

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

JASON P. W. HALL AND KEITH R. WILLMOTT

Dept. of Entomology and Nematology, University of Florida, Gainesville, Florida 32611, USA

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:

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 postdisical 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 postdisical 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 Ramón, 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.—*Sucumbios Prov.:* nr. La Bonita, Río Suncio, 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.—*Sucumbios 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). *Tungurahua Prov.:* Río Blanco Valley, Santa Ana, Apr 1936, 1 ♂ (AMNH). *Morona-Santiago Prov.:* km 20 Macas-Nueva 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

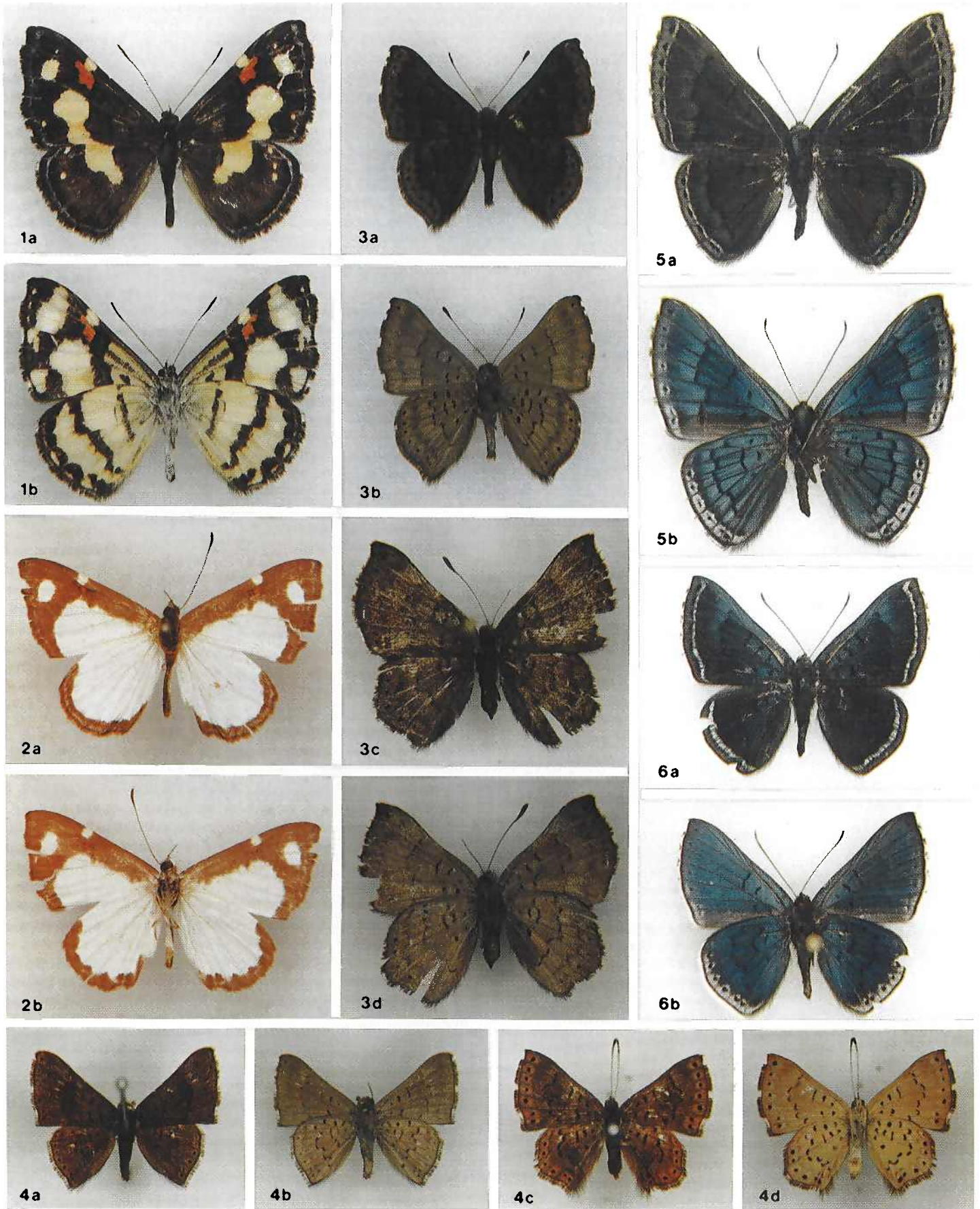


Fig. 1-6. 1. *Baeotis attali* Hall & Willmott n. sp., holotype male: a) dorsal surface; b) ventral surface. 2. *Baeotis kadenii* (C. & R. Felder, 1861), Colombian male, ZMHU: a) dorsal surface; b) ventral surface. 3. *Lasaia cutisca* Hall & Willmott n. sp., holotype male: a) dorsal surface; b) ventral 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.

