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Contribution to the knowledge of Neotropical Lycaenidae: *Brevianta bathoryon* sp. n. from the Western Cordilleras of the Andes with notes on the genus
(Lepidoptera: Eumaeini)

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ABSTRACT. A key based on male wing characters is given for distinguishing the members of the genus *Brevianta*. Eleven species belonging to four groups are established on the basis of alar androconia: *celelata* group (monotypic), *ematheon* group (five species), *undulata* group (three species), *tolmides* group (two species). *Brevianta bathoryon* is described on the basis of three specimens from Ecuador and Colombia. The alar androconia characters, associated females and diversity of *Brevianta* are briefly discussed. *B. saphonota* is left as *incertae sedis* species because the male is unknown. The results are concluded in a checklist with the reference to the type material. Material examined is listed in an appendix.

Key words: entomology, taxonomy, new species, species groups, androconia, Lepidoptera, Lycaenidae, Ecuador, Colombia.

INTRODUCTION

According to the most recent literature eight or nine species are placed in the genus *Brevianta* JOHNSON, KRUSE & KROENLEIN, 1997 (type species: *Thecla undulata* HEWITSON, 1867) (ROBBINS 2004, SALAZAR 2010). Examining the characters provided by their alar androconia, wing colouration and pattern, male and female sexual organs, the phenotypes of the imagines in the genus appear rather dissimilar. It became obvious that the genus *Brevianta* requires a proper diagnosis because it was not available in any of the above mentioned works. We have discovered that all species involved possess a

dorsal forewing scent patch positioned along the lower cross vein M3-CuA1. The patch, surrounded by typical scales covering wing membrane, responsible for its colouration, is often supplemented or even covered by other kinds of special scales.

In this paper we present a synopsis of the species involved emphasising the distribution of some characters which define species groups in *Brevianta* and describe one new species placing it amongst its closest relatives. Additionally, we provide a key for identification of the species of the genus *Brevianta* based on male wing characters, summarize all the data on this genus and present a checklist with the reference to the type material.

All the other terms and methods we applied are in concordance with our previous papers in the series (eg. BÁLINT & WOJTUSIAK 2006; BÁLINT, KERTÉSZ & WOJTUSIAK 2010). Altogether 104 specimens have been examined (number of dissections = 9), which are listed in the appendix in alphabetic order according to binominal species group names.

The acronyms used for the depositors of the examined material are: BMNH (British Museum, Natural History) = Natural History Museum, London, UK; CPB = collection of Pierre Boyer, Le Puy Sainte Réparate, France; MHNUC = Museo de Historia Natural, Universidad de Caldas, Colombia; MNHN = Museum national d'Histoire naturelle, Paris, France; MTD = Museum für Tierkunde, Dresden; NHMOU = Natural History Museum of Oxford University, Oxford, UK; MTM (Magyar Természettudományi Múzeum) = Hungarian Natural History Museum, Budapest, Hungary; MZUJ (Muzeum Zoologiczne Uniwersytetu Jagiellońskiego) = Zoological Museum of the Jagiellonian University, Krakow, Poland.

KEY TO *BREVIANTA*

1. Dorsal forewing surface androconia not covered by piliform black setae 2.
- Dorsal forewing surface androconia covered by piliform black setae (SE Brazil), (Fig. 1) (*celelata* group) *Brevianta celelata* (HEWITSON, 1874)
2. Dorsal forewing surface with special male scaling also in postdiscal area 4.
- Dorsal forewing surface special male scaling restricted to lower crossvein M3-CuA1, (Fig. 2) (*hyas* group) 3.
3. Dorsal wing surfaces with narrow (< 1mm) black border, ventral forewing medial area white *Brevianta hyas* (GODMAN & SALVIN, 1877)
- Dorsal wing surfaces with wider (> 2 mm) black border, ventral forewing medial area brown *Brevianta tolmides* (FELDER & FELDER, 1865)
4. Dorsal forewing androconia with a large black scent patch in the apical part of the discalis, plus a black postdiscal absorber or reflector (Figs 4-6) (*ematheon* group) 7.
- Dorsal forewing androconia with a large greenish scent patch in the apical part of the discalis, supplemented by a large violet reflector covering almost the whole wing-surface and comprised of blue, colour reflecting scales which are densely packed with melanin in the apical part (Fig. 3) (*undulata* group) 5.

5. Ventral wing surface medial area covered by minute dashed white pattern 6.
 – Ventral wing surface medial area with white band (Colombia)
 *B. magnifica* CONSTANTINO & SALAZAR, 2010
6. Forewing costal length < 15 mm, ventral surface medial white pattern vestigial,
 forewing reflector conspicuous (Colombia to Peru)
 *B. undulella* (STRAND, 1918)
- Forewing costal length > 15 mm, ventral surface medial white pattern conspicuous,
 forewing reflector not obvious (Mexico to Peru)
 *B. undulata* (HEWITSON, 1867)
7. Dorsal forewing medial area with black absorber 8.
 – Dorsal forewing medial area with a violet reflector 9.
8. Dorsal forewing black border extending from tornus to apex but not reaching
 postmedian area, therefore wing surface is shining blue; ventral forewing marginal
 area with bright v-shaped cellular pattern below vein media (Amazonia [Brazil,
 Colombia, Ecuador, Guianas, Peru])..... *B. ematheon* (CRAMER, 1777)
- Dorsal forewing black border extending from tornus to middle discal area, there-
 fore shining blue colour is restricted to area below vein Cubitus; ventral forewing
 marginal area patternless (Figs 6-12)..... *B. bathoryon* n. sp.
9. Inner edge of dorsal forewing black marginal border running straight from tornus
 to middle costa, hindwing with narrow (< 1 mm) black border (Mesoamerica)
 *B. perpenna* (GODMAN & SALVIN, 1887).
- Inner edge of dorsal forewing black marginal border more or less parallel with
 outer margin, hindwing with less narrow (> 2mm) black border (Mexico to Co-
 lombia, Venezuela) *B. busa* (GODMAN & SALVIN, 1887)

DESCRIPTION OF NEW SPECIES

***Brevianta bathoryon* n. sp.**

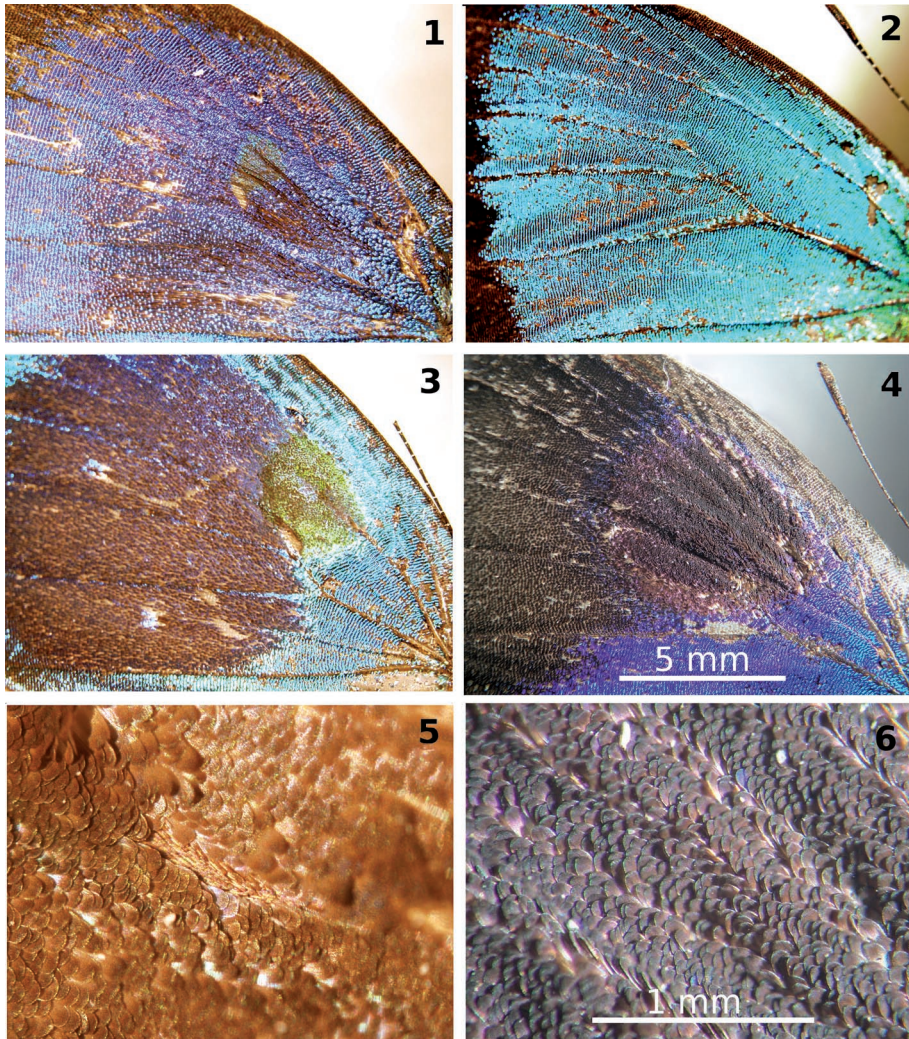
(Figs 6-12)

TYPE MATERIAL (holotype, two paratypes).

(1) MZUJ HOLOTYPE, male, Ecuador, Chiriboga; forewing length 21 mm (measured from the erection of radial vein to the terminus of vein radius 3), set dorsally, specimen in good condition (genitalia dissected, and placed in plastic microvial containing glycerol); labelled as (1) "ECUADOR, Pichincha, [//] Chiriboga, VII.1997 [//] coll. A Jasiński" (printed in white paper), (2) no inscription (grease-proof paper), (3) "Thecla [//] sp. nov. ♂ [//] ematheon" (handwritten, blue ink on white paper), (4) "Owda sp. [//] det. T. Pyrcz" (handwritten, black ink on white paper), (5) "ex coll. [//] A. Jasiński [//] 01/2008" (printed on pale green paper), (6) "Brevianta [//] sp. ♂" (handwritten, black ink on white paper), (7) "prep. genit. 01 [//] 10.03.2011/Lorenc [//] Brevianta sp. [//] Ecuador?"

(2) MZUJ allotype, female, forewing length 20 mm (measured from the erection of radial vein to the terminus of vein radius 3), specimen in good condition (genitalia

dissected, and mounted on microscopic slide) labelled as (1) “ECUADOR, Pichincha, [//] Chiriboga, VII.1997 [//] coll. A Jasiński” (printed in white paper), (2) “Chiriboga [//] Julio [//] 97” (handwritten on grease-proof paper), (3) “Brevianta sp. [//] det. T. Pyrcz” (handwritten, ink on white paper), (4) “Fot 3A” (handwritten, ink on white paper), (5) “ex coll. [//] A. Jasiński [//] 01/2008” (printed on pale green paper), (6) “prep. genit. [//] No. 12 [//] Lycaenidae” (handwritten, pencil on pale yellow paper).



1-6. Alar androconia in *Brevianta*. 1 = *celestata* group (*B. celestata*, Brazil), 2 = *tolmides* group (*B. tolmidis*, Colombia), 3 = *undulata* group (*B. undulata*, Peru), 4 = *ematheon* group (*B. ematheon*, Colombia) (Scale: same magnification), 5 = ditto, but in larger magnification; 6 = *ematheon* group (*B. bathoryon*) (Scale: same magnification)

(3) CPB paratype male, forewing length 19 mm, from Colombia, department Valle del Cauca, Calima Valley. 30 km N of Cali, 8.I.1991, C. Farrell leg.

DIAGNOSIS

As large as *B. ematheon*, male with similar androconia, but forewing deep blue colour restricted to postcubital area; hindwing vein CuA2 terminus with tail. Female



7-12. *Brevianta bathoryon*. 7 – holotype male dorsal view, 8 – ditto, ventral view; 9 – allotype female dorsal view, 10 – ditto, ventral view (Scale: Figs 7-10, in the same magnification, forewing length in Fig. 7 – 21 mm), 11 = male genitalia in lateral view (Scale: length of aedeagus: 3.92 mm), 12 – female genitalia in dorsal view (Scale: length: 7.05 mm)

dorsally greenish blue, as congeners. Ventral pattern in both sexes resembles that of the smaller species *B. busa* and *B. perpenna*, but the forewing medial line is undulated, not straight.

DESCRIPTION

Male. Thorax and abdomen dorsally gleaming blue, ventrally brown. Forewing costal length 20 mm (n = 2), costa slightly convex, apex pointed, outer margin straight; dorsal wing surface black, except of dark blue coloured postcubital area; discal cell short, androconia composed of large and densely arranged scales with rounded apex, pigmented apically, situated at the discalis apex and in the postdiscal area between R3 and Cu1. Lower crossvein M3-CU1 with scent patch comprised of small, long and narrow androconial scales, hidden under larger androconial scales. Hindwing dorsally blue with minute black margin and with 4 mm long tail at the terminus of vein CuA2; tornal lobe small, covered by black and dispersed white scales. Ventral surfaces of both wings brown with dark basal area border limbally by gleaming blue disruptive pattern, medial area with white speckled pattern towards margin with darker submedial and marginal areas, antemarginal area with gleaming border between vein CuA2 and anal margin, tornal lobe black (Figs 6-8). Genitalia: no brush organ; tegumen large and heavily sclerotized terminally with upcurving strong gnathos, sclerotized upper and lower margins; vinculum membranous, saccus of the half of valval length, valvae of 1/3 aedeagus length, dorsal flap and apex pointed, aedeagus three times longer than valva with an upcurved dorsal and twisted ventral cornuti (Fig 11). **Female.** Body as in a male. Wings. Forewing costal length 20 mm (n = 1), similar to male but with a somewhat shorter forewing outer margin, larger hindwing tail at vein 2A terminus plus an additional shorter tail at vein CuA1 terminus, dorsal structural colouration more extended covering also discal and postdiscal areas; ventral pattern more conspicuous in a lighter background (Figs 9-10). Genitalia: corpus bursae with small prickle-like signa, ductus bursae sclerotized with two lateral heavily sclerotized ridges joining bursa, posterior end with wide lamella with thin and short lateral extensions (Fig. 12).

DISTRIBUTION

Geographical: known only from Western Cordillera in Colombia (Calima) and Ecuador (Chiriboga); **spatial:** known from the elevation of 1500 m (Calima, Colombia) and 1800 m (Chiriboga, Ecuador); **temporal:** type specimens were collected in January (Colombia) and July (Ecuador).

ETYMOLOGY

The species named after the house of Bathory, king of Poland and princes of Transylvania, archbishop of Kraków and put in rhyme to refer the closely related and superficially similar species *B. ematheon*.

REMARKS

Generic placement. Male foreleg used for walking with fused foretarsus (Lycanidae), ten forewing veins, in lateral view “greyhound shaped” male genitalia without

juxta (Eumaeini), veins subcosta and radius branch 1 are approximating each other (*Micandra* genus group), a forewing dorsal scent patch present along cross vein M3-Cu1 (*Brevianta*) (Fig. 5). Males dorsally blue, females green, hindwings with or without short tail at vein termini Cu1, but always with long tail at vein termini Cu2, tornus lobed, ventrum brown in both sexes with speckled medial pattern used for crypsis.

Androconia. We do not know any group of lycaenids in the *Micandra* section of Eumaeini having similarly situated scent patch on the crossvein area. Only in *Jagiello* there is a scent patch in the same place of the wing membrane, but on the ventral surface of forewing (BÁLINT, KERTÉSZ & WOJTUSIAK 2010). Therefore we presume that the crossvenial scent patch is a good character for supporting the hypothetical common ancestry of species placed in *Brevianta*. However the imagines suggest that the different groups we distinguish have basically different biology. As we have already pointed out in the introduction and in the Key for identification, there are four different types of androconia in the genus. The species *Brevianta bathoryon*, *B. busa*, *B. ematheon*, *B. magnifica* and *B. perpenna* all possess the scent patch situated on the cross vein and a large absorber, or reflector covered with scales producing colours, packed with pigments at their apices (Figs 3-6). The species pair *hyas* – *tolmides* lack absorber and reflector and possess only a minute crossvenial androconia on forewing dorsal surface (Fig. 2). Another type of androconia, unique in Neotropical eumaeines, is represented in *B. celelata* where a large androconial cluster is situated in the discalis apex and additional scent patches occur also in the postcubital intercellular areas, in both regions covered by long piliform setae.

Female associated. Except of *Brevianta magnifica*, all the female phenotypes are known. They are difficult to associate to match their males as their ventral patterns are very similar (cf. D'ABRERA 1995: 1129). In the case of *B. bathoryon*, the species has larger size, and distinctive tornal lobe with pronounced tail at CuA2 terminus. These characters are supplemented by the evidence that the holotype male and the allotype female originate from the same collecting site and were collected together.

Diversity. The genus has a rather low diversity but its species are distributed in mountainous areas from southern Mexico to northern Bolivia, including Venezuela. Only *B. ematheon* is known from lower elevations having the widest range of distribution, practically the entire Amazon Basin, the eastern side of the Andes (D'ABRERA 1995) and the Guiana Shield (FAYNEL 2004). All the other species inhabit mountain forest environments, which were difficult to sample until recent times, when numerous new trails have been opened. Probably this explains why the two large and remarkable species of the genus, *B. bathoryon* and *B. magnifica*, were discovered only very recently. There is another lowland species, *B. saphonota* (CONSTANTINO, SALAZAR & JOHNSON, 1993) which has been placed in this genus on the basis of female genital characters (BÁLINT 2005). The male phenotype of this species is not yet known, therefore this species was not incorporated into the key. It can be expected that it has probably ventral hind wing pattern different than the female representing another example of marked sexual dimorphism as it is known in the case of large eumaine lycaenids (eg. BÁLINT 2009; BÁLINT & SALAZAR 2004, HALL & WILLMOTT 2005).

CONCLUSION

The genus *Brevianta* contains eleven described species placed in four species groups, according to their androconia and ventral wing pattern characters. Nine of them occur in mountainous habitats. One of them is widely distributed in the Amazon Basin. The eleventh species, inhabits the Chocó lowlands in Colombia, one of the less explored regions of South America.

***Brevianta* JOHNSON, KRUSE & KROENLEIN, 1997**

Type species: *Thecla undulata* HEWITSON, 1867.

Bussa JOHNSON, KRUSE & KROENLEIN, 1997; type species: *Thecla busa* GODMAN & SALVIN, 1887; unavailable, primary junior homonym of *Bussa* RAGONOT, 1888 (Lepidoptera: Pyralidae)

Celelata group

celelata (HEWITSON, 1874) (*Thecla*) – BMNH syntype female, BRAZIL: [no locality].

Ematheon group

bathoryon sp. n., *Brevianta* – MZUJ holotype male, ECUADOR: Chiriboga.
ematheon (CRAMER, 1777) (*Papilio*) – syntype(s) male(s), SURINAM: [no locality] (type not extant).
busa (GODMAN & SALVIN, 1887) (*Thecla*) – BMNH lectotype (JOHNSON, KRUSE & KROENLEIN 1997: 17), NICARAGUA: “Chontales”.
perpenna (GODMAN & SALVIN, 1887) (*Thecla*) – MNHU holotype male, COSTA RICA: “Chiriqui” (illustrated as “Figura 5” in SALAZAR 2010).

Undulata group

magnifica SALAZAR & CONSTANTINO, 2010, *Brevianta* – MHNUC holotype male, COLOMBIA: Chocó, San José del Palmar, El Tabot, 1500 m (illustrated as „Figura 2” and “Figura 3” in SALAZAR 2010).
undulata (HEWITSON, 1867) (*Thecla*) – BMNH lectotype (JOHNSON, KRUSE & KROENLEIN 1997: 21) male, COLOMBIA: “Bogotá”.
undulella (STRAND, 1918) (*Thecla*) – MTD holotype male, COLOMBIA: [no locality].
balinti SALAZAR & JOHNSON, 2004, *Brevianta* – MHNUC holotype male, COLOMBIA: “Caldas, Neira-Cantadelicia, 1550 m”.

Tolmides group

hyas (GODMAN & SALVIN, 1887) (*Thecla*) – BMNH lectotype (D’ABRERA 1995: 1128), COSTA RICA: [no locality] (illustrated as fig. “T. tolmidés hyas ♂ R” in D’ABRERA 1995: 1129).
tolmidés (C. FELDER & R. FELDER, 1865) (*Pseudolycaena*) – BMNH holotype male, COLOMBIA: “Bogota” (illustrated as figs 67-69 in BÁLINT & GOODGER 2003).

Incertae sedis

saphonota (CONSTANTINO, SALAZAR & JOHNSON, 1993) (*Denivia*) – MHNUC holotype female, COLOMBIA: “Valle, Alto Anchicayá, 700 m”.

APPENDIX: MATERIAL EXAMINED

Brevianta bathoryon BÁLINT & WOJTUSIAK, sp. n. (3 specimens: 2 males and 1 female; one male and female dissected) – COLOMBIA: Valle, Calima, 1500 m, January (BC: male paratype); ECUADOR: Pichincha, Chiriboga, 1800 m, July (MZUJ: male holotype, female allotype; both dissected).

Brevianta busa (GODMAN & SALVIN, 1887) (12 specimens: 9 males and 3 females) – COSTA RICA: Guapiles (BMNH: male). ECUADOR: Las Rios, La Chima (BMNH: male); GUATEMALA: Mirandilla, 1700 ft., Champion (male: BMNH paralectotype no. 266455); Forest of north of Vera Paz (BMNH: female). HONDURAS: San Pedro de Sula (BMNH: male and female). MEXICO: Chiapas, San Antonio, 4000 ft, August (MNHO: female); Cuesta de Misantla (BMNH: male); Misantla, July (MNHN: male); Vera Cruz, Presidio, T. Escalante, May (MNHO: male). NICARAGUA: Chontales, T. Belt (2 males: BMNH lectotype no. 266454; paralectotype 266456).

Brevianta celelata (HEWITSON, 1874) (3 specimens: male and 2 females; one female dissected) – BRAZIL: no locality (male; BMNH syntype no. 266498); Paraná, Piên, 900 m, April (HNHM: male); Santa Catharina, São Bento do Sul, Serra Rio Natal, 600 m, April (HNHM: female; gen. prep. Bálint no. 996).

Brevianta ematheon (CRAMER, 1777) (21 specimens = 19 males, 2 females; one female dissected) – COLOMBIA: no locality (HNHM: male); Upper Putamayo, XI. (MNHN: 2 males); no locality (HNHM: male). ECUADOR: Paramba (BMNH: female; gen. prep. Bálint no. 5831). PERU: PERU: Balsapuerto, March (MNHN: 2 males); Huancabamba, January (MNHN: male); Iquitos, May (MNHN: female); Perené River, 2000 ft (BMNH: male); Rio Contamano, 200 ft, October (MNHN: male); Rio Contamano, 400 ft, October–December (BMNH: 3 males); Rio Pastazoa (MNHN: male); Rio Purus, Madureira, Senna, December (BMNH: male); Rio Putamayo, Florida, December (BMNH: male); Rio Ugayali, Contakaia, November–December (BMNH: male). BRAZIL: Conceicao, Rio Tapajos, IX. (MNHN: 3 males).

Brevianta hyas (GODMAN & SALVIN, 1887) (20 specimens = 7 males, 13 females; three females dissected) – COSTA RICA: Cartago (BMNH: male, female; female: gen. prep. Bálint no. 5834); San José (BMNH: male); no locality (BMNH: 2 males, 3 females; lectotype male no. 265848, paralectotype male no. 265849; paralectotype female no. 265851–265853; gen. prep. Bálint no. 5833; MNHO: male, 5 females); San Juan (BMNH: male). GUATEMALA: Vera Paz, Forest of N. Vera Paz (BMNH: 2 females; paralectotype no. 265850; female: gen. prep. Bálint no. 5835). MEXICO: Chiapas, area near Lagos, Tison, 5000 ft, September (MNHO: male); no locality (BMNH: female); Vera Cruz, Presidio, Escalante, September (MNHO: female).

Brevianta perpenna (GODMAN & SALVIN, 1887) (3 specimens = 2 males, female) – PANAMA: Chiriqui (MNHN: male). NO PATRIA: ex coll. Monteiro (MNHN: male, female).

Brevianta undulata (HEWITSON, 1867) (29 specimens = 16 males, 13 females; one male, one female dissected) – COLOMBIA: Bogota (BMNH: male, female; female: holotype no. 266457), Mucatin, 2600 m (BMNH: female); Villa Elvira (BMNH: female); Cauca (MNHN: male); Cauca, Distrito de Pereira (BMNH: female); Interior of Colombia (BMNH: male); no locality (MNHN: male); Papayán (BMNH: male, female); Villa Elvira (BMNH: female). PERU: Amazonas, Rodriguez de Mendoza, 1700 m, September (MZUJ: 2 males, HNHM: male); Amazonas, Pomacochas, 2200-2400 m, June (MZUJ: female); Amazonas, Chachapoyas, Molinopampa-Granada, 2800 m, September (MZUJ: female); Jepelacio, June (MNHN: male). VENEZUELA: Estado Aragua, Rancho Grande, 1968 (HNHM: female); Estado Aragua, Rancho Grande, Cumbre, 1100 m (HNHM: 3 males; one male: gen. prep. Bálint no. 1360); Estado Bolívar, Caura Valley (BMNH: female); Merida (BMNH: male); Merida, 1630 m, June (BMNH: male); no locality (BMNH: 2 males, 3 females; one female: gen. prep. Bálint no. 5832).

Brevianta undulella (STRAND, 1918) (10 specimens = 6 males, 4 females) – BOLIVIA: La Paz (MNHN: male); no locality (BMNH: female). ECUADOR: Pomasoui (MNHN: male); Prov. Bolívar, Balzapamba (BMNH: male); Loja (MZUJ: male); no locality (BMNH: female). PERU: Abra P. Miguel, February (MZUJ: male); Junin, Chanchamayo, Quebrada la Lora, via Mina Pichita, 2000 m, June (MZUJ: male); Chanchamayo (BMNH: female); Pasco, Rio Colorado (BMNH: female).

Brevianta tolmides (Felder & Felder, 1865) (3 specimens = 3 males) – COLOMBIA: Bogota (BMNH: male; holotype no. 265847); P. N. Puracé, L. San Rafael, 3200-3250 m, March (MZUJ: male); Santa Fé de Bogota (BMNH: male).

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