

A NEW *POTAMANAXAS* (HESPERIIDAE: PYRGINAE: ERYNNINI), PATTERNED LIKE *P. BANA*, BUT WITH SICKLE-ARMED GENITALIA, NOT CHICKEN CLAWS

Nick V. Grishin

Howard Hughes Medical Institute and Departments of Biophysics and Biochemistry, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd, Dallas, TX, USA 75390-9050;
Research Associate, McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL, USA 32611-2710;
email: grishin@chop.swmed.edu

Abstract – A new species of *Potamanaxas* is described from West Andes in Colombia. *P. serp*, **sp. nov.** is very similar to *P. bana* E. Bell, 1956 in wing patterns, but differs profoundly in male genitalia, which uniquely characterize it. This pair of superficially close species, one with extended, sickle-shaped cuculli and the other one with very short, vestigial cuculli apparently parallels the relationship in another *Potamanaxas* pair: *P. perornatus* Hayward, 1940 (extended) and *P. andraemon* (Mabille, 1898) (short). Comparative analysis of male genitalia and possible sympatry in Ecuador suggest that *P. trigga* Evans, 1953 **new status**, is a distinct biological species and not a subspecies of *P. laoma* (Hewitson, 1870) as originally proposed. Primary type specimens and their genitalia are illustrated for relevant taxa.

Resumen – Una nueva especie de *Potamanaxas* se describe para la Cordillera Occidental en Colombia. *P. serp*, **sp. nov.** es muy similar a *P. bana* E. Bell, 1956 en patrones de ala, pero difiere profundamente en los genitales masculinos, que caracterizan de manera única. Este par de superficialmente especies cercanas, uno con cuculli extendida en forma de hoz y el otro con cuculli vestigial muy corto aparentemente es paralela a la relación en otro par *Potamanaxas*: *P. perornatus* Hayward, 1940 (extendida) y *P. andraemon* (Mabille, 1898) (corto). Análisis comparativo de los genitales masculinos y posible simpatria en Ecuador indican que *P. trigga* Evans, 1953 **nuevo estatus**, es una especie biológica distinta y no una subespecie de *P. laoma* (Hewitson, 1870) según la propuesta original. Espécimen tipo primarios y sus genitales están ilustrados para los taxones relevantes.

Key words: taxonomy, skipper butterfly, sister species, Neotropics, tuft of scales.

Many closely related species of skippers (Lepidoptera: HesperIIDae) share virtually indistinguishable facies, but evolve to have distinct, frequently dramatically different genitalia. One of the best known examples is probably genus *Celotes* Godman & Salvin, 1899. Initially monotypic and erected for *C. nessus* (W. H. Edwards, 1877), it was expanded by description of *C. limpia* Burns, 1974, which can be told apart by its unique genitalia and details of the thoracic pouch (Burns 1974). However, wing pattern characters fail to distinguish the two species. The third, more recently described species *C. spurcus* A. Warren, Steinhäuser, Hernández-Mejía & Grishin 2008 is also easily told apart by genitalia and scales on the thoracic pouch, but not by wing patterns (Warren *et al.* 2008). Other such difficult genera include *Staphylus* Godman & Salvin, 1896, *Gorgythion* Godman & Salvin, 1896 and *Ebrietas* Godman & Salvin, 1896 among many more. Therefore close inspection of HesperIIDae genitalia is fruitful for discovery of new species.

Another aspect of genitalic evolution in skippers is frequent parallelism in development of structures in different groups of closely related species. Such parallelism may be nothing more than a reflection of evolutionary plasticity in genitalia, which shape is tuned largely by a few regions in DNA, and a limited accessibility of possible shapes. One of the most familiar examples might be *Erynnis* Schrank, 1801 and differential expression of asymmetry in valvae (“clasps” of Evans 1953, see Scott 1986 for illustrations). For instance, closer relatives *E. icelus* (Scudder & Burgess, 1870) and *E. brizo* (Boisduval & Le Conte, [1837]) differ in the length and broadness of cucullus (“cuiller” of Evans 1953) in the left valva: thinner and longer in the former species, but stouter and shorter in the latter. On the other hand, similar-looking members of a different subgenus: *E. tristis tatus* (W. H. Edwards, 1883) and *E. scudderi* (Skinner, 1914) seemingly parallel that in having left valva with long and very narrow cucullus in the former, but very short cucullus in the latter.

Here, I report a new species of *Potamanaxas* Lindsey, 1925 that possesses very distinct male genitalia, but a wing pattern that may be confused with *P. bana* E. Bell, 1956. Interestingly, genitalic differences between the new species and *P. bana* parallel those found in other two *Potamanaxas* sister species: *P. perornatus* Hayward, 1940 and *P. andraemon* (Mabille, 1898) (Grishin 2013).

MATERIALS AND METHODS

Potamanaxas specimens were examined in the following collections: McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL (MGCL);

American Museum of Natural History, New York, NY (AMNH); Natural History Museum, London, UK (BMNH); National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM); Museum für Naturkunde, Berlin, Germany (ZMHB); Carnegie Museum of Natural History, Pittsburgh, PA (CMNH); Academy of Natural Sciences Philadelphia Collection, Philadelphia, PA (ANSP); Senckenberg Museum für Tierkunde, Dresden, Germany (MTD); Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (DEI); and Texas A&M University Insect Collection, College Station, TX (TAMU). Standard entomological techniques were used for dissection (Robbins 1991), i.e. adult abdomen was broken off, soaked for 40 minutes (or until ready) in 10% KOH at 60°C (or overnight at room temperature), dissected and subsequently stored in a small glycerol-filled vial on the pin under the specimen. Genitalic and wing venation terminology follows Steinhäuser (1981). Length measurements are in metric units and were made from photographs of specimens taken with a scale and magnified on a computer screen. Photographs of specimens and dry genitalia were taken by the author with Nikon D200 or D800 cameras through a 105 mm f/2.8G AF-S VR Micro-Nikkor lens; dissected genitalia were photographed in glycerol with Nikon D200 camera without lens through microscopes. Images were assembled and edited in Photoshop CS5.1. Dissected genitalia photographs were taken in several focus planes and stacked in Photoshop to increase apparent depth of field.

RESULTS AND DISCUSSION

My first glance at a drawer with *Potamanaxas* specimens at the MGCL collection revealed a large isolated specimen that I thought was *P. bana*, which I knew only from the holotype and photographs by Petit (2013). Broad white areas on the dorsal hindwing and yellowish pale spots on the forewing, especially near the apex, give *P. bana* (and this specimen) quite a distinct appearance to stand out from *P. laoma* (Hewitson, 1870) and relatives. Brief inspection of this specimen’s genitalia *in situ*, well-expanded and with scales carefully brushed off likely by S. R. Steinhäuser (the Steinhäusers collected it), revealed very long, laterally flattened and curved cuculli, not observed in *P. bana*. In fact, the illustration of *P. bana* valva in the original description (Bell 1956) looks odd and unlike any other species of *Potamanaxas* – it shows distal end of cucullus seemingly turned dorsad (Plate VII, Fig. 41d) and located where the usual basal process of cucullus (“style” of Evans 1953) would be

in many other *Potamanaxas* species, such as *P. laoma* (Hewitson, 1870) and *P. perornatus* (Plate VII, Fig. 36a). However, the main prong of cucullus that extends caudadorsad in other *Potamanaxas* species was missing from the sketch (Plate VII, Fig. 41d). Was it accidentally broken off? Inspection of both valvae on *P. bana* holotype genitalia slide in AMNH did not suggest any signs of caudal damage. Instead, it revealed the vestigial main prong of the cucullus, which was bulbous and sharply turned dorsad, almost aligning the direction with the basal process and hidden within it in lateral projection in one of the valvae (Plate VII, Figs. 41a, b). This explains why the main prong was not drawn explicitly, but apparently was marked as a small black triangle within the cucullus on Bell's sketch. Interestingly, valvae with a strong basal process and underdeveloped cucullus, while not as extreme as in *P. bana*, have been observed in other species, e.g. *P. andraemon* (Plate VII, Fig. 36b) and *P. laoma cosna* Evans, 1953. Therefore, profound differences in the cuculli shape of the MGCL Steinhauser specimen and *P. bana* holotype strongly argue that the former is a distinct species that is named herein.

***Potamanaxas serp* Grishin, new species**
(Plate IV, Figs. 1–2; Plate VII, Fig. 34)

Description.— *Male* (Plate IV, Figs. 1–2): right forewing length = 16 mm in holotype. **Forewing** apex rounded, costa short and convex, margin strongly convex. **Dorsal forewing** largely brown with complex pattern of white, violet and yellow: creamy-white discal band separated into spots by rows of brown scales along the veins and central crease of discal cell, this band from costa to Cu_2 vein, mostly contained between the origin of Cu_2 vein and distal end of Sc vein, basal margin of the band indented at the central crease of discal cell, distal margin convex from costa to Cu_1 vein origin, L-shaped belt of brown scales through the discal cell from the origin of R_1 vein to the middle between the origins of Cu_1 and Cu_2 veins, subapical-postdiscal band of pale spots from between the veins R_3 and R_4 at costa to the origin of Cu_1 vein, this band fused with the discal band at the base of M_3-Cu_1 cell, spots in M_1-M_2 and M_2-M_3 cells mostly yellow with a broader area of brown scales between them along M_2 vein, spot in R_5-M_1 cell mostly violet, small violet spots at the bases of R_3-R_4 and R_4-R_5 cells, small yellow spots near costa in R_1-R_2 and R_2-R_3 cells, marginal areas of yellow scales in each cell, areas of violet scales by the wing base and postdiscally in the posterior half of the wing, brown submarginal spots in all cells from costa to 2A vein, Cu_2-2A cell with kidney-shaped pale yellow spot in the middle, a doublet of yellow spots surrounded by violet scales at basal quarter, patch of yellow scales at the base, large brown submarginal spot surrounded by yellow patches and basal areas of violet, cell 2A mostly with violet scales, brown in the middle and with yellow patch by anal margin near tornus. **Ventral forewing** largely brown distad the line from mid-costa to tornus, creamy-white basad, dorsal pattern vaguely showing, diffuse brown spots in costal cell basal quarter and in Cu_2-2A cell base, cream subapical spots in cells between R_3 and M_1 veins, cream spots by costa in R_1-R_2 and R_2-R_3 cell, median band of cream spots separated by brown veins and fusing with the basal pale area of the wing from R_3 vein to the base of M_3-Cu_1 cell, dark brown submarginal spot in each cell between R_4 and 2A veins, spots largest in R_4-R_5 and R_5-M_1 cells, spot vaguely defined in Cu_2-2A cell, cream marginal spot distad of each submarginal spot, cream spot doublet in Cu_2-2A cell; terminal brown line. **Hindwing** apex and tornus rounded, margin convex from apex to Cu_1 vein, slightly concave from Cu_1 to tornus. **Dorsal hindwing** brown, covered with slate-white hair-like scales denser basad, a row of brown submarginal spots, one spot in each cell between $Sc+R_1$ and 2A veins, diffuse pale-yellow spots distad of these brown spots, extensive creamy white with yellowish tinge postdiscal areas in the anterior half of the wing, separated by brown veins and crossed by a brown postdiscal belt from M_1 vein to 2A vein, creamy spot in the anterior half of the discal cell. **Ventral hindwing** mostly creamy white, brown spot at the distal end of discal cell near the origin of R_s vein, vague brown spot overscaled with creamy white in Cu_2-2A cell near the distal end of discal cell, postdiscal band of brown spots, one spot in each cell between veins R_s and 2A, spot in M_2-M_3 cell offset distad, submarginal row of brown spots, one spot in each cell between $Sc+R_1$ and 2A veins, some spots arrowhead-shaped, tornus creamy-white, terminal brown line. **Fringes** brown, slightly paler than wing margins, with white scales particularly below; mostly white around hindwing apex. **Head** dark brown, cream spots between palpi, by antennae and behind eyes, eyes dark brown, palpi dark brown with white scales above, grayish-cream below, antennae dark-brown, beneath with white scales at segments. **Thorax and abdomen** dark-brown above, cream-grayish-white below; thorax above with patches of pale yellow scales, abdomen above

with cream-white scales near segment boundaries, legs mostly cream with brown scales. **Male genitalia** (Plate VII, Fig. 34): tufts of hair-like scales near the bases of valvae pale yellow-brown (wheat color) slightly paler at the bases, genitalia not dissected on the sole available specimen of this species because they were sufficiently exposed to be examined *in situ* and to distinguish this species from its described relatives; uncus arms thinner than in the *P. laoma* group species, cucullus extended, sickle-shaped, about twice as long as its basal process, not separated from the body of valva by a “neck”-like constriction basad of this process, but base of cucullus widens gradually anteriorly, collinear with the ampulla and costa; cucullus laterally flattened, narrowing caudad to a rounded flat tip, and slightly twisted inward and dorsad, irregularly serrated along the dorsal margin; basal process of cucullus thin, rod-like; margin of ampulla almost perpendicular to the axis of cucullus basal process, separated from the process by a wide L-shaped gap.

Female: unknown or unrecognized.

Types.— Holotype male, with the following four labels, rectangular in shape: white, printed, handprinted: || COLOMBIA: Valle del Cauca; | RIO CALI 1900 m. | 11/ I / 1976 | No. CH-1400 Coll. | by S.R. y L.M. Steinhauser || ; white, printed, handwritten: || *Potamanaxas violacea* | Dognin ♂ | Det: S. R. Steinhauser || ; white, printed: || A. C. Allyn | Acc. 1976-3 || ; red, printed: || HOLOTYPE ♂ | *Potamanaxas* | *serp* Grishin || . The holotype is in the collection of the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, FL.

Type locality.— Colombia: Valle del Cauca department, Rio Cali, elevation 1900 m. This location is on the eastern slopes of West Andes and judging from high elevation, is at least 5 miles west of Cali.

Etymology.— “*serp*” (Belarusian, Russian and Ukrainian: *cepr*, Serbian: *cpn*, Polish: *sierp*, Bosnian, Estonian: *sirp*, Croatian, Czech and Slovenian: *srp*) is a Slavic word for sickle, and refers to the shape of cuculli in male genitalia, which is the most distinctive character of the new species. The name is pronounced as “seraph” with “p” instead of “aph”, i. e. /sɛrɸ/ in International Phonetic Alphabet and is a non-latinized noun in apposition.

Distribution and phenology.— The species is known only from the holotype collected near Cali in West Andes of Colombia in January. Live individuals that superficially resemble this species were photographed near Medellin, about 350 km north-north-east of the type locality (Plate VI, Figs. 29–33). However their identity is not clear because genitalia were not examined. They might be *P. bana* or yet another undescribed species.

Justification of the new species status.— Using Evans (1953), the new species keys out to *P. laoma*, possibly to subspecies *violacea* (Dognin, 1888), as stated by Steinhauser on the determination label of the sole available specimen. Genitalia, while not dissected, were well exposed. This was apparently done on a fresh specimen because tufts of hair-like scales at the bases of valvae were expanded and spread out on both sides (Plate VII, Fig. 34). Genitalia were partly squeezed out, which caused the tufts to expand, and scales were brushed off valvae. It appears that Steinhauser used characters of valvae in his determination. Out of six *P. laoma* subspecies listed in Evans (1953), the wing pattern best matches the description of *violacea* and *cosna*, stated to be similar to each other and paler than the rest. Seemingly, *cosna* was rejected by Steinhauser because its “Clasp [is] much shorter” (Evans 1953). It is likely that *P. bana*, discovered after Evans book was published (Bell 1956), was also rejected for the same reason of having a very short cucullus. On the other hand, Evans writes that in *P. laoma trigga* Evans, 1953 “Clasp [is] more slender”, which agrees well with the specimen, but the facies description indicates that *trigga* is a darker subspecies, even somewhat darker than nominal *laoma*. Moreover, Evans genitalia sketch of *violacea* (Evans 1953: plate 42, E.49.10) is not particularly accurate showing very long cucullus matching well the specimen in question. Apparently, without inspection of genitalia and facies of primary types involved and some analysis of variation of the characters in longer series of specimens, the identification label “*Potamanaxas violacea*” might have been the best choice.

However, this identification is incorrect, because the characteristics of the Steinhauser specimen are not consistent with any of the six *P. laoma* subspecies. Many specimens of these taxa are illustrated in Warren *et al.* (2013) and a compilation of literature references is given by Mielke (2005). Dark appearance and details of wing patterns given by Evans (1953) rule out *P. laoma fumida*

(Draudt, 1922) and *P. laoma trex* Evans, 1953. The “clasp much shorter” (Evans 1953) trait and divided lower pale area in forewing discal cell rule out *P. l. cosna*. Primary type specimens of the remaining trio are illustrated in Plate IV, Figs. 7–8 (*trigga*), Plate V, Figs. 11–16 (*violacea*), 21–22 (*laoma*), and their genitalia are shown in Plate VII, Figs. 40 (*trigga*), 43–44 (*violacea*), 42 (*laoma*). It is apparent, that facies of the Steinhauser specimen do not agree well with any of these three subspecies. More specifically, the Steinhauser specimen is paler (especially on hindwing) than the palest *violacea*: creamy areas are larger, marginal brown rim is with more extensive pale overscaling and diffuse pale areas, dark submarginal spots are smaller and better defined. On the forewing, pale spots are yellower than in *P. laoma* subspecies.

The genitalia definitively refute identification of the Steinhauser specimen as *P. laoma*. First, the nominal *laoma* subspecies (Plate VII, Fig. 42) possesses bulbous and thick cucullus, about the same length as the basal dorsally directed process; caudal margin of ampulla is almost parallel to this basal process and is separated from it by a narrow and deep U-shaped gap. The Steinhauser specimen (Plate VII, Fig. 34) has extended, thin, blade-like and sickle-shaped cucullus, longer than the thin and straight basal process; ampulla not bulging out, its margin almost perpendicular to the basal prong, and is widely separated from it with a broad L-shaped gap. *P. laoma violacea* male genitalia are similar to the nominal subspecies in these two main characters (Plate VII, Figs. 43–45). Unfortunately, genitalia of one of the syntype specimens (Ecuador from near Loja, in BMNH, Plate V, Figs. 11–12) glued to a carton card by Evans are damaged and the cucullus is lost (Plate VII, Fig. 44a). Nevertheless, ampulla remains intact and it shows a prominent bulge consistent with other *P. l. violacea* genitalia (e.g. Plate VII, Fig. 45) and inconsistent with Plate VII, Fig. 34. Valva of this syntype has been sketched by Evans prior to its damage and his sketch on a carton card is pinned in the collection near the syntype (Plate VII, Figs. 44b, and inset to 42). This sketch is not particularly accurate in representing remaining shape of the valva and therefore might not be that accurate in showing the shape of cucullus. However, it depicts a U-shaped gap similar to genitalia shown in Plate VII, Fig. 45 and different from Plate VII, Fig. 34. Interestingly, the cucullus on the sketch is overly long and is likely not to be realistic, although it does show a bulbous ventral margin consistent with *P. laoma*, but not with Plate VII, Fig. 34. To further support this conclusion, Plate VII, Fig. 43 shows caudal end of *in situ* genitalia of the second syntype from near Loja (in USNM, Plate V, Figs. 13–14). The cucullus is bulkier than on the Evans sketch, more bulbous in the middle and rounder at the tip, is more similar to other *P. laoma* genitalia (Plate VII, Figs. 42, 45) and is very different from Plate VII, Fig. 34. Finally, the tufts of hair-like scales at the genitalic base are very pale yellow-brown in the Steinhauser specimen (Plate VII, Fig. 34), but are very dark, almost black in both *P. l. laoma* and *P. l. violacea* (Plate VII, Figs. 42, 43, 44a). Taken together, wing pattern and genitalia evidence presented above strongly suggest that the Steinhauser specimen is neither *P. l. laoma*, nor *P. l. violacea*.

Analysis of *P. l. trigga* genitalia is more intriguing. First, *P. l. trigga* as illustrated by the holotype on Plate VII, Fig. 40, has a cucullus very different from *P. laoma*. The cucullus is much longer than its basal prong, not bulbous and ends in a sharper point. The basal prong is thinner and straighter. The base of cucullus is long in the dorsoventral direction and is longer than the ampulla arch dorsally to it. In both *P. l. laoma* and *P. l. violacea*, the cucullus base is much narrower, “necklike” and it is about half the length of the ampulla dorsoventrally. These differences are consistent in a series of specimens and show little variation. Therefore, it is most likely that *P. l. trigga* is not a subspecies of *P. laoma*, but a distinct biological species, a **new status** for this taxon that is proposed here: *P. trigga*. Additional support for this hypothesis comes from possible sympatry of *P. laoma* and *P. trigga* in Ecuador, where they have been observed within the boundaries of Sangay National Park by J.-C. Petit (2013).

P. trigga's cucullus (Plate VII, Fig. 40) is more similar to that of the Steinhauser specimen (Plate VII, Fig. 34) than either of them to *P. l. laoma* or *P. l. violacea*; however the details of the shape differ. The cucullus in the Steinhauser specimen is flat, blade-like and rounded at the tip, and the plane of the blade bends medially and dorsally. *P. trigga*'s cucullus ends with a narrow point, not flattened and rounded at the tip, slightly bending dorsad. However, *P. trigga* is more similar to *P. laoma* in the shape of the gap between basal process of cucullus and ampulla - it is more narrow and U-like, rather than broad as in the Steinhauser specimen. Finally, tufts of hair-like scales at the base of genitalia are black in *P. trigga*, but are pale yellow-brown in Steinhauser's specimen. Interestingly, while these tufts were not fully preserved in the *P. trigga* holotype, some long scales luckily got caught by glue around the left valva and are clearly visible (Plate VII, Fig. 40a). As evidenced by these differences, the Steinhauser specimen is not *P. trigga*.

Furthermore, I inspected type specimens of the three *Potamanaxas* species described by Bell (1956) after the publication by Evans (1953). While *P. tunga* E. Bell, 1956 is a smaller and darker species with very different genitalia, *P. quira* E. Bell, 1956 and *P. bana* require a more detailed discussion. *P. quira* is quite similar to *P. trigga* both in facies (Plate IV, Figs. 9–10; Plate VI, Figs. 23–24) and genitalia (Plate VII, Figs. 37, 38) and may be synonymous with it. Thus the differences stated above for *P. trigga* equally apply to *P. quira*. Tufts of hair-like scales were not preserved in the *P. quira* holotype genitalia slide, but one such scale remained and is shown on Plate VII, Fig. 37d revealing similarity to the black tufts of *P. trigga*. To illustrate that such limited number of scales can reflect differences in the color of the tufts, *P. tunga* paratype scales caught in the genitalia slide preparation and photographed in similar conditions are shown on Plate VII, Fig. 39. These couple of scales are pale-brown in color, consistent with the color of the scales in *P. tunga* tufts, which are not black, but pale-brown.

The *P. bana* holotype (Plate IV, Figs. 3–4) is very similar to the Steinhauser specimen in wing patterns (Plate IV, Figs. 1–2), both in its paler aspect and yellower spots, but very different in the shape of cuculli (compare Plate VII, Figs. 34 and 41) as described above prior to the species description. Additionally, uncus arms appear thinner in the Steinhauser specimen compared to *P. bana* (Plate VII, Fig. 41c). Thus the Steinhauser specimen is not *P. bana*.

To ensure completeness, genitalia of the new species were compared to all other *Potamanaxas* taxa with discal pale spot in cell Cu_2-2A being narrower than the spot in Cu_1-Cu_2 cell and with extended and terminally narrowing cuculli having a thin basal prong. These are *P. frenda* Evans (holotype Plate VI, Figs. 27–28; Plate VII, Fig. 35) and *P. perornatus* (Plate VI, Figs. 25–26; Plate VII, Fig. 36a), but they are more distant and display more significant differences from the new species as stated in Evans (1953), namely that the forewing apex is darker and the postdiscal and subapical pale spots are not clearly expressed, and the shape of valvae differs. In conclusion, the Steinhauser's specimen does not agree well with any of the described *Potamanaxas* species and therefore is new.

Diagnosis and discussion.—The new species belongs to *Potamanaxas* because it is very similar to *P. bana* in wing patterns (Plate IV, Figs. 1–4), possesses all the characters given for the genus by Evans (1953) and has tufts of long hair-like scales near the valvae bases (Plate VII, Fig. 34). Per my examination, these genitalic tufts are present in all named species of *Potamanaxas* and may be synapomorphic for the genus.

The new species belongs to the *P. laoma* group because it has, as defined by Evans (1953): **a**) the forewing pale discal band divided into spots by veins; **b**) the forewing with a pale spot at the base of cell M_2-Cu_1 that is detached from the discal band; **c**) the discal pale spot in cell Cu_2-2A significantly narrower than the spot in Cu_1-Cu_2 cell; and **d**) the postdiscal spots in cells M_1-M_2 and M_2-M_3 as conspicuous as the spot in M_3-Cu_1 cell.

The combination of following male genitalic characters is diagnostic of the new species: **1**) cucullus sickle-shaped: extended (longer than its basal process), flattened laterally, irregularly serrated on the dorsal margin, narrowing caudad and terminating in a rounded flattened tip; the plane of cucullus twists slightly mediodorsad towards the caudal end; basal process of cucullus thin, rod-like; **2**) dorsal margin of ampulla almost perpendicular to the basal process of cucullus, forming a wide L-shaped gap between the process and ampulla; **3**) the tuft of hair-like scales at the bases of valvae pale in color, yellow-brown; **4**) uncus arms relatively narrower than in other species (Plate VII, Fig. 34). In other species of the *P. laoma* group (Plate VII, Figs. 37–45), the ampulla margin is almost parallel to the direction of the basal process of cucullus, forming a narrower U-shaped gap between them, or cucullus is much shorter (not longer than its basal process), may be bulbous or rounded, its basal process is commonly more robust; if cucullus is extended and flattened, it terminates with a narrow point and the tuft of hair-like scales at the base of genitalia is very dark, almost black.

In wing patterns, the new species is similar to *P. bana*, and both of them differ from all other species in the *P. laoma* group by the following characters: **1**) generally paler and appears more contrasty; **2**) hindwing with wider pale areas by the apex and paler margin; discal cell with a pale spot by its anterior margin; submarginal brown spots inside paler-brown band more prominently defined and less diffuse; **3**) forewing with yellower pale spots, especially by the margin in Cu_2-2A cell, which is largely pale-yellow distally from the brown submarginal spot.

Since the new species is known from a single specimen, variation of its facies is not explored and it is hardly possible to offer reliable characters to separate it from *P. bana* by wing patterns. However, comparison of *P. bana* (Plate IV, Figs. 3–6) with the new species (Plate IV, Figs. 1–2) suggests several

characters to be investigated when additional specimens are available: **1**) dark area around the distal end of discal cell on forewing (by M_2 vein origin) appears more extensive in the new species and rows of dark scales are partly covering the pale spots in cells M_1 - M_2 and M_2 - M_3 by the M_2 vein, these spots are clear in *P. bana*; **2**) basal edge of the discal pale spot in cell Sc- R_1 on the forewing is aligned with the basal edge of the discal cell spot and the spot by the costa in the new species, but extends basad from the edges of these two spots in *P. bana*; **3**) dark bars crossing the forewing discal cell anterior and posterior halves (“above” and “below” the central crease outlined with dark scales) are at an angle and not aligned in the new species, but are aligned and form rather regular cross together with the central crease in *P. bana*; **4**) ventral hindwing with dark postdiscal spots near vein M_1 in the new species (no such spot in *P. bana*), while dark lunules in the submarginal row are narrower and less blotchy in the new species than in *P. bana*; **5**) ventral forewing between veins M_3 and Cu_2 is largely brown distad the discal pale band in the new species, and mostly pale basad of submarginal brown band in *P. bana*. These five characters are provided for further exploration only, because it is quite possible that they do not tell the two species apart in a series. It should be noted that the specimen identified as *P. bana* shown on Plate IV, Figs. 5–6 lacks the abdomen, so this identification is also provisional. However, this Ecuadorian specimen seems to be more similar to *P. bana* holotype than to the holotype of the new species. Live individuals from Colombia shown on Plate VI, Figs. 29–33 display a combination of the new species’ and *P. bana*’s characters as listed above. For instance, they match *P. bana* in having a narrower dark area by the base of the cell M_2 on the forewing, and spot in Sc- R_1 vein protruding basad, but their hindwing is patterned more similarly to the new species. The identity of these individuals remains nebulous without genitalic examination, and they may even represent another unnamed *Potamanaxas*. It is apparent that many questions remain unanswered and much work and collecting ought to be done to fully assess the diversity in *Potamanaxas*, and it is also clear that *P. serp n. sp.* described here is a novel and distinctive species, whose description brings us closer to this goal.

ACKNOWLEDGEMENTS

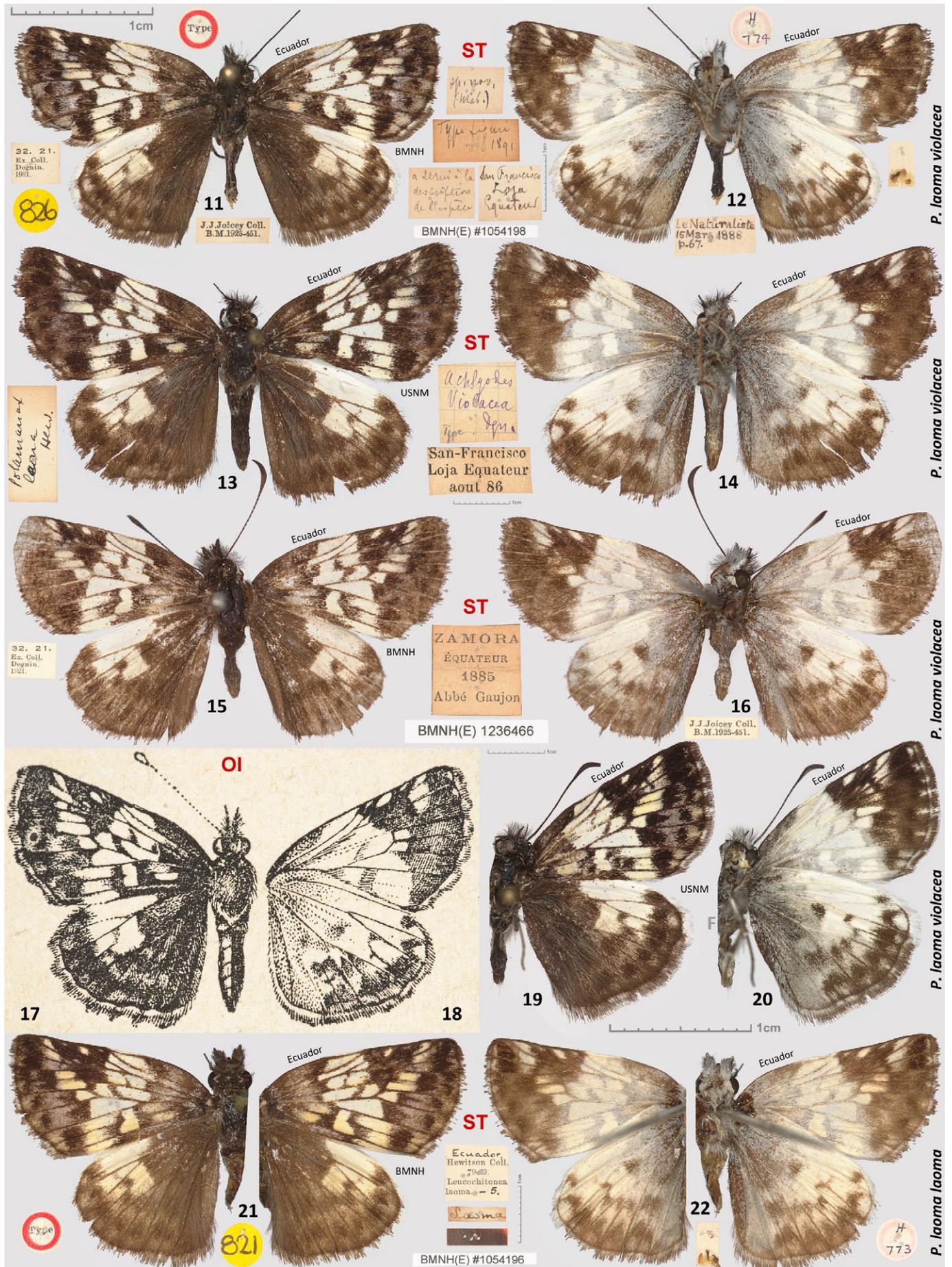
I am grateful to Andrei Sourakov and Andrew D. Warren (McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL), Andrew Johnston, David A. Grimaldi and Suzanne Rab Green (American Museum of Natural History, New York, NY), Blanca Huertas, John Chaaney and David Lees (Natural History Museum, London, UK), Robert K. Robbins, John M. Burns and Brian Harris (National Museum of Natural History, Smithsonian Institution, Washington DC), Wolfram Mey (Museum für Naturkunde, Berlin, Germany), Matthias Nuss (Senckenberg Museum für Tierkunde, Dresden, Germany), Christian Kutzscher (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany), John Rawlins (Carnegie Museum of Natural History, Pittsburgh, PA), Jason Weintraub (Academy of Natural Sciences of Drexel University Collection, Philadelphia, PA), Edward G. Riley (Texas A&M University Insect Collection, College Station, TX) for granting access to the collections under their care and stimulating discussions; to Juan Guillermo Jaramillo Velasquez and Kim Garwood for information and photographs of live individuals; and to Bernard Hermier for many enlightening discussions, critical reading of the manuscript and numerous suggestions; to Brian Banker for much needed edits to the manuscript and corrections; to Richard “Andy” Anderson for reviewing the manuscript, helpful comments, corrections and edits.

REFERENCES CITED

- Bell, E. L.**
1956. Descriptions of some new species of Neotropical Hesperidae (Lepidoptera, Rhopalocera). *American Museum Novitates* 1778: 1–13.
- Burns, J. M.**
1974. The polytypic genus *Celotes* (Lepidoptera: Hesperidae: Pyrginae) from the southwestern United States and northern Mexico. *Psyche (Cambridge)* 81(1): 51–69.
- Dognin, P.**
1888. Diagnoses de lépidoptères nouveaux de l’Equateur. *Le Naturaliste* (2)2(25): 67–68.
- Evans, W. H.**
1953. *A catalogue of the American Hesperidae indicating the classification and nomenclature adopted in the British Museum (Natural History). Part III (Groups E, F, G) Pyrginae. Section 2.* London, British Museum (Natural History). v + 178 pp., pls. 26–53.
- Grishin, N. V.**
2013. On the identity of *Potamanaxas andraemon* and its relatives, with the description of a new species from Peru (Hesperidae: Pyrginae: Erynnini). *Tropical Lepidoptera Research* 23(1): 1–13.
- Mielke, O. H. H.**
2005. *Catalogue of the American Hesperioidea: Hesperidae (Lepidoptera)*. Sociedade Brasileira de Zoologia, Curitiba, Paraná, Brazil, xiii + 1536 pp.
- Petit, J.-C.**
2013. Butterflies of Sangay National Park (Ecuador). Website accessed on Jul. 30, 2013 at <<http://www.sangay.eu/>>.
- Robbins, R. K.**
1991. Evolution, comparative morphology, and identification of the Eumaeine butterfly genus *Rekoa* Kaye (Lycaenidae: Theclinae). *Smithsonian Contributions to Zoology* #498, 64 pp.
- Scott, J. A.**
1986. *The Butterflies of North America. A natural history and field guide.* Stanford, Stanford University Press. xv + 583 pp., 64 pls., 71 figs., 2 tabs., maps.
- Steinhauser, S. R.**
1981. A revision of the *proteus* group of the genus *Urbanus* Hübner. Lepidoptera: Hesperidae. *Bulletin of the Allyn Museum* 62: 1–41.
- Warren, A. D., S. R. Steinhauser, C. Hernández-Mejía & N. V. Grishin**
2008. Notes on the genus *Celotes*, with the description of a new species from Mexico (Lepidoptera: Hesperidae: Pyrginae: Pyrgini). *Zootaxa* 1926: 27–40.
- Warren, A. D., K. J. Davis, E. M. Stangeland, J. P. Pelham & N. V. Grishin**
2013. Illustrated Lists of American Butterflies. [18-X-13] <<http://www.butterfliesofamerica.com/>>.

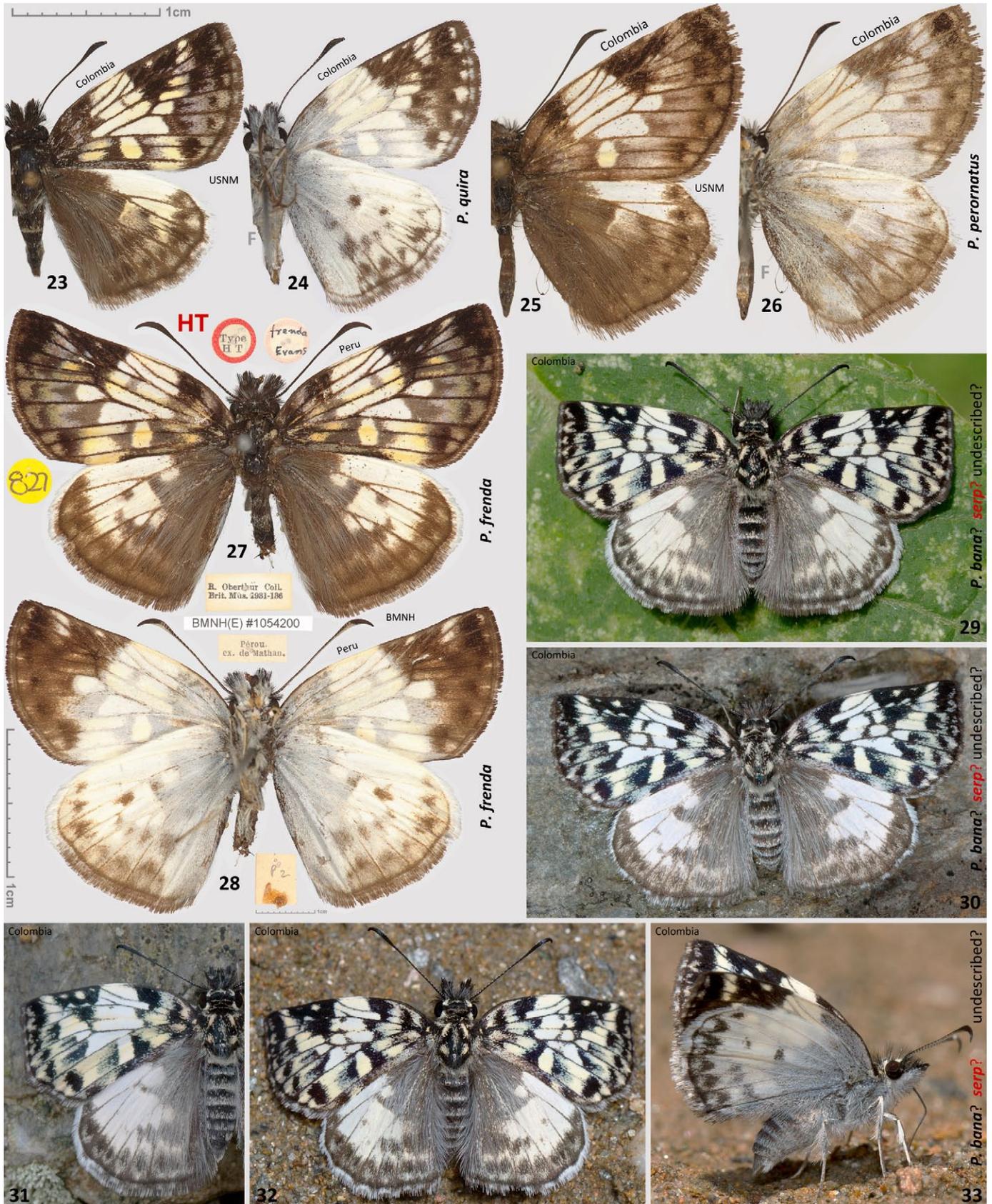


Figs. 1–33. *Potamanaxas* specimens and live individuals. 1–2. - *P. serp* n. sp. holotype ♂, Colombia: Valle del Cauca department, Rio Cali, 1900 m, 11-Jan-1976, No. CH-1400, leg. S. R. and L. M. Steinhauser [MGCL], (genitalia *in situ* Plate VII, Fig. 34); 3–4. - *P. bana* holotype ♂, Ecuador: vicinity of Baños, Rio Blanco, 1700–1900 m, 5-Oct-1939, leg. Clark MacIntyre, genitalia slide G2373 [AMNH] (genitalia Plate VII, Fig. 41); 5–6. - *P. bana*?, Ecuador: “Environs de Loja”, 1887, 32. 21. ex. coll. Dognin, 1921, J. J. Joicey Coll. B.M. 1925–451, specimen No. BMNH(E) #1236460 [BMNH], abdomen missing; 7–8. - *P. trigga* holotype ♂, Peru: Rio Tabaconas, 6000 ft, 1912, leg. A. E. & F. Pratt, J. J. Joicey Coll. B.M. 1925–451, specimen No. BMNH(E) #1054197 [BMNH] (genitalia Plate VII, Fig. 40); 9–10. - *P. quira* holotype ♂, Colombia: Boyacá department, Rio Opon region N. of Tunja, Rio Quirata, 6° 15' N ?W, 500–700 m, 16-Dec-1945, leg. L. Richter, Frank C. Johnson collection, genitalia slide G2371 [AMNH] (genitalia Plate VII, Fig. 37);

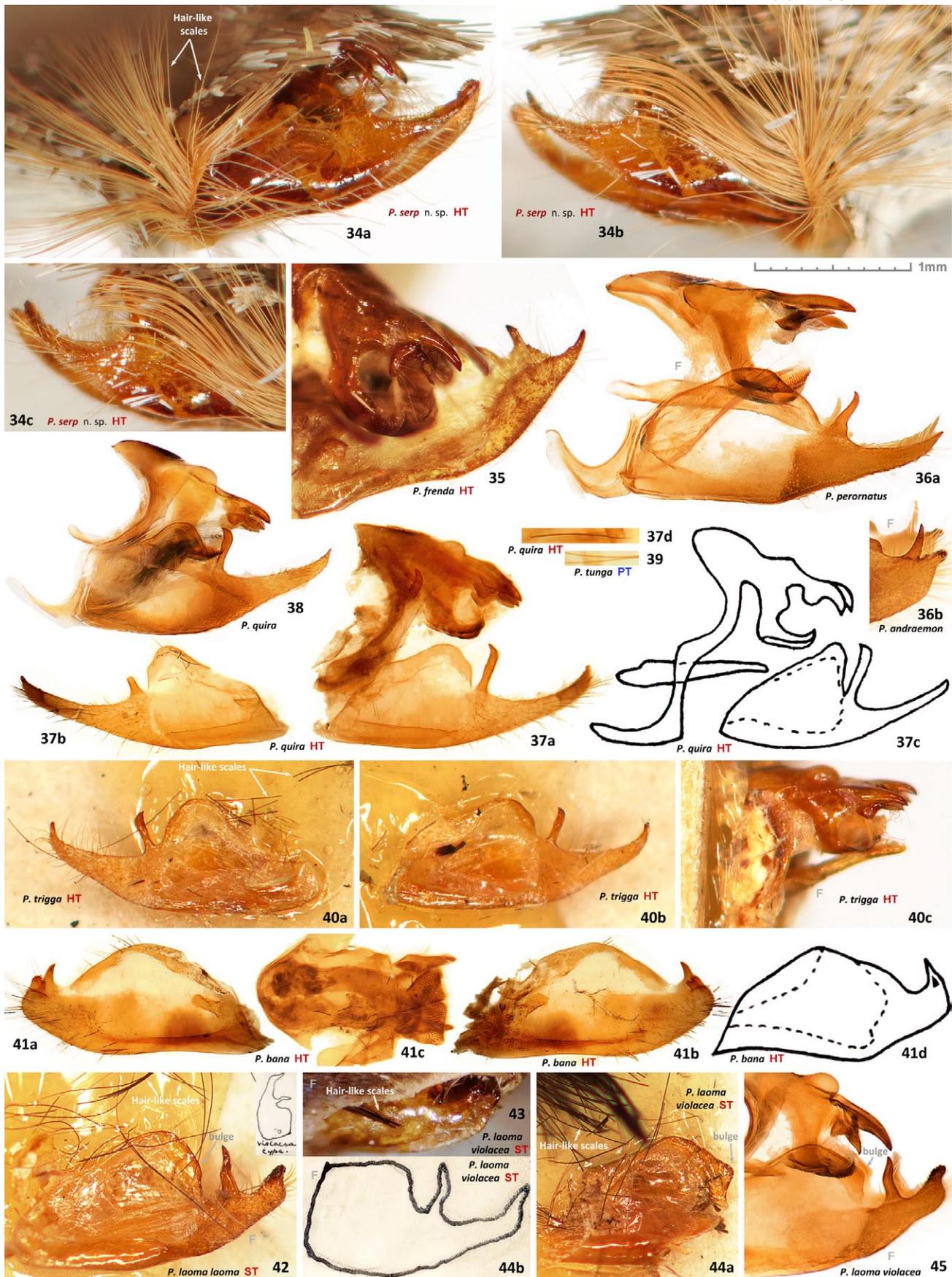


P. laoma violacea
P. laoma laoma

11–16. - *P. laoma violacea* syntypes ♂♂, Ecuador: 11–12. - Rio San Francisco near Loja, 32. 21. Ex. Coll. Dognin, J. J. Joicey Coll. B.M. 1925-451, type H 774, specimen No. BMNH(E) #1054198 [BMNH] (damaged valva Plate VII, Fig. 44); 13–14. - Rio San Francisco near Loja, Aug-1886 [USNM] (genitalia *in situ* Plate VII, Fig. 43); 15–16. - Zamora, 1885, leg. Abbé Gaujon, 32. 21. Ex. Coll. Dognin, J. J. Joicey Coll. B.M. 1925-451, specimen No. BMNH(E) #1236466 [BMNH]; 17–18. - *Achlyodes violacea* original illustration from Dognin (1888); 19–20. - *P. laoma violacea* ♂, Ecuador: Zamora-Chinchi, 32km Zamora-Loja Road, Upper Rio San Francisco, 3° 58.75'S 79° 05.16'W, 1900 m, 27-Sep-2003 Leg. D. H. Ahrenholz, genitalia vial NVG120922-02 [USNM] (genitalia Plate VII, Fig. 45); 21–22. - *P. laoma laoma* syntype ♂ Ecuador, Hewitson collection, type H 773, specimen No. BMNH(E) #1054196 [BMNH], the specimen is set non-planar, left and right halves of this specimen were photographed separately, (valva Plate VII, Fig. 42);



23–24. - *P. quira* ♂, Colombia: Boyacá department, Arcabuco, 2200 m, 31-Jan-1971, leg. S.S. & S. Nicolay, genitalia vial NVG121102-72 [USNM] (genitalia Plate VII, Fig. 38); 25–26. - *P. perornatus* ♂, Colombia: Boyacá department, Arcabuco, 2200 m, 31-Jan-1971, S. S. & S. Nicolay, genitalia vial # H754 prep. S. S. Nicolay [USNM] (genitalia Plate VII, Fig. 36a); 27–28. - *P. frenda* [holo]type ♂, Peru, ex. de Mathan, R. Oberthür Coll., Brit. Mus. 1931-136, specimen No. BMNH(E) #1054200 [BMNH] (genitalia Plate VII, Fig. 35). Dorsal and ventral surfaces of specimens are shown on odd- and even-numbered figures, respectively. Labels if shown are in-line with the specimen images. Round white “type” labels are shown in dorsal and ventral views. Labels are reduced 2.5-3 times compared to specimens: small scale bar below the labels refers to labels, and larger scale bars refer to specimens. “F” indicates mirror image (left-right inverted). Copyright (©) for 5–12, 15–16, 21–22, and 27–28: Trustees of the Natural History Museum, London (used with permission). 29–33. - live individuals of *Potamanaxas* species from Colombia: Antioquia department, near Medellín, superficially similar to *P. bana* and *P. serp* n. sp., photographed by Juan Guillermo Jaramillo Velasquez, used with permission: 29. - San Félix, 2600 m, 9-Dec-2012; 30–33. - municipio El Retiro, vereda Normandía, 2400-2500 m.



Figs. 34–45. Male genitalia of *Potamanaxas*. 34. - *P. serp* n. sp. holotype, *in situ* on a specimen, scales brushed off (specimen and data Plate IV, Figs. 1–2): a. left and b, c. right lateral views; 35. - *P. frenda* [holo] type (specimen and data Plate VI, Figs. 27–28), dry mount glued to carton card, left medial view, left valva removed; 36a. - *P. perornatus* (specimen and data Plate VI, Figs. 25–26), lateral view of entire genitalia; 36b. - *P. andraemon*, Colombia: Valle del Cauca, above Pance, 4000 ft, 19-Jan-1985, leg. J. B. Sullivan, cucullus in the same orientation as in 36a; 37. - *P. quira* (specimen and data Plate IV, Figs. 9–10): a, b. lateral views, c. original drawing from Bell (1956), d. a magnified section of genitalia showing a hair-like scale; 38. - *P. quira* (specimen and data Plate VI, Figs. 23–24), lateral view of entire genitalia; 39. - *P. tunga* paratype, Ecuador: Baños, 1800 m, 17-Jun-1939, leg. Clark MacIntyre, genitalia G2431 [AMNH], magnified section of genitalia showing segments of hair-like scales; 40. - *P. trigga* holotype (specimen and data Plate IV, Figs. 7–8), dry mount glued to carton card: a, b. left and right valvae in medial view, c. tegumen, uncus, gnathos and penis in lateral view; 41. - *P. bana* holotype (specimen and data Plate IV, Figs. 3–4): a, b. valvae in lateral views, c. the rest of genitalia in ventral view, (pressed and damaged on the slide), uncus and gnathos pointing right, d. original drawing from Bell (1956); 42. - *P. laoma laoma* syntype (specimen and data Plate V, Figs. 21–22), dry mount glued to carton card, right valva in medial view (inset shows the card with the sketch of *P. laoma violacea* 44b reduced in size); 43. - *P. laoma violacea* syntype (specimen and data Plate V, Figs. 13–14), *in situ* on a specimen, scales brushed off; 44. - *P. laoma violacea* syntype (specimen and data Plate V, Figs. 11–12): a. dry mount glued to carton card, damaged right valva (cucullus broken off) in medial view, b. Evans's sketch of the valva, pinned in the collection near the specimen, reduced but complete view of the card with the sketch is shown as inset on Fig. 42; 45. - *P. laoma violacea* (specimen and data Plate V, Figs. 13–14), lateral view of the distal 2/3 of complete genitalia. All photographs except 37d, 39 and inset on 42 are to scale, drawings 37c, 41d and 44b are scaled approximately to match photographs. "F" indicates mirror image (left-right inverted). Copyright (©) for 23, 28, 42, and 44: Trustees of the Natural History Museum, London (used with permission).