

Five new riordinid species from northwestern dry forest and northeastern Andean cloud forest habitats in Peru (Lepidoptera: Riordinidae)

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SUMMARY

HALL JPW, LAMAS G. 2001. Five new riordinid species from northwestern dry forest and northeastern Andean cloud forest habitats in Peru (Lepidoptera: Riordinidae). *Rev. per. Ent.* 42.- Five new riordinid species, *Euselasia perisama*, *Napaea tumbesia*, *Lasaia maritima*, *Symmachia calderoni* and *Uraneis incubus* are described from dry habitats in the northwest and wet cloud forest habitats in the northeast of Peru. Discussions concerning each of their closest relatives and brief notes on their habitats and behaviors are given. *Napaea umbratica* Zikán, 1952, is synonymised with *N. agroeca* Stichel, 1910 (syn. n.), and *Uraneis zamuro* (Thieme, 1907), is synonymised with *U. hyalina* (Butler, 1867) (syn. n.).

Key words: cloud forest, dry habitats, Ecuador, endemism, morphology, Peru, taxonomy.

RESUMEN

HALL JPW, LAMAS G. 2001. Cinco especies nuevas de riordinidos de hábitats de bosque seco del noroeste y bosque nublado del noreste de los Andes en Perú (Lepidoptera: Riordinidae). *Rev. per. Ent.* 42.- Se describe cinco especies nuevas de riordinidos de Perú, *Euselasia perisama*, *Napaea tumbesia*, *Lasaia maritima*, *Symmachia calderoni* y *Uraneis incubus*, de hábitats secos en el noroeste, y bosque nublado húmedo en el noreste. Para cada una se presenta una discusión acerca de sus congéneres más cercanos y se ofrece notas breves sobre sus hábitats y comportamientos. Se sinonimiza *Napaea umbratica* Zikán, 1952 con *N. agroeca* Stichel, 1910 (syn. n.), y *Uraneis zamuro* (Thieme, 1907) con *U. hyalina* (Butler, 1867) (syn. n.).

Palabras clave: bosque nublado, Ecuador, endemismo, hábitats secos, morfología, Perú, taxonomía.

Introduction

Andean premontane forests continue to yield more undescribed riordinid species, and indeed species from many other butterfly groups, than any other habitat in the Neotropics (SALAZAR & CONSTANTINO 1993, HALL & WILLMOTT 1995a, b, c, 1996a, 1998a, b, c, CALLAGHAN & SALAZAR 1997), yet there remains a relative paucity of basic biological surveys for the region, and there is a growing awareness that the increasing threat from human encroachment make the Andes one of the highest priorities for scientific research and conservation (CHURCHILL *et al.* 1995, BIODIVERSITY SUPPORT PROGRAM *et al.* 1995,

DINERSTEIN *et al.* 1995, ALDRICH *et al.* 1997). Indeed, two of the species described below were collected during a recent joint RAP (Rapid Assessment Program) expedition by Conservation International (Washington, DC, USA), and the Museo de Historia Natural (Lima, Peru) (SCHULENBERG & AWBREY 1997), to the remote Cordillera del Cóndor in Amazonas department.

The purpose of this paper is to describe three riordinid species in the genera *Euselasia* Hübner, [1819], *Symmachia* Hübner, [1819], and *Uraneis* Bates, 1868, from cloud forests in the northern Peruvian Andean departments of Amazonas and San Martín and two species in the genera *Napaea* Hübner, [819], and *Lasaia* Bates, 1868, from the dry northwestern departments of Tumbes, Piura and La Libertad. Together with a large area of south-west Ecuador, these latter departments also constitute a relatively poorly sampled (but see LAMAS 1976) and threatened region (see PARKER & CARR 1992) of high endemism, although of substantially lower diversity. Since all of the species are described here from localities in

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northern Peru that are in relatively close proximity to the southern border of Ecuador, often only kilometers away, it is expected that most, if not all, will eventually be found in that country, and indeed the new species of *Uraneis* is already known from Ecuador. Keith R. Willmott is included as an author on this last species as he was its co-discoverer.

Euselasia perisama Hall & Lamas, *sp. n.*

Male (figs. 1a-b).- FW length 20-22 mm (n=6). Forewing somewhat elongate, costa smoothly convex, distal margin approximately straight; hindwing elongate with tornus produced into rounded lobe, distal margin slightly pointed at vein Cu_1 . **Dorsal surface:** Forewing ground color black; broad, postdiscal cyan band surrounded by iridescent purple scaling curves from vein R_3 at costa around discal cell end to vein 2A in tornus, slightly narrower below vein M_3 , curves slightly outwards at tornus; fringe brown. Hindwing ground color black; small elongated triangle of cyan lined by iridescent purple scaling proximally in apex, occupying cells M_3-Cu_1 to R_s-M_1 ; distal half of wing exhibits subtle steely green iridescence at oblique angle; fringe brown. **Ventral surface:** Forewing ground color pale brown; yellow at base of costa, broad indistinct darker brown band at wing base, rich red-brown discal band surrounded by pale iridescent purple vertically traverses wing from costa to middle of cell Cu_2-2A where it becomes dark brown, crossing discal cell end; distal portion of wing red-brown, except for dark brown below middle of cell Cu_2-2A , with thin pale brown submarginal line and three black triangular spots (iridescent dark purple at oblique angle) in each of cells M_2-M_3 to $R_{4+5}-M_1$ (decreasing in size in that order), each surrounded by paler brown scaling, and proximally directed dark brown triangles outlined in pale brown in cells Cu_2-2A to M_3-Cu_1 ; postdiscal portion of veins outlined in pale brown. Hindwing ground color pale brown; broad darker brown band at wing base, rich red-brown discal band surrounded by pale iridescent purple above vein 2A diagonally traverses wing from costa to anal margin, pinkish-red stripe at anal margin occupies distal portion of anal cell, all of cell 2A-3A, and some scaling is present towards base of cell Cu_2-2A , distal portion of wing red-brown above vein 2A with thin orange marginal line, then thinner pale blue-gray line, medial area of red-brown contains elongate ovoid spots in each of cells Cu_2-2A (two) to Cu_1-Cu_2 and M_2-M_3 to R_s-M_1 surrounded by pale brown that is less prominent towards anal margin, those in cells M_2-M_3 to R_s-M_1 brown, that in

cell Cu_1-Cu_2 black, those in cell Cu_2-2A dark iridescent purple, and an ovoid black spot, with a large distally positioned dark iridescent purple pupil, surrounded by pale yellowish brown, in cell M_3-Cu_1 ; postdiscal portion of veins outlined in pale yellowish brown. **Head:** Labial palpi yellow-brown, third segment very short. Eyes bare and brown, margins yellow-white. Frons brown with yellow-white lateral scaling. Antennal segments brown with yellow-white basal scaling, narrow strip devoid of scales along inner-ventral edge; clubs brown, tips orange-brown. **Body:** Dorsal surface of thorax and abdomen black, ventral surface pale brown. All legs yellow-brown. **Genitalia** (figs. 6a-b): Uncus rounded; elongate valvae gradually taper to rounded tip in lateral view, distal portion of approximately even width in ventral view, sparse scales roundly elongate; aedeagus of approximately even width tapering to pointed tip, everted vesica a large round sac with two small rounded lateral projections and a fan of about nine rounded teeth or ridges at lower right side, no prominent transtilla.

Female.- Unknown.

Type-material: HOLOTYPE male, PERU, Amazonas, Cordillera del Cóndor, PV3 (Alfonso Ugarte), 1000-1200 m, 03°55'S 78°26'W, 18 July 1994 (G. Lamas); in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MUSM). PARATYPES: 4 males, same data as HT, but dates 18, 19, 19 and 25 July 1994, all in the MUSM; 1 male, same data as HT; deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM).

Etymology: A noun in apposition; the name refers to the similarity in dorsal pattern between this species and many members of the nymphalid genus *Perisama* Doubleday, 1849.

Remarks: *Euselasia perisama* sp. n. belongs in the "euodias group" of *Euselasia* (*sensu* HALL & WILLMOTT 1998c) with *E. euodias* (Hewitson, 1856), *E. issoria* (Hewitson, 1869), *E. orba* Stichel, 1919, and *E. pillaea* Hall & Willmott, 1998. The group is recognised by its species having a variably elongate patch of reddish-purple along the anal margin of the ventral hindwing, and the configuration of the remaining ventral pattern elements and male genitalia suggest that it is probably the sister group to the "orfitia group" (*sensu* CALLAGHAN 1997). *E. perisama* perhaps most closely resembles *E. euodias* and *E. issoria* because of its particularly elongate hindwing and by

possessing reddish-purple along the entire anal margin of the ventral hindwing, but it is readily distinguished from all species in the group by having extensive reddish-brown in the distal portion of both wings surrounding the submarginal ocelli (especially proximally on the hindwing) instead of dark brown and, most prominently, by having bright cyan dorsal coloration as a band on the forewing and a triangle in the apex of the hindwing instead of various hues of barely perceptible dark purple. The male genitalia in *Euselasia* vary very little interspecifically, and the "euodias group" is no exception. While the valvae of *E. pillaca* curve inwards towards their tips in ventral view (HALL & WILLMOTT 1998c), the valvae of the remaining species in the group are straight in ventral view and do not significantly differ from each other in their shape.

Euselasia perisama is currently known only from the Peruvian type locality and no other specimens have been located in the world's major collections. It was collected at a remote locality on the upper Río Comainas along the eastern edge of the Cordillera del Cóndor as part of an international rapid assessment program (RAP) inventorying the flora and fauna of the area (SCHULENBERG & AWBREY 1997). Since the type locality is only a few kilometers from the Ecuador-Peru border, *E. perisama* is sure to occur in the former country. It is somewhat surprising to find another cloud forest species in the "euodias group" of *Euselasia* (see HALL & WILLMOTT 1998c) but, given the number of unique undescribed Satyrinae also collected in the Cordillera del Cóndor (LAMAS 1997), the possibility remains that *E. perisama* is endemic to this region. The six specimens were collected on different days always perching on the same tree in a small forest lightgap, between 1100 and 1300 h, settling at a height of about 5 m. No females and no further males were seen anywhere else in the area surveyed.

Uraneis incubus Hall, Lamas & Willmott, *sp. n.*

Male (figs. 2a-b).- FW length 21,5-23 mm (n=5). Forewing costa approximately straight, distal margin slightly convex; hindwing tornus produced into very small lobe. **Dorsal surface:** Forewing ground color dark iridescent blue; broad white postdiscal band extends from cell R_2-R_3 to Cu_2-2A , broadening at middle and nearly touching discal cell end in cells M_2-M_3 and M_1-M_2 , white in cell Cu_2-2A divided horizontally into two portions that gradually fade out proximally, proximal and especially distal margins of entire band become gray-white; fringe black with faint pale scaling at

margin of cell Cu_2-2A . Hindwing ground color dark iridescent blue, dark brown at costal and anal margins; a pale blue ray traverses each of cells R_s-M_1 to Cu_2-2A , two in cell Cu_2-2A , one in upper distal corner only of cell 2A-3A, all rays except that in cell R_s-M_1 terminate at submargin in a pale blue proximally pointing triangle; fringe black with faint paler scaling at margins of cells $Sc+R_1-R_s$ and Cu_2-2A . **Ventral surface:** Forewing differs from dorsal surface in following ways: apex and margin dark brown, divided white marking in cell Cu_2-2A continues as two pale blue rays to wing base, pale blue ray in anal cell, pale blue scaling at base of costa and along costal edge of discal cell, prominent patches of pale blue setae along anal edge of discal cell and at base of cell Cu_1-Cu_2 . Hindwing differs from dorsal surface in following ways: margins dark brown, pale blue rays in cells Cu_2-2A to R_s-M_1 more prominent with submarginal triangles less well differentiated, large broad pale blue rays occupy discal cell, anal cell, cells 2A-3A and $Sc+R_1-R_s$, and pale blue also occupies base of costa and wing base. **Head:** Ventral surface of labial palpi white, dorsal surface black, second segment elongate. Eyes bare and brown, margins white. Frons black with white lateral scaling in ventral two-thirds, two white spots dorsally behind antennae. Antennal segments entirely black, inner ventral surface entirely denuded of scales except towards base; clubs black and elongate, tips orange-brown. **Body:** Dorsal and ventral surface of thorax black, patagia black with large red anterior spot; dorsal surface of abdomen black, ventral surface with two white stripes along margins of sternites, white scaling at base of abdomen along lower margin of tergites. Ventral surface of forelegs black, dorsal surface white; ventral surface of femur of mid and hindlegs black, dorsal surface white, remainder brown on both surfaces. **Genitalia** (figs. 7a-b): Uncus angular, "V"-shape indentation at posterior margin dorsally; vinculum narrow, forming small triangular saccus ventrally; valvae roundly rectangular in lateral view with single small posterior projection at upper posterior corner, narrow and medially concave in ventral view with posterior projection at tip inwardly curved, inner margin towards tip slightly uneven; aedeagus ventrally bulbous posterior to pedicel then narrow and elongate; pedicel somewhat broad and medially divided (especially prominent at base).

Female.- Differs externally from male in following ways: FW length 25 mm (n=1). Wing shape more elongate, forewing apex and hindwing tornus less pointed. Dorsal iridescent

blue slightly paler and less prominent. Second and third palpal segments more elongate.

Type-material: HOLOTYPE male, PERU, Amazonas, Cordillera del Cóndor, PV3 (Alfonso Ugarte), 1000-1200 m, 03°55'S 78°26'W, 18 July 1994 (G. Lamas); in the MUSM. ALLOTYPE female, ECUADOR, Pastaza, Mera, "900 m" [actually, 1100m], Sept 1948 (W. C. MacIntyre); in the Carnegie Museum of Natural History, Pittsburgh, PA, USA (CMNH). PARATYPES: 1 male, PERU, San Martín, km 18 Tarapoto-Yurimaguas rd., 1250 m, 06°27'S 76°17'W, 17 Nov 1998 (R. K. Robbins); in the USNM; 1 male, ECUADOR, Pastaza, Río Pindo Grande, nr. Shell, 1050 m, 19 Apr 1995 (J. P. W. Hall); in the coll. of Jason P. W. Hall & Keith R. Willmott, Washington, DC, USA (JHKW); 1 male, ECUADOR, Napo, km 49 Tena-Loreto rd., 1300 m, 23 Oct 1996 (K. R. Willmott); 1 male: same data as previous but Mar 1995; both in the JHKW.

Etymology: A noun in apposition; an incubus is "a male demon supposed to lie upon persons, especially women, in their sleep" (BROWN 1956).

Remarks: The fact that forewing vein R_4 meets the wing margin posterior to the apex (PENZ & DEVRIES 1999), a unique synapomorphy within the tribe Nymphidiini (*sensu* HALL 1999a, b), places *incubus* sp. n. in the genus *Uraneis*. *Uraneis incubus* perhaps superficially most closely resembles the partially sympatric *U. hyalina* (Butler, 1867), as both species possess distal white forewing bands, but the male genitalia suggest that *incubus* is most closely related to the allopatric west Andean species *ucubis* Hewitson, 1870. Both species possess dark blue iridescence over both dorsal wings, although this is darker and pure blue instead of blue-green in *incubus*, but *incubus* has a broad postdiscal white band on the forewing instead of submarginal white rays, and faint gray-blue rays over the whole hindwing instead of white rays restricted to the margin. The male genitalia of *incubus* differ from those of *ucubis* only by lacking small spines along the inner valve margins preceding the large terminal projection.

It is important to note here that the taxon *U. zamuro*, described by THIEME (1907) from a single female specimen (the original description states the type to be a male) from Archidona at 600 m at the base of the east Ecuadorian Andes, represents the Ecuadorian female phenotype of *U. hyalina*, as evidenced by sympatric series of males and females that

exhibit congruent wing pattern characters. *U. hyalina* is somewhat geographically variable, but since there is no evidence to suggest that this phenotype represents a discrete population worthy of subspecific recognition, we synonymise *U. zamuro* with *U. hyalina* (*syn. n.*).

Uraneis incubus is currently known only from premontane forest in Ecuador and north Peru between 1000 and 1300 m, although the species is likely to range more widely along the east Andean slope. At km 49 on the Tena-Loreto road in Ecuador, small groups of males were found perching high in subcanopy lightgaps along a ridgetop trail from 1130 h to approximately 1400 h. Their flight was rapid, and pairs of males were occasionally observed in upwardly spiralling flights together. They rarely landed, but did so with their wings outspread both beneath and on top of leaves. A single male was attracted at this locality to a subcanopy rotting fish baited trap, a phenomenon that has also been reported for *hyalina* (HALL & WILLMOTT 2000). The Ecuadorian male collected at Shell was observed resting beneath a leaf about 6 m above the ground around mid-day, alongside a small river.

Symmachia calderoni Hall & Lamas, *sp. n.*

Male (figs. 3a-b). - FW length 11 mm ($n=1$). Forewing costa approximately straight, distal margin convex; hindwing slightly pointed at tornus. **Dorsal surface:** Forewing ground color dark orange, orange at margin; four evenly spaced black bars in discal cell with tiny costal flecks inbetween, one marking cell end, basal one forming band that extends to anal margin, three evenly spaced black marks in basal two-thirds of cell Cu_2-2A , arc of five small postdiscal black spots extends from costa to cell Cu_1-Cu_2 , becoming faint below vein M_3 ; postdiscal black triangle at costa, submarginal row of five small, horizontally elongate black spots centered around each of veins $2A$ to M_2 , a black bar extending from vein M_1 to costa, six larger black marginal spots in anal cell and each of cells Cu_2-2A to M_1-M_2 , all round except that in cell Cu_2-2A vertically elongate; thin black line at very distal margin, fringe brown. Hindwing differs from forewing in following ways: costal and anal margin black, postdiscal arc of black spots very faint, marginal black spots become smaller towards apex. **Ventral surface:** Forewing ground color brown, pale brown at anal margin; black markings as on dorsal surface except each is more prominent and block-like, those in anal cell occupy width of cell, distal-most one disjointedly diagonal with orange scaling on either side, orange scaling

distal to remaining postdiscal line, increasing in extent from costa to cell Cu_1-Cu_2 where it forms large square; distal portion of wing black, orange marginal scaling with proximally pointed triangles encloses six black spots as on dorsal surface. Hindwing differs from forewing in following ways: anal margin not paler brown, some orange scaling present between medial black blocks of discal cell, postdiscal orange scaling reduced. **Head:** First and third segments of labial palpi black, second segment orange with some black scaling, third segment very short. Eyes bare and brown, margins orange. Frons black with orange lateral scaling. Antennae missing. **Body:** Dorsal and ventral surface of thorax black, patagia orange; segments one, two and eight of abdomen black, remainder with orange rings posteriorly that are most prominent dorsally and posteriorly; continuous band of concealed androconial scales present on upper anterior half of abdominal tergites 4 and 5 (fig. 8c) (see HARVEY 1987, and HALL & WILLMOTT 1996b for SEM illustrations of this scale type). All legs black. **Genitalia** (figs. 8a-b): Uncus angular, small "V"-shape indentation at posterior margin dorsally; vinculum markedly laterally convex, slightly swollen in upper half, produced into broad but short saccus ventrally; valvae consist of two short, rounded projections, an upper one that is lightly sclerotised medially and joins over aedeagus with thin band of sclerotised tissue, and a slightly shorter inwardly directed lower one; aedeagus very short and broad with broad tip that is slightly longer on right side, internal structures consist of a single large cornutus with two smaller ones behind on left side of vesica, and a semicircular row of small rounded teeth along right side; pedicel produced into posteriorly projecting "horn" that is broad dorsally to support aedeagus, ventral margins serrate medially, tip blunt and slightly concave.

Female.- Unknown.

Type-material: HOLOTYPE male, PERU, Amazonas, Mendoza, Quebrada Huarmiyacu, 2000 m, 06°23'S 77°27'W, Aug 1998 (B. Calderón); in the MUSM.

Etymology: A noun in apposition in the genitive case; the species is named after the local Peruvian collector, Benigno Calderón, who obtained the unique holotype.

Remarks: *S. calderoni* superficially resembles several orange and black spotted *Symmachia* species that are all restricted to lowland habitats, such as *S. virgatula* Stichel, 1910, *S. pardalis* Hewitson, 1867, *S. phaedra* (Bates, 1868), *S.*

tigrina Hewitson, 1867, and *S. eraste* (Bates, 1868), but closely resembles none, and it is not clear what it might be most closely related to. Only the last three species approximate *calderoni* in its very small size, and *phaedra* belongs to the "phaedra group" of species that possess two round divided patches of concealed androconial scales on male abdominal segments 4 and 5 (see HALL & WILLMOTT 1996b). As the only similar species to have parallel black lines at the margins of both wings, we tentatively suggest that *eraste* may be closely related to *calderoni*. These lines take the form of bands instead of spots in *eraste*, but the remaining ventral pattern elements are also somewhat similar. Unfortunately the unique male type of *eraste* lacks an abdomen and thus no comparisons of male genitalia can be made. However, it is worth noting that, although several species of *Symmachia* possess a male genitalic pedicel that is produced into a posteriorly projecting "horn", in the approximately half of the species in the genus whose male genitalia have been examined, none have been found to possess the bluntly angular tip to the horned pedicel nor the ventral serrations found in *calderoni*.

Symmachia calderoni is currently known only from the unique holotype from northeastern Peru, but it is sure to have a broader Andean distribution, extending at least northwards into Ecuador. It is clearly a very rare species, as no further specimens have been located in the world's major collections. *S. calderoni* was collected at the upper elevational limit known for symmachiine species, and it is most probably confined to lower montane forest habitats.

Lasaia maritima Hall & Lamas, *sp. n.*

Male (figs. 4a-b).- FW length 12-14 mm ($n=5$). Forewing costa straight, distal margin slightly convex with small indents at margins of cells Cu_2-2A and M_3-Cu_1 ; hindwing slightly angular and pointed at tornus with small indents at margins of cells Cu_2-2A to M_1-M_2 . **Dorsal surface:** Forewing ground color iridescent blue-green; two black marks in discal cell with paler blue-green distally, one black mark at base of cell Cu_2-2A , inwardly diagonal line of three discal black marks, one marking discal cell end; jagged postdiscal line of black marks is outwardly diagonal from costa to vein Cu_2 , then slightly inwardly diagonal and increasingly faint to vein 2A, three dirty white flecks distal to line at costa, submarginal row of black spots in cells Cu_2-2A to $R_{4+5}-M_1$, two in cell Cu_2-2A , apex dark brown; fringe brown with faint white scaling at margins of cells Cu_2-2A , M_3-Cu_1 and $R_{4+5}-M_1$. Hindwing differs from

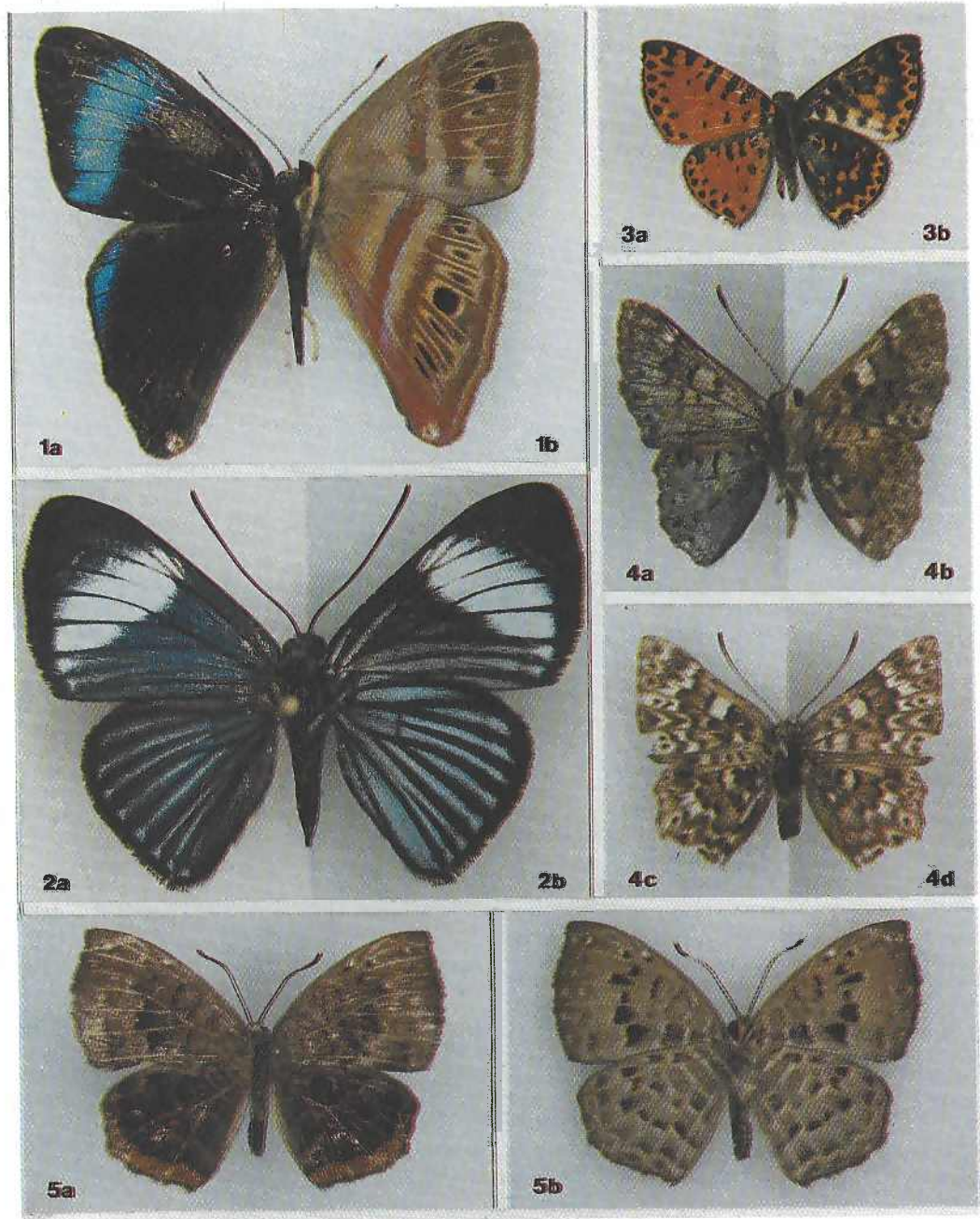
forewing in following ways: ground color a uniform shade of iridescent blue-green with brown at costal margin; all black markings fainter, all but submarginal spots barely visible below discal cell and vein M_3 ; fringe with white scaling variably prominent at margins of cells Cu_2 -2A to M_1 - M_2 , remainder brown. **Ventral surface:** Forewing differs from dorsal surface in following ways: ground color brown, basal, discal and postdiscal lines dark brown and more prominent, distal third of discal cell dirty white, dirty white scaling distal to postdiscal line in cell Cu_2 -2A, submarginal spots surrounded by dark dirty white with variably pointed dark brown semicircles proximally, that in cell Cu_1 - Cu_2 triangular. Hindwing differs from dorsal surface in following ways: ground color brown, basal, discal and postdiscal lines dark brown and more prominent, three additional dark brown spots apparent at base of cell R_5 - M_1 and one at base of costa, faint dirty white scaling distal to distal-most of these in cell R_5 - M_1 , ground color of anal cell dirty white, submarginal spots as on ventral forewing. **Head:** Labial palpi pale brown. Eyes brown and setose, margins dirty white. Frons brown. Antennal segments brown with white basal scaling, very narrow region devoid of scales along inner-ventral edge; tubular clubs brown, tips orange-brown. **Body:** Dorsal surface of thorax and abdomen blue-green, ventral surface pale brown. All legs brown. **Genitalia** (fig. 9): Uncus angular, a rounded "W"-shape indentation at posterior edge dorsally; tegumen with prominent notch at anterior margin; vinculum slightly posteriorly projecting and swollen medially, wraps under valvae ventrally; *processus superior* (*sensu* CLENCH 1972) of valvae slightly more posteriorly elongate dorsally, ventrally sheathing aedeagus, *processus inferior* of valvae a lightly sclerotised rounded rectangle; aedeagus long and thin, curved dorsally, and tapering gradually to pointed tip; pedicel posteriorly elongate (same length as *processus superior*), tipped with rounded scobinate patch with numerous fine setae dorsally.

Female (figs. 4c-d).- Differs externally from male in following ways: FW length 12-13 mm ($n=6$). Wing shape more compact, hindwing more angular. Dorsal surface differs from ventral surface of male by having slightly paler brown ground color, more prominent basal dark brown markings on hindwing and dirty white scaling surrounding submarginal spots, an entirely dirty white band distal to postdiscal line on forewing, and one that is only prominent in cells M_3 - Cu_1 and M_2 - M_3 on hindwing, anal cell brown. Ventral surface same as dorsal surface.

Type-material: HOLOTYPE male, PERU, Piura, Cerro Illescas, Reventazón, 50 m, [06°07'S 80°59'W], 25 May 1982 (G. Lamas); in the MUSM. ALLOTYPE female, same data as HT. PARATYPES: 3 males, 3 females, same data as HT; 1 male, 1 female, PERU, La Libertad, Puerto Mori, 0 m [sea level], [08°24'S, 78°54'W], 28 May 1982 (G. Lamas & E. Pérez); all in the MUSM; 1 female, PERU, Piura, Lobitos, [04°27'S 81°17'W], Apr 1929 (H. F. Slattery); in the Natural History Museum, London, UK (BMNH).

Etymology: A feminine adjective; the species name refers to its restricted coastal distribution.

Remarks: *Lasaia maritima* sp. n. is most closely related to *L. aerugo* Clench, 1972. This latter species was described by CLENCH (1972) from a single male specimen from the dry upper Marañón valley of Peru's north-east Andean department of Cajamarca, but the species is now known from both sexes from 600-2000 m in this department and on the west Andean slope of the equally dry neighbouring Loja area in southern Ecuador (HALL & LAMAS unpubl. data). *L. maritima* appears to replace *aerugo* in the much drier, desertic, seaboard habitat of the same general region. Both sexes of *maritima* are consistently smaller (male: 12-14 mm; female: 12-13 mm) than those of *aerugo* (male: 15-15.5 mm; female: 14.5 mm), the male has greener dorsal coloration and the basal and postdiscal black dorsal markings are reduced. The ventral surface in both sexes of *maritima* is also considerably darker, with the pale areas at the submargin of both wings and at the base of the hindwing in the male of *aerugo* being barely distinguishable from the dark brown background in male *maritima*. Pale areas on the ventral surface of male *maritima* are restricted to the end of the forewing discal cell, the anal margin of the hindwing, and distal to the postdiscal jagged line in the apex and at the tornus of both wings. The distance between the postdiscal and submarginal lines is also reduced in *maritima*, a character that is most prominently perceived in females since the intervening area contains pale dirty white scaling in this sex that is not present in female *aerugo*. The basal and submarginal areas of both wings in female *maritima* are also paler than those in female *aerugo*. The male genitalia of both species are very similar, but in *maritima* the *processus inferior* of the valvae extends further posteriorly, reaching the same length as the lateral portion of the



FIGURES 1-5.- 1. *Euselasia perisama* Hall & Lamas, sp. n., holotype male: a) dorsal surface, b) ventral surface; 2. *Uraneis incubus* Hall, Lamas & Willmott, sp. n., holotype male: a) dorsal surface, b) ventral surface; 3. *Symmachia calderoni* Hall & Lamas, sp. n., holotype male: a) dorsal surface, b) ventral surface; 4. *Lasaia maritima* Hall & Lamas, sp. n., holotype male: a) dorsal surface, b) ventral surface; allotype female: c) dorsal surface, d) ventral surface; 5. *Napaea tumbesia* Hall & Lamas, sp. n., holotype male: a) dorsal surface, b) ventral surface.

processus superior, while the pedicel is slightly shorter than that in *aerugo*, only reaching the end of the *processus superior* instead of the mid-point between the end of the *processus superior* and the aedeagal tip.

Lasiaia maritima is currently only known from a narrow coastal zone in the northwestern Peruvian departments of Piura and La Libertad; but it is likely to also occur further north in the Peruvian department of Tumbes and the neighbouring Ecuadorian province of El Oro. This very dry region contains pockets of sparse vegetation, consisting of some grasses (*Distichlis spicata*), some succulents, a legume shrub of the genus *Parkinsonia*, and a few mesquite trees (*Prosopis* sp.), surrounded by desert. It is quite likely that the larvae of *maritima* feed on *Prosopis* (Fabaceae), as both sexes have been found in close association with these trees, and the related legume genus *Albizia* is the reported foodplant for the only *Lasiaia* species reared thus far (DEVRIES *et al.* 1994).

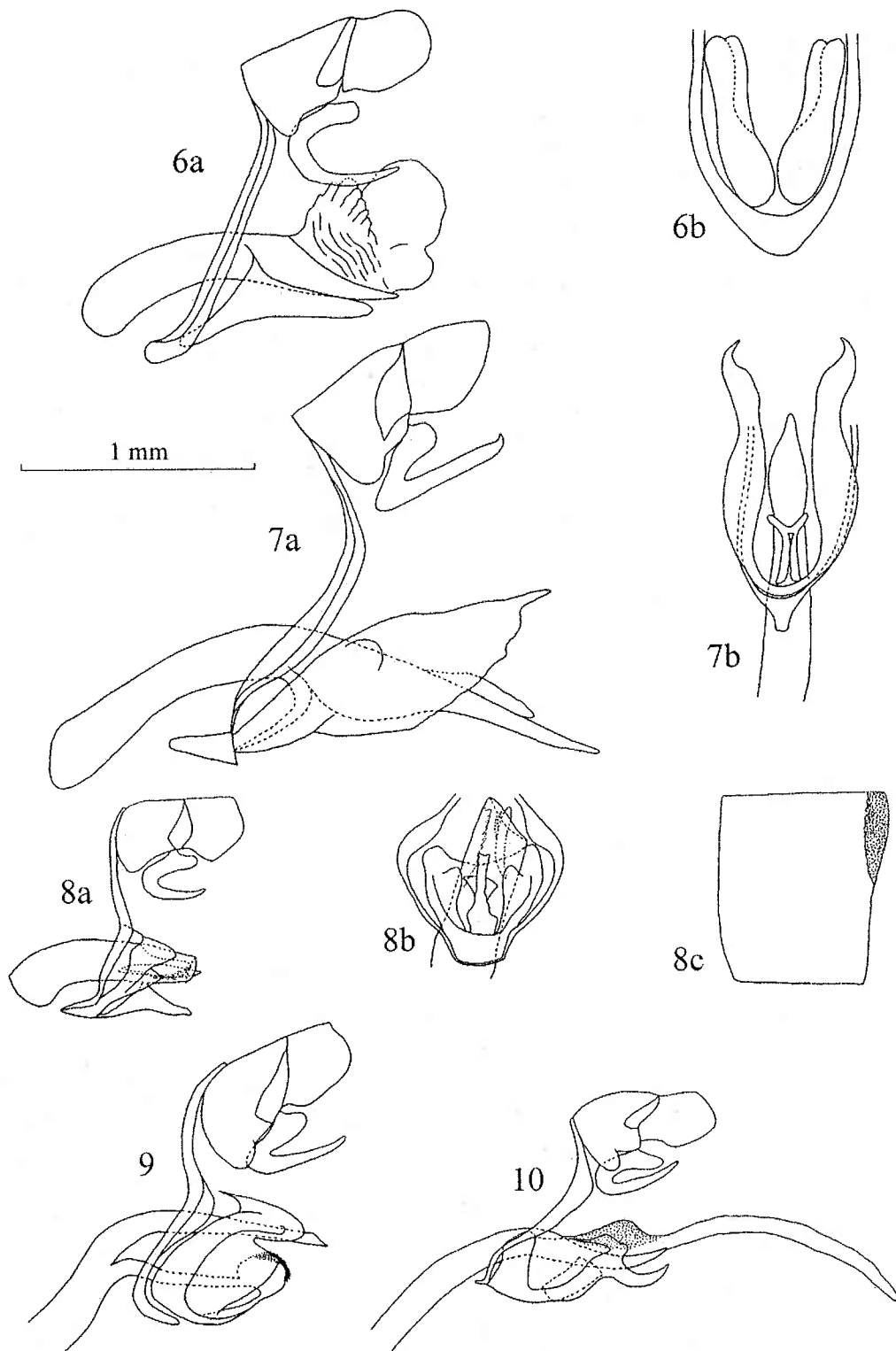
Napaea tumbesia Hall & Lamas, *sp. n.*

Male (figs. 5a-b).- FW length 14-17 mm (n=10). Wing shape compact; forewing costa convex, distal margin convex, creating slightly falcate apex; hindwing angular, most produced at vein M_3 . **Dorsal surface:** Forewing ground color pale brown; two large dark brown rings in discal cell, one around discal cell end, two rectangular ones towards base of cell Cu_2-2A and one smaller round one at base of cell Cu_1-Cu_2 ; jagged dark brown postdiscal line consists of two marks with immediately distal white spots towards base of cells $R_{4+5}-M_1$ and R_2-R_3 , a disjointed line with immediately distal faint dirty white scaling diagonally crossing cells M_2-M_3 and M_1-M_2 , and a jagged vertical line extending from vein M_3-Cu_1 to anal margin; proximal dark brown scaling becomes more prominent towards anal margin; faint dark brown submarginal marks increase in size towards tornus, those in cells M_2-M_3 to $R_{4+5}-M_1$ with small dirty white spot immediately proximally, that in cell $R_{4+5}-M_1$ the most prominent; fringe brown. Hindwing ground color pale brown, paler brown at anal margin; two large dark brown filled circles in discal cell, one around discal cell end, two rectangular ones towards base of cell Cu_2-2A and one smaller round one at base of cell Cu_1-Cu_2 ; jagged dark brown postdiscal band extends from anal margin to vein M_2 then kinks inwards; broad red-brown marginal band of approximately even width with a dark brown band of equal width proximally

extends from tornus to vein M_1 and contains faint dark brown scaling in each cell, fringe brown. **Ventral surface:** Forewing differs from dorsal surface in following ways: ground color paler brown, rings at wing base highlighted by paler instead of darker brown, dark brown elements of postdiscal band better defined, submarginal marks highlighted in paler instead of darker brown. Hindwing differs from dorsal surface in following ways: ground color paler brown, rings at wing base highlighted by paler instead of darker brown, three additional dark brown marks visible in basal half of costal region, dark brown elements of postdiscal band better defined and substantially reduced in extent, submarginal dark brown markings less prominent and reduced in extent, marginal dark brown markings more prominent, red marginal band only very faintly discernible from dorsal surface. **Head:** Ventral surface of labial palpi pale brown, dorsal surface brown, second segment very elongate. Eyes bare and brown, margins pale brown. Frons dark brown with pale brown lateral scaling. Antennal segments brown with white basal scaling, ovoid area devoid of scales along inner-ventral edge; clubs brown, tips orange-brown. **Body:** Dorsal surface of thorax and abdomen dark brown; ventral surface pale brown. All legs pale brown. **Genitalia** (fig. 10): Uncus very slightly angular, a rounded "V"-shape indentation at posterior edge dorsally; vinculum slightly swollen in upper half, tiny saccus ventrally; valvae rectangular with rounded ventral margin, an upwardly pointed projection at upper posterior corner with a small square projection dorsally at base; aedeagus a shallow upturned "U"-shape of approximately even width with pointed tip, everted vesica an elongate tube of approximately even width but with expanded area at base with tiny evenly spaced spines dorsally; pedicel very broad and slightly sclerotised medially.

Female.- Unknown.

Type-material: HOLOTYPE male, PERU, Tumbes, Puesto Campo Verde, 700 m, [03°49'S 80°12'W], 21-23 May 1982 (G. Lamas & E. Pérez); in the MUSM. PARATYPES: 6 males, same data as HT; 1 male, PERU, Tumbes, B. N. Tumbes, entre Quebrada Los Naranjos y P. V. Figueroa, 500-650 m, 03°50-52'S 80°09-14'W, 20 Feb 1996 (J. Grados); 1 male, PERU, Tumbes, B. N. Tumbes, entre P. V. Campo Verde y P. V. Cotrina, 300-450 m, 03°48-51'S 80°09-10'W, 23 Feb 1996 (J. Gra-



FIGURES 6-10.- Male genitalia in lateral view unless otherwise stated: 6. *Euselasia perisama*: a) lateral view of genitalia, b) ventral view of valvae; 7. *Uraneis incubus*: a) lateral view of genitalia, b) ventral view of genitalia; 8. *Symmachia calderoni*: a) lateral view of genitalia, b) ventral view of genitalia, c) lateral view of fifth male abdominal tergite, illustrating distribution of concealed androconial scales; 9. *Lasia maritima*; 10. *Napaea tumbesia*.

dos); all in the MUSM; 1 male, PERU, Tumbes, B. N. Tumbes, Quebrada Faical, 450 m, 03°50'S 80°16'W, 26 Feb 1996 (J. Grados); deposited in the USNM.

Etymology. A feminine adjective; the species is named after the Tumbesian center of endemism to which it is believed to be confined.

Remarks. The wing shape, pattern and male genitalic structures of *N. tumbesia* sp. n. clearly place it in the "phryxe group" of *Napaea*, which includes *N. agroeca* Stichel, 1910 (= *N. umbratica* Zikán, 1952, *syn. n.*), *N. phryxe* (C. & R. Feider, 1865), *N. umbra* (Boisduval, 1870), *N. danforthi* Warren & Opler, 1999, and a fifth taxon from southeast Brazil (figured by D'ABRERA 1994: 936 as male *N. agroeca*) whose exact status is currently uncertain since the type is not known for *N. cebrenia* (Hewitson, 1873), a name that may apply to it (HALL & HARVEY in prep.). Its members are recognised by their plain brown dorsal surfaces and by possessing dark brown rings at the base of both wings. *N. agroeca* and *N. danforthi* are readily distinguished from the remaining species of the group, as they do not have their strongly convex distal forewing margins with variably falcate forewing apices, and angular hindwings. *N. tumbesia* differs in wing pattern from *N. phryxe* and *N. umbra* by possessing a prominent red band at the margin of the dorsal hindwing, broader dark brown postdiscal bands on both dorsal wing surfaces, and white spots distal to the upper portion of the forewing postdiscal band. The male genitalia of *Napaea* species largely differ only in the shape of the valvae and in the configuration of the aedeagal cornuti. While the valvae differ slightly between species of the "phryxe group", each species possesses distinctive internal aedeagal structures and these best characterise them. *N. agroeca*, *N. danforthi*, *N. phryxe*, and *N. umbra* each possess prominent spines that differ in number, size and placement on a vesica of even width, while *N. tumbesia* has an expanded region at the base of the everted vesica that is evenly studded with tiny spines dorsally (visible only above 60x magnification).

N. tumbesia is currently only known from the northwestern Peruvian department of Tumbes, but since the dry deciduous forest that it inhabits extends into the adjacent provinces of El Oro and Loja in southwestern Ecuador, the species is sure to occur in that country. This general region of Peru and Ecuador is known as the Tumbesian center of endemism (BIBBY *et al.* 1992, BEST & KESSLER 1995) (also referred to as the "Porculla" biogeographic unit by LAMAS

[1982]), and other riordinid species endemic to this isolated region of dry forest include *Euselasia jigginsi* Hall & Willmott, 1998, *Charis calagutis* Hewitson, 1871, and *Melanis leucophlegma* (Stichel, 1910). No specimens of *N. tumbesia* have been located in the world's major collections, undoubtedly because of its limited geographic range. Most individuals were captured while nectaring on flowers of Asteraceae.

Label data indicate that most species of the "phryxe group" of *Napaea* are confined to dry forest habitats, and *N. agroeca* and *N. phryxe* occur in such habitats in southeast Brazil, *N. danforthi* in such habitats in northern Mexico (WARREN & OPLER 1999), and *N. umbra* in similar habitats from Mexico to Costa Rica (DEVRIES [1997] must have been confusing *umbra* with the very similar *phryxe* when he cited the range of *umbra* as being Mexico to Brazil). Without any conclusive morphological evidence, it would seem most parsimonious to assume that *N. tumbesia* is most closely related to the phenotypically most similar and geographically closest west Andean species in the "phryxe group", *N. umbra*. The two species are presently separated by the expanse of the wet Chocó region that extends from northwest Ecuador to Panama.

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