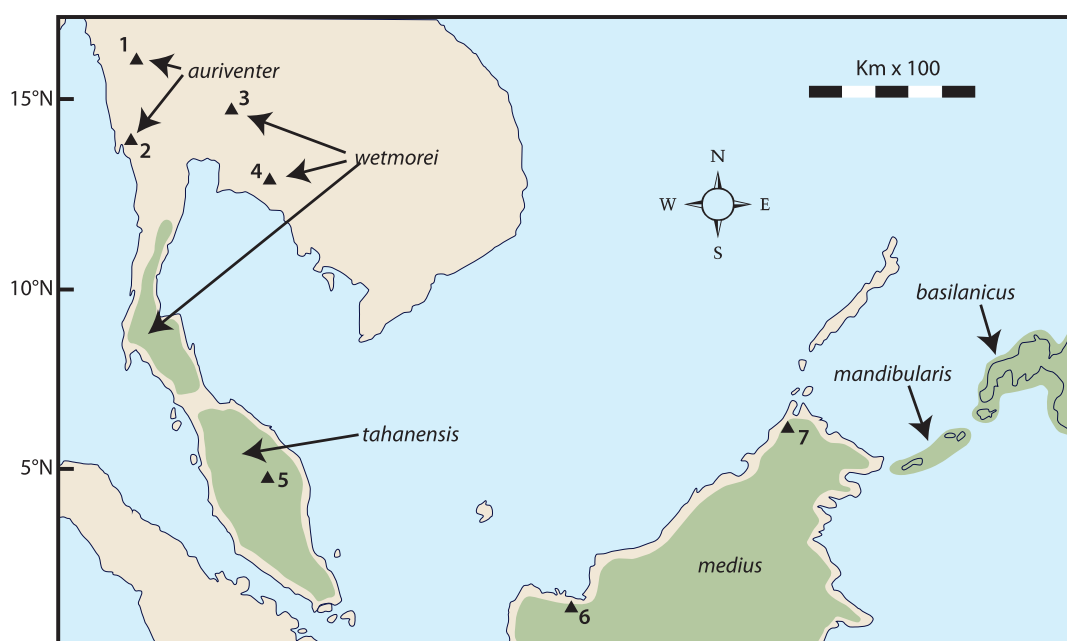


Figure 3. Currently understood geographical range relations of the *Zosterops auriventer* subspecies and neighbouring Philippine *Z. everetti mandibularis* and *Z. e. basilanicus*. Key: 1—Mulayit peak; 2—Tavoy; 3—Khao Yai National Park; 4—Soi Da Tai peak; 5—Mount Tahan; 6—Sadong peak; 7—Mount Kinabalu.

same fine green outer-web fringing at the base of rectrices and, except for one yellow-based supra-loral feather on one of the Soi Dao Tai specimens, green of the cap continuous to the lores and bill base, with no interposed yellow.

Within this series, *auriventer* and *wetmorei* specimens show identical tones and distribution of upperparts green, and measurements demonstrating that the supposedly diagnostically long bill of *wetmorei*, described from the Peninsula, is replicated north as well as east—making it difficult to accept that these two could be anything except one another's geographical representative. Apart from wingtip shape—shortfall of the outermost large primary (p9 descendant) behind tip <2 mm in *auriventer*, 3–5 times less than that of p5, vs. p9 and p5 sub-equal in *wetmorei* (Table 1)—indeed, nothing obvious from morphology stands in the way of linking them at an even lower taxonomic level. As such, it appears that *auriventer* should be added to Mees' *Z. everetti*.

The mainland *tahanensis* sample differs from *wetmorei* only by its shorter bill (Table 1) and, in most individuals, including all of three from the type locality, Mount Tahan in Taman Negara National Park, Malaysia, by being subtly darker olive-green above (Smithe colour Greenish Olive, no. 49), with even less uppertail-coverts contrast. Mees (1954) included Borneo in the range of *tahanensis*, but upperparts greens and level of tail-coverts contrast in most Bornean specimens, from east and north-west Sabah and south-west Sarawak, more closely resemble *auriventer* and *wetmorei*; only one (of three from Mount Kinabalu) being as dark above as topotypical *tahanensis*. They also average shorter winged than *tahanensis* from the Peninsula (Table 1), with a generally finer bill. No good reason has been found not to re-recognise their separate subspecies status, as *medius* Robinson & Kloss, 1923 (senior to Hachisuka's Kinabalu *parvus* by three years), type locality Mount 'Sidong' (= Sadong), Samarahan Division, south-west Sarawak.

Completing the continental round-up (*cf.* Stresemann 1939), a link with Black-capped White-eye *Z. atricapilla*, prominently yellow-striped and almost as similar in its tones and distribution of green, grey and yellow, is ruled out of contention mainly by a combination of black (rather than green) forecrown and face in adults, and, in montane forests of Borneo, up to 800 m of altitudinal range overlap with *medius* (Mann 2008).

Finally, Mees (1954) came to his view of the geographical range of *Z. everetti* impressed by similarity of the colour patterns of Bornean '*tahanensis*' (= *medius*) and *Z. e. basilanicus* of Mindanao west to Basilan, at the east end of the Sulu Island chain (Dickinson *et al.* 1991); also by equivalence of their habitats. Though widely adopted, his merger proposal faced certain difficulties. One, noted by Mees himself, being that *Z. e. mandibularis* Stresemann, 1931, which occupies the Sulu archipelago range gap between *basilanicus* and *medius*, rather than intergrading, diverges from both of these forms in the brightness of its upperparts green and paleness of its grey flanks. Another, not previously raised but apparent from the distribution map, Fig. 8 in Mees (1957), is that no representative has been found on Palawan, a biogeographical 'stepping stone' between the Sunda region and oceanic Philippines, or on any of its satellites; nor is one known to occur in the Philippines archipelago anywhere near the eastern end of this dispersal route. Among inland forest passerines accepted as being shared by Borneo and the Philippines such a gap is exceptional, as far as is known being shown only by Rufous-tailed Jungle Flycatcher *Cyornis ruficauda* and Chestnut-capped Thrush *Geokichla interpres*, the latter in any case reaching east only as far as the Sulu archipelago itself (Kennedy *et al.* 2000). Adding in a re-assigned *auriventer* and additional Thai populations also gives *Z. everetti sensu lato* a far larger continental Asian range than envisaged by Mees when he proposed the hypothesis of *everetti* stock having 'recently' invaded westward from the Philippines.

Any of three scenarios might apply: (a) Asian continental forms and *basilanicus* have separately retained hypothetical ancestor-group plumage features lost in other Philippine representatives of *Z. everetti*; (b) *basilanicus* does not form a part of Philippine *Z. everetti* but is a misclassified vicariant population of an otherwise wholly continental species; or (c) in comparable ecological space, similarities are due to convergence. Other tools are needed to tease these apart, but note is taken of size divergence between *basilanicus* and continental taxa (Table 1) that actually peaks against nearest neighbouring *medius*. *Contra* options (a) and (b), *basilanicus* also retains characters found only among other Philippine populations of *Z. everetti* (including *mandibularis*): dusky brownish vs., in continental adults, black lores; a relatively stout bill, especially different from that of *medius*; pale brown vs. slate-grey feet; and extensive green fringes to the rectrices. In fact, the tail pattern of Philippine *Z. everetti* is much more like that of *siamensis* and other northern *Z. palpebrosus* subspecies than it is of any presumed representative of *everetti* on the continent. In addition, some Mindanao *basilanicus* show yellow above the lores (Mees 1957). These populations might be related, but the strictly morphological rationale for species lumping has surely been stretched.

Returning *Z. everetti* to the status of Philippine endemic would leave nomenclature on the archipelago undisturbed. As first accepted (apparently unwittingly) for an inland forest white-eye by Sharpe (1887a) and recognised as such at least temporarily by several subsequent investigators (e.g., Stresemann 1931), by seniority the name of its continental counterparts would revert to being *Zosterops auriventer* Hume. Rather than an oceanic island species with a continental bridgehead, this proves to be widespread in inland mixed evergreen forests of mainland continental South-East Asia but has penetrated and / or persisted in only a part of the latter's island sector (absence particularly from Sumatra as yet unexplained). Provisionally, four subspecies must be recognised, the first two with uncertain range limits: nominate *auriventer* Hume, 1878, known only from central

Tenasserim; *wetmorei* Deignan, 1943, in southern Thailand (northern and eastern range limits as yet unknown) and the northern Thai-Malay Peninsula; *tahanensis* Ogilvie-Grant, 1906, in the southern Thai-Malay Peninsula; and *medius* Robinson & Kloss, 1923, on Borneo. 'Hume's White-eye', the only already published English name appropriate to an actual species *auriventer*, is proposed here in recognition of A. O. Hume's original description.

## Conclusion

Having cut *auriventer* adrift from species-level moorings on a combination of morphology and habitat selection (Wells 2017), the search here has been for a best fit of characters among alternative regional contenders, sorted by showing some degree of development of the main character of the *auriventer* type description—a mid-ventral yellow stripe. Among these, tightness of the fit of a range mainly of plumage features backed by apparently unique habitat equivalence permits a strong presumption that the true relatives of *auriventer*, at not above subspecies level, are the continental, as opposed to Philippine, forms of *Z. 'everetti'*. This and the taxonomic realignments that follow nevertheless still require the support of both molecular genetics and field data such as on vocalisations, especially song. Sampling should be sufficiently broad to address at least the following: (1) the relatedness of nominate *auriventer* (for which, given the age of museum material, fresh tissue collection probably will be required) and *siamensis*, testing the proposition that these two are not conspecific; (2) relatedness of nominate *auriventer* and the *erwini* / *williamsoni* pair, testing the proposition that they too are not conspecific; (3) range-wide relatedness within *Z. auriventer* as re-defined; and (4) the relatedness of *medius*, *mandibularis* and *basilanicus*, testing the Mees hypothesis. A wider investigation of *Z. everetti* within the Philippines would be expected to follow.

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For access to libraries and collections and the making or hosting of specimen loans I am indebted to Robert Prŷs-Jones and Hein van Grouw (Natural History Museum, Tring: NHMUK), James Dean and Chris Milensky (United States National Museum of Natural History: USNM), Peter Ng and colleagues (Lee Kong Chian Natural History Museum, Singapore: LKCNHM), Enrico Borgo (Museo Civico di Storia Naturale Giacomo Doria, Genoa: MSNG), and Steven van der Mije and Kees Roselaar (Naturalis, Leiden: RMNH). Many thanks also to Julie Dando of Fluke Art, Plymouth, for help with mapping, and to Philip Round, Bas van Balen and Robert Prŷs-Jones for comments and corrections that improved the manuscript.

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# On the female plumage of Glow-throated Hummingbird *Selasphorus ardens* Salvin, 1870

by Dale Dyer & Andrew C. Vallely

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**SUMMARY.**—Glow-throated Hummingbird *Selasphorus ardens* is a poorly known trochilid described from the highlands of western Panama. It is documented by no more than 12 putative specimens of which the last was collected in 1924. Most specimens have ambiguous or untraceable localities. There are few recent reports, and the lack of reliable diagnostic criteria has limited efforts to understand the status, distribution and life history of *S. ardens*. We reviewed the extant specimen material and demonstrate that published descriptions of female plumage cannot be verified and that female plumage is unknown.

Glow-throated Hummingbird *Selasphorus ardens* Salvin, 1870, is a poorly known species endemic to the humid highlands of west-central Panama. Very little has been published concerning its life history, ecology or possible movements (Collar *et al.* 1992, 1994) and the taxon has recently been classified as Endangered (BirdLife International 2013). There are very few recent reports of *S. ardens* in life (Collar *et al.* 1992, Angehr *et al.* 2008) and we know of no unambiguous photographs. Uncertainty regarding its identification criteria and distribution has led to confusion with the widespread Scintillant Hummingbird *S. scintilla* and has hampered efforts to locate and identify the species in the field. *S. ardens* is known from very few localities, and vagueness and unreliability of locality data have also contributed to the uncertainty of identification criteria. Female plumage has been described from a very small number of putative specimens, all with ambiguous label data, and including some that are certainly misidentified (Table 1). There is no material basis for published descriptions of female plumage, and therefore the female plumage is unknown. In this study, we review the available specimen material of *S. ardens* and compare it with published descriptions in the hope of clarifying diagnostic characters for female plumage.

## History

Salvin (1870) described *Selasphorus ardens* from two undated specimens taken by Arcé in the highlands of western Panama (Serranía de Tabasará) at localities believed to be in present-day Veraguas province (Wetmore 1968, Siegel & Olson 2008; Fig. 1). The two syntypes comprise an adult male labelled as being from 'El Castillo' (Natural History Museum, Tring, NHMUK 1887.3.22.1076; Fig. 2) and an immature male from 'Calovévora' (NHMUK 1887.3.22.1077; Fig. 2). Salvin (1870) provided a description of plumage characters to distinguish the adult male from Volcano Hummingbird *S. flammula* and *S. torridus* (now *S. flammula torridus*), including tail pattern, purplish-red throat and absence of elongated throat feathers, but he did not distinguish *S. ardens* from *S. scintilla*.

*Selasphorus* hummingbirds collected at Volcán Barva in central Costa Rica during the late 19th century were included in *S. ardens* until Carriker (1910) described these as *S. simoni* (Fig. 3), a restricted-range endemic now treated as a subspecies of *S. flammula* following Stiles (1983). The Volcán Barva birds have also been referred to *S. ardens underwoodi*, but

TABLE 1

Data and identification of specimens catalogued as *S. ardens* in natural history museums or identified as *S. ardens* in the literature (excluding '*S. a. underwoodi*'). For measuring protocols see Methods and materials. Measurements in mm. All specimens examined by both authors and measured by DD, except NHMUK material, which was examined by ACV and measured by Hein van Grouw, and the SFN specimen measured by Thais Zanata, who also measured AMNH specimens with closely similar results to DD. For acronyms see Acknowledgements.

Reg. no.	Age, sex	Label data	Wing chord	Bill	Tail	Species identity	Remarks
NHMUK 1887.3.22.1076	ad. ♂	E. Arcé, Castillo	38.6	11.9	27	<i>S. ardens</i>	Syntype
NHMUK 1887.3.22.1077	imm. ♂	E. Arcé, Castillo [struck through] Calovévora	39.5	11.7	24	<i>S. ardens</i>	Syntype
NHMUK 1913.3.20.588	ad. ♂	R. J. Balston, Veragua, 1907	38.9	11.5	28	<i>S. ardens</i>	
AMNH 37832	ad. ♂	E. Arcé, Costa Rica [struck through, 'Veragua' in pencil]	41.4	11.2	31	<i>S. ardens</i>	Erroneous locality? Elliot collection
AMNH 37833	ad. ♂	E. Arcé, Costa Rica	39.4	11.1	30	<i>S. ardens</i>	Erroneous locality? Elliot collection
AMNH 37834	(juv.?) probable ♀	Costa Rica [struck through], 'Veragua' [in black ink]	40.5	12.7	26	Not certainly <i>S. ardens</i>	Label identical to Arcé specimens; erroneous locality? From Boucard; Elliot collection
AMNH 37835	ad. ♂	'Veragua '	40.5	11.1	33	<i>S. ardens</i>	From Boucard; Elliot collection
AMNH 484754	ad. ♂	E. Arcé [pencil annotation] Chiriquí [In pencil:] 'Veraguas? AW'	39.4	11.7	32	<i>S. ardens</i>	Rosenberg & Rothschild collection labels
SFN 81965	ad. ♂	H. Whitely Veragua July 1882	39.1	12.0	30	<i>S. ardens</i>	Berlepsch collection label
FMNH 46464	ad. ♂	E. Arcé 1875 Veragua; [Boucard label reads] Chiriquí	37.6	n/a (bill broken)	28	<i>S. ardens</i>	Boucard, Rosenberg collection labels
AMNH 182684	ad. ♂	L. Griscom Cerro Flores, Chiriquí, (3,600 ft.?) 9 March 1924	40.3	10.3	29	<i>S. ardens</i>	
AMNH 182682	ad. ♂	L. Griscom, Cerro Flores, Chiriquí, (3,600 ft.?) 12 March 1924	40.0	11.4	28	<i>S. ardens</i>	
AMNH 182685	♀	L. Griscom, Cerro Flores, Chiriquí (3,600 ft.?) 11 March 1924	38.0	11	26	<i>S. scintilla</i>	
LSUMZ 177697	ad. ♂	J. T. Weir, Cerro Colorado, Chiriquí, 12 April 2003	34.5	10	27	<i>S. scintilla</i>	
LSUMZ 177698	ad. ♂	J. T. Weir, Cerro Colorado, Chiriquí, 12 April 2003	36.0	9		<i>S. scintilla</i>	
LSUMZ 177699	imm. ♂	J. T. Weir, Cerro Colorado, Chiriquí, 13 April 2003	37.0	9	22	<i>S. scintilla</i>	
UWBM 113266	♀	J. T. Weir, Cerro Colorado, Chiriquí, 13 April 2003	36.8	11	25	<i>S. scintilla</i>	

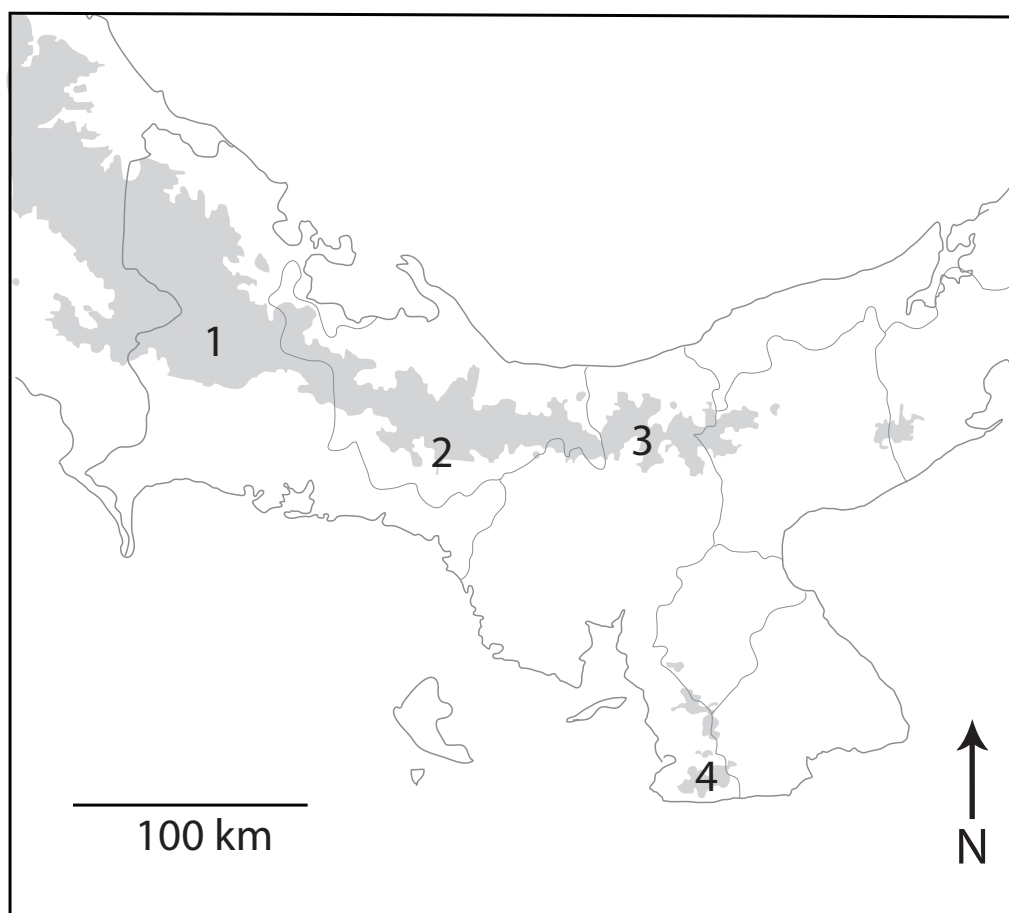


Figure 1. Map of western Panama showing localities mentioned in the text: (1) Volcán Barú; (2) Cerro Santiago; (3) Santa Fé; and (4) Cerro Hoya. Grey shading denotes areas above 700 m elevation.

Stiles (1983) demonstrated that the type of *underwoodi* is not of this taxon, but rather that it probably represents a hybrid between *S. scintilla* and *S. flammula*.

Elliot (1878) published the first description of the female, which included 'middle tail feathers bronzy-green, lateral ones buff with a black bar across their central part'. Elliot's description was repeated in full by Sharpe (1887) together with Gould's illustration of the syntypes. Boucard (1894–95) described both sexes using wording very close to that of Elliot (1878) and his description of the female tail is identical. Ridgway (1911) provided a detailed description of adult female *S. ardens* but remarked in a footnote that this was based on a single specimen and that he was 'very doubtful... whether this is not in reality a female of *S. scintilla*.' No other description of female plumage appeared in the literature until Wetmore (1968) reported his examination of 12 specimens of *S. ardens*, which from his account comprised nine males and three females. None of these authors stressed characters that distinguish *S. ardens* from *S. scintilla*. Stiles (1983) provided a diagram of female *Selasphorus rectrix* shape and markings. Brief descriptions of the female are also given in Ridgely & Gwynne (1989), Angehr & Dean (2010) and Stiles (1999).

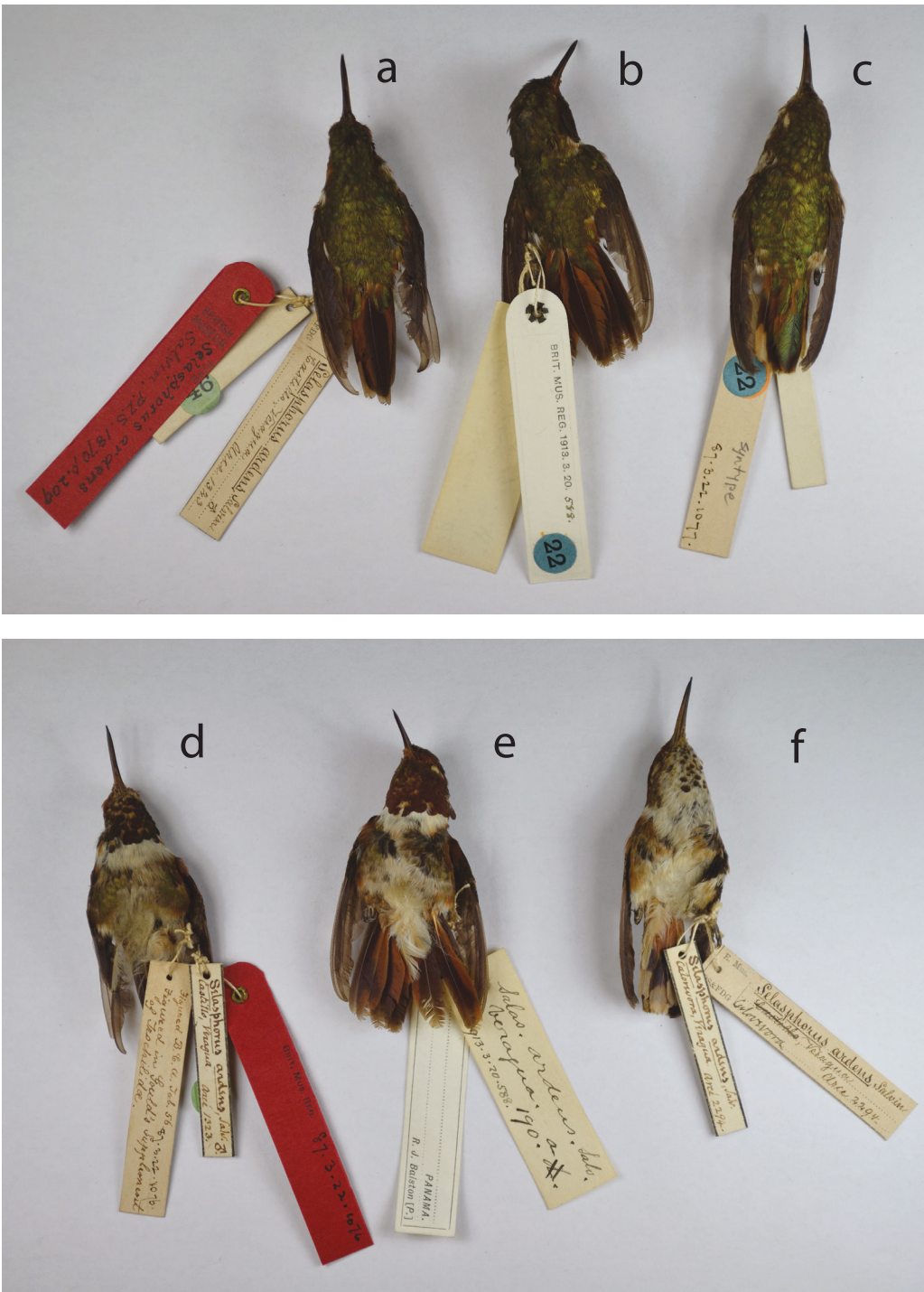


Figure 2. Specimens of Glow-throated Hummingbird *Selasphorus ardens* at Tring museum: (a) NHMUK 1887.3.22.1076 dorsal, syntype; (b) NHMUK 1913.3.20.588 dorsal; (c) NHMUK 1887.3.22.1077 dorsal, syntype; (d) NHMUK 1887.3.22.1076 ventral, syntype; (e) NHMUK 1913.3.20.588 ventral; and (f) NHMUK 1887.3.22.1077 ventral, syntype (Hein van Grouw, © Natural History Museum, London)



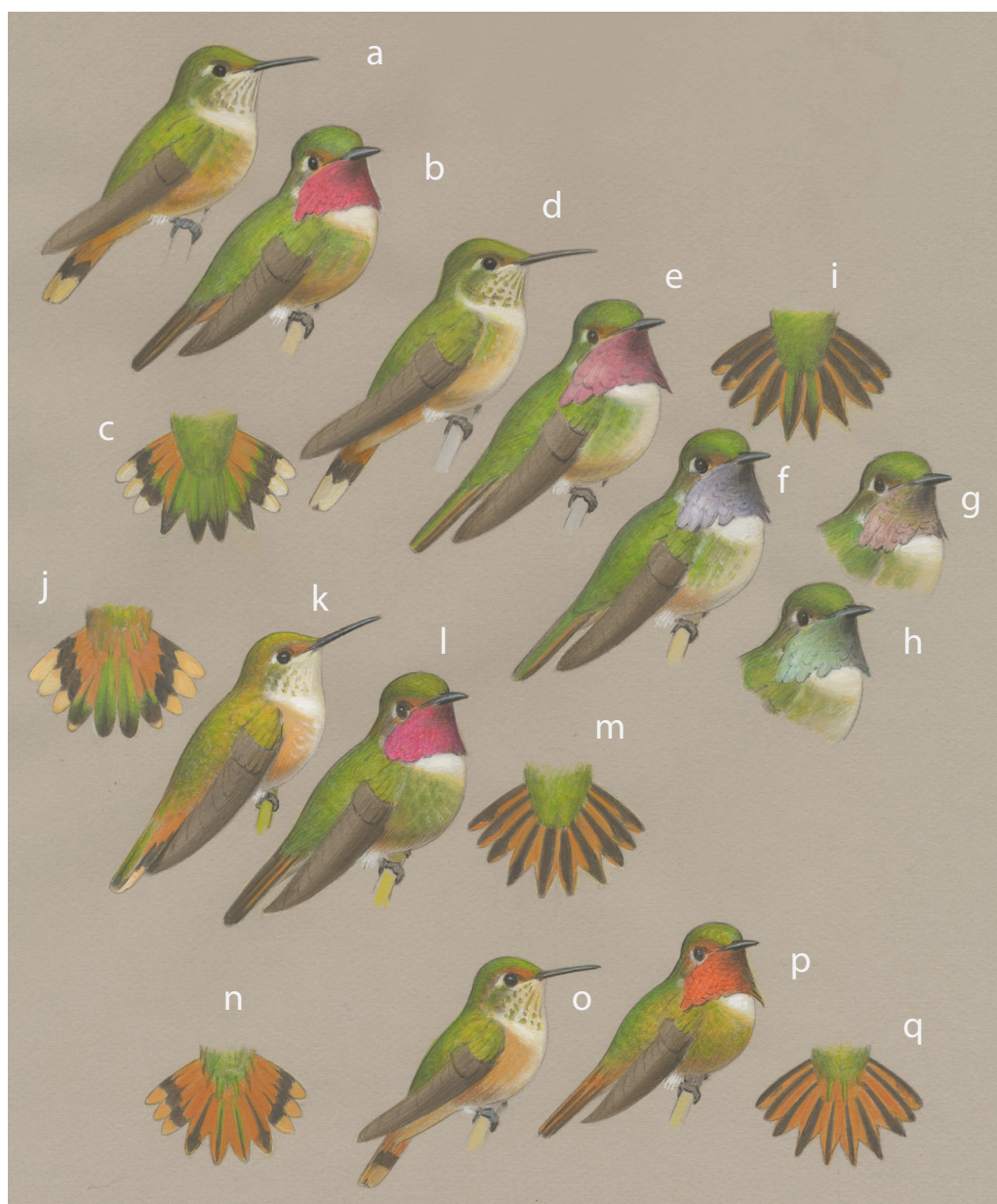


Figure 3. Plumages of the southern *Selasphorus* hummingbirds: (a) Volcano Hummingbird *S. flammula simoni* female; (b) *S. flammula simoni* male; (c) *S. f. flammula* female tail; (d) *S. f. flammula* female; (e) *S. f. flammula* male; (f) *S. f. torridus* male; (g) *S. f. torridus* male variant; (h) *S. f. torridus* male variant; (i) *S. f. flammula* male tail; (j) probable Glow-throated Hummingbird *S. ardens* female tail based on AMNH 37834; (k) probable female *S. ardens* based on AMNH 37834; (l) *S. ardens* male; (m) *S. ardens* male tail; (n) Scintillant Hummingbird *S. scintilla* female tail; (o) *S. scintilla* female; (p) *S. scintilla* male; and (q) *S. scintilla* male tail (Dale Dyer)

## Methods and materials

We searched museum collection databases, reviewed relevant literature and consulted specialists (see Acknowledgements) to compile a list of specimens catalogued as *S. ardens*,

exclusive of '*S. ardens simoni*' or '*S. ardens underwoodi*'. We examined all of these personally or via photographs, and where possible we obtained measurements of bill length (exposed culmen), wing chord and tail length (base to tip of longest rectrix). In an effort to verify published descriptions of female plumage, we compared these with available specimen material.

## Results

We located 17 specimens identified as *S. ardens* in the literature or museum catalogues, and determined 12 of these to be *S. ardens* or possibly *S. ardens* (Table 1). The majority ( $\geq 11$ ) of specimens are male. The single possible female does not bear complete or unambiguous label data that includes collector, a traceable locality and date, and thus its identity is uncertain. Identification of adult males is relatively straightforward and uncontroversial using the characters proposed by Salvin (1870), Ridgway (1911) and Stiles (1983), but in one case a recent series of male *S. scintilla* was misidentified as *S. ardens* (McGuire *et al.* 2014).

## Discussion

*Tracing localities.*—Salvin (1870) provided a map of western Panama, but was unable to place many of Arcé's localities, including 'El Castillo', and equally others have remained unresolved (Siegel & Olson 2008). One syntype (NHMUK 1887.3.22.1076) is denoted as being from 'El Castillo', but there are several localities bearing this name in western Panama. Cerro El Castillo, east of Santa Fé and reaching 1,297 m, is thought probably to be the locality concerned (G. Angehr *in litt.* 2016). A label on the second syntype (BMNH 1887.3.22.1077) is marked 'Calovévora' (although 'El Castillo' is also given, struck through). Salvin's map (1870) placed Pico Calovévora north of Santa Fé (Fig. 1), and also shows a 'Rio Calovévora.' Siegel & Olson (2008) traced Pico Calovévora to near what is now called Cerro Tute, and gave its elevation as 1,400 m, but this is doubtful. Cerro Cabeza de Toro (1,412 m), 8 km due west of Santa Fé and part of the same massif as Cerro Tute, is the peak that actually lies above the headwaters of the río Calovévora and is therefore perhaps the best candidate for 'Pico Calovévora' based on the name. There are, however, several other peaks nearly due north of Santa Fé that are also potential candidates, the highest being Saro at 1,518 m. Six other (Arcé?) specimens are labelled 'Veragua'. We note, however, that for 19th century naturalists, 'Veragua' referred to the entirety of modern-day west Panama to the Costa Rica border (Siegel & Olson 2008). Boucard (1894–95), for instance, wrote that the species 'was discovered on the Volcano of Chiriquí, Veragua (Colombia) by Mr. Arcé.' The name 'Chiriquí' is also problematic as it can refer to any of several features including the province or the volcano (now Volcán Barú).

In the American Museum of Natural History, New York, an adult male (AMNH 484754) is marked 'Chiriquí', and two adult males (AMNH 37832–833) and another individual labelled a female (AMNH 37834) are marked 'Costa Rica'. Of these specimens Wetmore (1968) wrote that the locality data is 'unquestionably incorrect. In view of the known range it is believed that all 3 [*sic*] are from Veraguas'. Given how little is known of the species' morphology, and present or past distribution, Wetmore's reasoning appears circular, and as to Chiriquí province it is contradicted by two specimens mentioned in his own account (see below). The AMNH males labelled 'Costa Rica' are morphologically consistent with the Veraguas and Chiriquí *S. ardens*, and not with *S. f. simoni*. While we accept Wetmore's (1968) assertion that identification of these males to *S. ardens* is correct, we cannot infer that their locality is 'unquestionably incorrect'. Annotators have deleted 'Costa Rica' on the labels of AMNH 37832 and 37834 and written 'Veragua'. Although AMNH 37832–835 were acquired

by the museum from Elliot in 1888, Elliot (1878) listed '*Hab. Veragua*' with no mention of Costa Rica.

In 1924, two adult males (AMNH 182682, 182684) were collected by Griscom at '3,600 ft.' (c.1,100 m) on Cerro Flores (1,605 m) in eastern Chiriquí province. These are the only specimens with elevational data. The site is near Cerro Santiago (Siegel & Olson 2008), which is within modern-day Comarca Ngäbe-Buglé, west of Veraguas. In addition, Griscom (1935) identified a male collected on Cerro Flores (also at '3,600 ft.') as *S. scintilla* (AMNH 182683). This established an eastern range extension for *S. scintilla* and the first documentation of sympatry between *S. scintilla* and *S. ardens*. Stiles (1983) doubted that *S. scintilla* was resident on Cerro Flores, supposing that two specimens (which must be AMNH 182683 and AMNH 182685) 'could have arrived via post breeding dispersal.' In recent years, *S. scintilla* has been regularly reported from nearby Cerro Colorado (G. Angehr *in litt.* 2016). We know of no basis for Griscom's (1935) inclusion of Veraguas in the range of *S. scintilla*.

In 1994, F. S. Delgado collected an immature male *Selasphorus* showing characters consistent with *S. ardens* at Cerro Hoya, Veraguas, on the Azuero Peninsula (Engleman 1994). The specimen was examined by G. Angehr and R. S. Ridgely, but has subsequently been lost (G. Angehr *in litt.* 2016). If the identity of the specimen was confirmed as *S. ardens* this would establish a new locality for the species, 75 km from the type localities and separated by lowlands (Fig. 1). In 2011, a small male hummingbird matching well with *S. ardens* was photographed on Cerro Hoya (Miller *et al.* 2015). Those authors concluded, however, that 'unless a specimen is collected and deposited in a formal natural history collection, we recommend removing *Selasphorus* from the list of species occurring in Cerro Hoya' (2015).

There have been sporadic sight reports of *S. ardens* from the Cerro Colorado area in recent decades. These observations are mainly from above 1,200 m on the road to Cerro Colorado (G. Angehr *in litt.* 2016). There were sight reports from near Cerro Tute, of a male *Selasphorus* at 800 m in 1974 (F. G. Stiles *in litt.* 2016) and another male in 1982 (Collar *et al.* 1992) but there are no recent reports from this region (Angehr *et al.* 2008; G. Angehr *in litt.* 2016). The species has not been reliably reported from any other locality since the 19th century, unless the Cerro Hoya birds prove to be of this species. In conclusion, while the collecting localities of the two syntypes are believed to be in central Veraguas province, and we can be confident in tracing the two Griscom specimens, the geographic provenance of the remaining eight known specimens remains obscure.

*Female specimens and plumage characters.*—We are unable to reconcile the currently available specimen material with that referred to in the literature. No previous authors have provided specimen numbers to identify their material unambiguously. In the following, we review putative female specimens in relation to published descriptions of female plumage.

Among 19th century skins marked 'Costa Rica' is one (AMNH 37834) also marked 'female' (Fig. 3). It is consistent in preparation and label style with males of *S. ardens* labelled 'Costa Rica' (AMNH 37832–833, collected by Arcé). Based on the AMNH catalogue, this specimen came into the museum's collection from Elliot along with a male *S. ardens* (AMNH 37835), and both had previously been purchased from Boucard. Elliot's (1878) brief description is fairly consistent with this bird. This 'female' was accepted as *S. ardens* by Wetmore (1968). The tail diagram presented in Stiles (1983) also is a fair match for the same specimen, but the pale tips to the outer rectrices of the specimen appear larger. Its rectrices are thin and weak, so it may be a juvenile, and therefore cannot be determined as certainly female based on plumage. The bill (12.7 mm), however, is longer than any of the *S. ardens* males, which is consistent with the pattern of dimorphism in *Selasphorus* (*cf.* Stiles 1983). Also, according to our observations immature male *Selasphorus* often show some



spots of glittering colour on their throats, which this bird lacks. The specimen is distinctive in several respects from females of *S. scintilla*, which is sympatric with *S. ardens* in Panama and which occurs also in Costa Rica (Fig. 3). Wing chord (40.5 mm) is longer than in female *scintilla* (36.2–38.8 mm; Wetmore 1968). Its central rectrices are mostly green with narrow rufous basal margins, whereas the typical pattern for female *scintilla* is mostly rufous with a narrow green median stripe. This specimen's outer rectrix tips are paler than most *S. scintilla*. Compared to most female *S. flammula*, it is more rufous above and below, has a less spotted throat, more cinnamon-tinged outer rectrix tips, and although its tail is incomplete it appears to lack the pointed central rectrices of adult female *flammula* (Fig. 3). Each of these characters is shared by some *S. flammula* specimens, especially juveniles. Its wing chord is comparable to female *S. flammula*, as expected for female *S. ardens*, because male *ardens* are within the size range of male *S. flammula*. The specimen lacks undertail-coverts. Based on morphology alone, we cannot eliminate the possibility that it is *S. flammula*. *S. ardens* and *S. flammula* are believed to be allopatric but, without faith in the data, identification cannot be based on locality.

Boucard was a dealer, and at least three of the known specimens passed through his hands (AMNH 37834–835, and Senckenberg Forschungsinstitut und Naturmuseum Frankfurt, SFN 81965). In 1892, he wrote 'I have two very fine males and one female of this rare species.' However, by 1888 AMNH 37834 (the 'female') and AMNH 39835 had passed into the New York collection via Elliot, and so he could not have been referring to these birds. We cannot ascertain if the specimens referred to by Boucard (1894–95) are extant.

We cannot determine what specimen Ridgway's (1911) female description was based upon, but we share his concern as to its identity. Wetmore (1968) stated 'Ridgway had available only two males and female from the American Museum', but we doubt that his descriptions were based on AMNH birds. The museum at that time had four specimens, including three males, and he probably would have measured all three. He did not mention 'Costa Rica', as three of those AMNH skins are labeled—the only localities he gave are those of the syntypes and Volcán Chiriquí. We have not discovered any specimen of *S. ardens* from Volcán Chiriquí, which lies 100 km west of any documented locality, and no subsequent author has included the Chiriquí / Talamanca range in the range of *S. ardens*. Ridgway (1911) gave the wing chord for his female as 1 mm shorter than that for the AMNH female (37834), although his bill measurement matches well. Most significantly, he included 'under tail-coverts pale cinnamon-buff' in his description, but AMNH 37834 lacks undertail-coverts. We cannot be certain what individual Ridgway was describing—perhaps a bird from Volcán Chiriquí (where both *S. scintilla* and *S. flammula* occur)—but it was probably not, as he feared, an individual of *S. ardens*.

Griscom collected a female (AMNH 182685) on Cerro Flores initially identified as *S. ardens*. Wetmore (1968) accepted this identification, but we do not and neither did Stiles (1983, see above). Its wing chord is 38 mm, large for a *S. scintilla* but smaller than all but one known specimen of *S. ardens* (a male). Because females are larger than males in *Selasphorus* (Stiles 1983), these measurements are probably too small for a female *S. ardens*. Its plumage characters, including central rectrix pattern, are consistent with female *S. scintilla*, and differ from the 'Costa Rica' female (AMNH 37834) mentioned above. Stiles (1983) determined it as a juvenile female, but we cannot confidently age it.

McGuire *et al.* (2014) presented a phylogenetic hypothesis for the Trochilidae based on molecular data and including four tissue samples listed as *S. ardens* (Table 1). These samples are from four birds taken by J. T. Weir in 2003 at Cerro Colorado and deposited at the Louisiana State University Museum of Zoology, Baton Rouge (LSUMZ), and Burke Museum University of Washington, Seattle (UWBM). One is a female. All were found



in their analysis to be close to an individual of *S. scintilla*. We examined the three males (LSUMZ 177697–699), two adults and one immature, and determined them as *S. scintilla* based on their small size and orange-red gorget. A fourth specimen from this series, the female, was deposited at UWBM (113266). Our examination indicated that it is also too small for any known *S. ardens* (wing 36.8 mm). It is consistent with *S. scintilla* in size, and also in central rectrix pattern. We believe that the Burke Museum female is also an example of the widespread *S. scintilla*.

Following the discussion of the syntypes (males) Wetmore (1968) wrote that he had ‘examined these 2 specimens and also a female, all collected by Arcé, in the British Museum’. However, there are currently three males and no female *S. ardens* at NHMUK. Wetmore gave measurements of females based on ‘3 from eastern Chiriquí and Veraguas’. It is possible that he placed his data for one male specimen in the wrong set. His means are not halfway between his longest and shortest measurements, and therefore a third bird must have been included. It would be highly desirable to see a female collected by Arcé from a topotypical locality, but Wetmore (1968) offered no more information concerning his supposed NHMUK female.

Like Wetmore’s (1968) account, Stiles’ (1983) data for females are puzzling. His Table 1 gives three as the number of adult females measured. These three probably included the AMNH ‘Costa Rica’ skin (AMNH 37834), but we cannot determine what, if any, additional material he possibly examined. None of the other collections Stiles consulted possess skins of *S. ardens*. Stiles’ measurements closely recall, but are not identical, to Wetmore’s (1968).

While we have arrived at the same number of specimens for the species (12) as Wetmore (1968) and Stiles (1983), our list is different as to material included, and Wetmore’s and Stiles’ differ from each other. While Wetmore (1968) and Stiles (1983) both give three as the number of females examined, the individual specimens referred to in these two accounts cannot be reconciled with each other.

## Conclusions

Definite localities for *S. ardens* are all in the highlands of central Veraguas province and what is now eastern Comarca Ngäbe-Buglé (Fig. 1). The species is rare in collections and most specimens are male. Three specimens (AMNH 37832–834), including the only probable female (AMNH 37834), bear a dubious locality attribution (‘Costa Rica’). Despite the confident assertions of earlier workers, no unambiguous characters documented from extant specimens are known to distinguish females of *S. ardens* from females of other *Selasphorus*. Until future collecting efforts can secure a female specimen, or a female specimen is confirmed to be *S. ardens* using molecular techniques, the female plumage of *S. ardens* remains unknown.

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# The type of Rapa Shearwater *Puffinus (newelli?) myrtae* from the Austral Islands, Polynesia, with remarks on the morphological variation of the taxon

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**SUMMARY.**—Rapa Shearwater *Puffinus (newelli?) myrtae* is known solely from five specimens held in Tring and Paris museums, and from observations on the breeding islands. It has a potentially tiny breeding population that is apparently restricted currently to islets off Rapa (it formerly also bred on the main island of Rapa), as well as probably on Marotiri (south of Rapa), in the Austral Islands, Polynesia. Clear differences in morphology between the series in Paris and the holotype in Tring can be explained in terms of age-related variation, with the latter specimen being a juvenile. As a result, we describe adult plumage in detail for the first time. Genetic analysis confirmed that the Paris and Tring specimens can be unequivocally referred to the same taxon.

Bourne (1959) described *Puffinus assimilis myrtae* from a single female shearwater now held in the Natural History Museum, Tring, reported to have been collected on Rapa Island (27°37'S, 144°20'W; c.40 km<sup>2</sup>), in the south of the Austral archipelago (previously Tubuai Islands), Polynesia, in mid-April 1925, by H. J. Kelsall during the St. George Scientific Expedition (NHMUK 1925.12.22.147). Subsequently, four additional specimens were collected (now in Paris museum, see below), while a specimen, taken in May 1880 and held at the American Museum of Natural History, New York (AMNH), labelled as being from 'Marotiri' Island, actually belongs to the *P. assimilis* group, and was collected off New Zealand by Andreas Reischek, a well-known bird collector working in New Zealand (H. Shirihihi pers. obs.; J.-C. Thibault pers. comm.). Austin *et al.* (2004) sequenced two of the Paris specimens and reported that *myrtae* was most closely related to Newell's Shearwater *P. newelli*, with the result that most subsequent commentators have considered *myrtae* a subspecies of *newelli*, with or without Townsend's Shearwater *P. auricularis* as a third race (e.g., Dickinson & Remsen 2013, del Hoyo & Collar 2014). Recently, however, it has been suggested that *myrtae* might most appropriately be treated specifically (Martínez-Gómez *et al.* 2015).

By inference, given his remark that 'it seems likely that a bird taken ashore in April was preparing to breed', Bourne presumably believed the Tring individual to be adult. Rapa and its associated islets have not been subject to frequent attention from ornithologists, but they were visited by the Whitney South Sea Expedition in April 1921 and February 1922, and more recently by J.-C. Thibault in October–December 1974 and A. Varney in December 1989–January 1990 (Thibault & Varney 1991). During the 1974 field work, four additional specimens of what has generally been assumed to be the same small black-and-white *Puffinus* were collected on Rapa's offshore islets and are now at the Muséum National d'Histoire Naturelle, Paris (MNHN 1975.1787–1790). However, recent detailed comparisons by HS of the Tring and Paris specimens revealed clear differences in plumage and biometrics between the type specimen of *myrtae* and the series in France. Here we describe the reasons

for this morphological variation, in the process describing adult *myrtae* for the first time, and provide genetic confirmation that the Tring and Paris specimens belong to the same taxon. Our study concludes that the type specimen is in fact a fledged juvenile, and not an adult as intimated by Bourne (1959).

Methods

**Specimen analysis.**—All relevant specimen material was examined by HS & VB, with the Tring *myrtae* being checked also by GMK; all measurements were taken by HS & VB according to standard protocols (Svensson 1992) using electronic callipers and a metal wing-rule with a perpendicular stop at zero: wing length (from carpal joint to tip applying gentle pressure to the primary-coverts—Svensson’s method 2); tail length (from the pygostyle to the tip); tarsus length (from the back of the intertarsal joint to the last complete scute before the toes diverge) and bill length (from the tip of the maxilla to the feathers).

**Molecular analysis.**—A partial fragment of the mitochondrial gene cytochrome *b* (cyt *b*) of the holotype of *myrtae* was sequenced for comparison with sequences of other *Puffinus* species available on GenBank including those from two of the specimens collected on Rapa in Paris (MNHN 1975.1787, 1975.1788) (Austin *et al.* 2004). Total genomic DNA was isolated

TABLE 1  
Conserved primer sequences used to amplify the mitochondrial cytochrome *b* gene; all those with the suffix \_neu have been slightly modified from Pyle *et al.* (2011).

Primer	Sequence
aCytbPro3F	5' CACACATGCCGAAAYGTACA
aCytbPro3R	5' GCAGTTGCTATRAGRGRAG
aCytbPro4F_neu	5' TAAAGAGACCTGAAACACAGG
aCytbPro4R	5' CCCCCTCAGGCYCATTCTAC
aCytbPro5F_neu	5' CAGCCATCCCATACATCG
aCytbPro5R_neu	5' AATGGGATTTTTCACAGTTTG
aCytbPro6F_neu	5' CACGAATCAGGCTCAAACAA
aCytbPro6R_neu	5' TGGTTTGATATGAGGAGGTG
aCytbPro7F_neu	5' CCTACTAGGAGAYCCAGAAATTT
aCytbPro7R_neu	5' GTTCGTTGTTTRGCCITGTG

from a toe-pad sample of the *myrtae* holotype using sbeadex® forensic kit (LGC Genomics). Five fragments resulting in a partial sequence of cyt *b* were amplified with polymerase chain reaction (PCR) using slightly modified versions of the published primer pairs aCytbPro3F/aCytbPro3R, aCytbPro4F/aCytbPro4R, aCytbPro5F/aCytbPro5R, aCytbPro6F/aCytbPro6R and aCytbPro7F/aCytbPro7R (Pyle *et al.* 2011) (Table 1). PCR reaction volume was 25 µl containing 12.5µl GoTaq® Hot Start Green Master Mix (Promega), 2 µl genomic DNA, 2µl of each primer with a concentration of 10µM and 6.5

µl ddH2O. PCR was performed using a SensoQuest Labcycler. The cycling conditions for amplification were: initial denaturation of 94°C for three minutes, followed by 40 cycles of denaturation at 95°C for 30 seconds, annealing for 30 seconds at 54°C and extension at 72°C for one minute, with a final extension at 72°C for seven minutes. PCR products were cleaned using the Wizard SV Gel and PCR Clean-UP System (Promega) or with Microsynth AG (Balgach, Switzerland). Sequencing was performed with Microsynth AG. Sequence preparation and editing of sequences was performed using Geneious Pro (Drummond *et al.* 2013).

Results

**Molecular.**—The resulting cyt *b* fragment from the *mrytae* holotype in Tring was 700 base pairs in length (GenBank accession no. KY933629) and differed in one synonymous substitution of a C with a T from the two sequences of *myrtae* from MNHN retrieved from GenBank (AY219938, 219939). We therefore eliminated the seemingly remote possibility that



TABLE 2  
Mensural data taken by HS & VB for all known specimens of *Puffinus newelli myrtae*, measured according to standard parameters (see main text; Svensson 1992). For museum acronyms, see main text. Measurements of live birds (from Holyoak & Thibault 1984) are also given for comparison.

Locality	Museum	Reg. no.	Date	Age	Sex	Wing	Tail	Culmen	Bill depth at hook	Bill width at gape	Tarsus	Mass
Rapa	MNHN	1975.1787	23/10/1974	Adult	F	191.0	73.0	26.20	5.50	11.60	37.65	
Rapa	MNHN	1975.1789	20/10/1974	Adult?		198.0	71.0	27.10	6.30	11.30	38.70	
Rapa	MNHN	1975.1788	20/10/1974	Adult	F	193.0	78.0	27.80	6.10	10.20	39.10	
Rapa	MNHN	1975.1790	16/10/1974	Adult	F	201.0	76.0	26.60	6.40	10.40	41.00	
Rapa	NHMUK	1925.12.22.147	17/04/1925	Juvenile	F	197.0	81.0	24.70	6.20	10.20	40.00	
Means (excluding NHMUK specimen)						195.75	74.5	26.93	6.08	10.88	39.11	
Mean for ten live birds				Adult	-	198.5	-	25.8	-	-	40.7	192

the Tring specimen was mislabelled as to locality or that it was a bird that had come ashore on Rapa from some other (perhaps even far) remote breeding grounds.

**Morphology.**—Our analysis of the five available specimens of *myrtae* (Table 2) revealed that the holotype in Tring is fairly distinct, being superficially most similar to the Southern Ocean Little Shearwater complex *P. elegans sensu lato* (although also very similar to larger forms assigned to *P. assimilis* in the New Zealand region) due to its distinctive greyish upperparts with extensive pale fringing, and especially the white vernal areas to the undertail-coverts and extensive white head-sides and inner webs to the primaries. Also in agreement with Bourne (1959), we noticed its clearly proportionately long tail and very short bill. Below we demonstrate that the holotype is a different age (juvenile) to the Paris series (all of which are adults), describe the latter plumage for the first time and its differences from the first plumage.

**The holotype is a juvenile.**—As noted above, it appears that Bourne (1959) believed the Tring female to be an adult that had come ashore at the start of its breeding season. However, it is a juvenile, based on the following characteristics (Fig. 1), at least some of which are typical of juveniles of closely related taxa: short, narrow bill with an all-dark and smooth surface (lacking the scratches and well-developed bill plates, especially the hook and nasal tubes usual of adults); apparently fresh juvenile wing feathers, with more pointed primary tips; broadly white-fringed wing-coverts (as is often observed in juveniles of the closely related *P. assimilis* group); extensive pale grey fringes to the upperparts; and the weakly expressed breast-side patches.

**Adult characters.**—The following is principally based on an adult female (MNHN 1787.1975) collected on the offshore islet of Tauturou, on 23 October 1974. This and the other three Paris specimens all have adult-type feathers throughout, while their bills possess rather ragged and scratched surfaces, and brownish-coloured stains on their bellies, presumably due to soil, further indicates that they were breeding at the time. Note that specimen MNHN 1975.1789 is labelled as a fledgling, but this is a mistake as this individual has its feathers (e.g., upperwing-coverts) both worn and new, which excludes the possibility that it had recently fledged.

Upperparts blackish to greyish brown. Dark crown extends to upper edge of eye and is generally sharply demarcated, although at border with white ear-coverts there is a dark-mottled (streaked black to dull grey on white) superciliary region (= lores and behind eye to neck-sides). Some slate-tinged feathers are present on neck-sides (several of them tipped white) and scapulars. Basal sides of forehead also white but do not join above bill



Figure 1. Holotype of Rapa Shearwater, taxon *myrtae* (NHMUK 1925.12.22.147), a juvenile female, collected on Rapa Island, Polynesia, in April 1925. Note unique combination of greyish dorsal areas (1a) with white tips, especially to the greater wing-coverts (1b), and white undertail-coverts (1c), inner webs to the remiges (1c), and area above the eye (1d), which phenotypically place the taxon closer to the *P. assimilis* complex (see Relationships). Note also the narrow all-dark bill with smooth surface (1d), more pointed primary tips (1a), broadly white-fringed wing-coverts but weakly expressed breast-side patches (a & b) inferring a juvenile (Hadoram Shirihihi, Tubenoses Project / © Natural History Museum, London)

because the dark crown reaches maxilla, with diffuse greyish-white upper forehead. Within the largely uniform head to tail and entire upperwing, the crown is noticeably blacker (appearing almost capped), as are the mantle, lesser coverts and carpal area to primaries. Clear demarcation between dusky upperparts and white underparts otherwise broken only by weak breast-side patches (dull blackish-brown mottling). Throat, breast and flanks



Figure 2. Dorsal, ventral and lateral views of two adult female Rapa Shearwaters, taxon *myrtae* (MNHN 1789.1975, below, and MNHN 1787.1975), collected on Tauturou, off Rapa Island, Polynesia, October 1974; unlike the holotype (a juvenile), note especially the much darker and more uniform upperparts (Hadoram Shirihai, Tubenoses Project / © Muséum National d'Histoire Naturelle, Paris)



clean white, partially separated from white undertail-coverts by blackish-brown divide formed by lateral extension of dark feathering extending narrowly from rump to thighs. Although undertail-coverts are predominantly white, some feathers (usually concealed) have inconspicuous, diffuse, greyish flecks and tiny patches. Underwing-coverts clean white, narrowly framed blackish brown on leading edge; remiges mostly dusky grey, with clear whitish basal inner webs to primaries, reaching to within c.3 cm of their tips; axillaries mainly white. No description of bare-parts coloration prior to collection. Now, bill appears mostly blackish with a slight slaty hue, while the inner tarsi, two inner toes and webs are paler than the otherwise blackish legs and feet.

**Differences between juvenile and adults.**—Bourne (1959) noted 'broad white feather edgings on the upper-parts' and we confirmed that the *myrtae* type is heavily scaled above (pale bluish-grey bases, subterminally darker and narrowly tipped whitish), but the four adults in Paris lack or virtually lack this feature, being far more uniformly dark in ground colour above. Furthermore, the juvenile *myrtae* type has obvious white fringes to the greater coverts (up to 2.5 mm wide), forming a clear wingbar, which is not seen in the four adults from Rapa. While pale / white tips can be lost with wear in these small shearwaters, the Paris specimens are still rather fresh, and overall much more uniformly black above than the *myrtae* type.

Bourne (1959) also reported that his type has 'a disproportionately-long tail', 81 mm (which measurement we confirmed), and both he and HS measured wing length very similarly, 196 mm (Bourne 1959) or 197 mm (right wing) and 198 mm (left wing), thus tail / wing ratio is 41.1. This is notably different from mean values for the four adults in Paris, which are 74.5 mm (tail), 196 mm (wing) and 38.0 (tail / wing ratio), respectively. Finally, Bourne (1959) and HS measured bill length as 25 mm and 24.2 mm, respectively, clearly indicating that the juvenile has a proportionately short bill (especially in relation to tail length, 29.9 tail / bill ratio). Mean bill length of the four adults in Paris = 26.9 mm (range 26.2–27.8 mm; tail / bill ratio 36.1). Additional measurements (of live birds) are available in Holyoak & Thibault (1984), including body mass (see Table 2).

## Collection locality and conservation

The *myrtae* type was collected during the St. George Scientific Expedition. The expedition focused mostly on marine biology, with Kelsall the sole ornithologist on board, and no expedition log or publication on the birds collected on Rapa or the expedition as a whole is available. Thus, the precise location and circumstances of the type's collection are unknown. From the specimen labels and museum register, we may assume that it was collected on the main island of Rapa, as the collection date and the description of the expedition's visit in Collenette (1926: 236–261) correspond. Breeding by *myrtae* on the main island of Rapa is unknown today, with the only small shearwater ever claimed to have been collected on the main island being the *myrtae* type (Christmas Shearwater *P. nativitatis* nests in comparatively small numbers on some of the same offshore islets: Thibault & Varney 1991). However, bones have been attributed to this taxon from a rich archaeological excavation (Tennyson & Anderson 2012). Based on the observations by Thibault & Varney (1991), wherein it is listed under *P. assimilis*, *myrtae* (c.255–380 pairs) breeds only on small islets off Rapa, namely Tauturou, Rapa iti, Karapoo iti and Karapoo rahi, but these authors suggested that it might also nest around the cliffs at Haurei in the interior of the main island. Therefore, a survey of the main island to search for *myrtae* would be worthwhile (as already suggested by Thibault & Varney 1991).



Breeding of *myrtae* on Rapa seems seasonal, with birds arriving in April–May and departing in October (Holyoak & Thibault 1984); indeed, no birds were seen at breeding sites in December (Thibault & Varney 1991), March (C. Gaskin pers. comm., on Marotiri) or April (Beck ms, Quayle ms). Fledging time was clearly during October in 1975, with numerous large feathered chicks being found on Rapa’s offshore islets by J.-C. Thibault in late October, suggesting synchronous breeding (details in Holyoak & Thibault 1984; J.-C. Thibault pers. comm.). The *myrtae* type is a young bird, which was collected in April. Either it is a recent fledgling, raising the possibility of asynchronous breeding or twin breeding seasons (‘winter’ breeding on islets due to competition for burrows with Black-winged Petrel *Pterodroma nigripennis*, and ‘summer’ breeding on the main island or on Marotiri?), or it is a six-month-old juvenile that remained in the vicinity of Rapa, suggesting sedentary behaviour in this population. Visits to the colonies by adults in late November (Holyoak & Thibault 1984), c.1 month after fledglings had left, indeed suggests that post-breeding adults remain around Rapa.

Relationships

The most recent molecular hypothesis (Martínez-Gómez *et al.* 2015) for shearwaters in the relevant subclade of Austin *et al.* (2004) recommended that *P. auricularis* (which nests on Socorro Island, off north-west Mexico) and *P. newelli* (an endemic breeder to Hawaii) be treated as conspecifics, with the former name having priority for the single species, but that *myrtae* be separated at species rank. This hypothesis is based solely on genetic data (and only mitochondrial DNA), which indicate that *myrtae* is sister to a monophyletic clade comprising *auricularis* and *newelli*. Whereas the two last-named taxa differ by at most 0.6% in mtDNA (cyt *b*), *myrtae* differs by between 1.5% and 2.3% from both other taxa (Martínez-Gómez *et al.* 2015), although Pyle *et al.* (2011) reported that *newelli* and *myrtae* differ by just 1.2% in cyt *b*.

Morphological data provide support for the genetic hypothesis for *myrtae* of Martínez-Gómez *et al.* (2015). Rapa Shearwater is much smaller (in all biometric characters) than the other two taxa (see Table 3), and is furthermore highly distinctive in having a unique combination of white undertail-coverts (vs. dark in both *newelli* and *auricularis*) and whitish inner webs to the remiges, as well as a white face. All these features place it closer to the *Puffinus assimilis* complex (including *tunneyi*, *kermadecensis* and *haurakiensis* as subspecies) than to smaller forms previously assigned to Tropical Shearwater *P. lherminieri sensu lato*. Genetically, it is slightly closer to the recently described Bryan’s Shearwater *P. bryani* and to Black-vented Shearwater *P. opisthomelas* (Pyle *et al.* 2011) than to *P. assimilis* (3.8% and 2.6% vs. 4.2%), but *myrtae* differs from *bryani* in being larger and again in having whiter

TABLE 3  
Mensural data taken by VB for three taxa of *Puffinus* shearwaters, measured according to standard parameters (see main text; Svensson 1992) and displaying mean values plus standard variation, and range.

Taxon	Wing	Tail	Culmen	Bill depth at hook	Bill width at gape	Tarsus
<i>Puffinus auricularis</i> (n = 20)	228.5 ± 5.8	76.6 ± 2.6	31.09 ± 1.3	7.38 ± 0.6	11.99 ± 1.2	45.16 ± 1.1
Range	216–240	72–81	28.2–34.4	6.8–8.9	9.9–14.4	43.2–47.2
<i>Puffinus newelli</i> (n = 60)	233.6 ± 7.0	85.3 ± 4.4	33.24 ± 1.3	7.43 ± 0.5	13.02 ± 1.2	47.14 ± 1.4
Range	214–248	77–97	30.4–36.4	6.4–8.8	10.0–15.1	44.6–50.5
<i>Puffinus newelli myrtae</i> (n = 5)	195.8 ± 4.0	75.8 ± 4.0	26.52 ± 1.1	6.06 ± 0.4	10.74 ± 0.7	39.43 ± 1.4
Range	191–201	68.5–81	24.7–27.8	5.5–6.6	10.2–12.0	37.6–50.5

dark undertail-coverts and inner remiges, while *opisthomelas* is of similar size, but has quite different plumage. Genetic and morphological data available to date therefore suggest that *myrtae* might be best considered as a species on its own, pending further analyses, especially using other genes, especially nuclear markers.

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## Clutch size of Blackish Nightjar *Nyctipolus nigrescens*

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**SUMMARY.**—Clutch size of Blackish Nightjar *Nyctipolus nigrescens* is generally considered to be one egg. Records of two-egg clutches mentioned in ornithological literature of the 19th and early 20th century are possibly mistakes or misidentifications. However, we report a documented recent observation of a female incubating two eggs.

Blackish Nightjar *Nyctipolus nigrescens* is widely distributed from eastern Colombia and eastern Ecuador, through southern Venezuela, the Guianas and Amazonian Brazil, south to eastern Peru and northern Bolivia. It occurs mainly on inselbergs, i.e. granitic outcrops, surrounded by forest, but also on rocks in and along rivers, and in otherwise sparsely vegetated stony and rocky areas. Away from rocky areas, it is found in natural openings and clearings in primary and secondary forest, along roadsides with low vegetation and on burnt ground. The species' eggs (Fig. 1–2) are elliptical, slightly glossy, creamy buff to pinkish buff, with lilac, greyish, brownish and blackish markings (Ingels 1981, Haverschmidt & Mees 1994, Cleere & de Juana 2016).

Except for the two arboreal *Lurocalis* nighthawks, all 33 Neotropical nighthawks and nightjars (Remsen *et al.* 2016) lay their egg(s) on bare sandy ground, on leaf- or pebble-littered soil, or on bare granitic rock. No nest is constructed, but a shallow depression in soft soil or a small area around the egg free of leaf litter or small pebbles may result from movement by the incubating bird. Neotropical caprimulgids lay clutches of one or two eggs (Cleere 1999, Holyoak 2001). Some species lay either single- or two-egg clutches, e.g. Common Pauraque *Nyctidromus albicollis*, whereas others consistently lay either one egg, as known until now for *Nyctipolus nigrescens*, or two eggs as in Ladder-tailed Nightjar *Hydropsalis climacocerca* (Cleere & Nurney 1998, Holyoak 2001).

Cabanis described the Blackish Nightjar as a new species, *Caprimulgus nigrescens* (Cabanis in Schomburgk 1848). The first specimens were collected in typical habitat for



Figures 1–2. Eggs of Blackish Nightjar *Nyctipolus nigrescens* in the Natural History Museum in Tring (UK), NHMUK E/1901.12.15.212 (26.7 × 18.5 mm) and NHMUK E/1901.12.15.213 (24.5 × 19.0 mm), collected by Henry Whitely between 1879 and 1894, in British Guiana (Harry Taylor, © Natural History Museum, London)

this nightjar, rocks beside the lower Essequibo River in British Guiana (now Guyana). Concerning its breeding biology, Schomburgk stated: 'Thre Eier legen sie unter niederes Gesträuch in kleine Vertiefungen des Erdbodens. Ich fand zwei weissen Eier in den Nestern' ('They lay their eggs on the ground in shallow depressions under low shrubbery. I found two white eggs in the nests'). The identification of the eggs is clearly incorrect as those of Blackish Nightjar are not white (Figs. 1–4). White eggs of Common Ground Dove *Columbina passerina* or Plain-breasted Ground Dove *C. minuta* (Baptista *et al.* 2016a,b) were possibly mistaken for those of Blackish Nightjar. These *Columbina* ground doves are sometimes found nesting on the ground beneath a grass tussock or other low vegetation in the same habitat where Blackish Nightjar occurs, e.g. roadsides with sparse vegetation (JI pers. obs. 2003).

Subsequently, the Penard brothers mentioned for the Blackish Nightjar: 'Het wijfje legt 1 of 2 tamelijk glanzende, elliptische, licht geelachtig rose gekleurde, duidelijk chocoladebruin en purpergrijs gevlekte en bewolkte eieren' (The female lays one or two rather glossy, elliptical, slightly yellowish-pink eggs, neatly mottled and clouded with chocolate-brown and greyish purple) (Penard & Penard 1910). The description of the eggs is correct, but the clutch size (sometimes two eggs) is doubtful. The Penard brothers, who suffered from leprosy from early boyhood, were unable to collect specimens themselves (Haverschmidt & Mees 1994). Instead, they were completely dependent on hunters and others to collect for them, but who were probably not always sufficiently skilled to identify eggs and birds correctly (A. Spaans pers. comm. 2015). Blackish Nightjar and Common Pauraque *Nyctidromus albicollis* are known to nest in close proximity (Kirwan 2009), and in places where both species occur, e.g. in the transition zone between an inselberg and the surrounding forest, with low arid vegetation, misidentification of eggs of both species could have occurred. As an example, the eggs on wikiaves.com.br photographs WA1118616 and WA1470416 are of *Nyctidromus albicollis* not *Nyctipolus nigrescens*. In 1910, the Dutch Rijksmuseum van Natuurlijke Historie obtained the egg collection brought together by the Penard brothers in Suriname. Hellebrekers (1942, 1945), in describing this collection, did not mention eggs of Blackish Nightjar. Therefore, it is possible that the Penard brothers knew both clutch size and egg coloration only by hearsay.

Beebe (1917) described the egg of *N. nigrescens*, as: 'ground colour was a light pinkish buff, sparsely covered with scrawled blotches of chocolate brown, which overlaid larger spots of greyish purple and lilac'. He also stated that 'Like other members of its family the Dusky Nighthawk laid its one egg on the ground'. Snethlage (1928: 696) wrote that *Nyctipolus nigrescens* lays '2 weiße Eier in kleinen Vertiefungen des Erdbodens unter niedrigem Gesträuch (Schomburgk)' ('two white eggs in shallow depressions of the ground under low shrubbery (Schomburgk)'), repeating Schomburgk (1848). Later, Schönwetter (1964) noted 'Schomburgks Angabe, daß sie einfarbig weiß seien, beruht auf Irrtum' (Schomburgk's statement that they [the eggs] were solid white, is in error).

*N. nigrescens* eggs are rare in natural history museums (Kiff & Hough 1985; eBEAC 2016, VertNet 2016). Among the 17 European museums with an oological collection of 10,000 sets or more, only two possess eggs of this nightjar, the former Rijksmuseum van Natuurlijke Historie at Leiden, now Naturalis (RMNH, Leiden, Netherlands) and the Natural History Museum (NHMUK, Tring, UK). Among North American and South American museums, only the Western Foundation of Vertebrate Zoology (WFVZ, Camarillo, USA) and Colección Ornitológica Instituto Alexander von Humboldt (COIAH, Bogotá, Colombia) hold Blackish Nightjar eggs (Appendix 1).

NHMUK holds a small series of eggs and accompanying manuscripts from the Welsh naturalist Thomas A. W. Davis (1899–1980). The eggs were collected by (and for) Davis



while he was Assistant Conservator of Forests for the Forestry Department in British Guiana during the 1920s and 1930s. Davis subsequently passed this material to his friend, Sir Charles Frederic Belcher (Chief Justice of Trinidad and Tobago, 1930–37) for incorporation into his collection, which was finally acquired by NHMUK and accessioned in 1952. The collection contains an index card written by Davis referring to a C/1 clutch taken in former British Guiana in 1937. Unfortunately, the egg to which it refers cannot be located at NHMUK and, indeed, it is unclear whether it ever came to the museum with the rest of the Belcher bequest. On Davis' death, in 1980, the NHMUK library was bequeathed a manuscript archive including correspondence, diaries, notes and photographs relating to the birds and plants of British Guiana, India and Kashmir. These reveal that Davis observed the species on several occasions and he noted (in his personal short-hand) observations twice in November 1938 at the Mazaruni River. However, the only known reference to breeding Blackish Nightjars Davis made is in the index card held with the NHMUK egg collection, and a handwritten copy of this in the manuscripts in the NHMUK library, as his diary for 1938 is unfortunately missing and was likewise apparently not received at NHMUK.

The two eggs present in the NHMUK collection form part of the bequest of Philip Crowley (1837–1900) and were collected by Henry Whitely between 1879 and 1894. They were accessioned with consecutive numbers, 1901.12.15.212–213 (Fig. 1), and are stored in the same box, giving the impression that they definitively formed a two-egg clutch. However, the differences in coloration and size between them (Fig. 2) raise doubts. Again, the original catalogues pertaining to the Crowley collection were never received at NHMUK and no other details relating to these eggs are currently available.

In 1953, Olivério Pinto described nests, skins and eggs collected by Carlos Estevão (Pinto 1953). He mentioned 11 clutches of *N. nigrescens*, all taken at Utinga (01°27'S, 48°30'W) near Belém, Pará, Brazil. For one of these, he wrote: '1923, Out. 2 (pele, ovos) – ♀ ad., Utinga (campinarana). "Estava chocando 1 ovo, sobre o solo". Medidas do exemplar: asa 136 mm; cauda 96 mm.' ('1923. 2 October (skin, eggs) – ♀ adult, Utinga (campinarana). "She was incubating one egg, on the ground". Measurements: wing 136 mm; tail 96 mm'.) From the additional comment we learn that it is a C/1, but the word 'ovos' (eggs), plural, suggests that it was a C/2 clutch. However, in additional comments on the 11 clutches, we read 'As observações aqui consignadas, em número de onze, são concordes em restringir a 1 único ovo as posturas desta espécie, na região de Belém. Entretanto, com base talvez em Beebe, que estudou a nidificação da espécie na Guiana Inglesa, dá H. Snethlage para ela posturas de dois ovos da "Guiana e Amazônia", o que só em parte pode ser verdade' ('The observations mentioned here, 11, are in agreement with the single-egg clutch of this species in the Belém region. However, perhaps based on Beebe, who studied the nesting of the species in British Guiana, H. Snethlage mentions two eggs for clutches in "Guiana and Amazonia", which can be only partly true'). The word 'ovos' mentioned above must, therefore, be a misprint. After Carlos Estevão's death, his widow donated his collection to the Museu de Zoologia da Universidade de São Paulo (Brazil). The 11 clutches were accessioned in 1950. However they later disappeared from the collection for an unknown reason on an unknown date (L. F. Silveira pers. comm. 2016) (Appendix 1).

Until now, the general belief is that *N. nigrescens* lays one egg (Cleere & de Juana 2016). Ingels *et al.* (1984) and Haverschmidt & Mees (1994) mention 69 and 16 C/1 clutches, respectively, all found in Suriname. Between 1999 and 2007, Ingels *et al.* (2009) found 41 C/1 clutches around Saül (03°37'N, 53°12'W) in central French Guiana. In 1977, Roth (1985) found six C/1 clutches near Aripuanã (10°10'S, 59°28'W) in Mato Grosso state, Brazil. Between 2006 and 2009, Solano-Ugalde *et al.* (2012) found seven C/1 clutches at Copalinga



Figures 3–4. ‘Nest’ of Blackish Nightjar *Nyctipolus nigrescens* with two eggs, near Saut Léodate (04°50’N, 52°48’W), a rapid on the Kourou River, French Guiana, May 2015 (Loïc Epelboin)

Ecolodge (04°03’S, 78°56’W) near Zamora, Zamora-Chinchipe province, Ecuador. In 2005–09, TVVC found several C/1 clutches north of Manaus in central Amazonian Brazil.

Recent monographs of Caprimulgidae and related nightbirds (Cleere 1999, Holyoak 2001) and the account in *Handbook of the birds of the world Alive* (Cleere & de Juana 2016) mention a clutch size of one egg. However, in the account of Blackish Nightjar in his photographic guide to these birds, Cleere (2010) wrote ‘Breeding: Eggs 1–2, whitish, pinkish or buff, ...’ possibly with Schomburgk (1848) in mind for two-egg clutches of white eggs.





Figure 5. Female Blackish Nightjar *Nyctipolus nigrescens*, near Saut Léodate (04°50'N, 52°48'W), a rapid on the Kourou River, French Guiana, May 2015 (Loïc Epelboin)

All field observations and clutches in oological collections show, however, that *N. nigrescens* consistently lays one egg.

Therefore, it was a surprise when, on 24 May 2015, LE found a female *N. nigrescens* incubating two eggs (Figs. 3–5), on a low rock in a clearing near Saut Léodate (04°50'N, 52°48'W), a rapid on the Kourou River in French Guiana. The clearing, with a diameter of c.50 m, is used as a drop-off zone by helicopters, is covered by low weeds and grasses, with low, dark rocks scattered throughout (Fig. 5), and connected to the rapids by a trail of c.250 m. In the clearing, just one pair of *N. nigrescens* was present, and none was seen on the rocks near the rapid. This nightjar sometimes breeds almost semi-colonially on inselbergs (Cleere & Ingels 2002, 2004). In such a situation, it is possible that two females could lay in the same 'nest'. However, the possibility that the eggs found by LE were laid by two different females is almost non-existent, as only one pair was observed in suitable habitat in a wide area around the 'nest'. Both eggs were rather similar in coloration and size (Fig. 3). Two-egg clutches for *N. nigrescens* described previously in the literature are in error. The observation reported here with photographic evidence is the first record of a C/2 clutch for this nightjar.

Among caprimulgids the pattern of occurrence of one- and two-egg clutches is complicated, with a tendency for one-egg clutches in tropical and subtropical regions, and two-egg clutches in temperate regions, especially for those species widely distributed over both, as in other bird species (Klomp 1970, Sick 1993). For caprimulgids breeding on the ground, the limitation of clutch size to one or two eggs may result from selection pressure to conceal the eggs and chicks. However, factors such as seasonal food availability may also influence clutch size. More studies are clearly needed to investigate factors determining clutch size of caprimulgids.

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## APPENDIX 1

Institutions holding eggs of Blackish Nightjar *Nyctipolus nigrescens*: collection where (originally) preserved, collection locality, collection number (collector, date of collection), comments.

**Colección Ornitológica Instituto Alexander von Humboldt, Bogotá** (formerly Colección Oológica Cornelis Johannes Marinkelle).

Colombia, Dpto. Caquetá, Municipio de Solano, Río Cuñaré, El Acuaría Creek, Bosque Caquí (00°29'N, 72°37'W), CJM-514: C/1 (Mauricio Alvarez Rebolledo, 5 November 2000).

Colombia, Dpto. Vichada, Corregimiento Santa Rita, Parque Nacional Natural El Tuparro (03°18'N, 67°57'W), CJM-4644, C/1 (collector?, 12 February 2004).

### **Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil**

Brazil, Utinga, Belém (01°27'S, 48°30'W), One egg registered 2200, two eggs 2202, others unregistered, 11 C/1 (Carlos Estevão, 20 September, 2 and 7 October 1923, 21 June, 26 July and 23 August 1924, 29 September 1926, 8 October 1928, 15 February and 29 May 1929, and 16 May 1930). Formerly in the Coleção Carlos Estevão. No longer at MZUSP.

### **Natural History Museum, Oology, Tring, UK**

Guyana (British Guiana), Camacusa (05°57'N, 59°54'W) or Bartica Grove (06°24'N, 58°37'W), NHMUK E/1901.12.15.212 and NHMUK E/1901.12.15.213, one C/2 or two C/1? (H. Whitely, 1879–1894). Part of the Philip Crowley bequest.

Guyana (British Guiana), Mazaruni Station (06°24'N, 58°39'W), NHMUK E/?, C/1 (Thomas A. W. Davis, 28 August 1937). Formerly in the T. A. W. Davis collection. No longer at NHMUK.

### **Rijksmuseum van Natuurlijke Historie Naturalis, Leiden, the Netherlands**

Suriname, Albina (05°30'N, 54°04'W), RMNH.AVES.54009: C/1 (F. Haverschmidt, 29 June 1953).

Suriname, Phedra (05°20'N, 55°03'W), RMNH.AVES.54010 and RMNH.AVES.54011: two C/1 (F. Haverschmidt, 18 April 1965 and 3 September 1967).

Suriname, Brownsberg (04°53'N, 55°10'W), RMNH.AVES.72791: C/1 (G. F. Mees, 30 August 1972).

### **Western Foundation of Vertebrate Zoology, Camarillo, California, USA**

Suriname, Crique Ouarémapan, Upper Litanie River (c.02°25'N, 54°25'W), WFFVZ 149348 (formerly Muséum Oologique Robert Daniel Etchécopar, Paris, France): C/1 (Jean-Pierre Gars, 27 August 1972).

Suriname, Voltzberg (04°40'N, 56°11'W), WFFVZ 145275, WFFVZ 145276 and WFFVZ 145277: three C/1 (J. Ingels, 28 October (two) and 1 November 1981).

Peru, Dpto. San Martín, c.15 km by trail north-east of Jirillo on trail to Balsapuerto (05°50'S, 76°36'W), WFFVZ 178561 (formerly Louisiana State University Museum of Zoology, LSUMZ 116445): C/1 (T. J. Davies, 28 October 1983).

## Some comments on Schodde & Bock (2016) on gender agreement

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Schodde & Bock (2016) put forward their interpretation of Art. 31.2.2 of ICZN (1999) taking selected cases from Aves, and contended that five names, of 27 examined, may require correcting. The authors offered their conclusion that the requirement for gender agreement in species-group names is the single biggest cause of nomenclatural instability in zoology, and, to resolve it, they advocated replacing gender agreement by original spellings for species-group names. Here, we wish to offer some comments.

Olson (1987) argued that the perception of stability is very largely caused by evolving knowledge leading to changes in attributions to genus, and thus in some cases consequent adjustments to the final syllable of names based on the rules for gender agreement. We agree completely that revised phylogenetic arrangements must be seen as the principal root cause of name changes in recent decades; moreover, as we hope these represent the advancement of science, we believe such change is appropriate. On this basis then, instability is a necessary part of our nomenclatural practice. By contrast, instability due to varied usage of the spelling of any species-group name over time is minimal and computers can be programmed to catch such variations.

Schodde & Bock based their comments on appendices (on CDs) to vols. 1 and 2 of the *Howard and Moore complete checklist of birds of the world*, fourth edn. (Dickinson & Remsen 2013, Dickinson & Christidis 2014). These appendices<sup>1</sup> are, respectively, David & Dickinson (2013) and David & Dickinson (2014). In these the authors explored as many cases as they could identify of individual taxon names that have been quite widely used both in original form and in variant forms, and appeared to represent problems. Interestingly, a variety of issues needed to be addressed, but the total number of cases is only 79 non-passerine names (vol. 1) and 163 passerine names (vol. 2), which can be related to either the c.28,000 species-group names listed in the above-mentioned checklist or to the figure of 130,000 species-group names, which is a conservative estimate of the sum of avian names in use plus the many synonyms that form part of our knowledge base.

We quite understand why, from these, Schodde & Bock selected for discussion the group of names that they did.

Interpretation of Art. 31.2.2 is not straightforward because some words and phrases are not clearly defined. In essence, the rule states that a species-group name must be treated as a noun in apposition when the following three conditions are all met: (1) where the author did not indicate whether he or she regarded it as a noun or as an adjective; (2) where the name may be regarded as a noun as well as an adjective; (3) and where evidence of usage is not decisive. Unfortunately, the expression 'evidence of usage' as used by the Code leads to interpretation because the word 'usage' means 'established practice' as well as 'action of using'. However, the wording of the Example accompanying Art. 31.2.2 is enlightening. This, in a point made on the basis of a subsequent combination where the name *Cephenemyia phobifera* 'has been often used' states that 'the original binomen was *Oestrus phobifer* Clark,

<sup>1</sup> PDFs of these appendices are available from the authors but are on the CD inserted at the back of the relevant volume of the book.

1815; since *Oestrus* is masculine, *phobifer* in that binomen ... is to be treated as a noun in apposition' and that the spelling *phobifer* is to be maintained, i.e. it is invariable. This was ignored by Schodde & Bock (2016). A word by word translation of the French text of Art. 31.2.2 yields 'If an epithet may be considered either as a noun or as an adjective, and the use to which it is put does not permit a conclusion, and if its author did not settle the matter, it must be treated as a noun in apposition.' Both English and French texts, and their examples, make clear that it is usage in the original combination that should prevail in any case of doubt, as explained by David & Gosselin (2011).

Schodde & Bock (2016) wrote: 'As is clarified in the appended "Example", usage here means that if the species name is used elsewhere in the original publication with the same or different gender ending in combination with another generic name of different gender, then it is respectively a noun or adjective.' However, the original publication is not the original binomen, and we consider that the Code, based on the very Example that Schodde & Bock referred to, clearly explains that usage in the original combination is to be considered as determinant.

Schodde & Bock (2016) then considered that Linnaeus (1766) used *dominicus* and *dominica* as adjectival epithets when he introduced *Tangara dominica* (p. 316), now *Dulus dominicus*, and *Colymbus dominicus* (p. 223), now *Tachybaptus dominicus*. However, *dominicus* and *dominica* can already be viewed as the classical Latin adjective *dominicus*, *a*, *-um* (Lewis & Short 1984).

The importance of an author's original epithet(s) is central to applying the rules; for example, the original *Tangara bresilia*<sup>2</sup> Linnaeus, 1766, now *Ramphocelus bresilius* (see Storer 1970: 315, Dickinson & Christidis 2014: 398) was treated by Linnaeus as variable while Schodde & Bock (2016) considered this to be a noun in apposition<sup>3</sup>.

Linnaeus' habit of modifying the spelling of species-group names, sourced from pre-Linnaean works—which are inadmissible from their original sources because they antedate the 1758 starting point for zoological nomenclature—is well exemplified by his treatment of names that he combined with 'Tanagra'<sup>4</sup> [= *Tangara*] (see Linnaeus, 1766: 313–317). It can be seen that Linnaeus used four modified nouns: *Jacapa* (instead of *Jacapu* Marcgrave), *Jacarina* (instead of *Jacarini* Marcgrave), *Episcopus* (as in *Episcopus* Brisson) and *Sayaca* (instead of *Sayacu* Marcgrave); as well as eight modified adjectives: *rubra* (instead of *canadensis* Brisson), *cyanea* (instead of *caerulea* Catesby), *cayana* (instead of *cayanensis viridis* Brisson), *cayana* (instead of *cayanensis nigra* Brisson), *dominica* (instead of *dominicensis* Brisson), *virens* (instead of *brasiliensis viridis* Brisson), *chlorotica* (instead of *nigro-lutea* Brisson) and *bresilia* (instead of *bresilica* Belon). Schodde & Bock (2016) should thus have concluded that *bresilia* Linnaeus, 1766, is an adjectival epithet, and of course Linnaeus (1766: 314–317) consistently used 'Brasilia' when naming the country.

It is, of course, regrettable that interpretation of Art. 31.2.2 is open to diverging views, but this has to be placed in perspective. In Aves, species-group names now in use number c.30,000 (compared to perhaps some two million across Zoology), including some 13,270

<sup>2</sup> The original has *bresilia* with the b in lower case (see Linnaeus, 1766: 314).

<sup>3</sup> It is worth remarking that Linnaeus (1758, 1766) provided specific epithets that either began, or did not begin, with a capital letter. His use of an initial capital letter has often been interpreted as signalling a noun in apposition. In fact, Linnaeus used the initial capital to signal names that he considered invariable so in some cases these were nouns in apposition, in others they were genitives and in a few cases nominalised adjectives.

<sup>4</sup> This spelling has since been replaced by *Tangara* because the Code has admitted genus-group names from Brisson (1760), taking precedence over *Tanagra* Linnaeus, 1764: 30; see ICZN (1913). In contrast to this decision in respect of genus-group names, Brisson's species-group names are in general not accepted under the Code—see also ICZN (1955, 1963).

'nouns' (genitives, nouns in apposition), some 15,760 adjectives and 170 that fall under Art 31.2.2. The latter thus represent 0.57% of avian names and perhaps just 0.0085% of zoological names. We agree that original names are the best basis for consistency, but the various relevant Articles of the Code requiring modification should be retained and decisions by the Commission that directly affect original spellings are reasons to reject outright abolition of gender agreement.

We support maintenance of gender agreement in zoological nomenclature, but questions still arise, e.g. in cases of incorrect original spellings. Do Schodde & Bock (2016) support use of *capicolum* Sundevall, 1857 (now *Streptopelia capicola*), *bonapartei* Boissonneau, 1840 (now *Coeligena bonapartei*), *Picoides* Hodgson, 1839 (now *Heterophasia picoides*), *Novoe-Hollandiae* Vieillot, 1816 (now *Recurvirostra novaehollandiae*), and (see Schodde *et al.* 2013) *melanoramphos* Vieillot, 1817?

We suggest that this spelling issue be focused on incorrect original spellings and that it might be useful to develop some clear rules, to be adopted into the Code, for the treatment of obviously incorrect original spellings. However, perhaps Bock & Schodde would accept all such cases. We imagine that there will be as many objections to this as have been put forward as a basis for the abolition of gender agreement.

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# Interpreting Article 31.2.2 of the Code, *Tanagra bresilia* Linnaeus, and gender agreement—a response to Dickinson *et al.* (2017) towards more positive outcomes

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Dickinson *et al.* (2017) take us to task for misguided interpretation of Art. 31.2.2 of the *International code of zoological nomenclature* (ICZN 1999), hereafter the *Code*, and for overreach in arguing that ‘gender agreement for species-group names is the single biggest cause of nomenclatural instability in zoology’ (Schodde & Bock 2016). Conflation is the argument of false analogy; and here we explain how Dickinson *et al.* (2017) use it to mistake our meaning of Art. 31.2.2, misjudge the noun / adjective status of *Tanagra bresilia* Linnaeus, and misrepresent the impact of gender agreement on species names. As a consequence, we offer suggestions to resolve those ambiguities in Art. 31.2.2 that open it to conflicting interpretation.

## 1. Article 31.2.2

Some species names in zoology (dual status names) may be either noun or adjective, so the purpose of Art. 31.2.2 is to settle on either noun or adjective for any given taxon in the interests of nomenclatural precision and stability. The Article does this by providing a simple recipe that fixes such names as nouns in their original spelling in cases where the original author neglects to select either noun or adjective. Such neglect is widespread in historical literature, and so Dickinson *et al.*’s (2017) interpretation of the Article is preoccupied with fixed original spelling as the ultimate objective or ‘determinant’. Because of that, however, they impugn Schodde & Bock (2016) for ignoring it and mistaking usage in the ‘original publication’ as the goal, stressing ‘the original publication is not the original binomen’. But Art. 31.2.2 has two functional parts, and it is only the second, where the original author did not take up his / her prerogative, that settles the name as a noun in its original spelling. The first, in contrast, attributes right to the author in the original publication to choose either adjective or noun, thereby giving author action precedence over fixed original spelling. To ensure there is no misunderstanding, we quote the Article:

‘Where the author of a species-group name did not indicate whether he or she regarded it as a noun or as an adjective, and where it may be regarded as either and the evidence of usage is not decisive, it is to be treated as a noun in apposition to the name of its genus (the original spelling is to be retained, with gender ending unchanged; see Article 34.2.1).’

The French version makes the same points. Where Schodde & Bock (2016) were explaining, correctly, usage in the ‘original publication’, they were addressing, equally correctly, the first part of the Article to explain how author action in the original publication functions. This has nothing to do with the second part of the Article which applies only in the absence of author action. Conflating the work of the two parts in the way Dickinson *et al.* (2017) have confuses the meaning of the Article as a whole and confounds its interpretation.

The meaning of the Code's Example for Art. 31.2.2 also comes into question here because it is used by Dickinson *et al.* (2017) to support the primacy of fixed original spelling. Critically, the Example fails to mention that the original author did not exercise choice in the case it describes (David & Gosselin 2011). Thus, if it is read literally, it gives the impression that fixed original spelling overrules all. If that reading is accepted, we make two points.

- (1) The Example is presently at variance with the Article in not acknowledging the prerogative of original author action specified in the Article.
- (2) An Example does not form part of the legislative text of the Code—see Art. 89.2. Thus its meaning has no authority when it conflicts with the meaning of an Article.

What the Example makes clear, nevertheless, is that 'evidence of usage' in Art. 31.2.2 excludes customary or prevailing use of noun or adjectival form in general literature as a determinant. Here Dickinson *et al.* (2017) correctly put their finger on the single ill-defined word in the Article: 'usage'. What does it mean for the Article? Dickinson *et al.* (2017) do not elaborate, but the answer, in our view (Schodde & Bock 2016), was reached and ably summarised by David & Gosselin (2011). Rules for determining noun or adjective in dual status names were first introduced in the third edition of the *Code* (ICZN 1985), in near-identical wording in English and French texts. The English text was repeated almost unchanged as Art. 31.2.2 in the current fourth edition (ICZN 1999); but, perhaps because its authors were more aware that uses of 'usage' had diversified in this edition, the French text was substantially re-structured to better reflect, we believe, the particular intent of 'usage' in the Article. David & Gosselin (2011) explain its meaning there thus:

'The phrase 'sans que l'usage qui en est fait ne permette de conclure / without the use that it is put to permitting a conclusion' makes clear that 'usage' relates first of all to use by the author in the original publication. So the word 'decisive' in the English text, means conclusive, and the noun vs. adjective status must be determined from the original publication, not from random subsequent use.'

There are two further reasons for accepting this meaning for Art. 31.2.2. First, it brings to the Article, beyond any other interpretation of 'usage', a precision of definition and clarity of meaning expected by—and from—the Code. Secondly, the late David Ride, Chair of the editorial committee for the current Code, personally advised us that 'usage' by the original author alone was its intended meaning. Expanding that meaning to cover other forms of usage would dissipate the focus of the Article.

To explain how 'usage' in this context enmeshes with other requirements of Art. 31.2.2, we offer one of diverse examples. Species names ending in *-fer*, as in *Lobospingus sigillifer* De Vis, 1897, may be nouns or masculine adjectives. De Vis (1897) did not expressly state that *sigillifer* was a noun or an adjective in the original description. If, however, he had used it with the feminine ending *-fera* for another new species combined with a different, feminine genus in the same paper, *sigillifer* in *Lobospingus* would have been implicitly 'used' as an adjective. Here the author would have indicated his choice through 'usage' in the original publication. As a consequence, De Vis' *sigillifer*, as an adjective, would have to change whenever subsequently combined with a genus of feminine gender, e.g. in *Erythrura trichroa sigillifera* (Blue-faced Finch). But De Vis did not use *sigillifera* in combination with a feminine genus in the paper describing *Lobospingus sigillifer*, and took no original author action at all. In that circumstance, *sigillifer* there stands as a noun, and is fixed in its original spelling as *Erythrura trichroa sigillifer*.

There is still a problem, however: this meaning of 'usage' is not clear from the wording of Art. 31.2.2 in its English text. Here Dickinson *et al.* (2017) have missed an opportunity.

They discuss imprecision and ambiguity in the Article, yet take no initiative to resolve it. We now accept the challenge. Their unspoken view of ‘usage’ in this case is surely no different from ours and David & Gosselin’s (2011) because one of their authors is David himself. Resolution of its intended meaning, then, can be achieved simply and easily by (1) inserting one small phrase in the Article to specify ‘usage in the original publication’, and (2) prefacing the final clause of its Example with a further clause that explains ‘...’because the author of the name in question, *phobifer*, did not indicate whether it was a noun or an adjective’, hence it is to be treated as a noun in apposition...’.

## 2. *Tanagra bresilia* Linnaeus

Is *bresilia* Linnaeus, 1766, for the Brazilian Tanager an indisputable adjective as claimed by Dickinson *et al.* (2017) and used as such by Dickinson & Christidis (2014) in *Ramphocelus bresilius*? Or should it remain the noun *bresilia* in its original spelling under Art. 31.2.2 because its status as noun or adjective cannot be determined conclusively (Schodde & Bock 2016)? Linnaeus (1766) based *Tanagra bresilia* on the *Merula bresilica* of pre-Linnaean authors, explicitly citing the name as *Merula bresilica* in his synonymy. He made no comment on its grammatical status and does not appear to have ever used the name again in the 12th edition of his *Systema* (Linnaeus 1766). In their review of species names affected by Art. 31.2.2, David & Gosselin (2011) interpreted *bresilia* as an adjectival variant of *bresilica* and cited Woods (1944) as their authority, thereby begging the question: why evaluate *bresilia* under Art. 31.2.2 in the first place? Schodde & Bock (2016) then showed that the name was based on the French name for Brazil, that Woods (1944) also specified the ending ‘-ia’ in *bresilia* as a noun form, and that ‘-ia’ is a conventional ending for Latinised nouns for countries with the ending ‘-ica’ for adjectives, e.g. *Britannia* (noun) and *britannica* (adjective). Thus they concluded that *bresilia* could also be interpreted as a noun. Dickinson *et al.* (2017) now shift ground, arguing that because Linnaeus (1766) maintained all of the noun species names that he adopted from pre-Linnaean authors as nouns, and all the pre-Linnaean adjectival names as adjectives, that *bresilia*, derived from the indisputably adjectival *bresilica*, must be an adjective too. This is a valid approach to determining noun / adjective status under ‘usage’ in Art. 31.2.2—but the question is: is the evidence sufficient to meet the standard of ‘decisive’ usage required by the Article? We do not think so. To pass that bar, this approach must demonstrate that Linnaeus adopted adjectival pre-Linnaean names as adjectives, and substantival names as nouns, consistently throughout the zoological section of the 12th edition of his *Systema*. This has not been done. Dickinson *et al.* (2017) evaluated only 24 species names in *Tanagra*, which, we argue, form much too small a sample to judge. Furthermore, at least four of the eight adopted adjectival names they quoted are of completely new replacement names, e.g. *rubra* for *canadensis* and *chlorotica* for *nigro-lutea*. Invoking conflation, these usages are irrelevant to Dickinson *et al.*’s argument, and erode it.

That Linnaeus decapitalised *bresilia* does not establish its adjectival status, as noted by Dickinson *et al.* (2017) and others; nor does his use of ‘*Brasilia*’ instead of ‘*Bresilia*’ for Brazil in his accounts of distribution because that is inferential evidence and not explicit, *pace* Dickinson *et al.* (2017). But there are other questions raised by *bresilia*. Why did Linnaeus change its pre-Linnaean adjectival ending ‘-ica’ to ‘-ia’ unless he wanted to use a noun form? This is perhaps his clearest show of intent in the original publication. Or was ‘*bresilia*’ a misprint for ‘*bresilica*’, inferring adjectival status, or a misprint for *brasilia*, inferring a noun? As noted, Linnaeus provided no explicit, objective indication of what he intended, leaving only circumstantial evidence in synonymy that is open to speculative and ambiguous interpretation. Thus *none* of the explanations offered by David & Gosselin (2011), Schodde & Bock (2016) and Dickinson *et al.* (2017) can be justified as *decisive* in determining whether

*bresilia* Linnaeus is a noun or an adjective. In such circumstances, Art. 31.2.2 rules that it is to be treated as a noun and its original spelling, *bresilia*, maintained.

### 3. Nomenclatural instability from gender agreement

Conflation reappears in the case by Dickinson *et al.* (2017) to shift the blame for gender-driven change in species names onto phylo-taxonomic rearrangement, while simultaneously minimising nomenclatural change from Code-regulated fiat. Schodde & Bock (2016) were exclusively concerned with nomenclatural instability resulting from change in the form (spellings) of species-group names caused by gender agreement. This we clarified in our text: gender agreement is 'the single greatest source of regulation-driven change in the spelling of species-group names, often disruptively so'. Phylo-taxonomic rearrangement has nothing to do with this. All it does is shift a species name to another genus, fulfilling an essential purpose in biology to communicate, via nomenclature, new knowledge concerning evolutionary relationships. Instead, what actually changes the form (spelling) of names in taxonomically regrouped species is the present regulation for gender agreement if the name is adjectival or participial. Put simply, if there was no such rule, the form of species names would not change when species are moved between genera.

How significant, then, is destabilisation from gender agreement. As a marker of rule-engendered impact generally, Dickinson *et al.* (2017) use Art. 31.2.2 to show that it affects 0.57% (170) of in-use names among Aves, and many fewer in the rest of zoology, although there may be some faulty arithmetic involved. Other rules, we agree, have a similarly insignificant impact—but not gender agreement. Dickinson *et al.* (2017) estimate that 54% (15,760) of in-use avian species-group names are adjectival. Thus, by their own criteria, 54% of such names—more than half of avian species-group taxa and orders of magnitude greater than the effect of Art. 31.2.2—are susceptible to change by gender agreement. In practice, of course, potential for change will be lessened by adjectival declension and common gender in the generic names among which adjectival names are shifted. A more realistic estimate of its extent may be gained from gender-ending shifts in the 156 to 178 species recognised in the family Meliphagidae (honeyeaters) by Salomonsen (1967), Dickinson (2003) and Dickinson & Christidis (2014), excluding taxa now removed from the family. In these species, gender ending has changed 18 times among ten of them across these works between 1967 and 2014, due solely to combination with different genera. If taxonomic shifts in Meliphagidae are average for the Aves, this extrapolates to a 10–12% change in the spellings of avian species-group names over 50 years. Adding to this are changes that result from historic misinterpretation of the gender of generic names and the noun / adjective status of compound species names (e.g. David & Gosselin 2002a,b). As we have stressed, no other Code regulation approaches gender agreement as a destabiliser of the form of species-group names.

The ornithological—and zoological—communities deserve an honest, open debate as to the pros and cons of gender agreement to inform understanding of its value: is it worth the disturbance that it causes in nomenclature? Its abolition came close in the fourth edition of the *Code* (Ride 1999: XXVI), but was eventually overruled by reaction from the zoological community. Schodde & Bock (2016) have now pressed the case for abolition again. The response by Dickinson *et al.* (2017) adds little: it defeats its own case for retaining gender agreement by miscalculating impact on stability without offering any real reason for retention other than a hand-on-heart 'we support maintenance of gender agreement'. They observe that 'decisions by the Commission that directly affect original spellings are reasons to reject outright abolition of gender agreement'. But why? What would abolition of gender agreement do to such decisions that the present requirement for agreement does



not? The clarifying explanation needed for informed judgement has not been produced. And even where abolition might affect adjectival name forms conserved by Opinions of the Commission, the issue can surely be resolved easily by a ruling from the Commission giving precedence to the forms conserved, in parallel with existing provisions of Art. 32.5.2 that correct 'misformed' original spellings. We find such provisions to be simple, logical and sensible.

In support of the retention case, we recognise the scholarship that names in the grammar of Latin and ancient Greek bring to systematics, and their magnificent history of tradition in zoological literature. This we respect deeply. We are less sure, nevertheless, that those values outweigh nomenclatural destabilisation, particularly for long-accustomed names for familiar species. We are also of the view that the level of understanding of Latin and Greek grammar needed to apply gender agreement properly expects too much of workers already burdened by the complexities of modern systematics. Such understanding prevents all zoologists unfamiliar with those languages from using and practising nomenclature effectively. Others will have a different view. Whether that ensures the survival of gender agreement into the future will depend on future generations of the Commission and the zoological community that it listens to and serves. But if gender agreement does survive, it will continue to bring nomenclatural destabilisation to species names beyond any other regulation in the *Code*, because it will then remain for as long as there is research in evolution and taxonomy, and that will never end.

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## Yellow-crowned Elaenia *Myiopagis flavivertex*, new to Colombia

by Pablo Flórez & Guy M. Kirwan

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An inhabitant of *várzea* and flooded, swampy forest, as well as more locally in flooded forest in sandy-soil areas, Yellow-crowned Elaenia *Myiopagis flavivertex* is comparatively widely distributed across much of northern and western Amazonia. It is known from north-east and southern Venezuela (including Monagas south to Delta Amacuro, and Amazonas), the Guianas, north-east Ecuador (Sucumbíos, Napo), north-east Peru (in eastern Loreto, Ucayali) and Brazil across the central Amazon Basin, but also south along the Madeira River to northern Rondônia (Fitzpatrick 2004, Ridgely & Tudor 2009). There are no published records in Colombia (Salaman *et al.* 2010, Donegan *et al.* 2016), although Hilty & Brown (1986) suggested that it might be found near San Fernando de Atabapo, which is just inside neighbouring Venezuela, and McMullan & Donegan (2014) illustrated the species given that its occurrence was expected. Recently, we have recorded the species three times in the extreme east of the country, in the environs of Puerto Inírida, eastern Guainía, thereby confirming its presence, precisely in the region predicted by Hilty & Brown (1986).

On 7 October 2014, in the environs of Caño Matraca, just upstream of Puerto Inírida on the left (west) bank of the Inírida River, GMK heard and briefly observed at least one *M. flavivertex* inside the canopy of lower-stature flooded *várzea*, together with N. Bostock *et al.* Unfortunately, at the time, they and the other observers present, including PF, were all focused on photographing and sound-recording a pair of Orinoco Softtails *Thripophaga cherriei*, and GMK did not capture any vocalisations in the background of his recordings. Subsequently, the observation was more or less forgotten about for almost two years—especially as GMK was unfamiliar with the species' (non-)status in Colombia but also because its presence in the extensive *várzea* forest around Puerto Inírida appeared so unsurprising. In mid-September 2016, PF sent GMK photographs and a sound-recording (XC345120; [www.xeno-canto.org](http://www.xeno-canto.org)) from the same region, which GMK immediately recognised as being of *M. flavivertex*. It was only then that GMK noticed that the species was not previously known to occur in Colombia and a little later came across his notes from 2014 again.

PF's observations were made on 12 September 2016, when a single was seen with a mixed-species flock (which this species does not routinely follow), in *várzea* forest beside the Inírida River. In addition to the recording, his photographs show the majority of the salient features associated with a *Myiopagis* elaenia and specifically *M. flavivertex*, other than the wingbars, namely: the small bill with pinkish base to mandible, dark eyes, rather flat crown with no crest, greyish-olive breast and throat merging into more yellowish belly, lack of an obvious pale superciliary except on the supraloral region, slightly long-tailed appearance, and yellow-fringed tertials and flight feathers. However, although the underparts pattern differs from that of the otherwise very similar Forest Elaenia *M. gaimardii* (which has a greyish-white throat and upper breast, with a hint of olive streaking), the latter species is best identified by its voice. The only Tyrannidae that might be confused with *M. flavivertex* by voice is Euler's Flycatcher *Lathrotriccus euleri*, but the latter is very different in plumage. While *M. flavivertex* is a specialist of *várzea* forest, whereas Forest Elaenia is typically

found in dry-land forest habitats, although it also occurs in inundated habitats, at least in Suriname and Venezuela (P. Boesman *in litt.* 2017).

Subsequently, T. M. Donegan (*in litt.* 2016, 2017) alerted us to the fact that other observers have also reported *M. flavivertex* in the same area of Colombia, among them T. Friedel, who photographed one individual on 30 January 2016 ([http://www.birdphotos.com/photos/index.php?q=gallery&g2\\_itemId=228164&g2\\_imageViewsIndex=1](http://www.birdphotos.com/photos/index.php?q=gallery&g2_itemId=228164&g2_imageViewsIndex=1)). Furthermore, during another visit to the area, on 16 February 2017, PF, GMK, G. R. R. Brito and J. Lobel heard, and GMK sound-recorded, the species in the, at this season, dry *várzea* forest along the trail to Caño Matraca (XC365007)

A recent ornithological inventory of the Puerto Inírida region recorded only Forest Elaenia there, listing this species as occurring in both *terra firme* and *várzea* forests (Stiles & Beckers 2016), which suggests that *M. flavivertex* might have been to some degree overlooked by previous workers, perhaps because it is easily missed even when vocalising. The species' discovery in easternmost Colombia is plainly unsurprising, given both the extensive availability of suitable habitat in this part of Guainía and the presence of *M. flavivertex* at several localities in immediately adjacent Venezuela (south-west Amazonas; Hilty 2003). Nevertheless, that it should have escaped previous notice, despite considerable recent survey effort around Puerto Inírida (Stiles & Beckers 2016), surely is somewhat remarkable and hints at the possibility of still-further ornithological discoveries in this, and many other regions of the country. Indeed, while the present manuscript was in production, Ramírez *et al.* (submitted) reported several records of *M. flavivertex* from the departments of Guaviare and Meta, indicating that its range in eastern Colombia is considerably broader than believed. Given records very close to the Colombian border inside Peru (e.g. XC16599; <http://www.hbw.com/ibc/photo/yellow-crowned-elaenia-myiopagis-flavivertex/yellow-crowned-elaenia-perched>), the species can also be expected to occur around Leticia, in the extreme south of dpto. Amazonas.

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# First nest description for Spot-backed Antwren *Herpsilochmus dorsimaculatus*

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The genus *Herpsilochmus* comprises 17 species, of which 12 occur in Brazil (Zimmer & Isler 2003), where in recent years two new species have been described from Amazonia (Cohn-Haft & Bravo 2013, Whitney *et al.* 2013). There are few data concerning the breeding biology of any species in the genus. Basic information on reproductive period is available for Yellow-breasted Antwren *H. axillaris*, Ash-throated Antwren *H. parkeri*, Ancient Antwren *H. gentryi*, Black-capped Antwren *H. atricapillus* and Spot-tailed Antwren *H. sticturus* (Zimmer & Isler 2003). The nests of just three species have been described: Large-billed Antwren *H. longirostris* (Straube *et al.* 1992, Marini *et al.* 1997), Pectoral Antwren *H. pectoralis* and Caatinga Antwren *H. sellowi* (Silva *et al.* 2008). For another, Dugand's Antwren *H. dugandi*, nesting materials used and nest site alone are described (Zimmer & Isler 2003). Recent descriptions (e.g. David & Londoño 2013, Greeney *et al.* 2013, Chaparro-Herrera *et al.* 2014, Flórez & Londoño 2014, Leite *et al.* 2016, Williams 2016) have contributed to our knowledge of breeding in several species of Amazonian antbirds, although this aspect of natural history is still poorly known in many Neotropical species.

Spot-backed Antwren *Herpsilochmus dorsimaculatus* occurs in southern Venezuela, eastern Colombia and the north-western Brazilian Amazon, in the states of Roraima, Amazonas and Pará (Zimmer & Isler 2003). It inhabits the canopy and subcanopy of *terra-firme* forests and white-sand vegetation (*campinarana*). In Venezuela, it has also been found in seasonally flooded forests (Zimmer & Isler 2003). We present the first breeding data and describe a nest presumed to belong to this species.

The nest was found at the Adolpho Ducke Forest Reserve (10°01'03.2"S, 68°12'03.2"W), north of Manaus, Amazonas, Brazil. The reserve is a 10,000-ha forest fragment containing primary *terra firme* forest. Local climate is tropical humid, with relative humidity of 75–86% and annual rainfall of 1,750–2,500 mm. The rainy season is November–May, with highest precipitation in March and April. Mean annual temperature is 26°C (Baccaro *et al.* 2008).

On 21 August 2016, an alarm call drew our attention to a pair of *H. dorsimaculatus* just 1.5 m above ground, behaviour unusual for the species, which typically inhabits the canopy. Shortly thereafter, we found a nest, 3.5 m above ground in the fork of a short (4 m tall) tree of the genus *Lacunaria* (Ochnaceae). The tree had fallen due to the collapse of a larger tree against its trunk, and the nest was turned sideways at a 60° angle, with the inside facing vertically. The nest tree was c.5 m from one of the reserve's trails. One of the pair was carrying food in its bill and adopting an agitated posture, emitting a low call, and we soon spotted a chick perched c.1 m above ground and c.2 m from the nest. The chick, already fully fledged, had plumage similar in pattern to that of the adult male, albeit with a shorter tail and bill. After feeding the chick, the adult departed and gave several calls, being followed by the fledgling, which performed short flights between perches, until all three birds were lost from view.

Another hypothesis is that the nest belonged to another species and it was coincidence that the chick was so close to it, but we have strong reasons to attribute the nest to this species. Although the nest was found in dry season, the night prior to our visit there



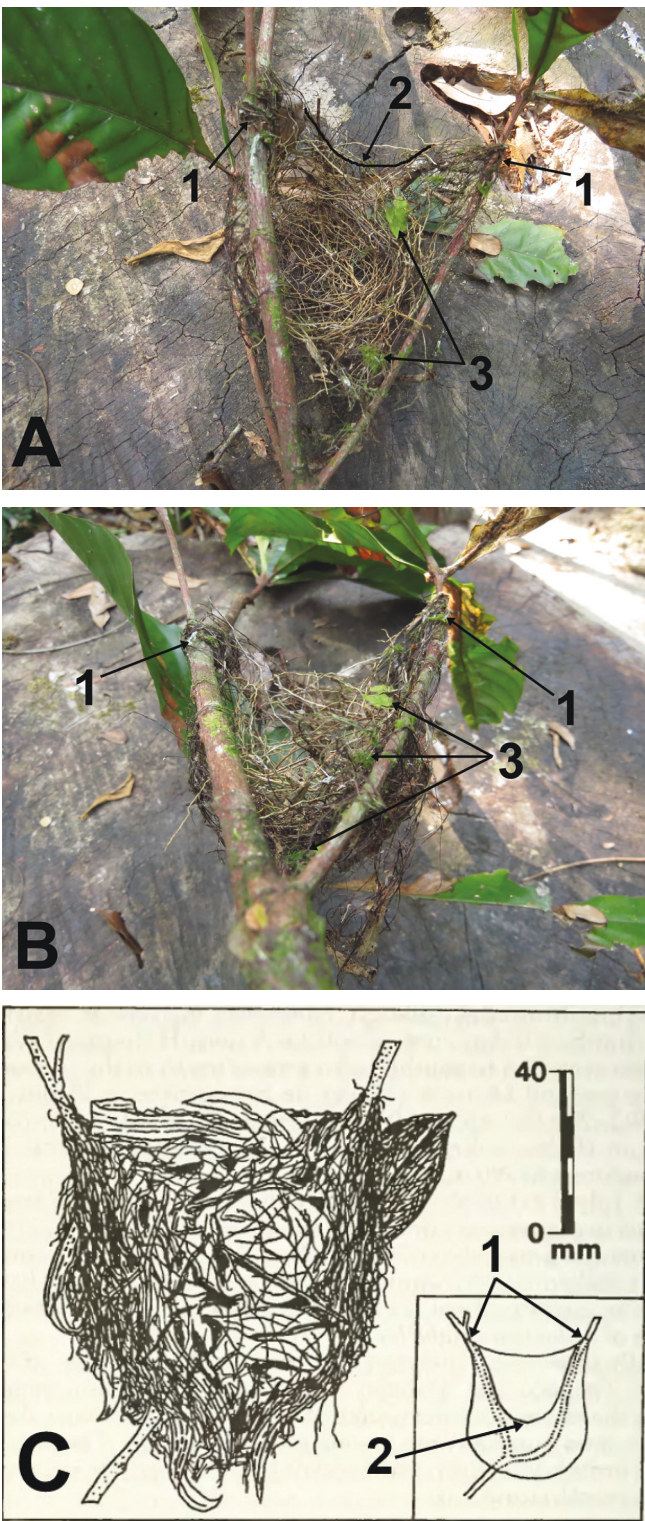


Figure 1. Nest of Spot-backed Antwren *Herpsilochmus dorsimaculatus* (A) from above, (B) from side; and (C) nest of Large-billed Antwren *H. longirostris* described by Straube *et al.* (1992). The numbers indicate important characteristics: (1) main attachment of the nest to the broadest portion of the fork, (2) lower depression in the wall on one side of the nest, and (3) live moss, i.e. the same material gathered by an adult *H. dorsimaculatus* observed by M. Cohn-Haft north of Manaus (Tomaz Nascimento de Melo)

was heavy rain, which possibly caused the tree to fall. Although the trunk of the *Lacunaria* had broken, the leaves were green and fresh, and the nest was in perfect condition, and clearly very recent. The presence of the chick beside the nest reinforces the idea that the tree fell after the nest was built, and the chick was forced to leave.

Although few nests of *Herpsilochmus* are known, the characteristics of this one correspond to others constructed by the genus. Among the principal features are the main attachment to the broadest portion of the fork and a depression on one side of the nest wall (Fig. 1), possibly to accommodate the tail when the bird is incubating or brooding (see Straube *et al.* 1992, Marini *et al.* 1997, Silva *et al.* 2008). The nest of *H. dorsimaculatus* has the same general cup shape as that of other antbird genera like *Thamnophilus* or some *Myrmotherula* (Leite *et al.* 2016, Zyskowski *et al.* 2008), but seems to have more shallow incubation chamber, like *H. sellowi* (R. Bessa; [www.](http://www.)

TABLE 1  
Measurements and materials used on the construction of the known nests of the genus *Herpsilochmus*.

Species	External diameter	Internal diameter	Depth	Nest height	Materials used	Source
<i>H. dorsimaculatus</i>	86 × 70 mm	59 × 50 mm	49 mm	58 mm	Fibres of roots and palms, green mosses, thin branches and pieces of dry leaves	Present study
<i>H. longirostris</i>	80 × 50 mm		60 mm	60 mm	Leaves (especially of the bamboo <i>Guadua spinosissimum</i> ), spadices of grasses, filaments of fungi ( <i>Marasmius</i> sp.) and roots	Straube <i>et al.</i> (1992)
<i>H. longirostris</i>	65 mm	50 mm		55 mm	Not detailed, only the similarity to the nest found by Straube <i>et al.</i> (1992) was mentioned	Marini <i>et al.</i> (1997)
<i>H. pectoralis</i>	71 × 67 mm	51 × 50 mm	45 mm	60 mm	Grasses and roots, passion fruit tendrils, leaves of various sizes and branches of lianas	Silva <i>et al.</i> (2008)
<i>H. sellowii</i>	56 × 50 mm	46 × 44 mm	30 mm	40 mm	Fungal hyphae ( <i>Marasmius</i> sp.), sheathes and leaves of grasses, tendrils, pieces of leaves, and webs	Silva <i>et al.</i> (2008)

wikiaves.com/183754). Therefore, the available evidence leads us to attribute the nest to *H. dorsimaculatus*.

The nest, which has been deposited in the collection of Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA), was of the low cup type attached to a fork (following the classification of Simon & Pacheco 2005) and was constructed of thin pale-colored roots and dark fibres, probably from palm trunks. This material, when interlaced, forms narrow walls, enabling one to see through them into the nest’s interior. The nest was decorated internally and externally with a few small green mosses, thin branches and small pieces of dry leaves. Throughout, the cup was attached by roots to the fork (Fig. 1). Although the measurements of the few described nests of *Herpsilochmus* vary, even in the same species (Table 1), the general cup shape is common to all species. Except for one *H. longirostris* nest, attached to two parallel branches of a fern (Marini *et al.* 1997), nests are usually constructed in forks of thin horizontal (Silva *et al.* 2008) or vertical (Straube *et al.* 1992) branches. Despite that *Herpsilochmus* are predominantly canopy-dwellers (Zimmer & Isler 2003), the genus seems to commonly nest just 1–3.6 m above the ground (Straube *et al.* 1992, Marini *et al.* 1997, Zimmer & Isler 2003, Silva *et al.* 2008). The only known exception was a *H. dugandi* nest sited 35 m above ground. The material appears to vary according to the environment, but use of delicate and interlaced fibres forming thin walls seems to be a generic pattern, although the nest of *H. dorsimaculatus* has less material than in other species of the genus (Straube *et al.* 1992, Marini *et al.* 1997, Zimmer & Isler 2003, Silva *et al.* 2008). One adult was observed north of Manaus gathering live moss from a tree trunk, 1 m above ground, also in the dry season (M. Cohn-Haft pers. comm.). Interestingly, this material was found in our nest too (Fig. 1). The species’ breeding period corresponds to that for many bird species in central Amazonia, with the peak at the start of the dry season (Stouffer *et al.* 2013).

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# First photographs of the endemic Tagula White-eye *Zosterops meeki*, on Sudest Island (Louiade Archipelago), Papua New Guinea

by David K. Mitchell

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Tagula White-eye *Zosterops meeki* Hartert, 1898, is an apparently uncommon bird, seldom seen in the canopy of the hill rainforests on Sudest Island (Pratt & Beehler 2015, Beehler & Pratt 2016). It is the only white-eye species known from Sudest and is, as far as is known, confined to this island. The species has a distinctive white throat and breast, compared to Louisiade White-eye *Z. griseotinctus* Hartert, 1899 (LeCroy 2011), an olive-green bird with a yellowish-green breast that occurs on nearby islands in the Calvados chain and Louisiade archipelago (Pratt & Beehler 2015). Mayr & Diamond (2001) placed *Z. meeki* within the *Z. [atriceps] atrifrons* complex, as *Z. a. meeki*, whereas Pratt & Beehler (2015) maintained it as a species apart.

Hartert (1898) described *Z. meeki* from adult male and female specimens (Rothschild & Hartert 1903) collected on 18 April 1898 by Albert S. Meek on Sudest (Tagula) Island, in the eastern Louisiade archipelago, Papua New Guinea. These, the lectotype and paralectotype respectively, once part of the Rothschild Collection at Tring, UK, are now held in the American Museum of Natural History (AMNH), New York (LeCroy 2011) (Fig. 1).

At the time they were collected, Meek observed that Sudest Island was well wooded and inhabited, with several villages situated inland of the coast (Hartert 1898). These villages have since been relocated along the coastal fringe of grassy ridges and rainforest valleys that extend to the forest-covered mountainous interior. Forests are heavily impacted by cyclones and landslides (pers. obs.).

There have been few recorded sightings of *Z. meeki* since it was collected by Meek 120 years ago and by Albert & George Eichhorn more than a century ago, in early 1916,



Figure 1. Male lectotype (above) and female paralectotype of Tagula White-eye *Zosterops meeki* (© American Museum of Natural History, New York)





Figure 2 (left). Tagula White-eye *Zosterops meeki*, Araeda, Sudest Island, Papua New Guinea, 16 December 2016 (David K. Mitchell)

Figure 3 (right). Tagula White-eye *Zosterops meeki*, coastal vegetation below Araeda, Sudest Island, Papua New Guinea, 16 December 2016 (David K. Mitchell)

despite several subsequent visits and expeditions to Sudest by ornithologists. The most recent known records are those of T. K. Pratt and D. Mitchell (*in Pratt et al.* 2005) who heard white-eyes on Sudest in 2004, and observations by Australian ornithologist W. Goulding in 2012 and 2013–2014 (BirdLife International 2016; W. Goulding pers. comm. 2016). A solitary *Zosterops* was observed by British entomologist John Tennent (pers. comm. 2016), at Rambuso on the north coast of Sudest in December 2014.

### New observations and photographs

During entomological fieldwork on Sudest between 1 and 16 December 2016 by myself and J. Tennent, a transect was made from the coastal village of Vuwo to the summit of Mount Riu (Rattlesnake), at 799 m the highest point on the island, and back to the coastal village of Araeda 2.5 km south-east along the coast from the start point. During the ascent from 150 m to Mbejelele at 645 m, individuals and small groups of 2–4 white-eyes were heard by the author as they moved through the canopy, but were not visually identified.

However, *Z. meeki* was also seen on the morning of 16 December 2016, when again small groups of 2–4 birds moved through the trees at the edge of the easternmost coastal hamlet of Araeda, at 11°45.41'N, 153°58.11'E, and the adjoining coastal fringe, three hours after sunrise and just before a period of heavy rain.

Photographs taken by the author (Figs. 2–3) represent confirmation of the continued presence of *Z. meeki* on Sudest, and are almost certainly the first-ever photographs in life of the species.

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# Resolution of a case of secondary homonymy in the genus *Sylvia* Scopoli, 1769

by James A. Jobling

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Working on the HBW Alive Key to Scientific Names in Ornithology to ensure that the nomenclature and taxonomy therein reflects those in the *HBW and BirdLife International illustrated checklist of the birds of the world* (del Hoyo & Collar 2016), I discovered a case of preoccupation in the now expanded genus *Sylvia*.

In vol. 2, p. 498, of the above-mentioned work the genera *Pseudoalcippe* Bannerman, 1923, *Lioptilus* Bonaparte, 1850, and *Parisoma* Swainson, 1831, are subsumed within *Sylvia*. As a result, the subspecific name *Parisoma subcaeruleum ansorgei* von Zedlitz, 1921, *Orn. Monatsb.* 29: 52 (currently *Sylvia subcoerulea ansorgei*) becomes preoccupied by *Lioptilus abyssinicus ansorgei* Rothschild, 1918, *Bull. Brit. Orn. Cl.* 38: 78 (currently *Sylvia abyssinica ansorgei*). Because the prior *ansorgei* Rothschild, 1918, was published after 1899 (Art. 23.9 of the Code (ICZN 1999)), and as no other names are available for the subspecies *ansorgei* von Zedlitz, 1921, I propose:

## *Sylvia subcoerulea iohannis* nom. nov.

The name will serve as a new replacement name for *Parisoma subcaeruleum ansorgei* von Zedlitz, 1921, in *Sylvia* preoccupied by *Lioptilus abyssinicus ansorgei* Rothschild, 1918. Under Art. 72.7 of the Code (ICZN 1999), the type of the new name is automatically that of the replaced name, *ansorgei* von Zedlitz, with the same type locality. The new eponym honours Prof. Dr William John Ansorge (1850–1913) the British physician and zoologist after whom the above-named taxa were originally named.

It should be noted that other recent taxonomic treatments (e.g. Dickinson & Christidis 2014, Gill & Donsker 2017) place *ansorgei* Rothschild, 1918, and *ansorgei* von Zedlitz, 1921, as subspecies in different genera, under which circumstances both remain valid names.

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