The ‘foremost ornithological mystery of Costa Rica’: *Amazilia alfaroana* Underwood, 1896

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Abstract

The hummingbird *Amazilia alfaroana* is known from a single specimen, collected on the Volcán de Miravalles, in north-west Costa Rica, in September 1895. Since the early 20th century, the taxon has been almost always been treated as a subspecies of Indigo-capped Hummingbird *A. cyanifrons*, which is otherwise endemic to Colombia, although it has also been tentatively suggested that the holotype might represent a hybrid between two unnamed species of trochilids. Our detailed analysis of the specimen reveals species-level differences between *A. alfaroana* and *A. cyanifrons*, and no evidence of characters that might suggest a hybrid between two species known to occur in the relevant region. Until molecular techniques have been brought to bear, we believe that *A. alfaroana* is best treated as a possibly now extinct species.

Key words: Trochilidae, Costa Rica, *Amazilia alfaroana*, Volcán de Miravalles

Over time, the family Trochilidae has presented far more than its fair share of ornithological enigmas and conundrums, owing in large part to the high 19th century demand for hummingbird specimens and the lack of accurate locality data for many of these, as well as the capacity of forgers to make their own contributions to satisfying collectors’ hopes for new species. Cases include the Bogota Sunangel *Heliangelus zusii*, recently confirmed using molecular data to be just what its describer suspected it was, a valid and strikingly distinct (if sadly perhaps extinct) species (Graves 1993, Kirchman et al. 2010) and, in contrast, ‘*Amazilia aeneobrunnea*’, a remarkable composite that briefly duped one of the foremost museum workers on Neotropical birds of the era (Chapman 1889a,b), and the ‘Harlequin Hummingbird *Trochilus multicolor*’, another composite (at least some of its feathers probably belonged to a psittacid) which, despite being debunked as long ago as the 1830s (Lesson 1832), persisted in some ornithological literature into the early 20th century (Ingersoll 1919; see also http://blog.biodiversitylibrary.org/2014/01/hummingbirds-and-harlequins.html). However, the case dubbed by Stiles & Skutch (1989) the ‘foremost ornithological mystery of Costa Rica’ concerns a specimen that neither is of doubtful or unknown provenance nor shows any indication of a fraudster’s handiwork, yet it has attracted surprisingly little interest, especially given the relative accessibility of the region in question.

The holotype (NHMUK 1898.3.12.13) of *Amazilia alfaroana* (Figs. 1–4), at the Natural History Museum, Tring, UK (NHMUK), was collected on the Volcán de Miravalles, in the Cordillera de Guanacaste, north-west Costa Rica, on 10 September 1895 (Underwood 1896: 441–442). Underwood (1896: 432) indicated that his collecting base was at ‘approximately 1450 feet’ (440 m) and that he ‘rarely climbed more than another 500 to 800 feet’. The highest elevation he reached was therefore c.2250 feet (c.680 m), and although Weller (2001: 103) believed that the type was taken somewhere around 450–600 m, Underwood (1896: 442) himself mentioned that it ‘was taken at a pretty high point’, which suggests somewhere possibly as high as 600–650 m. The original label states that the bird is a female, but Weller (2001) argued persuasively that it is more likely a male. Underwood remarked that it was his only encounter with the species during his sojourn on Miravalles, and that ‘something unfamiliar about this bird induced me to shoot it’. His brief type description was accompanied by a footnote by Osbert Salvin who, having compared the specimen with Blue-tailed Hummingbird *A. cyanura* and with *A. sophiae*
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Given certain similarities with *A. saucerotettia hoffmanni*, which occurs on the same mountain (thereby at once eliminating the possibility that *alfaroana* is a subspecies of *A. saucerotettia*, assuming the former is or was resident there), it would seem reasonable to assume that one potential parent of a mixed pairing would be *hoffmanni*. Other species known from the same region of occurrence in a blue (or purple) crown (which a parent would need, given its lack in *A. saucerotettia*) are: Long-billed Starthroat *Heliomaster longirostris*, Crowned Woodnymph *Thalurania colombica*, Purple-throated Mountain-gem *Lampornis calolaema*, Fiery-throated Hummingbird *Panterpe insignis* and Violet-headed Hummingbird *Klais guimeti*. None of these has the crown the same shade of blue as in the type of *alfaroana* (according to our examination of specimens at NHMUK). Furthermore, several have dramatically larger body and bill sizes, especially the species in *Heliomaster, Lampornis, Panterpe* and *Klais*, and even the bill shape of *alfaroana* is different. Finally, none of the other highly distinctive plumage characters of these species is apparent (even in a much-reduced state) in *alfaroana*, e.g. the underparts coloration in either sex of *Lampornis*, striking throat coloration in *Panterpe*, large green bib contrasting with otherwise purple underparts in male *Thalurania*, purple gorget with otherwise off-white/greyish underparts in *Heliomaster*, and very obvious white...
post-ocular spot and violet-blue chest in *Klais*. Furthermore, there is no evidence that the gorget, rectrices or remiges in *A. alfaroana* are in any way intermediate between any of the above species and those of an *Amazilia*, which would be expected if the specimen was a hybrid (Graves 1990).

Even the unlikely hypothesis (based on the somewhat mixed plumage features) that a vagrant *A. cyanifrons* wandered north (far from its native range) and paired with a local *A. saucerottei hoffmanni*, which already stretches credulity, cannot explain why the type specimen of *alfaroana* should possess a distinctly longer tail and bill than either putative ‘parent’ species (Table 1). As mensural characters are considered to be polygenic (Graves 1990), the apparently larger size of *alfaroana* further weakens the hypothesis for this particular hybrid pairing.

**TABLE 1.** Comparative mensural data (in mm) for the holotype of *Amazilia alfaroana* (NHMUK 1898.3.12.13), Steely-vented Hummingbird *A. saucerottei hoffmanni* (*n* = 11, six males, five unsexed, Costa Rica and Nicaragua) and Indigo-capped Hummingbird *A. cyanifrons* (*n* = 11, all unsexed, Colombia). All specimens held at NHMUK and measured by GMK using a metal wing rule with perpendicular stop at zero and dial callipers: wing from carpal joint to tip, flattened against the ruler (to 0.5 mm); tail from pygostyle to tip (to 0.5 mm); and bill from tip of maxilla to skull (to 0.1 mm). Mean plus standard deviation (and range).

<table>
<thead>
<tr>
<th>Taxon</th>
<th>bill</th>
<th>wing</th>
<th>tail</th>
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</thead>
<tbody>
<tr>
<td><em>A. alfaroana</em></td>
<td>24.4</td>
<td>55.5</td>
<td>34</td>
</tr>
<tr>
<td><em>A. saucerottei hoffmanni</em></td>
<td>21.2 ± 0.89</td>
<td>54.8 ± 1.23</td>
<td>29.4 ± 1.48</td>
</tr>
<tr>
<td>(19.6–22.5)</td>
<td>(53–57)</td>
<td>(27–31)</td>
<td></td>
</tr>
<tr>
<td><em>A. cyanifrons</em></td>
<td>20.4 ± 0.82</td>
<td>55.5 ± 1.46</td>
<td>29.9 ± 1.98</td>
</tr>
<tr>
<td>(19.2–21.5)</td>
<td>(53.5–57.0)</td>
<td>(27–32)</td>
<td></td>
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</tbody>
</table>

Until such time as a genetic analysis is able to yield more information concerning the relationships of this unique hummingbird, or a detailed hybrid hypothesis is presented (essential if this possibility is to be properly entertained; Graves 1990: 10), we concur with Weller (2001) that the most parsimonious conclusion to draw is that it is a valid taxon that can plausibly be ranked only as a species, given the degree of differentiation from either *A. saucerottei* or *A. cyanifrons*. Gill (2014) recently argued that a new null hypothesis should be the starting point for avian taxonomic decisions, namely ‘one that places the burden of proof on “lumping” rather than on “splitting” taxa at the species level.’ We do not necessarily agree with Gill that ‘flicking a switch’ to a pre-Peters era would be of inherent benefit to avian taxonomy. However, given that every commentator (bar Simon 1921) to have personally examined the type of *alfaroana* has validated its status as a species, and that, to date, no-one has posited a plausible pair of species that might produce such a combination of characters, in this case we do consider that the burden of proof lies with those who would maintain it as a subspecies of *cyanifrons* or deem it of hybrid or otherwise doubtful provenance. We would, therefore, invert the AOU position and argue that the status of *A. alfaroana* as a hybrid individual rather than as a species has not been adequately demonstrated, and indeed appears unlikely.

Certainly the AOU Check-list Committee’s response to the challenge posed by this lone specimen needs greater coherence. Listing it as a subspecies of *cyanifrons*, which was the default position up to and including the seventh edition of the Check-list (AOU 1998), was arguably defensible as a cautiously centrist approach, neither dismissing it as a taxon nor endorsing it as a species. However, the text of that and the previous edition errs to some extent in stating that the ‘type [of *alfaroana*] closely resembles *A. cyanifrons*’ (our emphasis), but importantly it goes on to remark that it ‘does not appear to be a hybrid between any Middle American species of *Amazilia*’. The subsequent decision (Banks et al. 2002) to relegate *alfaroana* to doubtful status (and greater obscurity) appears doubly unaccountable given the committee’s previous position and the then recent publication of the most complete exposition—which Banks et al. (2002) do nothing to address by way of counter-argument—of the type’s features and potential status (Weller 2001).

Nevertheless, perhaps the greatest puzzle is the complete absence of further records of birds exhibiting the same suite of characters. Stiles & Skutch (1989) mentioned that unsuccessful visits had been made on several occasions to the same mountain, but it is unclear if these were dedicated searches, what form they took, or how intensive they were. The Volcán de Miravalles appears to remain fairly well forested (https://www.google.co.uk/maps/place/Volcan+Miravalles) and is designated as a ‘protective zone’ (11,670 ha) between Rincón de la Vieja and Volcán Tenorio National Parks within the Tilarán Highlands Important Bird and Biodiversity Area (BirdLife...
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FIGURES 1–4. Dorsal, lateral and ventral views, plus close-up of the crown of the holotype of *Amazilia alfaroana*, NHMUK 1898.3.12.13, collected on the Volcán de Miravalles, Cordillera de Guanacaste, north-west Costa Rica, 10 September 1895 (Guy M. Kirwan, © Natural History Museum, London)
FIGURES 5–6. Dorsal and ventral views of two specimens of Indigo-capped Hummingbirds *Amazilia cyanifrons* (on right), from Colombia, compared to the holotype of *Amazilia alfaroana* (Guy M. Kirwan, © Natural History Museum, London)

FIGURES 7–8. Dorsal and ventral views of two specimens of Steely-vented Hummingbird *Amazilia saucerottei hoffmanni* (on left), from Costa Rica, compared to the holotype of *Amazilia alfaroana* (Guy M. Kirwan, © Natural History Museum, London)
International 2016). Underwood (1896: 432) clearly worked on the south-west (Pacific) slope of Miravalles, where the modern condition of the vegetation is unreported (there is much disturbance and loss on the Caribbean slope: BirdLife International 2016), but Google Earth suggests that at least some forest persists. It is of course likely that the species has suffered from habitat destruction on the lower levels of the mountain over the past century, and this may lie behind the absence of subsequent records of birds resembling *Amazilia alfaroana*.

Although numerous birdwatchers visit Costa Rica each year we doubt whether many are even vaguely aware of this intriguing case. The treatment of *alfaroana* as a subspecies in Stiles & Skutch (1989) and hence in the *Handbook of the Birds of the World* (Weller 1999, del Hoyo & Collar 2014), and as an invalid taxon by the AOU Check-list, means that it can be on few, if any, ornithologists’ lists of targets. In publishing this short reappraisal, we seek to encourage ornithologists, birdwatchers and conservationists to put this rather unremarkable little hummingbird, steeped in unusual levels of mystery, back on their agenda. The recent rediscovery of the Blue-bearded Helmetcrest *Oxypogon cyanolaemus* (Rojas & Vasquez 2015) required a dedicated search; *Amazilia alfaroana* will surely need the same, starting with the Volcán de Miravalles but with surveys duly extending throughout the Tilarán Highlands.

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[http://dx.doi.org/10.1111/j.1474-919x.1896.tb07074.x](http://dx.doi.org/10.1111/j.1474-919x.1896.tb07074.x)
