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NOTES ON THE IDENTITY OF *EVENUS CORONATA* (HEWITSON, 1865) (LEPIDOPTERA: LYCAENIDAE: THECLINAE: EUMAEINI) WITH THE DESCRIPTION OF A REMARKABLY OVERLOOKED SIBLING SPECIES

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Abstract - The syntypes of *Thecla coronata* Hewitson, 1865 and holotype of *Thecla watkinsi* Lathy, 1926 were examined and their identity is discussed. A lectotype is designated for *Thecla coronata* Hewitson, 1865 in order to stabilise the nomenclature. A new Andean species, *Evenus felix* **sp. nov.**, is described. Distribution data indicate extensive sympatry of both species in the eastern Andes. We present diagnostic characters for the new species including differences in wing pattern, male modified wing scale patches and genitalic brush organs, and mitochondrial COI DNA "barcode" sequences. A discussion and natural history notes follow for both species. We document adults and their genitalia, and distribution data and maps are provided.

Resumen - Se examinaron los sintipos de *Thecla coronata* Hewitson, 1865, el holotipo de *Thecla watkinsi* Lathy, 1926 y se argumenta sobre su identidad. Se designa un lectotipo de *Thecla coronata* Hewitson, 1865 para estabilizar su nomenclatura. Se describe una nueva especie andina, *Evenus felix*, **n. sp.** Los datos de distribución indican amplia simpatría entre ambas especies en los Andes orientales. Se presentan los caracteres diagnósticos para la nueva especie incluyendo diferencias en el patrón alar, áreas de escamas modificadas en las alas de los machos, órganos en forma de pincel del aparato genital y secuencias de "barcode" del gen COI de su ADN mitocondrial. Se discuten aspectos de la historia natural de ambas especies. Se documentan los estadios adultos y sus estructuras genitales, datos geográficos y mapas de distribución.

Key words: lectotype, *watkinsi*, genitalia, immature stages, *Pouteria*, Sapotaceae, Andes, Ecuador, mitochondrial COI DNA barcode

INTRODUCTION

The Neotropical genus *Evenus* Hübner, [1819], includes some of the most spectacular and iconic butterfly species in the world, ventrally clothed with brilliant iridescent green or blue-green ventral scales, patterned with intricate black lines and streaks, and adorned with a pair of delicate streaming tails on each hindwing. As currently classified (Robbins, 2004b), the genus contains 12 species, but this paper focuses on a single species, *Evenus coronata*, and the description of an unrecognised sibling species with which it has always, and quite remarkably, been confused.

The name *Thecla coronata* Hewitson, 1865 was proposed and figured on the basis of an unstated number of male and female specimens from Guatemala and Colombia ("Bogota"). The original plates and the accompanying text (Hewitson, 1865: 70, pl. 27) not only emphatically stressed the extraordinary beauty of the butterfly, but also drew attention to an especially striking character of the species, echoed by its scientific name, which can be interpreted as "Crowned Hairstreak" (*Thecla* and related species are known as "Hairstreaks") - the male frons bears a tuft of gleaming green scales standing upright from the head (figured in Godman & Salvin, 1887: pl. 48, fig.7a).

There cannot be many readers unfamiliar with this magnificent species, given that specimens identified as such have been figured in many well-known reference books such as Lewis (1973), Smart (1975), D'Abrera (1984), d'Abrera (2001, 2006), and Carter (1992), and even on collectable cards. Furthermore, specimens labelled as this species are commonly found mounted in boxes for wall displays, and are a popular "trophy" species for collectors. These specimens are almost exclusively provided by professional insect dealers from Baños in eastern Ecuador (Tungurahua Province), where pupae of the species have been ranched from the town's orchards and gardens for at least a hundred years (pers. obs. and pers. comm. from various local sources).

In stark contrast, however, adult specimens collected in the field (especially male), as for example the syntypic material, are rare in museums, probably with the sole exception of the Romero family collection (Maracay, Venezuela), with 28 specimens. This material, collected primarily during the great annual butterfly migrations through Portachuelo Pass to the north of Maracay (Aragua state) (Beebe, 1949), was curated by the late Francisco "Paco" Romero (1920-2002) (González, 2004) and his family as two "forms" on the basis of wing coloration and pattern (somewhat ironically, despite his long study, Beebe never recorded this or any other *Evenus* species: Beebe, 1951).

Both authors of this paper independently visited the Romero family and studied their collection. The separation of these two *Thecla coronata* phenotypes was evidently well founded, and in fact represented at least two species, distinguished very obviously along the ventral forewing cubitus in the males of one species by the presence of highly distinctive double androconia which are single, smaller, and distally displaced in the second species.

This discovery posed the question how to apply the name proposed by Hewitson. Assembling data over the past two decades on these species from many sources we concluded that the name *T. coronata* actually applies to the species represented by very rare Mesoamerican specimens, whilst in a truly spectacular twist of fate the Andean specimens which are so abundantly represented in collections worldwide, and widely figured in the literature, have no applicable name.

MATERIALS AND METHODS

External morphology and dissections were studied using stereomicroscopes and photographed using digital cameras. Wing venation terminology follows the Comstock-Needham system described in Miller (1970) (see also Comstock, 1918). Neural interspaces are named by reference to the vein immediately anterior to the space. Areas and elements of the wing pattern follow Neild (2008).

The abdomens of 16 males and 18 females were dissected to observe genital structures. Abdomens were dissected using standard techniques, with adult abdomens being soaked in hot 10% KOH for 10-15 minutes, dissected and subsequently stored in glycerine. Dissections were photographed using various digital cameras, and drawn using a camera lucida. The terminology for genital and abdominal structures follows Klots (1970).

Legs from 37 specimens from Colombia, Ecuador, and Venezuela were sent for analysis (>200 bp) of their mitochondrial COI gene sequence (DNA "barcode"), using the Kimura 2 parameter, to Barcode of Life Data Systems (BOLD), by Christophe Faynel (project NLCYA) and Daniel Janzen and Winnie Hallwachs (project MHMYH) via Robert Robbins.

We checked all known type specimens of the described nominal taxa, and examined additional specimens in the following public and private collections to locate type specimens, assess morphological variation, and document geographical and elevational distribution:

AM	Alfred Moser, São Leopoldo, Brazil
AMNH	American Museum of Natural History, New York, USA
BJ	Bernard Jost, Bern, Switzerland
BMNH	The Natural History Museum, London, UK (formerly the British Museum of Natural History)
CF	Christophe Faynel, Montaud, France
CR	Cristóbal Ríos-Málaver, IVIC, San Antonio de los Altos, Miranda, Venezuela
GR	Gabriel Rodríguez, Mitú, Colombia
HNHM	Hungarian Natural History Museum, Budapest, Hungary
JCS	Juan Carlos De Sousa, Funchal, Madeira
JCP	Jean-Claude Petit, Fresnoy-le-Luat, France
JFLC	Jean François Le Crom, Bogotá, Colombia
JSa	Julián A. Salazar, Manizales, Colombia
JSh	John Shuey, Indianapolis, Indiana, USA
LG	Loran Gibson, Florence, Kentucky, USA
MCC	Mauro & Clara Costa, Caracas, Venezuela
MECN	Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador
MGCL	McGuire Center, University of Florida, Gainesville, Florida, USA
MHNUC	Museo de Historia Natural, Universidad de Caldas, Manizales, Colombia
MIZA	Museo del Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay, Venezuela
MNCR	Museo Nacional de Costa Rica, San José, Costa Rica
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MUSM	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
MZUJ	Jagiellonian University, Zoological Museum, Kraków, Poland
NF	Norbert Flauger, Bejuma, Venezuela
NMW	Naturhistorisches Museum Wien, Vienna, Austria
OUMNH	University Museum of Natural History, Oxford, UK
PB	Pierre Boyer, Le Puy-Sainte-Réparade, France
RF	Romero Family, Maracay, Venezuela
RL	Robert Lehman, La Ceiba, Honduras
RM	Roberto de la Maza, Mexico City, Mexico
UMO	Oxford University Museum, Oxford University, Oxford, UK
USNM	National Museum of Natural History, Washington, DC, USA
WF	Walter Faisthuber, Monteverde, Costa Rica

ACRONYMS EMPLOYED

D	Dorsal
V	Ventral
FW	Forewing
HW	Hindwing

THE IDENTITY OF *THECLA CORONATA*

Hewitson (1865: 70) described *Thecla coronata* on the basis of an undisclosed number of male and female specimens (i.e. syntypes). The author also figured (on plate 27) the dorsal surfaces of both sexes, and the venter of the male (see fig. 1). These specimens were stated to come from "Bogota" (in the British Museum collection), and from "Guatemala" (then in the private collection of Osbert Salvin). There is a pair of specimens in the BMNH whose labels indicate they should be treated as syntypic material: a male from Verapaz (Guatemala), and a female from Bogotá (Colombia).

We believe it is important to designate a **lectotype**, and of the male sex, for the following reasons. After the discovery that the *Thecla coronata* species group includes at least three taxa, the identity of *Thecla coronata* is not unequivocal, and it is therefore important to identify *Thecla coronata* by pinning its name to a readily identifiable type specimen. Males in the *coronata* species-group provide the most reliable diagnostic characters, and therefore via this action *Thecla coronata* can be objectively diagnosed and distinguished from any sibling species.

Fig. 1. Figures of *Thecla coronata* from the original description by Hewitson (1865: plate 27) (3: dorsal; 4: dorsal; 5: ventral).

The male **lectotype** (see fig. 2), with a FW length (base to apex) of 29.5 mm (1.16 inches), is accompanied by the following labels, all in black ink, and on white rectangular card unless indicated otherwise: Type. Sp. figured / All. TYPE [handwritten in red ink] / Coronata [handwritten] / Vera paz low f. [= forests?] [handwritten] / Forests of N. Vera Paz. F. D. G. & O. S. / Godman-Salvin Coll. 1911.-93. B. C. A. Lep. Rhop. Thecla coronata, Hew. / BMNH(E) # 266778 / SYNTYPE ♂ Thecla coronata Hewitson. London, viii.14. Zs. Bálint, 2000 [on red card]. Note that this male lectotype is likely to be the specimen figured in ventral view on plate 27 in Hewitson (1865: fig. 5), despite its physically damaged state which contrasts with the perfectly reconstructed appearance of the illustrated male. Its identity can be inferred from the sprinkling of unusual straw-coloured marks in the VFW apical and subapical region of the figured specimen. These marks correspond to similar ones on the lectotype which we presume are the result of damage to the wing during capture, of the kind caused by fine gravel in the net. It is of course possible, though most unlikely, that another syntype male existed which was also damaged in this way. In fact, the notes regarding the capture of this specimen in Godman & Salvin (1887: 10) make it clear that only one specimen was taken in Guatemala. This source also provides interesting additional information about the type locality: "The first male specimen of this beautiful species was captured in the forest between Coban and San Luis, in the department of Peten, in the month of March 1862."

The female **paralectotype** of *Thecla coronata* (see fig. 6) with FW length 28.0 mm, has the following labels, all in black ink, and on white rectangular card unless indicated otherwise: Type [round white paper label with red rim] / B. M. Type No. Rh. 505 / Thecla coronata, Hew. / Coronata [handwritten] / Bogota [handwritten round label] / BMNH(E) # 266277 / SYNTYPE ♀ Thecla coronata Hewitson. London, vi.15. Zs. Bálint, 2000 [on red card]. (NB: This paralectotype is in fact a specimen of the Andean subspecies *Evenus coronata watkinsi*).

It is curious to note that Hewitson (1865: 70 & pl. 27) made a number of errors or misleading comments in his description of the male which are not borne out by reference to either his own plates nor to any other known specimens. He describes the outer dorsal margins merely as "brown" (not even dark brown, as he does the female), even though they are nearly the same colour as the anal patch which he describes correctly as black. He describes the underside as "green irrorated with

Fig. 2. A male of *Evenus coronata coronata* (= the male lectotype of *Thecla coronata* Hewitson, 1865, from Guatemala), BMNH collection (dorsal surface at left, ventral at right). FW length = 29.5 mm. Photos: A. Neild, © BMNH.

Fig. 3. A female of *Evenus coronata coronata* from Nicaragua, BMNH collection (dorsal surface at left, ventral at right). FW length = 29 mm. Photos: A. Neild, © BMNH.

black". This rather overemphasises the brown or dark brown, not black, sprinkling effect of the smaller background scales (most obvious on the basal half of the VHW). Moreover, unlike Draudt (1919: 746), this statement fails to note that most of these iridescent scales change colour from green to golden-green depending on the angle of view and intensity of light. Hewitson writes that both wings "are crossed near the middle by a band of red-brown" when this band is confined to the hindwings. And finally he refers to an isolated "small blue spot" (on the distal side of the black median band in space M3) and "silvery-blue" (near the tail) when the colour is pale green in both cases (dorsally it is silvery blue near the tail). The description of the female is incident-free.

GEOGRAPHICAL DISTRIBUTION OF *EVENUS CORONATA* AND THE IDENTITY OF *THECLA WATKINSI* (LATHY, 1926)

Nominate *Evenus coronata* (see figs. 2 & 3), occurs in the extreme east of Mexico (Chiapas), Central America, and in the Chocó region of western Colombia and north-western Ecuador. In western and northern Venezuela, the Colombian Sierra Nevada de Santa Marta and Western, Eastern and presumably Central Cordilleras (except on Chocó slopes), eastern Andean Ecuador, and in the northern half of eastern Peru, the wing pattern of *E. coronata* is distinguishable from that of the nominate race. The males are very close to *E. coronata coronata*, but often possess wider black dorsal margins (especially on the FW), a shorter patch of modified scales on the basal half of the DFW costa, a black tornal patch on the DHW which usually encloses only one blue streak (although there may be traces of a second), and a duller, less vibrant green ventral surface (see tables 1 and 2 for more details). This taxon probably extends its range southwards into southern Peru and Bolivia, although this supposition is based on female specimens alone (we have not seen any males from these locations). We assume this taxon to be an exclusively Andean subspecies of *E. coronata* (occurring to the east of Chocó slopes).

Map 1. The distribution of *Evenus c. coronata, E. c. watkinsi,* and *E. felix* **sp. nov.** (green, white, and blue markers, respectively). For locality data see Appendices. Map data © 2014 Google, SIO, NOAA, US Navy, NGA, GEBCO, Image Landsat, US Dept. of State Geographer, LDEO-Columbia, NSF.

The most senior name available for this predominantly eastern Andean taxon is likely to be *Thecla coronata watkinsi* Lathy, 1926 (see figs. 4-7) , which was originally described as a subspecies of *E. coronata*. Nonetheless, we cannot be sure if the female holotype (see fig. 4; also Johnson, 1991: fig. 29) from central-eastern Peru, with its unusually pale blue dorsum, and with narrower dark marginal dorsal bands (especially on the HW), is merely a form of the other females we believe to represent the largely east Andean subspecies of *E. coronata*, or if it belongs to yet another taxon. Moreover, it is not impossible that this holotype is mislabelled – in fact it closely resembles two other specimens we have seen, both from "Rancho Grande" (Henri Pittier National Park) in northern Venezuela in the MIZA and Romero family collections (see fig. 5). However, there is an especially unique character found on this Peruvian holotype: the very close proximity and parallel running of the two black lines that cross the anal lobe of the VHW, a combination of characters we have not seen in any other specimen, not even those from Peru. We will need to await more specimens from Peru in the hope that the identity of this enigmatic taxon can eventually be established. However, we can categorically state that the holotype of *watkinsi* is not a female of our new species, described below.

Nominate *Evenus coronata* and its subspecies *E. c. watkinsi* differ as described below from the new species, which appears to be restricted to the Andean chain, with records from northern and western Venezuela through central Colombia and down the eastern cordillera of Ecuador to at least central Peru (Huánuco). Although we personally examined the holotype of *Thecla watkinsi* several times, we did not dissect it. As the comparative material at our disposal of nominate *E. coronata* was so limited there was no compelling reason to dissect this unique specimen.

Evenus felix Neild & Bálint, sp. nov.

(Figs. 8-15)

TYPE DATA

In order to easily locate and identify type specimens, data are reproduced verbatim from labels; they are listed in alphabetical order by collection name, and within each collection by date of capture.

Holotype ♂ (FW length: 30 mm) Baños, Tungurahua, E. Ecuador. Ex-pupa farmed from wild. Jan. 2005. 1850 m. A. Neild Coll. (to be donated to **MECN**). Note: the approximate geographic coordinates for Baños are 1°23'S 78°25'W.

Paratypes: AM: 2♂ 1♀ Ecuador, Pcia.Tungurahua, Baños, Mantos de la Novia, 1800 m., 4.05.2003. A. Moser leg. **AN:** 5♂ 6♀ same data as holotype; 2♂ 3♀ same data as holotype, Neild Prep. Gen. Vial Nos. 263 & 264 (♂), 265, 266 & 275(♀); 1♂ Tungurahua – Pastaza, 1800 m. E. Andes of Ecuador.

BMNH: 1♂ Banos, Rio Pastaza, E. Ecuador, 6100ft., Dec. 10 / Rothschild Bequest B.M. 1939-1; 4♂ 1♀ Equateur, Env. d'Ambato, R. P. Irenée Blanc (1♂ dwarf excluded; see notes); 3♂ Banos, Rio Pastaza, E. Ecuador, 6400 ft. Jan. '10; 6♂ 3♀ Baños, Rio Pastaza, E. Ecuador, 5-7000 feet, M. G. Palmer; 4♂ 2♀ Ob. Pastaza, Ecuad. C. 1000m. Coll. Niepelt; *idem*: 1♂ 1♀ Okt.-Dec. 1906; 15♂ 8♀ D'un envoi fait du Guayaquil, par Erich Feyer à Carl Zacher d'Erfurt, saisi en mer sur le vapeur italien "Sienna" et vendu à Toulon par le service des prises le 7-10-1915 en execution du décret du 18-8-1915 / Ex Oberthür Coll. Brit. Mus. 1927-3. **CF:** 1♂ Baños, Tungurahua, no date, Ecuador, coll. C. Faynel n° 24046; *idem*: 1♀ n° 24048; 1♂ Baños, 1800m, II. 1997, Ecuador, coll. C. Faynel n° 24045; 1♀ Baños, 2000m, I. 2002, Ecuador, coll. C. Faynel n° 24049; 1♂ Baños, Tungurahua, 1800m, III. 2002, Ecuador, coll. C. Faynel n° 24047. **HNHM:** 1♂ Ecuador, Prov. Tungurahua, Baños, 1800-3000 m, 1998. I.21-22, leg. Hácz; coll. Hácz; *idem*: 1♂ / Zs. Bálint gen. prep. nos. 1518 (♂); 1♂ 1♀ Ecuador [Baños], [20]04. VII. 2., Juhász György, don. L. Végh; 2♂ 2♀ Ecuador, Tungurahua, Baños, Pastaza, 1850 m, 2005. I., ex pupa, don. A. Neild. / Zs. Bálint gen. prep. nos. 1361 & 1362 (♂), 1460 & 1461 (♀)**.** **MIZA:** 1♂: Baños, Tungurahua, Ecuador. 1800 m. 2-I-1972. Velastegui, leg.; *idem*: 1♂ 5-I-1972; *idem*: 1♂ 7-III-1975; *idem*: 1♂ 31-III-1975; *idem*: 1♀ 19-III-1976**.** **MNHN:** 6♂ 1♀ Baños, Rio Pastaza, E. Ecuador, 6000 ft, Jan. 10; *idem*: 3♂ Dec. 10; *idem*: 26♂ 2♀ 5000 to 7000 ft, Aug. & Sept. 10; *idem*: 11♂ 1♀ 5000 to 7000 ft, Oct, Nov and Dec 10**.** **MUSM:** 1♂: Ecuador, Tungurahua, Baños, 01º24'S/78º25'W, 10.x.69, S.E. Velástegui; 1♂: Ecuador, Tungurahua, 1800-2500m, i.2003, M. Büche leg. **MZUJ:** 1♀: Ecuador, Tungurahua, Baños. V.1995. / ex coll. A. Jasiński 01/2008; 1♀: Ecuador, Prov. Tungurahua, Baños. 1900 m. 10.2001. Coll. J. Wojtusiak; 3♂ 1♀: Tungurahua, Baños / ex coll. A. Jasiński 01/2008. **OUMNH:** 3♂ 1937. Ecuador. Baños. d. d. Major. R. H. Thomas. 1006-1940; *idem*: 1♂1800 m; 2♂ Baños: 5-7000. E. Ecuador. R. Pastaza. M- G- Palmer. Pres. 1911 by H. Druce; 1♂ ex coll. Sir K. Cantlie. Pres. 1972; 2♂ 1♀ Tungurahua, Baños, 1850 m, II.1869, R. de Lafebre. A. C. Allyn, Acc. 1970-33 exchange, 1985, from AME/FSM to HEC/OUM no. Acc. 3 – 1985. **PB:** 1♂ 3♀ Baños, Tungurahua, 1800m, 15 November 1989; *idem*: 2♂ 2000m, November 1996; *idem*: 2♀ 1900m, 6 January 1997; **USNM:** 1♂ Ecuador 1800 m., Baños, Tungurahua, 20 Sept. '80. Velastegui; *idem*: 1♀ 14 Nov. '80; 1♂ Oriente, Ecuador. July.

Additional specimens examined: see Appendices 1 & 2

DESCRIPTION & DIAGNOSIS

Evenus felix **sp. nov.** and *E. coronata* are remarkably similar. Our description is therefore simplified and presented as a diagnosis to highlight the differences between the two taxa. These diagnostic characters are presented in tabular format (see table 1). We initially present and discuss the most important characters, firstly for mounted specimens, and secondly for live specimens in the field. Other less important diagnostic characters are presented in a subsequent table.

Forewing length ♂ 26.0 – 32.0 mm (n = 56), ♀ 24.0 – 28.0 mm (n = 29) based mostly on BMNH material. (Comparative figures for the much rarer *E. coronata*, based primarily on BMNH material, and a much smaller sample size: ♂ 29.5 – 33.0 mm (n = 6), ♀ 26.0 – 32.0 mm (n = 16); these figures exclude dwarf [bred?] specimens).

Male (fig. 8): this sex bears the clearest and most reliable species-level characters, namely the presence of modified wing scale patches (alar organs *sensu* Faynel & Bálint, 2012, such as androconia), on the DFW, VFW, and DHW. These differ by location, shape, and size in each species.

The most important character is present on the VFW in *E. felix* there are two long, thin strips containing pale creamy-grey androconia forming a scent patch (see Robbins, 1991; Faynel & Bálint, 2012) in the submedian area lying immediately alongside the cubital vein, one on each side, each approximately 3 mm long, with the distal ends of each terminating approximately 1 mm basal to the stem of Cu2 (see fig. 9). These scales may be greyer in some specimens, especially in the anterior patch. In *E. coronata* there is but a single such scent patch (see fig. 9), of a similar colour and length, but appearing to be thinner as it is more tightly enclosed by the surrounding green scales. This single androconia patch is sited further distally compared to its sister species, beginning near the base of Cu2 and extending distally along the basal edge of the posterior discocellular vein, but not reaching the base of Cu1. This patch is barely visible to the naked eye, and in its distal half it is nearly completely covered by the darker and longer green scales that surround it, so that it is not obvious even under microscopic examination.

These VFW androconia are much shorter than the surrounding green scales, and consequently sit well below them, creating the impression of a "slit" in the green scales. The anterior of these two patches in *E. felix* is often covered to some degree by the surrounding green scales, but examination under a microscope reveals that the creamy androconia are still present beneath.

Table 1. Primary diagnostic characters for *Evenus felix* **sp. nov.** and *Evenus coronata*

Sex	Wing(s)	***Evenus felix* sp. nov.**	***Evenus coronata*** **(including *E. c. watkinsi*)**
♂	VFW	Androconial patch double (one on each side of cubital vein) and wide; located basal to root of vein Cu2.	Androconial patch single (on basal side of posterior discocellular vein M3 and cubital vein) and narrower; located at and distal to root of vein Cu2.
♀	DHW	Tornal red patches very large, barely separated by black scales along Cu2, with narrow black borders; red often a little darker than other taxa.	Tornal red patches reduced, separated by wide black band along Cu2, and with wider black borders; red often a little paler than *E. felix*.
♂♀	VFW	Black median band narrower, regular in width.	Black median band wider, especially in female, and often wider centrally.
♂♀	VHW	Black median band with a light green basal border; this character not obvious on VFW.	Black median band with a much lighter glossy bluish-green or silvery-green basal border in *E. c. coronata*, but a duller whitish-green in *E. c. watkinsi*; this character also on VFW, but reduced in width.
♂♀	VHW	Black median band narrower, of regular width.	Black median band thicker, of irregular width, and especially wide between 1A and M3 (black even thicker in nominate subspecies compared to *E. c. watkinsi*).

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8. *Evenus felix* **sp. nov.** from Baños, Ecuador (dorsal surface at left, ventral at right). Top row: male holotype, MECN collection. FW length = 30 mm; Bottom row: female paratype, AN collection. FW length = 26 mm. Photos: A. Neild.

Fig. 4. The female holotype of *Thecla watkinsi* Lathy from Peru, MNHN collection (dorsal surface at left, ventral at right). FW length = 26 mm. Photos: C. Faynel.

Fig. 5. A Venezuelan female of *Evenus coronata watkinsi* closely resembling the holotype of *Thecla watkinsi* Lathy, Romero family collection (dorsal surface at left, ventral at right). FW length = 28 mm. Photos: A. Neild.

Fig. 6. A Colombian female of *Evenus coronata watkinsi* (= the female paralectotype of *Thecla coronata* Hewitson), BMNH collection (dorsal surface at left, ventral at right). FW length = 28 mm. Photos: A. Neild, © BMNH.

Fig. 7. A Colombian male of *Evenus coronata watkinsi*, BMNH collection (dorsal surface at left, ventral at right). FW length = 32 mm. Photos: A. Neild, © BMNH.

There is virtually no intraspecific variation in either species in the diagnostic VFW androconia patches. In every one of several hundred wild-farmed specimens of *E. felix* we have examined from Baños (Ecuador), collected over many decades and at all times of the year, we have never found single patches, only double (this is also true for all other specimens examined from elsewhere in the species' range). Other primary diagnostic characters are also relatively constant in farmed and wild-caught specimens spanning the whole range of the species (rarely one character might vary, but never in combination with others). Likewise, the single androconial patch in *E. coronata*, and its more distal wing location, are also constant in all specimens we have examined, as well as other primary diagnostic characters. We have not found any specimen in

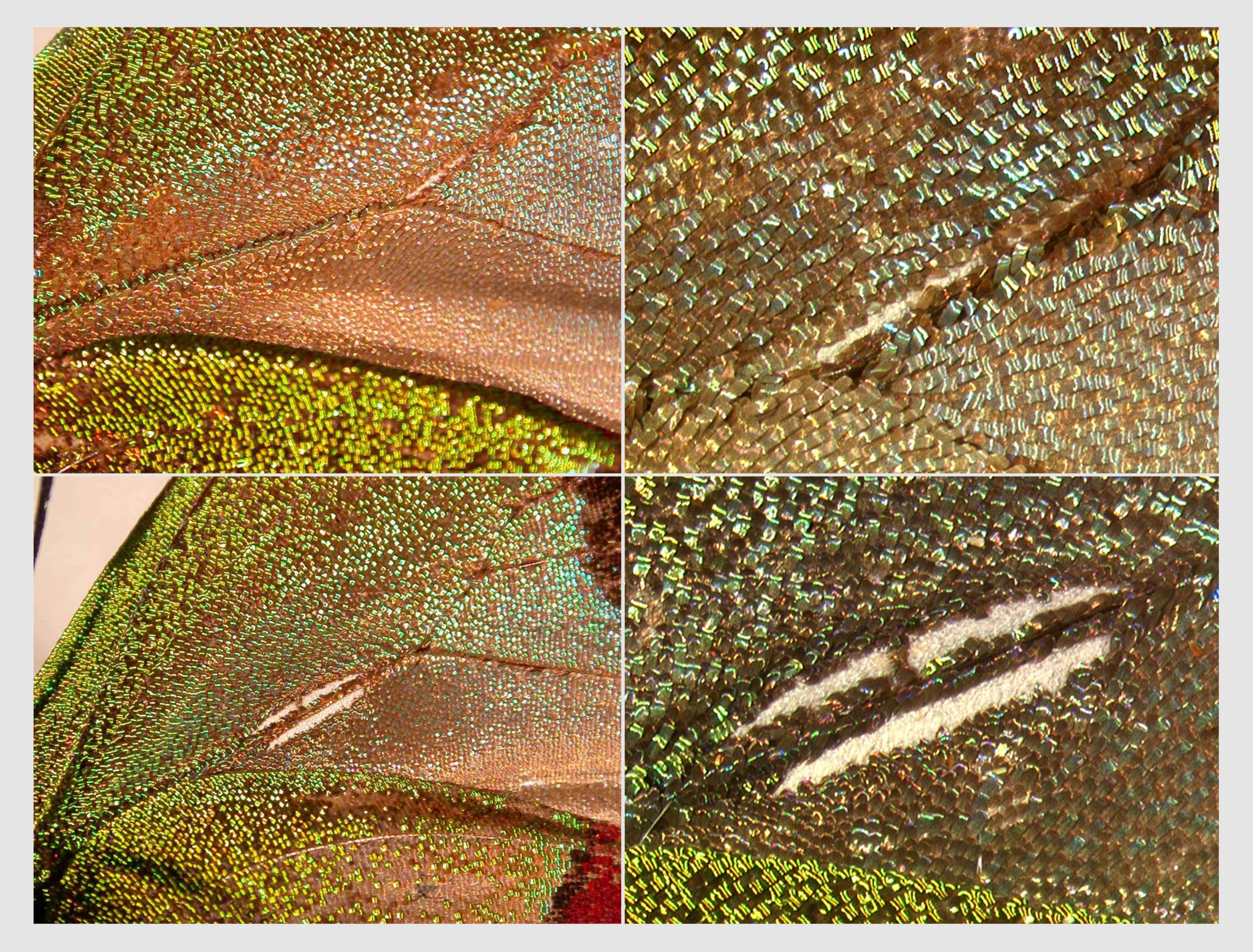

Fig. 9. Androconia patches along the VFW cubital vein (magnified view in right column). Top row: *E. coronata watkinsi*, Bogotá, Colombia; bottom row: *Evenus felix* **sp. nov.**, Santa Marta, Colombia. BMNH collection. Photos: left column, K. Willmott; right column, C. Smith; © BMNH.

which the primary characters of both species are present. Moreover, fresh specimens of both species have been collected sympatrically and synchronically in Venezuela (Páramo Las Coloradas, Cordillera de Mérida, and on the Ávila mountain, north of Caracas) by Mauro and Clara Costa (pers. comm.), so that seasonality can be discounted as a possible explanation for the morphological differences between the two species. In Baños, at least, the species appears to be univoltine, appearing in greatest numbers from about October through to January (with lesser numbers in September, February, and March), depending on the year (local collectors, pers. comm.). Note that many commercial specimens from Baños do not bear the date of emergence from the pupa, but rather the date of sale of the specimen, which is added later along with locality data (pers. obs.). It is therefore not safe to accept commercial data to study phenology, for this location at least. Similar restricted flight periods have also been reported for *E. regalis* and *E. batesii* Hewitson in Central America (Sermeño *et al*., 2013), and for *E. regalis* in French Guiana (Brévignon 2002: 475).

Female (fig. 8): specimens are most quickly distinguished dorsally by the size of the red tornal patches on the HW. These are large in *E. felix* with relatively narrow black borders, while in *E. coronata* these red patches are much reduced, and the black border correspondingly broader. Ventrally the black median band of the FW is narrower in *E. felix* and regular in width, while it is much broader in *E. coronata* and often wider centrally.

IDENTIFICATION AND LIVE SPECIMENS

We note here that for quick identification of specimens in the field or in photographs, where only a ventral view is usually possible, *E. felix* is most easily recognised in both sexes on the ventral surface by the thin, bright green line which runs alongside the internal edge of the black median band of both wings. In *E. coronata* this thin median line is replaced by one that is notably lighter and more contrasting than in *E. felix*, being a bright whitish-green in *E. c. watkinsi*, or a pale bluish-green or silvery-green in *E. c. coronata*.

Table 2. Secondary diagnostic characters for *Evenus felix* **sp. nov.** and *Evenus coronata*
The following characters are based on typical specimens - there is usually a limited degree of variation.

Sex	Wing(s)	***Evenus felix* sp. nov.**	***Evenus coronata* (including *E. c. watkinsi*)**
♂	Dorsal surface	Darker blue than *E. coronata* (see Berthier et al., 2007; Bálint & Berthier, in prep.).	Paler blue with greenish basal tones in *E. c. coronata*; *E. c. watkinsi* a little darker, closer to *E. felix*.
♂	DFW	Modified dark costal scales extend from base for approximately whole length of antennae (see note 2).	Modified dark costal scales extend from base to well beyond length of antennae in *E. c. coronata*; approximately antennae length or a little less in *E. c. watkinsi* (see note 2).
♂	DHW	Subcostal patch of modified scales in space Sc + R_1 dark grey, generally rounder than in *E. c. coronata* (see note 2).	Subcostal patch of modified scales in space Sc + R_1 paler grey (with greenish tinges in *E. c. coronata*), generally more oval (stretched baso-distally) (see note 2).
♂	DHW	Black tornal area with blue streak in spaces Cu1 and Cu2; green scaling in Cu1 reduced.	Black tornal area in *E. c. coronata* with blue streak in spaces Cu1 and Cu2, green scaling in Cu1 prominent; blue streak absent in Cu2 in *E. c. watkinsi*, and green scaling in Cu1 reduced.
♀	DFW	Dark outer margins comparable in width to *E. c. coronata* but wider than *E. c. watkinsi* (see note 2).	Dark outer margins of *E. c. coronata* comparable in width to *E. felix* but wider than *E. c. watkinsi*, generally extending further basad, especially along inner margin (character less valid, more variable, on HW) (see notes 1 & 2).
♀	DHW	Submarginal bluish-white lunule in red tornal patch in cells Cu2 & 1A prominent; occasionally also present in cell Cu1.	Submarginal bluish-white lunule in red tornal patch in cells Cu2 & 1A usually reduced or absent; rarely also present in cell Cu1.
♀	VHW	Green stripe present in cell Cu2 between reddish anal patch and black anal outer margin (see note 3).	Green stripe in cell Cu2 narrower, often absent, between reddish anal patch and black anal outer margin.
♂♀	FW	Wingspan smaller on average: ♂ 26.0-32.0 mm, ♀ 24.0-28.0 mm	Wingspan larger on average: ♂ 29.5-33.0 mm (n = 5), ♀ 26.0-32.0 mm
♂♀	Ventral surface	Ventral green duller like *E. c. watkinsi*, less vibrant and glossy than in *E. c. coronata* (see note 5).	Ventral green more vibrant and glossy, especially in HW tornal area in *E. c. coronata*; duller in *E. c. watkinsi*, like *E. felix* (see note 5).
♂♀	VHW	Red and reddish-white postmedian bands narrower, distal green area greater (see note 4).	Red and reddish-white postmedian bands wider, distal green area reduced.
♂	Abdomen	Genitalic brush organs dark; individual hairs visibly thicker and less numerous than *E. coronata.*	Genitalic brush organs pale; individual hairs visibly finer and more numerous than E. *felix***.**

Notes

1. The dorsal dark borders of the female of *E. coronata* appear to vary in extent and appearance – they may meet the blue area cleanly, with a sharp border, or diffuse gradually, with an indistinct border. One Venezuelan specimen from "Rancho Grande" has a very reduced dark DHW border, approximating that of the Peruvian holotype of *E. c. watkinsi*. It will be necessary to examine more specimens of *E. coronata* from Colombia through to Bolivia to evaluate dorsal variation and establish if *E. c. watkinsi* merely represents a form or a subspecies.

2. Small, poorly developed males of both species (presumably the result of diminished quality or availability of food in the larval stage – see Sermeño *et al*., 2013: 44), usually lack the modified dark scales along the basal half of the DFW costa (see Godman & Salvin, 1887: pl. 48, fig. 7b), and the grey DHW subcostal patch, both of which are present on fully developed larger specimens (see fig. 10). The VFW androconial patches remain present, however. Specimens may also be a darker blue dorsally (and in *E. c. coronata*, with less of a greenish tinge). In addition, some specimens have notably wider black margins (this variation also appears in dwarf females). Given that only small specimens lack these characters it seems logical to assume that the presence or absence of these alar organs is directly correlated with their development. We tested this relationship between the absence of alar organs and wing size by checking the BMNH collections for unusually small specimens of other eumaeines with DFW androconia, and discovered the same phenomenon in several specimens of two other species: *Evenus satyroides* (Hewitson, 1865) and *E. latreillii* (Hewitson, 1865). Absence of androconia in species where it is normally present has been reported previously (see Robbins *et al*., 2012 and references therein), but to our knowledge absence has not previously been associated with under-sized adults. However, Robert Robbins and Ichiro Nakamura (pers. comm.) have independently studied this same correlation with size in males of other eumaeines.

3. This green VHW streak varies in size even in sympatric and synchronic specimens in both species.

4. On the VHW of Peruvian females of *E. felix* the red and reddish-white postmedian bands are wider than in specimens from Ecuador, Colombia, and Venezuela (the distal green area is narrower), and approximate *E. coronata* in width. The only known male does not differ in this respect, but does display other differences, although it may be an aberrant individual – it has much narrower ventral median black bands on both wings (nearly absent on the FW), and a distinctive blue-green line running parallel to the inner edge of this median band.

5. The colour of the iridescent scales is difficult to reproduce in flash photographs. The ventral surface in particular appears much yellower under artificial illumination than in natural light, under which it is a vibrant green. Even without flash, however, the intensity and angle of natural light affects the perceived colour of the ventral iridescent scales: these vary from green to golden-green.

Fig. 10. A dwarf male of *Evenus felix* **sp. nov.** (FW length 22 mm) from Ecuador – note the absence of alar organs on the DFW costa and DHW subcosta, and the relatively wider black outer margins on both wings (dorsal surface at left, ventral at right). BMNH collection. Photos: A. Neild, © BMNH.

GENITALIA

Male genitalia (see fig. 11, and also Bálint , 2005: fig. 4c) (8 specimens examined: see Appendix 3) with a large, nearly black "brush organ" (see Eliot, 1973) attached to the membrane connecting the posterior 8th abdominal segment with the anterior edge of the vinculum. The capsule, with large tegumen, is of the "greyhound" type (see Eliot, 1973: 387) with the vinculum inclined, juxta absent, valvae small, and penis long.

Fig. 11. Male genitalia. Left column: *Evenus felix* **sp. nov.** from Baños, Ecuador (Bálint gen. prep. no. 1518, HNHM), lateral view, penis removed (top); lateral view of penis (bottom). Right column: *E. c. watkinsi* from Bogotá, Colombia (Bálint gen. prep. no. 1363, BMNH), lateral view, penis removed (top); lateral view of penis (bottom). Photos: Z. Bálint. Scale bars = 1 mm.

Female genitalia (see fig. 12) (11 specimens examined: see Appendix 3) with tubular and sclerotized ductus bursae roughly equal in length to posterior part of male penis, slightly narrowing anteriorly but widening before joining corpus bursae and before posterior terminal opening; corpus bursae oval with a pair of elongated, feather-like signa, with central linear sclerotization and an anteriorly pointed spine; lamella postvaginalis projecting at a slight angle dorsally from ductus bursae as two wide subtriangular plates, the apex of each plate pointing distad, with sclerotizations appearing as teeth or spines (of which one or two at the apex may be especially prominent) along the two outer edges of the lamella postvaginalis and from its anterior corners.

Notes Due to the rarity of nominate *E. coronata* we were unable to dissect sufficient specimens to make meaningful comparisons with *E. felix*. For this reason we include the following observations. No consistent differences between the genitalia of *E. coronata coronata*, *E. c. watkinsi* and *E. felix* were observed in either sex. Frederick W. Goodson, an overlooked expert on American hairstreaks who worked at the BMNH (London) in the first half of the 20th century (Bálint, 2005), also closely examined both species, but evidently did not find any significant genitalic differences between the Mesoamerican and Andean populations and recognised only one species ("*Thecla coronata*"), though remarking that "the Ecuador specimens may be worthy of a subspecific name" (manuscript examined in the BMNH, London). Nonetheless, we suspect that some traits might be useful for species-specific determination after quantitative (statistical) assessment. We suggest that the following characters merit further examination when larger samples of *E. coronata* are available for comparative studies. (1) Male abdominal brush organ: we observed that the individual hairs of this structure in topotypic (Ecuadorian) *E. felix* are much thicker, much darker, and less numerous than the finer, lighter, and abundant hairs of *E. c. coronata* and *E. c. watkinsi* (see fig. 11). (2) Although the figured female genitalia appear to show differences in the lamella postvaginalis (see fig. 12), these genital plates show great variability regarding spinosity.

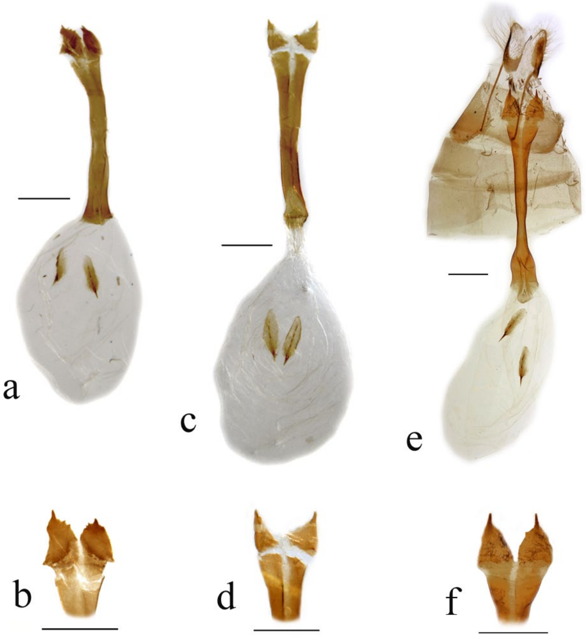

Fig. 12. Female genitalia. *Evenus felix* **sp. nov.** from Baños, Ecuador (Bálint gen. prep. no. 1461, HNHM; photos: Z. Bálint): (a) genitalia, ventral view; (b) lamella postvaginalis. *Evenus felix* **sp. nov.** from Colombia (Bálint gen. prep. no. 1088, HNHM; photos: Z. Bálint): (c) genitalia, ventral view; (d) lamella postvaginalis. *Evenus c. coronata* from Cayuga, Guatemala (slide 9-IX-1946 W.D.F. 2093, USNM; photos: K. Darrow): (e) genitalia, ventral view; (f) lamella postvaginalis. Scale bars = 1 mm.

Table 3. DNA specimens sampled by BOLD (projects EUM, MHMYH, and NLYCA), with sample identifications, localities, and GenBank accession and BOLD Process ID numbers

Species	Sample ID	Locality	Sequence Accession Nos. (respective to sample ID)
E. felix	CF-LYC-476, -477, -478	Tungurahua, Ecuador	Genbank: KM894137, 133, 132
E. felix	10-Robbins-0001 to 0030	Tungurahua, Ecuador	BOLD Process ID: MHMYH001-10 to 030-10
E. c. coronata	CF-LYC-480, -481	Puntarenas, Costa Rica	Genbank: KM894136, 135
E. c. watkinsi	CF-LYC-479	Mérida, Venezuela	Genbank: KM894134
E. c. watkinsi	CF-LYC-482	Boyacá, Colombia	Genbank: KM894138

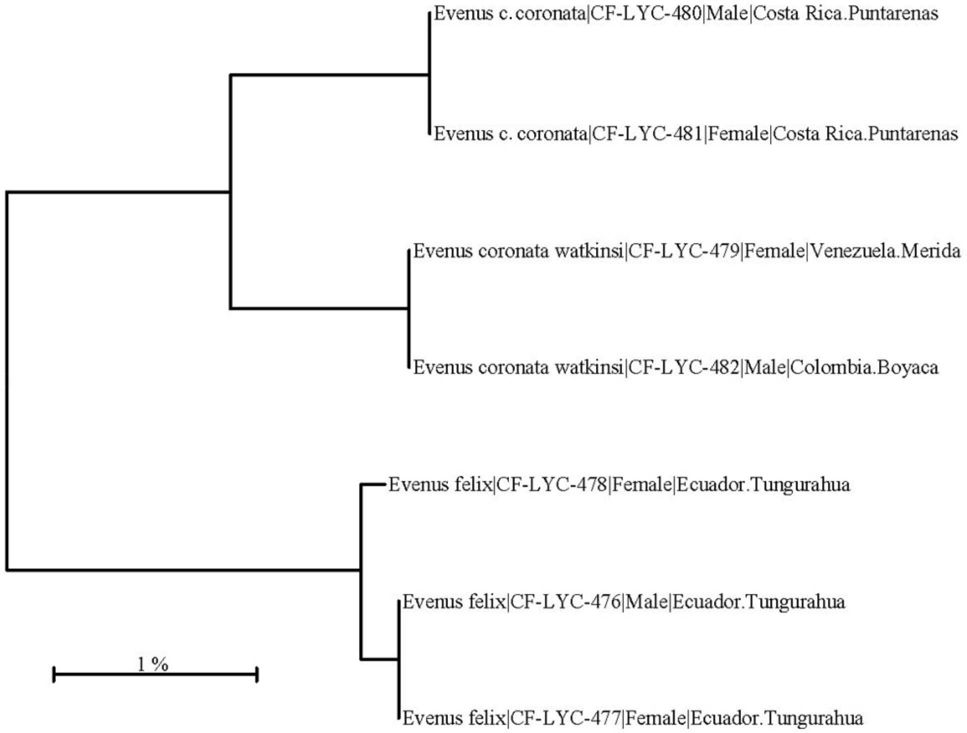

Fig. 13. Neighbour-joining tree (Kimura 2 parameter) for *Evenus felix* **sp. nov.**, *E. c. coronata* and *E. c. watkinsi* based on >200 bp of COI (barcode region) for Project NLCYA samples.

COI DNA SEQUENCE

In combination with other characters, analysis of DNA can provide additional evidence to support the separation of sympatric butterfly species (e.g., Hebert *et al*., 2004; Hajibabaei *et al*., 2006; Janzen *et al*., 2009). Our colleagues Christophe Faynel (project NLCYA) and Daniel Janzen and Winnie Hallwachs (project MHMYH) via Bob Robbins, sent legs from 37 specimens (see table 3) for analysis of their mitochondrial COI gene sequence to Barcode of Life Data Systems (BOLD) (http://www.boldsystems.org). Extraction and sequencing techniques are described in Hajibabaei *et al*. (2006). The results indicate that the mean DNA sequence divergence between *Evenus felix* and both *E. c. coronata* and *E. c. watkinsi* is 4.0%, and the mean within-species divergence is 0.7%. These data, along with other characters presented herein, are consistent with *E. felix* and *E. coronata* being treated as distinct species, and the western and eastern *E. coronata* being treated as subspecies (see fig. 13; note that the MHMYH sequences are not included in fig. 13, but they clustered with samples CF-LYC-476/477).

ETYMOLOGY

We name this new species for Felix Appelbe (London, UK) in gratitude for his generous support of the senior author's research work for "*The Butterflies of Venezuela*" book series (Neild, 1996, 2008).

DISTRIBUTION
(See Map 1)

Evenus felix has been recorded in Venezuela from the Cordillera de la Costa, eastern Cordillera de Mérida, and the Sierra de El Tamá. In Colombia it has been found in the isolated northern mountainous system of the Sierra Nevada de Santa Marta, and in the Central and Eastern Cordilleras, but is notably unreported from the Western Cordillera. In Ecuador it is distributed along eastern Andean slopes, and also in northern and central Peru (Junín). For specific data see Appendix 1.

ADULT BIOLOGY

Adults of *E. felix* and *E. coronata* occur in premontane and montane habitat, typically in cloud forest where they are good indicators of relatively pristine forest. Specimens have also been encountered infrequently in less humid upper tropical evergreen forest, in more disturbed habitat, and occasionally even on walls in the streets of large towns (several specimens of each species taken in Pamplona, Norte de Santander, Colombia, by Cristóbal Ríos-Málaver, pers. comm.). Elevational data indicate a significant number of records from as low as c. 600 m, but there is a clear preference for middle elevations from around 1100 m up to a little over 2000 m (Salazar *et al*., 2013; see data in Appendix 1 & 2), with one extreme record at about 3250 m from Siminchucuá in the Sierra Nevada de Santa Marta, Colombia (Schultze-Rhonhof, 1931: 28). According to our analysis of data in Appendices 1 and 2, more specimens have been caught during the wetter months of the year (taking into consideration regional and temporal variations in meteorological conditions).

According to various sources (pers. comm. from Pierre Boyer, Mauro Costa, Walter Faisthuber, Robert Lehman, Cristóbal Ríos-Málaver, and John Shuey; Salazar & Ríos-Málaver, 2005), males are usually reported from forested ridges or hilltops, where they perch on leaves in light gaps or at the edge of trails or wider vehicle tracks, and sporadically on vegetation beside streams. As Godman & Salvin (1887: 10) poetically note, the first male specimen collected of *E. coronata* (now the lectotype) was captured "sitting on a leaf on which a ray of sunshine rested". Several observers have reported finding males engaged in such behaviour, but only on very bright sunny mornings, sometimes flying for minutes at a time before settling again, rarely as low as a metre from the ground, but generally at heights from three up to five or six metres, but infrequently as high as 12 metres. Reviewing video footage taken by John Banks (UK), we note that hairstreaks with a large dividing line on the VHW often sit on a leaf partly in sunlight, and partly in shadow, and position themselves along the dividing line, thus improving their camouflage. When the sun is obscured by clouds flight ceases, and the butterfly remains motionless on its chosen leaf, but as soon as the sun re-emerges the male begins to vigorously defend his territory, chasing butterflies from other groups including, for example, species of nymphalids in *Adelpha* Hübner, [1819], *Epiphile* Doubleday, [1845], and *Marpesia* Hübner, 1818. Male individuals have been reported from as early as 09:30, females a little later, and both sexes fly until around midday.

Females are seen much more frequently than males, primarily as a result of their behaviour which is more conspicuous to humans. Most often, females are observed for fleeting moments as they search for oviposition sites, settling for a very short period of time on a leaf and disappearing again within seconds. However, unlike males, they are occasionally encountered nectaring (see fig. 14). They have been observed on small white composite flowers of Eupatorieae, especially *Eupatorium*. In January 2001, Mauro & Clara Costa (pers. comm.) found females of both *E. felix* and *E. coronata watkinsi* feeding together on white flowers of a *Eupatorium* bush along a stretch of road leading to Páramo Las Coloradas in the Cordillera de Mérida in north-western Venezuela, at 1650 m elevation. On this occasion dozens of individuals were seen over the course of two days feeding on the same extensive patch of roadside flowers. On one occasion three specimens were seen feeding on one flower head, a very rare sight indeed.

Fig. 14. A female of *Evenus felix* **sp. nov.** nectaring at the Instituto Venezolano de Investigaciones Científicas (IVIC), near San Antonio de los Altos (Miranda state), northern Venezuela. Photo: C. Ríos-Málaver.

We are not aware of any reports of males visiting nectar sources, although "puddling" (ingesting salts and minerals from damp substrate) has been reported on one occasion: Salazar & Ríos-Málaver (2005) note that a single male of *Evenus felix* (identified as *E. coronata*) was collected in the morning puddling on wet sand beside a river bank. Females have also been observed to puddle, an activity rarely seen in this sex in other butterfly families (pers. obs.). On a single day in May 2001 in the mountains of the Cordillera de la Costa north of Caracas (Venezuela), Mauro & Clara Costa (pers. comm.) captured two females (one of each species) puddling on damp earth along a ridge at 2000 m, in the same place where they have also seen - most unusually in Venezuela, at least - females of various nymphalids puddling (*Adelpha* spp., *Cybdelis mnasylus* Doubleday, [1848], *Doxocopa cyane* (Latreille, [1813]) and *Marpesia corinna* (Latreille, [1813]). It is worth noting from the above that the two species are microsympatric and microsynchronic in at least some localities.

We do not know enough about the biology of *E. felix* and *E. coronata*, and the sample size of specimens listed in the Appendices is too small, to state if there are any behavioural or ecological differences between the two species. Nonetheless, such differences may yet exist, and future research may shed light on this matter.

EARLY STAGES

The early stages of *Evenus felix* were described in detail by the German botanist and entomologist Schultze-Rhonhof (1938) based on specimens found in Baños, Tungurahua Province, in eastern Ecuador. Although at the time these were identified as *Thecla coronata*, we now know that *E. coronata* is not found on the cited host trees at this location (local collectors, pers. comm.), and there can be little doubt that the many individuals that he saw were all *E. felix*. Schultze-Rhonhof notes that the larvae of *E. felix* feed on "*Lucuma obovata*", a junior synonym of *Pouteria lucuma* (Ruiz & Pavón) Kuntze, a species of Sapotaceae, the known host family for other *Evenus* species (see records in Beccaloni *et al*., 2008: 362; see also Robbins, 2004a: xxv, and Sermeño *et al*., 2013). The report in Schultze-Rhonhof by a local collector of oviposition on avocado (*Persea americana* Miller) is unlikely to be accurate given the exclusive use of Sapotaceae by other *Evenus* species, and may be the result of visual confusion with the true host which does indeed resemble this species.

According to Schultze-Rhonhof, he found eggs, larvae in different stages, and a single pupa on bushes and trees of its host plant in gardens in Baños. Nowadays local collectors and Pierre Boyer (pers. comm.) report specimens are best sought out on host trees on the slopes above Baños, at around 1900 m elevation. Schultze-Rhonhof remarks that almost no larger *Pouteria* tree is free from eggs. These he found on leaf buds and young leaves at the end of branches. Pierre Boyer (pers. comm.) likewise observed females laying eggs on leaf buds, but also on the stems under flowers, at about head height. Schultze-Rhonhof states that larvae eat continuously both by day and by night, especially the young buds and leaves of the plant, and sometimes even the tender stems. They rarely feed on old leaves, but when they do, they eat the epidermis through from below. The German scientist also notes the astonishing camouflage of the caterpillars amongst the fresh leaves and buds, especially in the case of brown coloured individuals. There were no ants attending the larvae. The pupae can be found at the foot of host trees on fallen leaves and resemble bird droppings. Pierre Boyer (pers. comm.) also found some pupae under leaves still attached to the tree. Schultze-Rhonhof presented figures of the early stages, although rather crudely and in halftone (reproduced here as fig. 15). A comparison of these drawings with the colour photos of Sermeño *et al*. (2013), for *E. regalis* and *E. batesii*, and Janzen & Hallwachs (2014) for *E. regalis*, indicates many similarities.

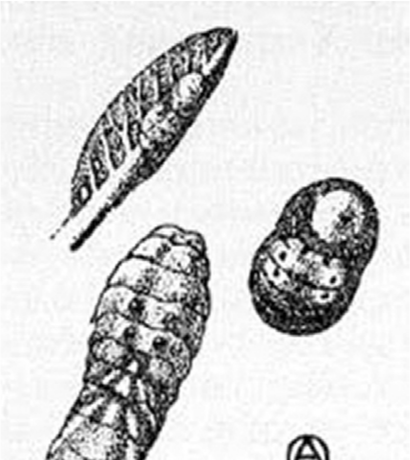

Fig. 15. Larvae and pupa of *Evenus felix* **sp. nov.** from Baños, Ecuador (reproduced from Schultze-Rhonhof, 1938: 42).

The German scientist observes that the development from egg to pupa takes approximately one month, recording 25 days in the larval and six days in the prepupal stage. The length of the pupal stage is variable: while generally lasting about five to six months, it can occasionally be much shorter. In general, this contrasts strongly with the 12-14 days pupation period reported by Sermeño *et al*. (2013) for *E. regalis* and *E. batesii*, although the authors note that some *E. regalis* do not emerge from pupation at the end of the rainy season (these presumably aestivate for six months until the rains begin again in October). Some adults were found nectaring on the flowers of avocado trees in the hotel garden where Schultze-Rhonhof stayed, and were also observed in the gardens and streets of the town, as well as on the slopes of Tungurahua volcano which towers over Baños.

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APPENDIX 1

Evenus felix sp. nov.: additional specimens examined

Data are quoted verbatim from labels

COLOMBIA *Boyacá*: 1♂ Rio Minero, Muzo, 2500 ft. **(BMNH)**; *Caldas*: 1♂ Manizales, Qda La Caracola, 1750 m, 6-III-2005 (= not "2006" as cited in Salazar *et al*., 2013; = "Qda. El Águila" cited in Salazar & Ríos-Málaver, 2005: Salazar, pers. comm.) **(MHNUC)**; 1♀ Manizales, El Coliseo, 2150 m, 13-III-2010 **(MHNUC)**; *Cundinamarca*: 1♀ Bogota **(BMNH)**; *La Guajira*: 1♂ Sierra Nevada de Sta. Marta, Surivaquita. 8000ft. 21.IV.1939 **(BMNH)**; *Norte de Santander*: 1♀ Pamplona, Campus U. de Pamplona, posada sobre pared, 7° 23´0860"N - 72°39´00.02´´W, 2356msnm, 3/agosto/2011; *idem*, except as indicated: 1♀ 3/agosto/2014, 1♀ 7° 22´11.15´´N - 72°39´00.09´´W, 2304msnm, 9/septiembre/2014, 1♀ 7° 22´11.15´´N - 72°39´00.09´´W, 2304msnm, 22/septiembre/2014, 1♀ 14/octubre/2014, 1♀ posada sobre sauco, *Sambucus nigra*, 15/octubre/2014 **(CR)**; *No specific locality*: 1♂ Interior of Colombia **(BMNH)**; 1♀ No data (Coll. Salazar, via Johnson, New York) / Zs. Bálint gen. prep. no. 1088 **(HNHM)**; *idem*: 1♂ **(HNHM)**. **VENEZUELA** *Aragua*: 1♀ Rancho Grande, 1100 m. 30.VI.52 **(MIZA)**; 1♀ Rancho Grande, 1100 m. 19.VI.53 **(MIZA)**; 1♂ R. Grande, 1100, VIII.64 **(RF)**; 1♀ R. Grande, 1100, IX-69 **(RF)**; 1♀ Rancho Grande, 1100, IX-69 **(RF)**; 1♂ R.G. 7, 9-71 **(RF)**; 1♂ 1♀ Rancho Grande, 1100, IX-71 **(RF)**; 1♀ R. Grande, 1100, VI-72 **(RF)**; 1♀ R. Grande, 1100, VI-75 / Zs. Bálint gen. prep. no. 1107 **(RF)**; 1♀ Choroni, 1550, VIII-75 **(RF)**; 2♂ Choroni, 1250, XII-75 / Zs. Bálint gen. prep. nos. 1105 & 1106 **(RF)**; 1♀ Rancho Grande, 1100 m. 13-IX-76 **(MIZA)**; 1♂ Choroni, 1250, 1-77 **(RF)**; 1♂ Rancho Grande, 1550, V-79 **(RF)**; 1♂ Colonia Tovar. 2000m. 06-X-2013 **(MCC)**; *Carabobo*: 1♂ Bejuma, Carabobo. La Cumbre. 1200 m. 2.VII.95 **(NF)**; 1♂ Bejuma, Cerro San Isidro, 1600 mt. 10-VIII-2003 **(MCC)**; *Distrito Federal*: 1♀: Highest point on track N. from San Bernadino (NW Caracas) to Galipán, Cordillera de la Costa, 19.V.01. 2000 mts. / Zs. Bálint gen. prep. no. 1114 **(AN)**; *idem*: 1♀, 19.VIII.01 **(AN)**; 1♀, Altos de Pipe (IVIC) 10º24’03.97”N - 66º38’40.40”W, 1650 msnm, Fecha: 16-Feb-2012, Hora: 10:30, Hosp: arbusto (compositae), Altura pecha: 60 cm / Neild Prep. Gen. Vial No. 277 **(AN)**; 1♀ Altos de Pipe (IVIC) 10º24’03.97”N - 66º38’40.40”W, 1650 msnm, Fecha: 06-Feb-2013 **(CR)**; *Lara*: 2♀ Páramo Las Coloradas, 02-01-2001, 1650 mt. **(MCC)**; 1♀ Via Sanare – Caspo, 1.700 m. 30-XII-2.001 **(JCS)**; *Mérida*: 1♀ Merida. 1897 **(BMNH)**; 1♀ Merida. April.99 **(BMNH)**; 1♂ Merida, Ven. **(USNM)**; *Portuguesa*: 1♂ Acarigua, Cuevas de Puente Oscuro, 600 m. 28 XI 2011 **(CR)**; *Táchira*: 1♀ Funda Piedra Blanca, Qda. La Florida, above San Vicente, PN El Tamá. 2000-2350m. XII.98 **(AN)**; *idem*: 1♀ Neild Prep. Gen. Vial No. 276 **(AN)**; 1♀ Fundo Piedras Blancas, 2300 m. Marzo 2004 **(MCC)**. **ECUADOR** *Chimborazo*: 1♂ 1♀ Riobamba. 2798m **(BMNH)**; *Napo*: 1♂ R. Napo, Oriente. 1935 **(BMNH)**; 1♂ Guacamayos, 2000m, Napo, 11/1998 **(PB)**; *Pastaza*: 1♂ Alpayacu, Rio Pastaza, 3600ft **(BMNH)**; 1♂ Canelos, 1907 **(MNHN)**; *idem*: 1♀ 800 m, 1♀ 800 m, 1♀ Canelos, 800 m **(MNHN)**; 1♂ Canelos **(BMNH)**; 4♂ Canelos, 800 m. **(BMNH)**; 1♀ Canelos, 800 m **(MGCL)**; 1♀ Partidero, Oriente. 7.ii.36 **(BMNH)**;1♂ Pastaza **(BMNH)**; 1♂ 2♀ Ob. Pastaza. Oct-Dec ’06. 3000 ft **(BMNH)**; *Tungurahua*: 2♀ Baños, R. Pastaza, 5000 to 7000 ft. Aug and Sept. ’10 **(BMNH)**; 1♂ Banos. VII. 35, 1800 m **(BMNH)**; 1♂ Baños **(BMNH)**; *Incorrect locality*: 1♂ 1♀ Urskov öst. für Guagaquil **(MNHN)**; *No specific locality*: 1♂ **(JFLC)**; 2♂ 1♀ coll. Leeman, 1♂, 1♂ "24", 1♂ "894", 1♂ "coll. G.", 1♀ ex coll. Monteiro **(MNHN)**; 2♂ 1♀ Ost Ecuador, Brasilien Grenze **(MNHN)**; *No label*: 6♂ 2♀ **(MNHN)**. **PERU** *Amazonas*: 1♀ Mendoza-Llanuayco, 29.VIII.1998. 2200-2400 m (**MZUJ)**; *Huánuco*: 1♂ (aberrant) Chaupiyunca, 1500-2000m, 2005.VIII / Zs. Bálint gen. prep. no. 1513 **(HNHM)**; *idem*: 1♀ 2005 [no month] /Zs. Bálint gen. prep. no. 1514 **(HNHM)**; *Junín*: 1♀ Chanchamayo, O. Peru. III.1964 **(NMW)**; *Pasco*: 1♂ Pto. Inca, Pachitea [mislabelled] **(AMNH)**; *San Martín*: 1♀ Peru, San Martín, Saposoa 500m, Nov.1999 **(AM)**. **MISLABELLED** 1♀ S. Catherina, Brazil **(BMNH)**. **NO LOCALITY** 3♀ No locality **(BMNH)**.

APPENDIX 2

Evenus coronata (including *E. c. coronata* and *E. c. watkinsi*): additional specimens examined

Data are quoted verbatim from labels

MEXICO *Chiapas*: 1♀ Chajul, Río Lacantún. 18-V-81 **(RM)**. **BELIZE** *Toledo*: 1♀ Edwards Central Camp, limestone rainforest, ~ 700m., 09-AUG-2006, B1B6091 **(JSh)**; *idem*: 1♂ 10-AUG-2006, B1B6161, 1♂ 16-AUG-2006, B1B6101, 2♀ 16-AUG-2006, B1B6161, 2♀ 17-AUG-2006, B1B6171 **(JSh)**; 1♀ Gloria Camp, karst rainforest, ~ 700m., 14-AUG-2006, B1B9141 **(JSh)**; *idem*: 2♀ 15-Aug-2006, B1B9151 **(JSh)**; *Toledo*/ *Cayo*: 1♀ Doyle’s Delight, montane rainforest, 1,100 m. 22-AUG-2007. C1C7221 **(JSh)**. **GUATEMALA** *Alta Verapaz*: 1♂ Forests of N. Vera Paz. F D. G. & O. S. (**lectotype** of *Thecla coronata* Hewitson) **(BMNH)**; *Izabal*: 1♀ Cayuga / June **(USNM)**; 1♀ Cayuga / June / ♀ genitalia on slide 9-IX-1946 W.D.F. 2093 **(USNM)**; 1♂ Cayuga / Aug. / ♂ genitalia on slide 9-IX-1946 W.D.F. 2094 **(USNM)**. **HONDURAS** *Atlántida*: 1♀ near El Recreo, ca. 40 km SW of La Ceiba. June 15 1994. appr. 500m **(RL)**. **NICARAGUA** *Chontales*: 1♂ 1♀ Nicaragua / B.M.(N.H.) Rhopalocera Vial No. 8950 (♂) & 8951 (♀) **(BMNH)**. **COSTA RICA** *Puntarenas*: 1♂ Monteverde, 4600ft. 1960 **(AMNH)**; 1♀ San Vito, Puntarenas. 980 m. 30 April 1996 **(MNCR)**; 1♂ Monteverde, Cordillera de Tilarán, 05.July.2003, 1560mts alt. **(WF)**; *idem*: 1♂ 01.May 2011, 1♀ 02.July.2011, 1♀ 07.August.2011 **(WF)**. **PANAMA** *Chiriquí*: 1♀ Fortuna. 1100 m. 17.VI.1982 **(USNM)**; 1♀ Distrito de Renacimiento, Santa Clara. 1350 m. 9-VII-82 **(USNM)**; *Darién*: 1♀ Cana (Cerro Pirre). 1200 m. 7º56’N 77º43’W. 13.IX.1982 **(USNM)**; *Veraguas*: 1♀ Santa Fe. 2500’ IX-6-1975 **(USNM)**; 1♀ no specific data **(BMNH)**. **COLOMBIA** *Antioquia*: 1♀ Amalfi, 1500 m, 4-X-2008 **(GR)**; *Cauca*: 1♂ Munchique, La Playa, 1600m **(JFLC)**; *Cundinamarca*: 1♀ Bogota (**paralectotype** of *Thecla coronata* Hewitson) **(BMNH)**; 1♀ Bogota **(BMNH)**; 1♀ Nr. Bogota **(BMNH)**; 1♂ Sta. Fe de Bogota **(BMNH)**; 1♂ Bogot. / BMNH(E) # 266276 / Zs. Bálint gen. prep. no. 1363 **(BMNH)**; *Bolívar*: 1♀ Antigua- El Machín, 1800 m, X-1989 **(JSa)**; *Boyacá*: 1♂ Muzo **(WF)**; *Magdalena*: 1♂ Minca, Sta. Marta. 03-0I-2008. 1500m **(GR)**; *idem*: 1♀ 03/01/05, 1700-2000m **(GR)**; *Norte de Santander*: 1♀ Pamplona, Campus U. de Pamplona, posada sobre pared, 7° 23´0860"N

- 72°39´00.02´´W, 2356msnm, 10/diciembre/2013 **(CR)**; *Tolima*: 1♀ Honda **(BMNH)**; *Valle del Cauca*: 1♂ Queremal - Qda San Juan, Km 55, 1200m, 13.VII-83 **(JSa)**; 1♀ 1200 m., 45 km. W of Buga, Calima Valley. 14-16 June 1989 **(USNM)**; 1♀ Calima, 24.I.1991 **(PB)**. **VENEZUELA** *Aragua*: 1♂ Rancho Grande. 1100m. 19-XII-63 **(MIZA)**; 1♀ R. Grande 920 II-65 **(RF)**; 1♂ R. Grande 1100m VI-69 / Zs. Bálint gen. prep. no. 1109 **(RF)**; 1♀ Rancho Grande 1100, VIII-69 **(RF)**; 1♀ R. Grande 1100 VII-72 **(RF)**; 1♀ R. Grande 1100, VI-75 **(RF)**; 1♂ Rancho Grande, Portachuelo. 1100m. 15-V-1979 **(MIZA)**; 1♀ Rancho Grande 1100 VIII-87 **(RF)**; 1♂ Choroni, 800 m. 1-88 / Zs. Bálint gen. prep. no. 1108 **(RF)**; 1♀ R. Grande 1100, VIII.88 / Zs. Bálint gen. prep. no. 1113 **(RF)**; 1♀ Portachuelo. Rancho Grande, 1100m. 3-VII-1989 **(MIZA)**; *Barinas*: 1♂ Santo Domingo-Barinitas 1500m, 10-13.II.1995; 1♀ Altamira, 700m (Barinas) 7.IV.2006 **(PB)**; *Distrito Federal*: 1♀ Avila, 19-5-01, 2000mt. **(MCC)**; *Mérida*: 1♀ La Azulita, 4.I.1998, 1600m **(BJ)**; 1♀ Páramo Las Coloradas, Mérida. 01-0I-2001, 1650m. **(MCC)**; *idem*: 3♀ 02-0I-2001 **(MCC)**; *Táchira*: 1♂ Via Ch. Del Indio 1100 V-84 / Zs. Bálint gen. prep. no. 1111 **(RF)**; 1♀ La Flautera, 1200. X-84 **(RF)**; 1♀ La Flautera, 1200. XI-84 **(RF)**; 1♀ Via Chorro del Indio 1100 IX-85 / Zs. Bálint gen. prep. no. 1112 **(RF);** 1♂ La Flautera, 1200. X-85 / Zs. Bálint gen. prep. no. 1110 **(RF)**; 1♀ Río Frío, 600m, V-88 **(RF)**; 1♀ Río Frío, 800m, X-90 **(RF)**;1♀ Río Frío, 600, III-91 **(RF)**. *Trujillo*: 1♀ P.N. Guaramacal. 28km via Boconó – Guaramacal. 1480m. 18-25-V-2001 **(MIZA)**; **ECUADOR** *Esmeraldas*: 1♂ environs de Lita, 700m, IX.1999 **(PB)**; *Imbabura*: 1♀ Los Cedros Biological Reserve, Near Saguangal. 30/vii/1992. 1500m **(HNHM)**; *Morona-Santiago*: 1♀ vía Sardinayacu, 1300m, 25/10/2009 **(JCP)**; *Pastaza*: 1♀ Banos **(BMNH)**; 1♀ El Topo, Rio Pastaza, 4200 ft. (**BMNH**); 1♀ Ob. Pastaza, c. 1000m **(BMNH)**; *No specific locality*: 2♀ **(BMNH)**. **PERU** *Amazonas*: 1♀ Alto Nieva, 1400/1800m, II.2005 **(PB)**; 1♀ Jorge Chavez, 1400 m. 2007.VII **(HNHM)**; *idem*: 1♀ V.2008 **(HNHM)**; 1♀ 1600-1800 m. VIII.2008 / Zs. Bálint gen. prep. no.1463 **(HNHM)**; 1♀ IV.2008 / Zs. Bálint gen. prep. no.1462 **(HNHM)**; 1♀ Alto Nieva, 2011.IX **(HNHM)**; *Cuzco*: 1♀ Cosñipata Valley, El Mirador, 1720 m. km. 144 Paucartambo - Pilcopata Rd. 7.ii. 2010 on *Mikania* flowers **(LG)**; *Huánuco*: 1♀ Chaupiyunca, 1500-2000m., 2005.IX / Zs. Bálint gen. prep. No. 1516 **(HNHM)**; *Pasco*: 1♀ Pichis Rd., Peru. 4800 ft. xi, xii '19 (holotype of *Thecla watkinsi* Lathy) **(MNHN)**; *San Martín*: 1♀ Río Serranoyacu, 1600m, 12 March 1986 **(MUSM)**; 1♀ Jordanea, 800/850m, II.2005 **(PB)**; 1♀, Rioja 1000-1500m Feb.2003 **(AM)**; 1♀ Afluente, 1500-1800m., 2009.III **(HNHM)**; *idem*: 1♂ 2012.III / Zs. Bálint gen. prep. no. 1515, 3♀ 2012.III, 3♀ Via Rioja a Bagua, 1300m, VIII.2007 **(HNHM)**. **BOLIVIA** *La Paz*: 1♀ Nor Yungas, Caranavi 1500m 02/2002 **(AM)**; *idem*: 1♀ 12/2004 **(AM)**; 1♀ Yungas, Caranavi, ~ 1500 m, 12/2004 **(HNHM)**; 1♀ Yungas, Caranavi, 1000 m [no year, no month] **(HNHM)**; *Santa Cruz*: 1♀ 600 m. 20.iii.19[illegible] – Zischka **(GR)**. **MISLABELLED** 1♀ Braz. **(BMNH)**. **NO LOCALITY** 1♀ Ex Colls. Kaden, Herbert Druce & Godman-Salvin. Presented 1896 by F. D. Godman and O. Salvin (**OUMNH**).

APPENDIX 3
Genitalic specimens examined

(For details see type data for Ecuadorian *E. felix*, and Appendix 1 & 2 for all others)

Evenus felix: (8♂ 11♀) **AN:** Neild Prep. Gen. Vial Nos. 263 & 264 (♂), 265, 266, & 275 (♀) (Ecuador), 276 & 277 (♀) (Venezuela); Zs. Bálint gen. prep. no. 1114 (♀) (Venezuela); **HNHM**: Zs. Bálint gen. prep. no. 1088 (♀) (Colombia); Zs. Bálint gen. prep. no. 1361, 1362, & 1518 (♂), 1460 & 1461 (♀) (Ecuador); Zs. Bálint gen. prep. no. 1513 (♂) & 1514 (♀) (Peru); **RF**: Zs. Bálint gen. prep. no. 1105 & 1106 (♂), 1107 (♀) (Venezuela).

Evenus coronata coronata: (2♂ 2♀) **BMNH**: B.M.(N.H.) Rhopalocera Vial Nos. 8950 (♂) & 8951 (♀) (Nicaragua); **USNM**: slide 9-IX-1946 W.D.F. 2093 (♀) & 2094 (♂) (Guatemala).

***Evenus coronata watkinsi*:** (6♂ 5♀) **BMNH**: Zs. Bálint gen. prep. no. 1363 (♂) (Colombia); **HNHM**: Zs. Bálint gen. prep. no. 1515 (♂), 1462, 1463, & 1516 (♀) (Peru); **RF**: Zs. Bálint gen. prep. no. 1108-1111 (♂),1112, 1113 (♀) (Venezuela).

APPENDIX 4
Citations for *E. felix* sp. nov. and *E. coronata* in selected publications

This list is not intended to be an exhaustive catalogue of all published references to this species. It is intended to identify those figured in a broad selection of scientific and enthusiast reference books.

Evenus felix

Werner, 1956: 103 (pl. 17) (♂ dorsum, as *Thecla coronata*)
Goodden, 1973: 47 (♂ venter, as *Thecla coronata*)
Lewis, 1973: 69 (♂ dorsum, ♂ venter, as *Theritas coronata*)
Smart, 1975: 172 (♀ dorsum, as *Evenus coronata*)
Mészáros & Gál, 1982: 19 (pl. VIII) and back cover (♀ dorsum, as *Evenus coronatus*)
Raymond, 1982, 1994: 41 (♀ venter and ♀ dorsum, as *Thecla coronata*), 105 (♂ venter and ♂ dorsum, as *Thecla coronata*)
Watson & Whalley, 1983: pl. 244 (♀ dorsum, as *Thecla coronata*)
D'Abrera, 1984: 228 (♂dorsum, ♀ dorsum, and ♀venter, as *Evenus coronata* ["Mexico" in error])
Carter, 1992: 88 (♂ dorsum, ♀ dorsum, as *Evenus coronata*)
D'Abrera, 1995: 1105 (♂ dorsum, ♂ venter, and left ♀ dorsum as *Evenus coronata*; right ♀ dorsum is *Evenus coronata watkinsi*), and jacket cover (female ♀ venter, as *Evenus coronata*)
Moreno *et al*., 1998: 140 (♀ dorsum, as *Thecla (Evenus) teresina*), 141 (♂ dorsum, as *Theritas coronata*)
d'Abrera, 2001: 347 (♂ dorsum, ♂ venter, and ♀ dorsum as *Evenus coronata*)
d'Abrera, 2006: 15 (live ♀ depicted, as *Evenus coronata*), p. 267 (♂ dorsum and venter, ♀ dorsum, as *E. coronata*)
Glassberg, 2007: 37 (♂ venter, as *Evenus coronata*)

Evenus coronata coronata

Godman & Salvin, 1887: pl. 48, figs.7-9 (♂ dorsum, ♂ venter, and ♀ dorsum as *Thecla coronata*)
Draudt, 1919: pl. 146, D (♂ dorsum) & E (♀ dorsum and venter) as *Thecla coronata*
Maza, 1987: pl. LXI (♀ dorsum, as *Evenus coronata*)
Garwood & Lehman, 2012: 9 (♀ dorsum, ♀ venter, and ♂ dorsum, as *Evenus coronata*; ♀venter, row 2, is *Evenus coronata watkinsi*)

Evenus coronata watkinsi

Schmid & Endicott, 1968: 34 (♂ dorsum and ♂ venter, as *Thecla coronata*)
Vélez & Salazar, 1991: 115 (♀ dorsum, as *Evenus coronata*)
D'Abrera, 1995: 1105 (right ♀ dorsum *only*, as *Evenus coronata*)
Garwood & Lehman, 2012: 9 (row 2 ♀venter *only*, as *Evenus coronata*)