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# THREE NEW SPECIES OF RIODININI FROM THE CLOUD FORESTS OF ECUADOR (LEPIDOPTERA: RIODINIDAE)

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ABSTRACT.– Three new species of the tribe Riodinini, in the genera *Baeotis* Hübner, [1819] (*Baeotis attali* **n. sp.**), *Lasaia* Bates, 1868 (*Lasaia cutisca* **n. sp.**), and *Chalodeta* Stichel, 1910 (*Chalodeta pescada* **n. sp.**), are described from east Andean cloud forest habitats in Ecuador. Comparative taxa are also illustrated, including *Baeotis kadenii* (C. & R. Felder, 1861) (**n. comb.**), which is transferred from *Imelda* Hewitson, 1870, *Lasaia incoides* Schaus, 1902 (**n. comb.**), which is transferred from *Exoplisia* Godman & Salvin, 1886, and *Lasaia scotina* Stichel, 1910, which is synonymised with *Lasaia incoides* (**n. syn.**).

KEY WORDS: Argentina, ***Baeotis attali*** n. sp., bait trapping, behavior, Bolivia, Brazil, ***Chalodeta pescada*** n. sp., Colombia, *Exoplisia*, *Imelda*, ***Lasaia cutisca*** n. sp., Neotropical, Paraguay, Peru, South America, taxonomy, Uruguay, Venezuela.

East Andean cloud forest habitats in Ecuador continue to yield interesting new riodinid discoveries (Hall & Willmott, 1995a,b, 1996, 1998). This paper describes three new species in the riodinine genera *Baeotis*, *Lasaia* and *Chalodeta*. All of these genera are comparatively well known and the species description in *Lasaia* represents the first since Clench (1972) revised the genus, that in *Chalodeta* the first since Rebillard (1958) (see Callaghan, 1995) and that in *Baeotis* only the second valid one in the latter half of the century (see Brévignon, 1995). During the course of searching for sister taxa to the new species, the necessity for two new generic combinations was also uncovered.

The following museum acronyms are used throughout the text:

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|---|---|
| AMNH | American Museum of Natural History, New York, NY, USA |
| BMNH | Natural History Museum, London, England |
| MNCN | Museo Nacional de Ciencias Naturales, Quito, Ecuador |
| USNM | United States National Museum, Washington, DC, USA |
| ZMHU | Zoologische Museum, Humboldt Universität, Berlin, Germany |

### *Baeotis attali* Hall & Willmott, **new sp.**

Fig. 1a,b; 7a,b.

**Description**.– MALE: forewing length 18mm. Forewing distal margin slightly sinuate, hindwing rounded. *Dorsal surface*: forewing ground color dark brown; two slightly darker brown markings at base of cell 1A+2A, one dark brown line across cell end and one before cell end; orange-red square at base of cell $M_2$, slightly larger, contiguous orange-red triangle at base of cell $M_1$, small yellow patch joining this latter marking to costa; yellow circle in middle of wing extends in a narrower band to anal margin at a point two-thirds distance from base to tornus, rectangular yellow subapical patch, yellow spots towards tornus; undulating silver-blue line at margin, white fringe elements at margins of cells 1A+2A, $Cu_1$ and $M_1$. Hindwing ground color dark brown; one dark brown line across cell end and one before cell end; inwardly curving postdiscal yellow band extends from mid-point of costa to vein $Cu_2$, much broader above vein $M_3$; three tiny yellow spots in apex, one in each of cells $M_3$-$M_1$; even, silver-blue line at margin extends from apex to tornus, faint white fringe elements at margins of cells 1A+2A and $M_2$. *Ventral surface*: forewing ground color dark brown; one dark brown line across cell end and one before cell end; discal cell proximal to this latter line yellow with a brown streak through middle from wing base to line; yellow triangle at base of cell 1A+2A marked distally with a dark brown line, dark brown line through its middle; orange-red square at base of cell $M_2$, slightly larger contiguous orange-red triangle at base of cell $M_1$, with small yellow patch joining this latter marking to costa; unevenly edged yellow band through middle of wing extends from anal margin into cell $Cu_1$; submarginal yellow band, which is broad in subapex, tapers towards costa, broken in cell $Cu_1$, almost absent in $Cu_2$, full in 1A+2A; three tiny yellow spots at distal margin of apex. Hindwing ground color dark brown; basal half of wing yellow with dark brown line at discal cell end and thin postdiscal dark brown line that traverses wing from costa to vein 1A+2A; broad, unevenly edged, yellow band at submargin, extends from apex to tornus, broader at middle; elongate yellow marginal streak in cells 1A+2A-$M_2$, joined to the submarginal band in the former. *Head*: labial palpi black with white scaling. Eyes brown and bare. Frons dark brown. Antennal segments black with basal white scaling laterally, reduced white scaling towards clubs; clubs black. *Body*: dorsal surface of thorax and abdomen dark brown, ventral surface grayish-white. Legs gray. *Genitalia* (Fig. 7a,b): uncus rounded, deeply divided posteriorly; vinculum extends over dorsum of tegumen, which has deeply indented anterior notch; aedeagus long, thin and pointed; posteriorly elongate pedicel of same length as aedeagus and tipped with coarse scobinate patch; *processus superior* (*sensu* Clench (1972)) of valvae divided into upper, lobed aedeagal sheath and lower, larger posteriorly projecting process, *processus inferior* attached to latter portion and very lightly sclerotized.

FEMALE: unknown.

**Types**.– *Holotype male*: ECUADOR.– *Zamora-Chinchipe Prov.*: Loja-Zamora rd., nr. Sabanilla, Quebrada San Ramon, 1700m, 29 Oct 1997 (K. R. Willmott); to be deposited in the BMNH.

*Paratypes*: ECUADOR.– *Zamora-Chinchipe Prov.*: same data as above, 5 ♂: 1 ♂ (MNCN), 1 ♂ to be deposited in USNM, 3 ♂ in coll. of the authors. Loja-Zamora rd., Río San Francisco, 1900m, 28 Nov 1993, 2 ♂ (B. Méry & S. Attal); in coll. of S. Attal, Paris, France.

**Etymology**.– This species is named for our friend Stéphane Attal, who, to our knowledge, collected the first specimens and generously loaned them to us for description.

**Diagnosis**.– *Baeotis attali* n. sp., although somewhat divergent in wing pattern compared to typical *Baeotis* species, shares the same basic wing pattern elements and male genitalia to members of that genus. Although the divided submarginal band in the tornus of the ventral hindwing in *B. attali* is reminiscent of that in members of the "*B. melanis* Hübner, [1831], group", and its forewing costal orange-red markings are similar to those of *Baeotis nesaea* Godman & Salvin, 1889 (though these are probably not homologous, occurring in $R_1$, $R_2$ and $M_1$ in *B. nesaea*), *B. attali* does not closely resemble any of the species hitherto regarded as belonging to *Baeotis*. The sister species to *B. attali* appears to be *Baeotis kadenii* (C. & R. Felder, 1861) (**n. comb.**) (Fig. 2a,b), which occurs in similar habitats in the Andes of Venezuela and north Colombia. *B. kadenii* has hitherto been placed as a member of the genus *Imelda* Hewitson, 1870, in the *incertae sedis* section (four forewing radial

veins) of Harvey (1987) (Stichel, 1930; Bridges, 1994), but since it possesses a deep anterior notch in the tegumen of the male genitalia it properly belongs in the tribe Riodinini. Given the following similarities to *B. attali* and its otherwise *Baeotis*-like male genitalia (Fig. 8a,b), we transfer *kadenii* from *Imelda* to *Baeotis*. Although *B. kadenii* has white instead of yellow pattern elements and its discal band is very broad, it shares with *B. attali* a homologous postdiscal orange-red pair of markings on the forewing that are joined to the costa by a small pale patch, a subapical pale patch and marginal markings, and a similarly broad wing shape. Together, *B. attali* and *B. kadenii* appear to form a distinct species group within the genus. As the sexes of *B. kadenii* are not dimorphic, those of *B. attali* are also assumed to be very similar.

**Discussion**.– Two groups of males of *B. attali* were found along the Quebrada San Ramon, a small river in a steep forested valley, perching very high on and flying about overhanging bushes around 10-15m above the stream, where they were active from midday to 1600h. Males typically flew almost constantly at a fixed height and in certain flight paths in natural open areas above the river with a slow fluttering flight typical of perching *Baeotis* species, except when engaged in faster, spiralling male-male interactions. Very occasionally they would land, but only fleetingly, beneath leaves with their wings outspread. Although only two or three males were visibly present at any one time, captured individuals were quickly replaced by others.

*B. attali* is currently known only from the Río Zamora valley in southeast Ecuador between altitudes of 1700-1900m. The forest here is less moist and the canopy lower than at similar altitudes elsewhere in the east Ecuadorian Andes and the general region exhibits a high level of endemism at the subspecies and species level (Hall and Willmott, unpubl. data). The possibly restricted range of this species, and the height at which individuals usually fly, perhaps account for the lack of specimens in major collections.

### *Lasaia cutisca* Hall & Willmott, **new sp.**

Fig. 3a-d; 9a,b.

**Description**.- MALE: forewing length 12.5mm. Forewing distal margin convex, costal margin concave at middle and sharply convex at apex, hindwing tornus elongated to a point. *Dorsal surface*: forewing ground color dark brown; three darker brown marks in discal cell, one marking cell end, two at base of vein 1A+2A; thin, darker brown postdiscal line, with fainter darker brown scaling proximally, extends diagonally from vein $R_{4+5}$, at a point three-quarters distance from wing base to apex, to vein $M_3$ then vertically to anal margin; a pair of small black submarginal spots in 1A+2A, a single similar spot in each of cells $M_1$-$Cu_2$, all individually surrounded by a square of paler brown, darker brown distally; distal tips of veins silver-blue at distal margin; white fringe elements at center of distal margins of cells 1A+2A, $Cu_1$, $M_2$ and $M_1$. Hindwing ground color dark brown; three darker brown markings in discal cell, one marking cell end, remaining two positioned with one just distal and one just proximal of a square black spot in cell Rs; two indistinct darker brown spots below discal cell; uneven, darker brown postdiscal line extends from costa, at a point two-thirds distance from wing base to apex, to vein 1A+2A; submarginal pattern same as forewing; faint white fringe element at distal margin of cell $M_2$. *Ventral surface*: forewing differs from dorsal surface in following ways: ground color paler brown, most distal marking at base of cell 1A+2A divided in two, postdiscal line slightly displaced at vein $Cu_1$ and with no darker brown proximally, submarginal black spots fainter and not surrounded by paler brown, vein endings not silver-blue. Hindwing differs from dorsal surface in following ways: ground color paler brown, two basal dark brown spots visible in base of cells Rs and 1A+2A, one visible at base of $Cu_2$, submarginal black spots not surrounded by paler brown, vein endings not silver-blue. *Head*: labial palpi mixture of dark brown and pale brown scales. Eyes brown and setose. Frons dark brown. Antennal segments black with lateral streaks of white scales, clubs black. *Body*: dorsal surface of thorax and abdomen dark brown, ventral surface brown. Legs brown. *Genitalia* (Fig. 9a,b): uncus thickens significantly in lower half, distal edge mildly toothed, tegumen with deeply indented anterior notch; aedeagus long, thin and pointed with lightly sclerotised elongate cornutus towards tip; posteriorly elongate pedicel of same length as aedeagus and tipped with recurved scobinate patch that has numerous fine setae; *processus superior* of valvae upwardly, roundly pointed with small rounded projection from lower edge, lightly sclerotized *processus inferior* attached along length of latter except for pointed tip.

FEMALE: differs from male in following respects: forewing length 14mm. Medial portions of distal margins more bulbous on both wings, forewing apex more falcate. *Dorsal surface*: ground color paler brown; forewing postdiscal line more uneven and slightly more diagonally positioned in upper portion.

**Types**.– *Holotype male*: ECUADOR.– *Sucumbíos Prov.*: nr. La Bonita, Río Sucio, 1800m, 21 Nov 1996 (K. R. Willmott); to be deposited in BMNH. *Allotype female*: ECUADOR.– *Napo Prov.*: Baeza, 0°27'S 77°53'W, 2000m, 5 Nov 1988 (R. Robbins) (USNM).

*Paratypes*: ECUADOR.– *Sucumbíos Prov.*: same data as holotype, 8 ♂: 1 ♂ deposited in the MNCN, 1 ♂ deposited in the USNM, 6 ♂ in the coll. of the authors. *Napo Prov.*: same data as allotype, 1 ♂ (USNM); same locality data as allotype, 27 Oct 1988, 1 ♂ (J. S. Miller) (AMNH). *Tunguruhua Prov.*: Río Blanco Valley, Santa Ana, Apr 1936, 1 ♂ (AMNH). *Morona-Santiago Prov.*: km 20 Macas-Nueve de Octubre rd., Río Abanico, 1800m, 27-29 Sept 1997, 1 ♀ (R. C. Busby); in coll. R. C. Busby, Boston, MA. *Pichincha Prov.*: 70 km E. of Sto. Domingo, 2050m, 22 Oct 1980, 1 ♂ (G. W. Busby III); in coll G. W. Busby III, Boston, MA.

**Etymology**.– The species name is taken from the Quechua word "cutisca", meaning dull or discolored, in reference to the atypical brown dorsal surface of this species.

**Diagnosis**.– *Lasaia cutisca* n. sp. is very similar to *Lasaia incoides* (Schaus, 1902) (**n. comb.**) (= *Lasaia scotina* Stichel, 1910 **n. syn.**). However, since in his revision of *Lasaia*, Clench (1972) illustrated *L. incoides* (as *L. scotina*) only in black and white and neglected to figure the male genitalia, the systematic position of this species has always been less than certain. To rectify this situation, we illustrate the type of *L. incoides* (in the USNM) in color (Fig. 4a,b) and figure the male genitalia (Fig. 10a,b) (based on the holotype of *L. scotina* in the ZMHU). *L. incoides* was formerly placed in *Exoplisia* Godman & Salvin, 1886 (Bridges, 1994, see also Hemming, 1967), a genus that is polyphyletic even with the exclusion of *L. incoides* (Hall & Willmott, unpubl. data). Since the male genitalia of *L. incoides* lack the additional lateral flanges on the *processus superior* that are characteristic of *Exoplisia* and are instead very similar to those of *Lasaia* species, we place it in combination with the latter genus. Both *L. cutisca* and *L. incoides* also resemble certain species in the genus *Chalodeta* Stichel, 1910, but they both possess a posteriorly pointing pedicel tipped with a scobinate patch in the male genitalia, a character typical of many riodinines but not found in any *Chalodeta* species that we have dissected, including the type, *C. theodora* (C. & R. Felder, 1862).

Both sexes of *L. cutisca* differ from those of *L. incoides* by their larger size (e.g., forewing length 12.5mm instead of 10.5mm in males), by having a more concave-convex forewing costal margin and convex distal margin, slightly darker dorsal and ventral ground colors which have less well contrasted pattern elements, a straighter forewing postdiscal line and two prominent white fringe elements in the subapex of the forewing instead of one. In the male genitalia of *L. cutisca* the posteriorly projecting pedicel is much longer than that of *L. incoides*, being of similar length to the aedeagus, the scobinate patch is broader and the setae are shorter and more numerous, the elements of the *processus superior* of the valvae are less pointed and the *processus inferior* is slightly longer and more pointed at its tip.

Perhaps even more similar to *L. cutisca* is what appears to be an undescribed species from southeast Brazil (there is a small series of males in the USNM). It has an almost identical wing pattern to *L. incoides* but is more similar in size to *L. cutisca* as it is in the male

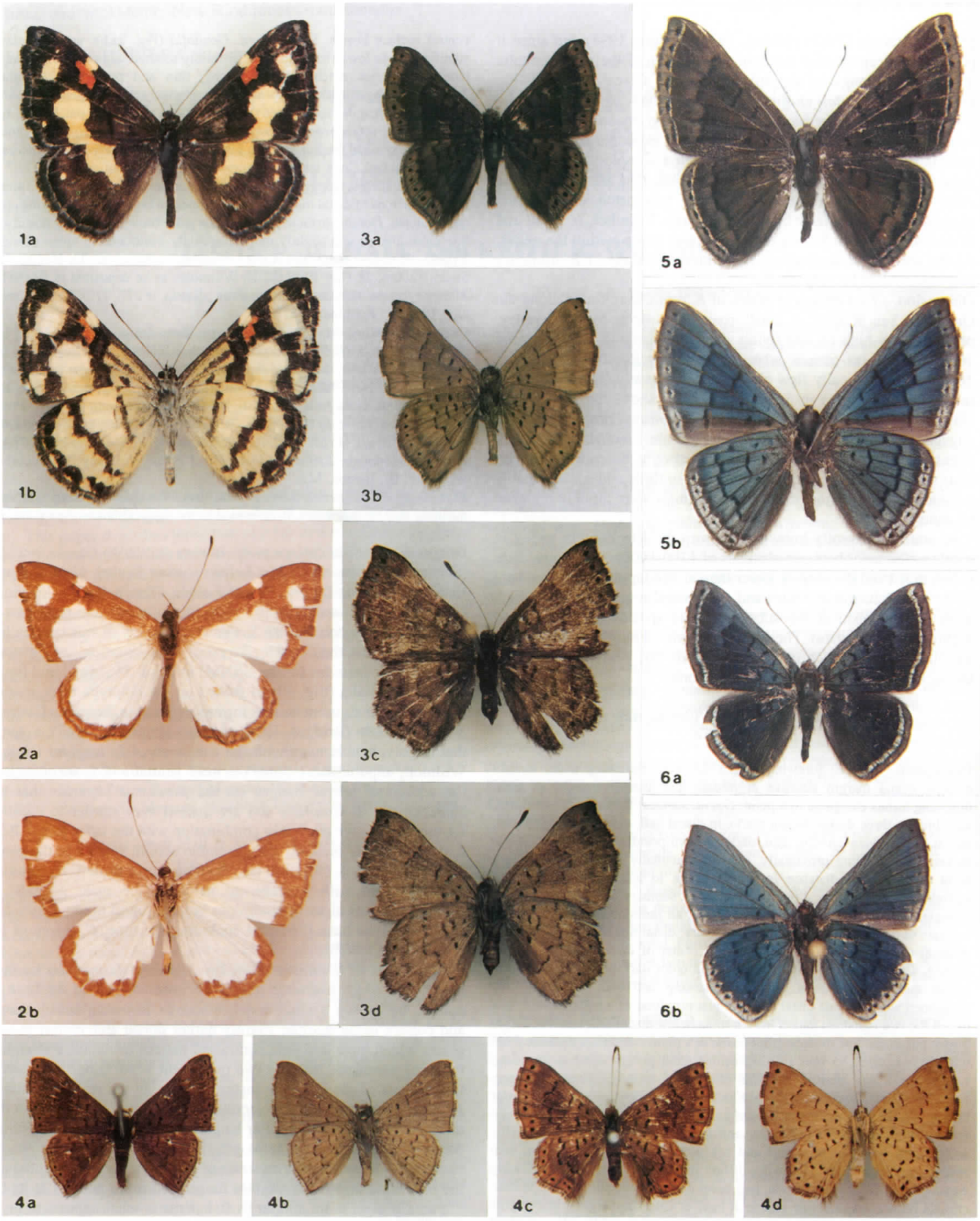


Fig. 1-6. **1.** *Baeotis attali* Hall & Willmott **n. sp.**, holotype male: a) dorsal surface; b) ventral surface. **2.** *Baeotis kadenii* (C. & R. Felder, 1861), Colombian male, ZMHU: a) dorsal surface; b) ventral surface. **3.** *Lasaia cutisca* Hall & Willmott **n. sp.**, holotype male: a) dorsal surface; b) ventral surface. Allotype female: c) dorsal surface; d) ventral surface. **4.** *Lasaia incoides* (Schaus, 1902), holotype male, USNM: a) dorsal surface; b) ventral surface. Allotype female, USNM: c) dorsal surface; d) ventral surface. **5.** *Chalodeta pescada* Hall & Willmott **n. sp.**, holotype male: a) dorsal surface; b) ventral surface. **6.** *Chalodeta panurga* Stichel, 1910, Ecuadorian male: a) dorsal surface; b) ventral surface.

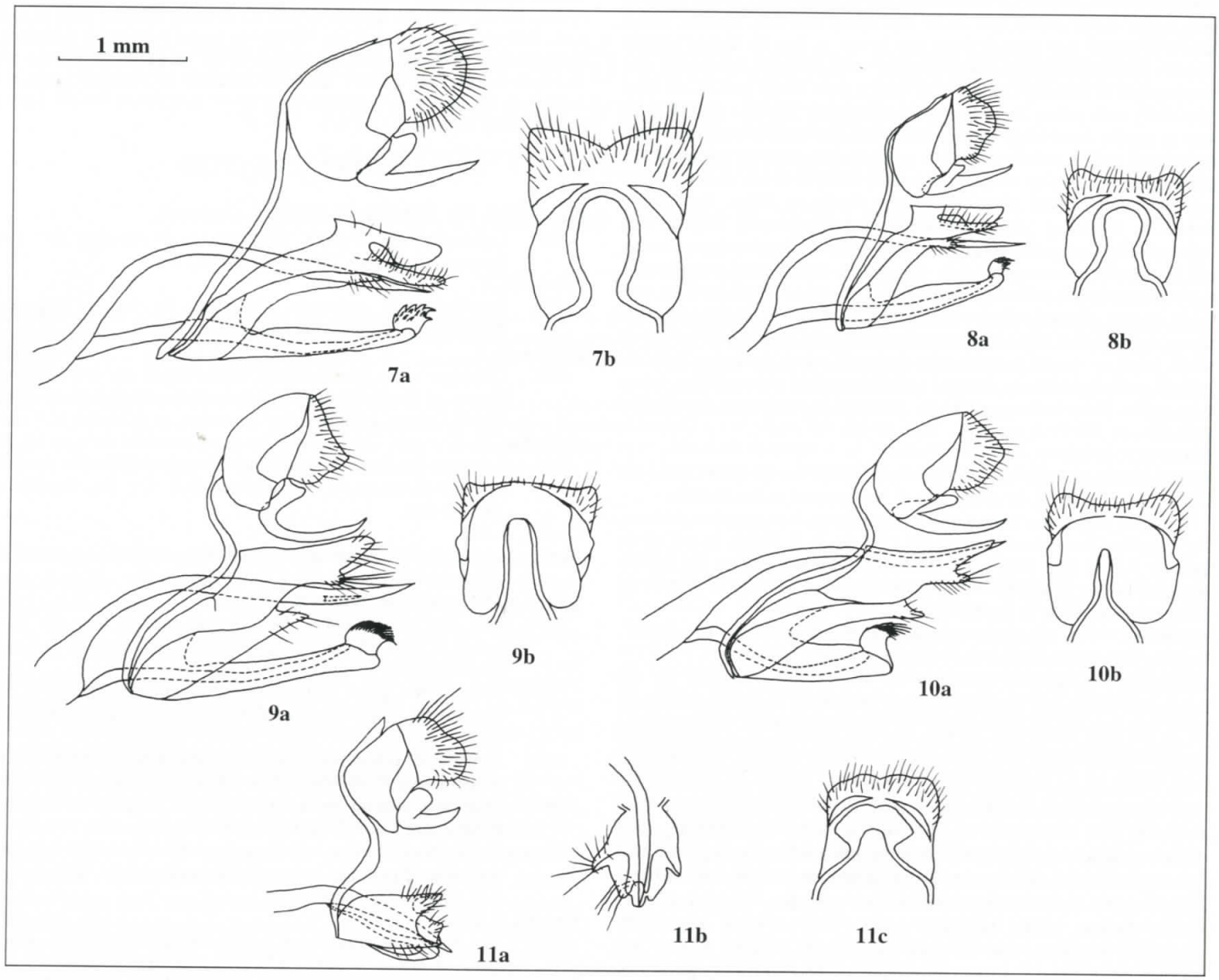


Fig. 7-11. Male genitalia, a) lateral view, b) anterior view of uncus (7-10): **7.** *Baeotis attali* **n. sp.**. **8.** *Baeotis kadenii* (C. & R. Felder, 1861). **9.** *Lasaia cutisca* **n. sp.**. **10.** *Lasaia incoides* (Schaus, 1902) (based on holotype of synonym *scotina* Stichel, 1910, in the ZMHU). **11.** *Chalodeta pescada* **n. sp.**: a) lateral view; b) dorsal view of valvae; c) anterior view of uncus.

genitalia. However, although the pedicels of the undescribed species and *L. cutisca* are of a similar length, the scobinate patches are different shapes and there are also differences in the shapes of the uncus and the *superior* and *inferior* portions of the valvae. There thus appear to be three species in this group of *Lasaia* with the following geographic distributions: *L. cutisca* E. Andes, probably Colombia-Peru or Bolivia; *L. incoides* Argentina, Paraguay, S.E. Brazil (Paraná, Santa Catarina, Rio Grande do Sul [TL of *scotina*]), probably Uruguay (Biezanko *et al.*, 1957) (the TL of Peru for *incoides* is in error; D. Harvey, pers. comm.); *L.* sp. n. S.E. Brazil (mountains of Rio de Janeiro).

**Discussion**.– *L. cutisca* is currently known only from Ecuador, from several east Andean provinces and the west Andean province of Pichincha between 1800-2050m, but given its occurrence near the Ecuador/Colombia border, it will certainly be found in the latter country. A small group of males was encountered at the type locality at a slight rise along a riverside path where they were perching on the tops of bushes about 2m high, resting on the tops of leaves with their wings shut between 1000h and 1215h. Males maintained particular leaves as perches and their flight was very rapid, especially when engaged in male-male interactions, not unlike that of thecline lycaenids. Solitary males were also encountered perching elsewhere along the path, which appeared to have been cut relatively recently through the forest and was lined with low secondary growth bushes.

### *Chalodeta pescada* Hall & Willmott, **new sp.**

Fig. 5a,b; 11a-c.

**Description**.– MALE: forewing length 16.5mm. Forewing costal margin concave at middle, convex at apex, distal margin convex, apex slightly falcate; hindwing rounded with pointed tornus. *Dorsal surface*: forewing ground color dark brown; three dark brown marks in discal cell, one marking cell end, two at base of 1A+2A; thin darker brown postdiscal line extends diagonally from costa, at a point three-quarters distance from wing base to apex, to vein $M_3$, then vertically and unevenly to vein 1A+2A at anal margin, with slightly paler brown distally; pair of small, elongate dark brown submarginal spots in cell 1A+2A, single similar spots in cells $M_1$-$Cu_2$, all lined proximally with a thin, continuous blue-green silver line that extends from tornus to apex where it curves fractionally inwards; distal margin fringe entirely white except for black scaling at vein endings. Hindwing ground

color dark brown; two darker brown markings in discal cell, one marking cell end, a faint darker brown spot above and below cell; thin, uneven, darker brown postdiscal line extends from near tornus to vein Rs before kinking inwards, with slightly paler brown distally; small, elongate dark brown spot in submargin of cells $M_2$-$Cu_2$, a pair of similar spots in cell 1A+2A, all lined proximally with a thin, continuous blue-green silver line that extends from apex to tornus; distal fringe entirely white. *Ventral surface*: forewing differs from dorsal surface in following ways: ground color iridescent greenish-blue, submarginal black spots smaller and fainter, those in tornus surrounded by pale blue; submarginal silver line absent. Hindwing differs from dorsal surface in following ways: all submarginal black spots rounded and surrounded by contiguous rectangles of pale blue with dark blue-gray distally and proximally; submarginal silver line absent. *Head*: labial palpi brown. Eyes chestnut brown and setose. Frons brown. Antennal segments black with small amount of basal white scaling, clubs black. *Body*: dorsal surface of thorax and abdomen black, ventral surface blue-gray. *Genitalia* (Fig. 11a-c): uncus lobed in ventral portion, falci short and robust, aedeagus thin and pointed, pedicel posteriorly elongate and thickened but still strap-like, valvae form upper, lower and central points, latter sheaths aedeagus dorsally and ventrally.

FEMALE: unknown.

**Types**.– *Holotype male*: ECUADOR.– *Napo Prov.*: km 49 Tena-Loreto rd., 1300m, 7 Oct 1996 (K. R. Willmott); to be deposited in the BMNH.

*Paratypes*: ECUADOR.– same locality data as above, 4 ♂: same data as above, 2 ♂, in coll. of the authors; 1 ♂, 23 Oct 1996 (A. F. E. Neild), in coll. of the authors; 1 ♂, 14 Mar 1995 (J. P. W. Hall), to be deposited in the USNM. *Pastaza Prov.*: nr. Shell, Río Pindo Grande, 1050m, 7 Feb 95, 1 ♂ (J. P. W. Hall), to be deposited in the MNCN.

**Etymology**.– This species is named after the Spanish word "pescado", meaning fish, in reference to the bait that so readily attracts it.

**Diagnosis**.– *Chalodeta pescada* n. sp. is most similar to the sympatric *Chalodeta panurga* Stichel, 1910 (Fig 6a,b), but differs by its larger size (forewing length 16.5mm instead of 14mm), plain brown dorsal surface that lacks the extensive blue-gray coloration on both wings of *C. panurga*, its greenish-blue instead of blue ventral ground color, more distinct and slightly distally displaced postdiscal forewing line, much reduced submarginal forewing markings, more distally positioned postdiscal hindwing line and by having pale blue rectangles instead of triangles at the hindwing margin with a black spot in each. Another somewhat similar sympatric *Chalodeta* is *C. lypera* (Bates, 1868), but this species has a more proximally positioned postdiscal line on both wings, only a vague hint of dull blue-gray iridescence on the ventral surface and no submarginal pale blue on the ventral hindwing. The male genitalia of *C. pescada* are typical for the genus and differ little from that of the type, *C. theodora* (C. & R. Felder, 1862), which has quite different wing facies.

**Discussion**.- This species is only known from lower cloud forest habitats in the east Ecuadorian Andes from 1050-1300m, where it occurs in sympatry with congeners *C. panurga*, *C. lypera* and *C. theodora*. To date we have only found *C. pescada* in traps baited with rotting fish placed 5-10m above the ground in forest light gaps between 1100h and 1400h, and we have yet to find males perching. We have recorded all Ecuadorian *Chalodeta* species feeding on fish (Hall and Willmott, in prep.), and indeed *C. lypera* and *C. panurga* have only been collected by us in Ecuador from fish traps; we have recorded just two specimens of the latter species and seen only two more (including the type) in the ZMHU.

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