

New data on the butterflies of São Tomé e Príncipe: description of one new subspecies from Príncipe, notes, and reference to two faunistic novelties from São Tomé (Lepidoptera: Papilionoidea)

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Abstract

One new subspecies of *Sevenia amulia* (Cramer, 1777) (Nymphalidae, Biblidinae) is described from Príncipe Island and compared with the previously known subspecies. Two faunistic novelties are reported from São Tomé Island and for the country: one species of Lycaenidae (Polyommatainae), another of Nymphalidae (Heliconiinae). The presence on Príncipe Island of another species, an endemic Hesperidae (Hesperinae) not reported from the country for almost a century, is confirmed and commented.

KEY-WORDS: Lepidoptera, Papilionoidea, new subspecies, faunistic novelties, new data, São Tomé e Príncipe.

Nuevos datos sobre las mariposas de Santo Tomé y Príncipe: descripción de una nueva subespecie de Príncipe, notas, y referencia a dos novedades faunísticas de Santo Tomé (Lepidoptera: Papilionoidea)

Resumen

Se describe una nueva subespecie de *Sevenia amulia* (Cramer, 1777) (Nymphalidae, Biblidinae) de la isla de Príncipe y se la compara con las subespecies ya conocidas. Dos novedades faunísticas son señaladas de la isla de Santo Tomé y del país: una especie de Lycaenidae (Polyommatainae), otra de Nymphalidae (Heliconiinae). Se confirma y se comenta la presencia real de otra especie en la isla de Príncipe, un Hesperidae (Hesperinae) endémico, no citado del país durante casi un siglo.

PALABRAS CLAVE: Lepidoptera, Papilionoidea, subespecie nueva, novedades faunísticas, nuevos datos, Santo Tomé y Príncipe.

Novos dados sobre as borboletas de São Tomé e Príncipe: descrição de uma nova subespécie do Príncipe, notas, e referência a duas novidades faunísticas de São Tomé (Lepidoptera, Papilionoidea)

Resumo

Descreve-se uma subespécie nova de *Sevenia amulia* (Cramer, 1777) (Nymphalidae, Biblidinae) da ilha do Príncipe que se compara com as subespécies já conhecidas. Duas novidades faunísticas são apontadas para a ilha de São Tomé e para o país: uma espécie de Lycaenidae (Polyommatainae), outra de Nymphalidae (Heliconiinae). Confirma-se e comenta-se a real existência na ilha do Príncipe de uma outra espécie, um Hesperidae (Hesperinae) endémico, não referido do país durante quase um século.

PALAVRAS-CHAVE: Lepidoptera, subespécie nova, novidades faunística, novos dados, São Tomé e Príncipe.

Introduction

Recent field activities developed in São Tomé e Príncipe by the senior co-author since 2004 allowed us: (i) to conclude that the population of *Sevenia amulia* (Cramer, 1777) (Nymphalidae) exclusively known in the country from Príncipe Island, is somewhat distinct from that of the nominate subspecies, as well as from specimens of *S. amulia intermedia* proceeding from Angola - it is, further, different from *S. rosa*, previously considered as one more subspecies of *S. amulia*; (ii) to identify two species that remained unknown in the country until now, a Lycaenidae (Polyommatainae) and a Nymphalidae (Heliconiinae); and (iii) to rectify the presence in São Tomé e Príncipe of one species of Hesperidae (Hesperinae) described nine decades ago. The aim of this contribution is therefore, to discuss the validity of *Andronymus thomasi* Riley, 1928 upon a female obtained in northern Príncipe; to describe one new subspecies of *Sevenia amulia* (Cramer, 1777) endemic from the same island; and to confirm from São Tomé the presence of *Chilades trochylus* (Freyer, 1844) (Lycaenidae) and of *Acraea (Acraea) neobule* Doubleday, Hewitson & Westwood, 1850 (Nymphalidae), both common throughout the Afrotropical Region but previously unknown in the country.

The last general contributions to the knowledge of the Papilionoidea of São Tomé e Príncipe are those of PYRCZ (1981, 1992) and of MENDES & BIVAR-DE-SOUSA (2012a, b). However, a deeper and global study of the butterflies and skippers of the country is close to completion.

Materials and methods

The following abbreviations will be used throughout the text: BM - The former British Museum (Natural History), now Natural History Museum, London, Great Britain; C - Central; CAR - Central African Republic; DRC - Democratic Republic of the Congo; Cu₁ - First cubital vein; CZ - Former Centro de Zoologia of the IICT; D - Dorsal wing surface (recto); E - East, eastern; FW - Forewing; FWL - Forewing length; HW - Hindwing; IICT - Former Instituto de Investigação Científica Tropical, now integrated in the MUHNAC; LM - Collected by the senior author; M₁ - First median vein; M₂ - Second median vein; M₃ - Third median vein; MUHNAC - Museu Nacional de História Natural e da Ciência, Lisbon University, Portugal; N - North, northern; PR - Príncipe Island; S - South, southern; SE - Southeast, south-eastern; ST - São Tomé Island; STPR - São Tomé e Príncipe (country); V - Ventral wing surface (verso).

All the studied specimens were net-collected by the senior author and are part of the entomological series of the CZ (IICT), now integrated in the MUHNAC - the registration numbers concern the sequence followed in the CZ collection. The samples are known from the localities listed below for which the administrative district (only one in PR) is reported and the approximate latitude, longitude, and altitude (in meters above sea level) are presented, based on the JIU (1961/1962 and 1962) maps.

Locality	District	Latitude	Longitude	Altitude
PRÍNCIPE ISLAND				
Bombom road to Airport	Pagué	01°41' N	07°44' E	100-150
Porto Real	Pagué	01°39' N	07°24' E	120
Príncipe Airport	Pagué	01°40' N	07°25' E	180
Terreiro Velho	Pagué	01°37' N	07°26' E	200-220
SÃO TOMÉ ISLAND				
Água Izé	Cantagalo	00°13' N	06°44' E	< 50
Morro Peixe	Lobata	00°24' N	06°39' E	60
Ribeira Funda	Lembá	00°22' N	06°35' E	< 50

The FWL was measured using an etalon clipper along the FW anterior border or costa, from its insertion on the thorax to apex. For the photos of the preserved specimens a Canon EOS-450D camera

supported by a computer Macintosh iMac LED16:9 with a 27-inch widescreen was used. When necessary, the specimen study was performed under the stereomicroscopes Wild M5A and Leica M165C.

Taxonomy

HESPERIIDAE HESPERIINAE

Genus *Andronymus* Holland, 1896

Andronymus thomasi Riley, 1928 (Figs. 2-3)

Andronymus thomasi Riley, 1928a

Andronymus neander thomasi Riley, 1928. Evans, 1937, Bacelar, 1958; Ackery *et al.*, 1995; Larsen, 2005; Williams, 2008; Mendes & Bivar-de-Sousa, 2012a; Mendes & Bivar-de-Sousa, 2012b.

Material examined: PR: Near Bombom, beginning of the road to the airport, western slope, 20-VI to 8-VII-2016, 1 ♀ (CZ-6024).

Andronymus thomasi was described from ST (RILEY, 1928) and later reported by EVANS (1937, as a subspecies of *A. neander*) from STPR (1 ♂, ST, 1 ♀, PR both noted as in the BM collection, the male being certainly the holotype); there are a few known references but the species was not again observed for almost nine decades. According to LARSEN (pers. comm.) at least the holotype remains in that Museum. *Andronymus thomasi* is endemic from STPR although its recent presence in the ST Island remains unconfirmed and its geographically detailed origin in this island is unknown.



Fig. 1.— Slope on the western side of the forest road close to Bombom - road to the Airport - where the studied *Andronymus thomasi* female was collected.

The studied specimen (FWL: 18 mm) lacks as it is typical to the similar *A. neander*, the clear separation between whitish inner part of the HWV and its brownish border. It is the only Hesperiiidae known in the country to show a large and conspicuous transparent white discal spot in the HW (Figs. 2-3). The brownish area of both wings D and V is darker than in *A. neander*, and in the present species there is (almost) no dark punctuation on the light area of the HWV and the marginal cilia are dark brown. The FW is somewhat distinct to that of *A. neander* (photos of East African specimens in KIELLAND, 1990; LARSEN, 1996), being shorter and apically less acute; the subapical spots of *A. thomasi* were reported as being three and smaller than those in *A. neander*. However, in the studied female there are only two subapical spots that are conspicuous, despite being quite small. Further, the white-translucent areas were described as being tinted with yellow, but in the Bombom specimen they are pure white.

The studied female was collected at the beginning of the gravana, still with rains; it comes from close to the limits of the Bombom Lodge in the extreme N Príncipe, from a ca. 10 m high steep forest slope and was perched on the green leaves at 1.5-1.7 m above the soil - no flowering plants were present around (Fig. 1). *A. neander*, which is known throughout most of sub-Saharan Africa except for parts of South Africa, seems to occur in forest, forest-savanna transition and gallery-forest. Nothing is known about the STPR immature stages although the caterpillars of the mainland African species reportedly feed on Fabaceae (*Brachystegia*) and on Malpighiaceae. However, *Brachystegia* is not present in STPR and the Malpighiaceae are rare and poorly diverse in the country (EXELL, 1944; FIGUEIREDO *et al.*, 2011) which suggests possibly distinct insular host-plants for *A. thomasi*.

LYCAENIDAE
POLYOMMATINAE

Genus *Chilades* Moore, 1881

Chilades trochylus (Freyer, 1844) (Figs. 4-5)

Material examined: ST: Morro Peixe, 9-IX to 24-IX-2015, 1 ♂ (CZ-5968); Id, 12-VII-2016, 3 ♂♂, 1 ♀ (CZ-6027). All the specimens were collected between 10.00 and 12.00 h.

Chilades trochylus is easy to recognize taking into account its minute size - FWL: ♂: 7.5-8 mm; ♀: 9 mm - being the smallest butterfly in the country and one of the smallest Afrotropical species. It is also distinctive due to its bluish brown D and the orange-red anal marginal band on the HWD, enclosing three small black spots; this area also exists on the HWV where the black scales of the spots are mixed with numerous others, bright metallic green (Figs. 4-5). STEMPFFER (1967, under *Freyeria*) figures the male genitalia.

The species is known throughout Africa, SE Europe, Near East and Arabia mainly in open, exposed areas, and more rarely along forest pathways. It is now reported for the first time from ST and for the country, where it appears to be localized in the NW drier area of the island. The species is apparently rare in STPR, but the much reduced wingspan of the imagoes may have contributed to the fact that it has been previously overlooked. It is often considered to include the genus *Freyeria* Courvoisier, 1920, presently placed in the *Chilades* synonymy (LARSEN, 2005).

The studied specimens were all collected among more or less dry Gramineae and Leguminosae in the road verges, close to cultivated areas - mainly with maize and cassava; they flew slowly and very low, no more than 20-30 cm above the herbs. No other specimens were observed despite the Morro Peixe area being prospected throughout the year (the last time during the end of January 2017).

The caterpillars (never locally observed) are known to feed on *Indigofera* (Fabaceae) and *Heliotropium* (Boraginaceae), both genera with species occurring in STPR (FIGUEIREDO *et al.*, 2011). They are usually attended by *Pheidole* worker ants (Myrmicidae).

NYMPHALIDAE
BIBLIDINAE

Sevenia Koçac, 1996

***Sevenia amulia principensis* Mendes & Bivar de Sousa, ssp. n.** (Figs. 6-7)

Crenis amulia Cramer, 1777. Bacelar, 1958

Sallya amulia (Cramer, 1777). Pyrcz, 1991

Sallya amulia amulia (Cramer, 1777). Pyrcz, 1992

Sevenia amulia amulia (Cramer, 1777). Mendes & Bivar-de-Sousa, 2012a, 2012b

Material examined: Type material: Holotype ♀ (CZ-6053): PR: Porto Real, 25-I-2017, 10-11.30 h. Paratype: PR: Id, 21-I-2016, one specimen without abdomen (CZ-6009) - also collected in mid-morning. Non-type specimen: PR: Airport, 12-X-1955, coll. Décio de Passos, a not well preserved ♀ (CZ-2422).

Description: Female. FWL: 27-29 mm, the specimen without abdomen: 24 mm. D and V as in figures 6 and 7, quite unique among the STPR butterfly species. D is brown with some irregular and indistinct FW darker maculation, mainly a dark irregular spot on the cell apex, and with a very weak, violaceous sheen; one complete row of submarginal dark spots are present on the HW. V is orange and alternated with thin bluish-gray bands and small black markings encircled by light bluish-gray in the HW; additionally there is a row of black submarginal spots in all four wings. FWV with one blackish-brown round spot in the pre-apical area and three small dark brown spots in spaces M₁-M₂, M₂-M₃ and M₃-Cu₁. The male remains unknown.

Biotope: Forest trails margins.

Discussion: Two subspecies of *S. amulia* (Cramer, 1777) are presently known. The nominate one, assigned from Ghana, Nigeria, Cameroon, Gabon, Congo, CAR and C and N DRC, whose type-locality was reported as Sierra Leone (false-locality after LARSEN, 1996); and *S. amulia intermedia* (Carcason, 1961), described from the "Katanga" (Shaba) and also known from other DRC provinces (Lualaba, Lomami, Maniema and Sankuru), Angola, N Zambia and (vagrant?) Botswana. When compared with *S. amulia intermedia* (Figs. 8-9) - material from Angola (Kwanza Sul, Malanje and Bié), was used for comparison - *S. amulia principensis* ssp. n. shows almost no violaceous sheen, being more dark brown than violet. It also has small but quite conspicuous dark spots on the median and medio-cubital spaces of the FWV, which are absent or quite diminished in the remaining subspecies; further, the post-median row of HWV spots is more distant from the wing' border than in *S. amulia intermedia*. *S. rosa* (Hewitson, 1877), described from S Mozambique (Delagoa Bay, currently Maputo Bay), known from woodland and forest margins in Kenya (migrant?), E Tanzania, Malawi, Zambia, E Zimbabwe, Botswana, Namibia (Caprivi strip) and South Africa (KwaZulu-Natal) was also considered a subspecies of *S. amulia* - see ACKERY *et al.* (1995) - but is now accepted as a valid species. It is much lighter and more violaceous than *S. amulia* and has a much strongly marked D, mainly in the female (Figs. 10-11); further, it shares with *S. amulia amulia* and with *S. amulia intermedia* the reduced dark maculation on the FWV, allowing its prompt diagnosis relatively to the new *S. amulia principensis*.

Preliminary DNA barcoding results based on the CO1, revealed no significant differences between *S. amulia intermedia* from Angola (Malanje) and the PR types (not published). Based on the registered morphological dissimilarities, the PR specimens are, however, considered to belong to a new subspecies despite the inconclusive genetic analyses and the absence of information on the male genitalia morphology.

Host-plants: PYRCZ (1991) reports he saw oviposition on *Cola* sp. (Sterculiaceae) at Terreiro Velho, in the extreme S of the island. This is likely to constitute the subspecies' food-plant in the PR. In continental Africa, *Maprounea*, *Sapium* and *Shirakiopsis* (Euphorbiaceae) are considered to be the host-plants of the known subspecies (ANONYMOUS 2017, D'ABRERA, 2004, LARSEN, 1996, 2005) but all these genera remain unknown in STPR (FIGUEIREDO *et al.*, 2011).

Notes: An additional specimen was observed on the wing the January 2017, which together with the reduced number of specimens collected, points to a quite uncommon taxon eventually restricted to the “gravanito”, the small dry season. Relatively to PYRCZ (1991) reference to the Terreiro Velho, no date is provided for the observation.

Etymology: The subspecies is named after the PR, the only island from where it remains known and from where it is likely endemic.

HELICONIINAE

Acraea Fabricius, 1807

Acraea (Acraea) neobule Doubleday, Hewitson & Westwood, 1850 (Figs. 12-16)

Material examined: ST: Morro Peixe, 18-IX-2014, 3 ♂♂, 1 ♀ (CZ-5939); Id, 25-VI-2015, 7 ♂♂, 2 ♀♀ (CZ-5960); Id, 19-IX to 24-IX-2015, 1 ♀ (CZ-5968); Id, 09-II-2016, 1 ♂ (CZ-6016); Id, 12-VII-2016, 5 ♂♂, 1 ♀ (CZ-6027). Ribeira Funda, 25-VI-2015, 2 ♂♂, 1 ♀ (CZ-5959); Id, 10-II-2016, 1 ♂, 4 ♀♀ (CZ-6017). Água Izé, 14-VII-2016, 1 ♂ (CZ-6034). All the specimens were collected mid-morning, between 10.00 and 12.00 h.

The FW length is 25-30 mm, with that of the female often being slightly larger. The species, known from the Afrotropical Region, S Arabia included, is somewhat variable which led to the description of several subspecies, presently considered as lacking validity. It is, however, quite distinctive and impossible to mistake with any other *Acraea* from STPR due to the apically vitreous FW with some inconspicuous marginal intervein orange markings and to the existence of marginal lunules on the HW (Figs. 12-16). The FW base and the whole HW ground-colour is deep orange in the males and lighter orange-ochre or greyish in the females. There are several black dots on the FWD, and on both the HW surfaces, which are variably developed but usually larger in the females; one of them is a cell-spot, another exists at the cell apex. The HWD has a wide black margin usually containing orange round dots, almost indistinct in the darker specimens. In the basal HWV there are 2-3 black and white contrasting spots, distinct, however, from the “chequered” basal area of the larger *A. (Acraea) zetes annobona* D’Abrera, 1980, a common and widely distributed species known all along ST and PR.

A. neobule is new for ST and STPR and is known from open habitats and degraded areas, including road verges and agricultural areas, but it does not enter forest. In the Morro Peixe area it is not uncommon in the drier seasons, the gravana (June to August/September) and the gravanito (January/February). In the course of our last visit to the area, in January 2017, no specimen was collected or even seen. In Ribeira Funda it was found mud-puddling (especially males) on the salt mud close to the sea. It is likely to occur sporadically in the eastern coast, since only 1 ♂ was obtained in Água Izé, where *A. zetes annobona* is the dominant *Acraea* throughout the year. It was considered a synonym of the Oriental *A. terpsicore*, though their complete independence is presently fully accepted (LARSEN, 1996).

The known host-plants are *Adenia*, *Passiflora*, *Tryplostemma* (Passifloraceae), *Hybanthus* (Violaceae) *Corchorus* (Tiliaceae) and *Barleria* (Flacourtiaceae); two species of *Adenia*, three of *Passiflora* and two of *Corchorus* are known in STPR (FIGUEIREDO *et al.*, 2011).

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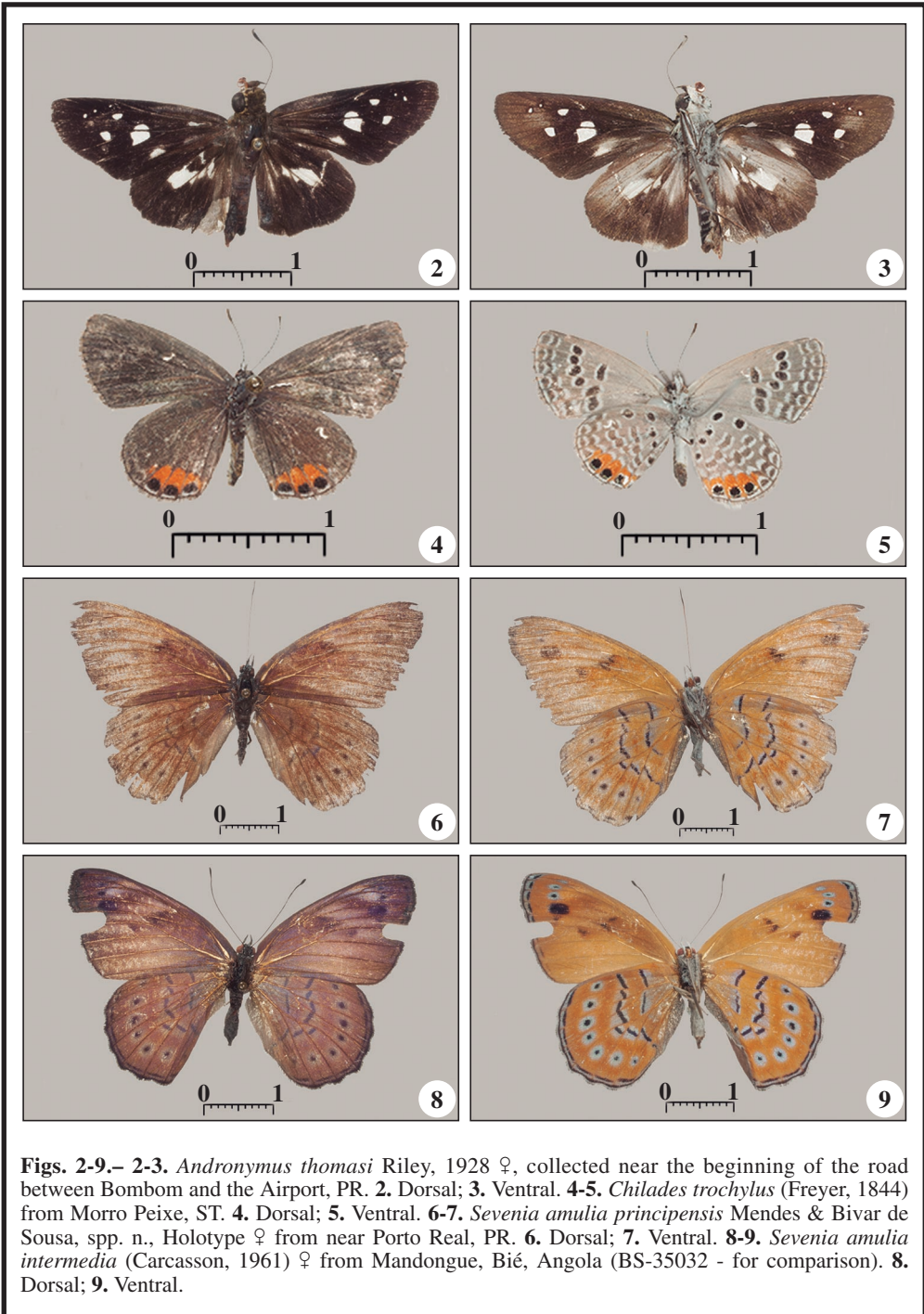
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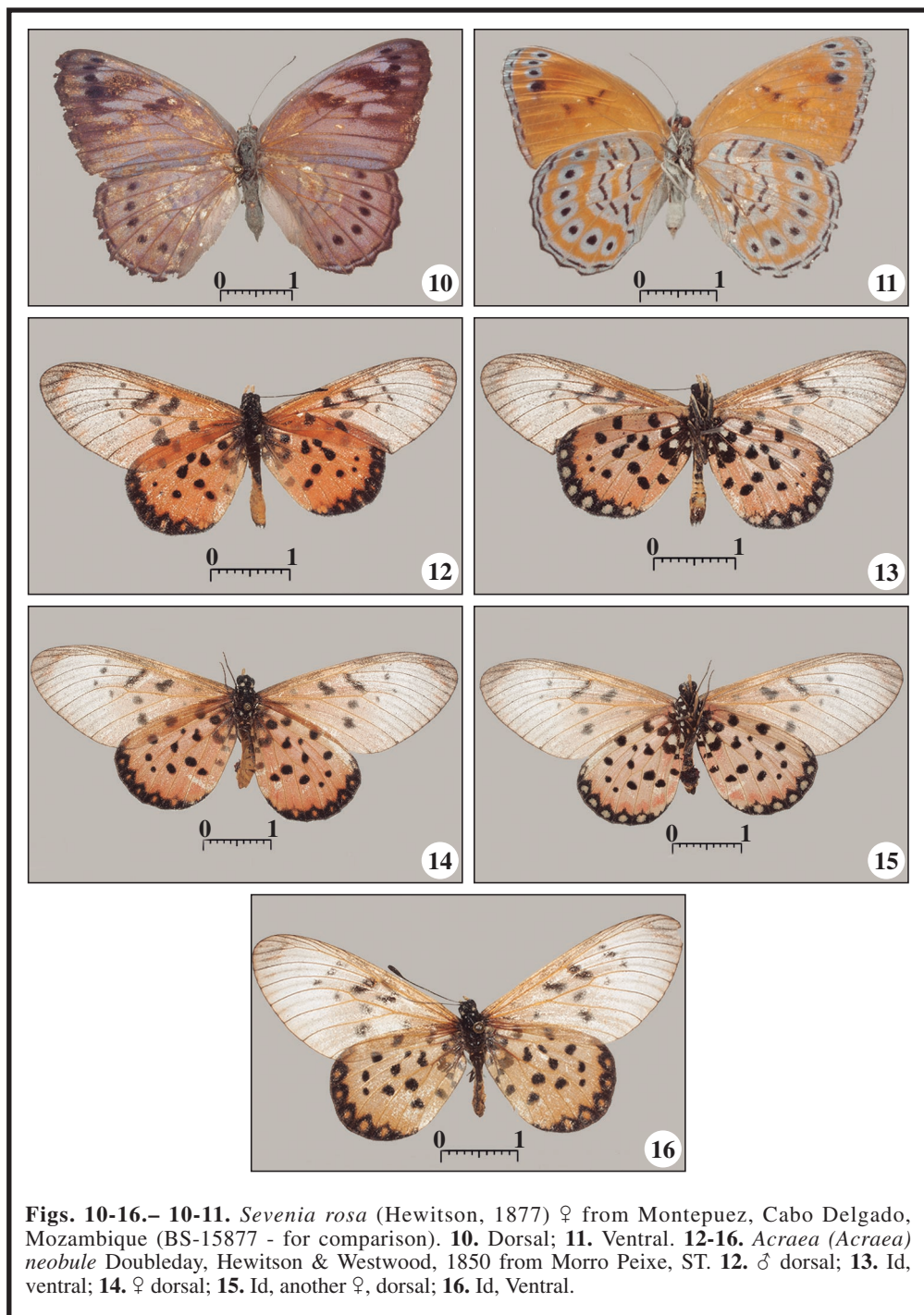
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Figs. 2-9.– 2-3. *Andronymus thomasi* Riley, 1928 ♀, collected near the beginning of the road between Bombom and the Airport, PR. 2. Dorsal; 3. Ventral. 4-5. *Chilades trochylus* (Freyer, 1844) from Morro Peixe, ST. 4. Dorsal; 5. Ventral. 6-7. *Sevenia amulia principensis* Mendes & Bivar de Sousa, spp. n., Holotype ♀ from near Porto Real, PR. 6. Dorsal; 7. Ventral. 8-9. *Sevenia amulia intermedia* (Carcasson, 1961) ♀ from Mandongue, Bié, Angola (BS-35032 - for comparison). 8. Dorsal; 9. Ventral.



Figs. 10-16.— 10-11. *Sevenia rosa* (Hewitson, 1877) ♀ from Montepuez, Cabo Delgado, Mozambique (BS-15877 - for comparison). 10. Dorsal; 11. Ventral. 12-16. *Acraea (Acraea) neobule* Doubleday, Hewitson & Westwood, 1850 from Morro Peixe, ST. 12. ♂ dorsal; 13. Id, ventral; 14. ♀ dorsal; 15. Id, another ♀, dorsal; 16. Id, Ventral.