

ADDING TO THE RICH FAUNA OF THE CHOCÓ REGION IN ECUADOR, A NEW SPECIES OF *POTAMANAXAS* (HESPERIIDAE: PYRGINAE: ERYNNINI)

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 the Chocó region in northern Ecuador. *Potamanaxas hermierei*, **sp. nov.** is most similar to *P. paralus* (Godman & Salvin, 1895) and differs from it in the shape of the discal cream-colored band on wings and characters of the male genitalia. Furthermore, significant differences in male genitalia and facies suggest that *P. cranda* Evans, 1953 **new status**, and *P. paphos* Evans, 1953 **new status** are distinct species and not subspecies of *P. thestia* (Hewitson, 1870) and *P. hirta* (Weeks, 1901), respectively. The status of *P. paralus* as a species-level taxon is confirmed by the analysis of morphology. Lectotypes for *Potamanax paralus* and *Leucochitonea thestia* Hewitson, 1870 are designated to ensure nomenclatural stability.

Resumen – Se describe una nueva especie de *Potamanaxas* de la región del Chocó en el norte de Ecuador. *Potamanaxas hermierei*, **sp. nov.** es la más similar a *P. paralus* (Godman & Salvin, 1895) y se diferencia de ella en la forma de la banda de color crema discal en las alas y las características de los genitales masculinos. Además, las diferencias significativas en los genitales masculinos y facies sugieren que *P. cranda* Evans, 1953 **nuevo estatus**, y *P. paphos* Evans, 1953 **nuevo estatus** son especies distintas y no subspecies de *P. thestia* (Hewitson, 1870) y *P. hirta* (Weeks, 1901), respectivamente. El estado de *P. paralus* como un taxón de nivel de especie se confirma por el análisis morfológico. Lectotipos para *Potamanax paralus* y *Leucochitonea thestia* Hewitson, 1870 son designados para asegurar la estabilidad nomenclatural.

Key words: biodiversity, taxonomy, endemism, skipper butterfly, Río Chuchuví

Genus *Potamanax*, with the type species *Leucochitonea flavofasciata* Hewitson, 1870, was proposed by Watson (1893) to include four more species known to him at the time: *P. thestia* (Hewitson, 1870), *P. latrea* (Hewitson, 1875), *P. thoria* (Hewitson, 1870) and *P. unifasciata* (C. Felder & R. Felder, 1867). Since this genus name was already occupied by Pilsbry (1893; in Mollusca) for about four months, *Potamanaxas* was suggested by Lindsey (1925) to replace Watson's junior homonym. Prior to monumental treatment from Evans (1953), 18 entities were placed in this genus (Mielke 2005). Evans (1953), misspelling it as *Potomanaxas*, suggested 11 new names, all but one as subspecies-level taxa, extracted two more from other genera (*Carrhenes andraemon* Mabille, 1898 and *Milanion marica* Godman & Salvin, 1895) to synonymize with the taxa already in the genus, confirmed the fluctuant status of *P. laoma* Hewitson, 1870 (Mielke 2005), and treated some names as subspecies and synonyms. Many of these names were based on very few specimens, because taxonomic diversity in *Potamanaxas* seemingly exceeds the ability of collectors to catalogue it. Reiterating this point, three more *Potamanaxas* species, all from just one or two specimens each, have been described by Bell (1956). Recently, Mielke & Casagrande (2002), reinstated the status of *Potamanax paralus* Godman & Salvin, 1895 as a species, correcting Evans's treatment of *paralus* as a subspecies of *P. thestia* (Hewitson, 1870) by citing apparent sympatry of these skippers in Peru. Additionally, Grishin (2012a) removed *unifasciata* C. Felder & R. Felder, 1867 from *Potamanaxas* to place it in a new genus, *Eburuncus*. Finally, Grishin (2013) presented evidence that *P. perornatus* Hayward, 1940 is a distinct species rather than a subjective synonym of *P. andraemon*, argued that *P. fuma* Evans, 1953 and *P. forum* Evans, 1953 are species-level taxa, and described *P. lamasi* as a new species in the *P. andraemon* group.

The latest *Potamanaxas* catalogue (Mielke 2005) corrected for recent changes (Grishin 2012a, 2013) lists 34 names (not counting misspellings) arranged in 19 species (13 monotypic) and 12 additional subspecies, making the remaining 3 names subjective junior synonyms. All *Potamanaxas* taxa including almost all their primary type specimens are illustrated at the Butterflies of America website (Warren *et al.* 2013). As for the higher classification, *Potamanaxas* has been treated in Antigonous subgroup of Telemiades group E. by Evans (1953), and found its place within the tribe Erynnini Brues & Melander, 1932 as suggested by Warren *et al.* (2008, 2009).

According to Evans (1953), *Potamanaxas* is distinguished by the following characters. The forewing costa is short and convex, apex rounded, not truncate, termen convex, inner margin (=dorsum) not concave. The forewing discal cell is shorter than the inner margin and recurrent vein (=lower median veinlet) is absent. Forewing Sc vein (=vein 12) is short, ending basad of the end of discal cell, and the R₁ vein (=vein 11) ends over the end of discal cell.

Hindwing costa and inner margin are about equal in length, and longer than abdomen. No hyalinity is present in pale spots on wings. Mid-tibiae lack spines. The third segment of palpi is porrect (i.e. "in line with the body", Evans (1949), p. xviii). Antenna is about half of the costa in length, with the club arcuate about its center, apiculus sharply pointed, nearly equal in length to the unbent portion of the club, and the nudum (scaleless portion of antennal club) possesses around 17 segments. No secondary sexual characters are seen, such as a costal fold, thoracic pouch or tibial tuft; however, tufts of long hair-like scales are developed near the bases of valvae in male genitalia (Plate III, Figs. 21, 23, 26). Evans (1953: 137) mentions that "usually there is a hair tuft springing from below the vinculum on either side of the genitalia" in *Potamanaxas*. My examination shows that these genitalic tufts are present in all *Potamanaxas* taxa with known males, and might be synapomorphic for the genus.

Evans's characters for *Potamanaxas* have withstood the test of time as they circumscribe "a compact genus" (Evans 1953) consisting of apparently phylogenetically close relatives. However, as it has been argued by several researchers, many of Evans's subspecies and synonyms are better viewed as species-level taxa (e.g. Austin & Warren 2001, 2002, Burns & Janzen 2001, Mielke & Casagrande 2002). Therefore it is expected that careful reexamination of HesperIIDae names will yield a more consistent taxonomic treatment more closely reflecting biological reality. This process is not a negative consequence of taxonomic inflation (Isaac *et al.* 2004), when researchers juggle ranks of taxa at will, but a reflection of true discoveries of biological species through accumulation and analysis of additional data. For instance, new observation by Gerardo Lamas of sympatry of *P. thestia* and *P. paralus* (cited by Mielke & Casagrande 2002) suggests that these names should refer to distinct biological species. A consistent and accurate description of biodiversity is needed to strategize conservation efforts (Kim & Byrne 2006). This is particularly important for biodiversity hotspots such as the Chocó region, where species richness is astounding, and its timely cataloguing is essential.

Here, a small step is taken towards this goal. Revision of *P. thestia* relatives suggests that two other taxa proposed by Evans as subspecies in all likelihood represent distinct biological species, and a new *Potamanaxas* species is described from the Chocó region in Ecuador.

MATERIALS AND METHODS

Potamanaxas specimens were examined in the following collections: National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM); Natural History Museum, London, UK (BMNH); McGuire

Center for Lepidoptera and Biodiversity, Gainesville, FL (MGCL); American Museum of Natural History, New York, NY (AMNH); Museum für Naturkunde, Berlin, Germany (ZMHB); Carnegie Museum of Natural History, Pittsburgh, PA (CMNH); Academy of Natural Sciences of Drexel University, 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 24 hours in 10% KOH 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 camera 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

Inspection of *Potamanaxas* specimens in museum collections and analysis of live individuals in photographs by Lepidoptera enthusiasts has shed further light on *Potamanaxas* distribution and variation. This new data suggested several changes to *Potamanaxas* taxonomy as described below. In addition, recent collecting efforts in South America have resulted in the finding of several genuinely new *Potamanaxas* species. One of these undescribed species is named here. Prior to this new species description it is necessary to stabilize nomenclature and secure the identity of several related taxa in accord with their name usage since Evans (1953) by designation of lectotypes.

Potamanaxas thestia (Hewitson, 1870), lectotype designation

(Plate I, Figs. 5–6; Plate II, 13–14; Plate III, Figs. 26–27, 33–34)

Leucochitonea thestia has been described by Hewitson (1870) from several specimens from Ecuador: Sarayaco, leg. Buckley, of which four syntypes were located in the BMNH collection housing the Hewitson collection today. A specimen in the Natural History Museum (BMNH) bearing seven labels: circular, yellow on one side, handprinted: / 810 / , white, covered in glue on the other side; round, white with red circle on one side, printed: / Type / inside the red circle and handprinted: / H / 771 / on the opposite side of label; rectangular, red (partly degraded into black) on one side, white on the other, no text; rectangular, white, handwritten: / *Thestia* / ; square, white, handwritten & printed: / Ecuador / Hewitson Coll. / 79-69 / *Leucochitonea* / *thestia*. 1. / on one side, and a small rectangular white label glued on the other side, printed: / *Equa* / ; rectangular, printed: / BMNH(E) #1054004 / is hereby designated as the lectotype of *Leucochitonea thestia*. The following red rectangular label will be added to the specimen after publication of this study: / LECTOTYPE / *Leucochitonea thestia* / Hewitson, 1870. *Equat. Lep.*, p. 77 / designated by Grishin, 2013 /. This specimen is illustrated in Plate II, Figs. 13 and 14. It is a male mounted on a minuten pin, lacking antennae and is recognized by a small chip at the forewing margin vein M_2 ; abdomen is glued on, glue signs also visible around wing bases. Genitalia mounted on a carton card by Evans (Plate III, Figs. 33–34) pinned under the specimen together with labels. This specimen seems to be the only *thestia* syntype that belongs to this particular species, with three other syntypes being a different species named later *Potamanaxas latrea tusca* (Evans, 1953).

The lectotype is designated to ensure nomenclatural stability and to preserve current usage of the name, which is necessary taking into account that two different species are illustrated by Hewitson as male and female *P. thestia* (Hewitson 1875), and four Hewitson collection specimens of these two different species labeled as *thestia* are present in BMNH, thus making the *P. thestia* type series polytypic. The lectotype designated above and the data on its labels agree with the original description (Hewitson, 1870: 77), it has been placed in a drawer with other primary type specimens, and it matches Evans's concept of *P. thestia*, used in all subsequent publications. The other

three *P. thestia* type specimens—all males, no females among them, contrary to Hewitson (1875)—were named *Potamanaxas latrea tusca* (Evans, 1953) and are also the type series of this latter taxon.

Potamanaxas paralus (Godman & Salvin, 1895), confirmed reinstated status and lectotype designation

(Plate I, Figs. 3–4; Plate II, Figs. 11–12; Plate III, Figs. 21–25)

Potamanax paralus has been described by Godman & Salvin (1895) from an unstated number of specimens from Cosnipata Valley, Peru. H. Whitely leg., including those mentioned by Druce (1876) as "*Pyrgus thestia*". A specimen in the Natural History Museum (BMNH) bearing eight labels: circular, yellow on one side, handprinted: / 814 / , white, covered in glue on the other side; round, white with red circle on one side, printed: / Type / inside the red circle, no markings on the opposite side; round, white with red circle on one side, printed: / Type / inside the red circle and handprinted: / H / 772 / on the opposite side of label; rectangular, printed: / Cosnipata Vall., / E. Peru. / H. Whitely. / ; rectangular, white, printed: / ♂ / ; rectangular, white, printed: / Godman-Salvin / Coll. 1912.-23. / ; rectangular, white, framed on top and bottom, printed: / B.C.A. Lep. Rhop. / *Potamanax* / *paralus*, / G.&S. / ; and rectangular, printed: / BMNH(E) #1054005 / is hereby designated as the lectotype of *Potamanax paralus*. The following red rectangular label will be added to the specimen after publication of this study: / LECTOTYPE / *Potamanax paralus* Godman & Salvin, 1895 / *Biol. Centr.-Amer., Lep.-Rhop.* 2, p. 392 / designated by Grishin, 2013 /. This specimen is illustrated in Plate II, Figs. 11 and 12. It is a male with both antennae intact and one leg protruding forward in front of the head, wing bases secured by glue, specimen can be recognized by small longitudinal tears at the margin of left hindwing near veins R_s and M_3 and a mostly latitudinal tear by R_s vein of right hindwing. This specimen and the data on its labels agree with the original description (Godman & Salvin 1895: 392), the specimen has been curated as a "type" in a drawer with other primary type specimens and separately from the rest of the *P. paralus* type series. It represents the Godman & Salvin concept of *P. paralus* well and matches all subsequent usage of the name. Since Godman & Salvin (1895) in their description of *P. paralus* referred to Druce's (1876) work that mentioned no less than two specimens ("Mus. G. S. & D.", p. 249), calling them "*Pyrgus thestia*", and it is not possible to rule out that at least one *P. paralus* syntype that I have not been able to locate might have been actual *P. thestia*, the lectotype is designated to ensure nomenclatural stability and to avoid confusion with a new species (close to *P. paralus*) that is described below.

Potamanaxas paralus has been treated as a subspecies of *P. thestia* by Evans (1953), but species status for it was reinstated by Mielke & Casagrande (2002) who cite observations by Gerardo Lamas that the two taxa are apparently sympatric in Peru. Consistently with this sympatry, genitalia of *P. paralus* and *P. thestia* show many differences (compare Plate III, Figs. 21–25 and Figs. 26–27 & 33–34), most notably that *P. thestia*'s cucullus is narrower at the base and broader at the distal end—over two times longer than its "height" at the level of the dorsal tooth. Other differentiating characters include *P. thestia*'s arched, apically almost angular costa of a valva; its more massive style-like process of sacculus, originating very close to the base of the valva; a flatter and shorter tegumen with a small bulge apically near uncus; the gnathos separated more widely from the uncus, and the saccus frequently more pointed cephalad (pointed at by a gray arrow on Plate III, Fig. 27, compare to Fig. 25). Some of these features are seen in genitalia mounted on a carton card by Evans of the *P. thestia* lectotype designated above (Plate III, Figs. 33–34). Wing patterns are also different as stated by Evans (1953), i.e. *P. paralus* lacks the yellow or orange spot of *P. thestia* on the forewing basal of the discal pale band in cell Cu_2-2A , its pale band is cream in color and narrower vs. almost white and broad in *P. thestia*, and perhaps the most obvious character, the shape of distal edge of the hindwing discal band in cells R_s-M_1 and M_1-M_3 , on both wing surfaces, which is particularly noteworthy ventrally. In *P. thestia*, this edge is sharply defined and scallop-shaped with areas of brown scales invading along veins R_s , M_1 and M_3 . In *P. paralus*, the edge is more diffuse with cream overscaling partly extending into the dark-brown ground color distad of the band, and edge being straighter or somewhat irregular rather than scalloped. These differences confirm the status of *P. paralus* as a distinct species as originally proposed in its description (Godman & Salvin 1895). *Potamanaxas paralus* ranges in the Andean region from Colombia to Bolivia. Inspecting *Potamanaxas* holdings at USNM collection I stumbled upon a unique specimen from northern Ecuador that was apparently close to, but distinct from, *P. paralus*, and is hereby described as a new species.

***Potamanaxas hermierei* Grishin, new species**

(Plate I, Figs. 1–2; Plate III, Fig. 17–20)

Description.— *Male* (Plate I, Figs. 1–2): forewing length = 17 mm (holotype). **Forewing** apex rounded, not truncate, termen convex, inner margin slightly convex, discal cell shorter than the inner margin, Sc vein ends basad the end of discal cell, R₁ vein ends just over the end of discal cell. **Dorsal forewing** dark-brown, crossed by a relatively narrow (about equal to the width of discal cell) cream-colored discal band from near the costa through the origin of R₁ vein, to between the origins of veins Cu₂ and Cu₁, and to the middle of inner margin; band broken into spots rounded at angles by brown scales at veins; spot in C-Sc cell very faint, barely defined as a small diffuse patch of cream scales; spot in Sc-R₁ cell more strongly expressed, most elongated; spot in discal cell most rectangular in shape, not cracked in half by a stretch of brown scales along its distal margin (which is convex, not m-shaped); spot in Cu₁-Cu₂ cell the widest, almost elliptical in shape, not noticeably broadening distad; spot in Cu₂-2A trapezoid, almost as wide posteriad as the previous spot; spot in 2A cell more broadly separated from the rest of the band by a belt of brown scales along Cu₂ vein, half-lanceolate in shape, widening towards inner margin; no cream scales in cells R₁-R₂ and M₃-Cu₁; faint pattern of slightly paler areas in dark-brown ground color distad the discal band. **Ventral forewing** paler brown with the dorsal spot pattern faintly repeated and masked by a broader, more even-edged band of whitish scales; the band broadens distally towards inner margin to over twice its width at costa, entirely covering the cream spots; diffuse whitish overscaling basad of the band. **Hindwing** semi-triangular, termen evenly convex, costa and inner margin about equal in length, longer than abdomen. **Dorsal hindwing** dark-brown, same ground color as the forewing, but white antieriad of Sc+R₁ vein with a patch of brown scales near the termen and base; crossed by a relatively narrow (about equal to the width of discal cell) cream discal band, slightly paler in color than the forewing band; band from Sc+R₁ vein, distally from the origin of Rs, through the origin of Cu₁ vein and to 1A vein, this band is entire, with only very few brown scales along veins, band narrower at Rs and M₁ in M₃-Cu₁ cell, wider in Cu₁-Cu₂ cell and narrower again in Cu₂-1A cell; band paler, almost white in Sc+R₁-Rs cell; very few cream scales in 1A-2A cell; hair-like slate-colored scales in discal posterior area. **Ventral hindwing** similar in color to ventral forewing, dorsal band faintly repeated and broadly covered by whitish scales widening distad towards the costa to twice the dorsal band width; slate overscaling basad of the band and in discal posterior area. Remaining fringe scales dark-brown on both wings, with slate scales ventrally along hindwing anal margin. **Head** dark-brown above with whitish spots above eyes, whitish-slate below, palpi black, pale-slate beneath; antennae dark-brown with some whitish scales below. **Thorax and abdomen** dark-brown above, thorax pale-slate below, abdomen mostly cream below, slate basad and browner caudad; legs light brown with slate scales. **Male genitalia** (Plate III, Figs. 17–20): tufts of scales near the bases of valvae dark-brown, paler at both ends; tegumen more than twice the length of uncus arms, with a bulge centrally by the uncus, uncus arms about twice as long as wide at the base; gnathos is upturned and joint ventrad in the caudal half, spiculose on its surfaces caudad, widely separated from uncus: distance from gnathos ventral side to the base of uncus dorsally exceeds the length of uncus arms; saccus slightly longer than wide, spatulate and rounded antieriad; valva with rounded, concave costa, cucullus irregularly dentate along the dorsal edge, extending caudad for about the same length as costa, cucullus caudal end narrow, rounded and directed posteriodorsad, at the base of dorsal margin cucullus with a triangular projection-like tooth directed dorsad, dorsolateral dimension of the valva (“height”) is about half the distance between the tooth and caudal end of valva (=cucullus length); sacculus with style-like projection about twice as long as wide, not widening dorsad, projection at the distance from the base of the valva equal to projection length; penis slightly shorter than valva length.

Female: unknown or unrecognized.

Type.— Holotype male, mounted ventral side up, with the following labels: white, printed: / ECUADOR: Esmeraldas, / Río Chuchuví, km. 12.5, / Lita-San Lorenzo rd., / 0° 53'01" N, 78° 30'90" W / 800-900 m, July 2002 / I. & R. Aldas / ; white, handwritten in magenta: / 101b / Chuchuví / 19/7/02 / Trampa / ; white printed: / NVG120922-46 / ; red, printed: / HOLOTYPE ♂ / *Potamanaxas hermierei* Grishin / . Genitalia vial is pinned under the specimen. The GPS coordinates in the label given verbatim above are typed incorrectly and instead should be 0° 53.01' N, 78° 30.90' W, as seen on labels of other specimens from this location (Grishin 2012b). The holotype is deposited in the National Museum of Natural History, Smithsonian Institution, Washington DC (USNM).

Type locality.— ECUADOR: Esmeraldas Province: km 12.5 Lita–San Lorenzo Rd., Río Chuchuví, 0.883° -78.515°, 850 m. This location is along the road between Alto Tambo and Lita in San Lorenzo Canton of Esmeraldas Province, a quarter mile west of the border with Carchi Province and about 20 air miles south of the border with Colombia. The specimen was apparently collected in a very wet premontane rainforest near the Río Chuchuví, about 2 miles upstream of the Río Mira. Interestingly, this site is also a type locality for two other recently described Lepidoptera species: *Tithorea pacifica* Willmott & Lamas, 2004 (Nymphalidae: Ithomiinae) and *Entheus warreni* Grishin, 2012 (Hesperiidae: Eudaminae). Generally, the Chocó is a biodiversity hotspot well-known for high endemism (Gentry 1992). There is a mismatch between the GPS coordinates and elevation given on the label. Elevation for the GPS coordinates would be about 710 m, however, elevation above 800 m is indicated on the label. It is likely that the GPS coordinates were measured where the river crosses the road, but elevation might refer to the site of actual specimen capture somewhere along the trail that climbs up into the forest to elevation of about 900 m. Given an uncertainty in the elevation specified on the label (“800–900 m”) it is likely that the specimen was collected in the premontane forest along the trail rather than by the road. Such discrepancies when GPS data is given for the parking site, and the collection site accessible by foot is some distance away are unfortunately quite common, and might be significant when elevation changes rapidly with distance (K. Willmott, pers. comm.).

Etymology.— *Potamanaxas hermierei* n. sp. is named in honor of Bernard Hermier, from Cayenne, French Guiana, a friend of the author, whose help with this and other Hesperidae projects has been instrumental and essential. Bernard’s enthusiasm for Hesperidae and their investigation, collection, photography, identification and taxonomy is limitless, and is only equaled by his unsurpassed kindness, grace and generosity in helping naturalists with their studies. Bernard has been a content advisor and active photo contributor for the Butterflies of America (BOA) website (Warren *et al.* 2013), and we are benefiting tremendously from his ample knowledge, diligence and meticulous attention to details, not to mention thousands of high-resolution photographs of Hesperidae type specimens he obtained in travelling to museums around the globe and shared with the world through BOA. Bernard’s charm and elegance in communication with people, refined and gentle touch married to modesty and patience, sharp, precise thinking and deep knowledge are quite familiar to everyone who has had the pleasure to interact with him.

Distribution and phenology.— The species is known only from the holotype collected in the Chocó forest of northern Ecuador in July. It remains to be seen whether *P. hermierei* n. sp. is yet another Chocó endemic, or a species with a broader distribution.

Diagnosis: The new species belongs to *Potamanaxas* as defined by Evans (1953) because it possesses all the characters of the genus specified in the Evans keys and listed in the introduction and description above. In facies and male genitalia, it appears to be most similar to *P. paralus* (Plate I, Figs. 3–4; Plate II, Figs. 11–12; Plate III, Figs. 21–25), distributed from Colombia to Bolivia and thus might be sympatric with it. The following characters are shared between these two species: (a) wings dark-brown dorsally, with cream-colored, not white, discal bands on both wings; (b) forewing band separated into spots by brown scales along veins, but spots relatively well aligned with each other; (c) small yellow or orange spot absent basad of the discal band in forewing cell Cu₂-2A; (d) very faint spot-like (not streak-like) pattern of paler-brown or cream (not white) slate or bluish scales distad of discal forewing band, and postdiscal dark-brown areas in between veins M₁-M₃ and in cell Cu₂-2A; (e) cucullus extended to a narrowing point caudad, dorsally irregularly dentate; (f) cucullus moderately broad, i.e. valval “height” (dorsoventral measurement) at the cucullus dorsal tooth is about half of cucullus length; (g) costa of valva rounded, not angled apically; and (h) saccus rounded antieriad.

The following characters set the new species apart from *P. paralus*. (1) Likely the best single diagnostic character is the extent of the cream-colored band on dorsal hindwing; this band is longer but narrower in *P. hermierei* n. sp. than in *P. paralus*. More specifically, the band extends below the discal cell and reaches 1A vein, i.e. there are well defined, broad cream areas in cells M₃-Cu₁, Cu₁-Cu₂ and Cu₂-1A; even the cream area in Cu₁-Cu₂ cells is broader than that in M₃-Cu₁ cell (Plate I, Fig. 1). In contrast, in three dozen *P. paralus* specimens from across its range of distribution there does not seem to be any significant variation and the discal hindwing band largely terminates at M₃ vein, not extending below the discal cell, and only small spots and patches of cream scales may be present in cells M₃-Cu₁ and Cu₁-Cu₂ (and no cream scales were

observed in Cu_2 -1A cell) (Plate I, Fig. 3; Plate II, Fig. 11). (2) Cream discal bands on both wings are slightly narrower in *P. hermierei* n. sp., and the bands are more even around the edges with spots closer aligned. In *P. paralus*, a spot in the forewing discal cell has m-shaped distal edge with an area of brown scales wedging in the cream area in the middle, and the spot in Cu_1 - Cu_2 cell conspicuously protrudes distally away from the band. (3) The forewing cream spot in C-Sc cell is not fully developed in *P. hermierei* n. sp. and is present largely as overscaling, but this spot is prominent in *P. paralus*. (4) The tegumen with a bulge apically at the base of uncus in *P. hermierei* n. sp. (gray arrow points to it in Plate III, Fig. 17); the tegumen is almost flat in *P. paralus* (Plate III, Figs. 21, 23). (5) The distance from the caudal end of uncus arm to the indentation between uncus and tegumen (=length of uncus, between black arrows in Plate III, Fig. 17) is less than half the distance between the indentation and cephalic end of tegumen (=length of tegumen, between black arrows in Plate III, Fig. 17) in *P. hermierei* n. sp., and this distance is more than half in *P. paralus* (Plate III, Figs. 21, 23). (6) The gnathos is set further from uncus in *P. hermierei* n. sp., with the distance between the ventral edge of gnathos and dorsal edge of uncus at the base exceeding uncus length (between black arrows in Plate III, Fig. 17) compared to *P. paralus*, with the distance being about equal to or smaller than length of uncus (between black arrows in Plate III, Fig. 23, another specimen shown on Plate III, Fig. 21, distances not marked). (7) The style-like process of the sacculus originates further caudad from the base of valva in *P. hermierei* n. sp. (Plate III, Fig. 17) than in *P. paralus* (Plate III, Figs. 22, 24). It should be noted that since only a single specimen of *P. hermierei* n. sp. is known, some of the genitalic characters listed above may not hold in a series and may reflect individual variation.

Potamanaxas cranda Evans, 1953, new status

(Plate I, Figs. 7–8; Plate II, Figs. 15–16; Plate III, Figs. 28–32)

Named as a subspecies of *P. thestia* from a single Costa Rican specimen (Plate II, Figs. 15–16; Plate III, Figs. 31–32, examined in BMNH, photographed, images available in Warren *et al.* 2013), this taxon exhibits a number of notable differences from *P. thestia* that argue against their phylogenetic closeness. In addition to the analysis of holotype genitalia, which are dry-mounted on a carton card by Evans, with the right valva unfortunately damaged (internal view of left valva shown in Plate III, Figs. 31–32), dissections have been performed on Panamanian specimens from USNM that superficially appear close to the *P. cranda* holotype. The most notable similarity between genitalia of the *P. cranda* holotype and the Panamanian specimens, setting them apart of other taxa discussed here, is the lack of a style-like process from the sacculus at the base of the valva. This process is present in *P. thestia*, *P. paralus*, *P. hermierei* n. sp. and some other *Potamanaxas* species. Absence of the process in *P. cranda* suggests its phylogenetic distinctness from these other taxa. Additionally, the cucullus is not bending dorsad in the *P. cranda* holotype and Panamanian specimens and appears rather straight, terminating in a mediad-directed small tooth (Plate III, Figs. 29–32). *Potamanaxas thestia*'s cucullus is curved dorsad and terminally rounded, with no inner-directed tooth (Plate III, Figs. 26, 33–34). *Potamanaxas cranda*'s gnathos is not prominently spiculate on its surfaces caudad, but each arm carries a prominent bulge ventrally (Plate III, Fig. 28). Many additional differences in genitalia of *P. cranda* and *P. thestia* can be seen in essentially every structure on Plate III, Figs. 28–32 and Figs. 26–27 & 33–34.

Wing pattern differences are also ample (compare Plate I, Figs. 7–8; Plate II, Figs. 15–16 with Plate I, Figs. 5–6 and Plate II, Figs. 13–14), and most straightforward characters are stated by Evans (1953). *Potamanaxas thestia* possesses a yellow or orange spot in cell Cu_2 -2A basad of the discal white band; this spot is lacking in *P. cranda*. Paralleling the differences between *P. hermierei* n. sp. and *P. paralus*, *P. cranda* differs from *P. thestia* in having narrower pale discal bands, with the hindwing band being extended at least to vein 2A in males. This hindwing band in *P. thestia* is more spot-like, rounded and does not extend beyond Cu_1 vein at its base. Additionally, *P. cranda* is characterized by the broadly white front of its antennal club. The club is dark brown in *P. thestia*, *P. paralus* and *P. hermierei* n. sp.

As a summary, while being seemingly allopatric with *P. thestia*, significant morphological differences in genitalia, wing patterns and coloration of antennae strongly argue that *P. cranda* is a species-level taxon, to which it is formally raised here. Interestingly, Panamanian specimens treated as *P. cranda* (e.g. Plate I, Figs. 7–8), while being similar to *P. cranda* holotype from Costa Rica (Plate II, Figs. 15–16), display certain differences in wing shape (more elongated) and the width and shape of their discal pale band (narrower, less

regular). Differences are also noted in genitalia; however without comparison of wet genitalia preparations firm conclusions seem unjustified. It is possible that further analysis will reveal that these Panamanian specimens represent a species close to, but distinct from *P. cranda*. Nevertheless, even if these Panamanian specimens are not *P. cranda*, characters of the *P. cranda* holotype are sufficient to support its distinctness from *P. thestia*.

Potamanaxas paphos Evans, 1953, new status (Plate II, Figs. 9–10; Plate III, Fig. 35)

Described as a subspecies of *P. hirta* (Weeks, 1901) by Evans (1953), this taxon's type series is from Costa Rica, Colombia and Northern Ecuador, [holo]type (as deduced by Mielke (2005)) being from Ecuador: Paramba (Plate II, Figs. 9–10; Plate III, Fig. 35, type series examined in BMNH, photographed, with images available in Warren *et al.* 2013). Nominal *P. hirta* (holotype from Colombia: Bogotá district per original description (Weeks 1901), not Bolivia as per Evans (1953), photograph examined, available in Warren *et al.* 2013) with its subjective synonyms *Potamanax pisates* H. Druce, 1912 (type series of three specimens and a specimen from Godman & Salvin collection mentioned in the original description, all from Ecuador, examined in BMNH, photographed, image of the specimen bearing the "type" label available in Warren *et al.* 2013) and *Potamanax fassli* Draudt, 1922 (lectotype from Colombia, photographs examined, available in Warren *et al.* 2013), seemingly overlap with *P. paphos* in distribution, which is from Colombia to Bolivia. Thus, *P. paphos* and *P. hirta* are likely to be sympatric. Recent on-line reports from the Sangay National Park in Ecuador suggest the same: "we found *Potamanaxas hirta paphos* West of Palora; the surprise is that, in this same area *Potamanaxas hirta hirta* is quite common? could it be a different species?" (Petit 2013).

Wing pattern differences between *P. hirta* and *P. paphos* parallel those between *P. hermierei* n. sp. and *P. paralus*, in particular in the pale hindwing band being longer and narrower in *P. paphos* (reaching 1A and 2A veins in some specimens) and shorter and broader in *P. hirta* (not reaching much further than the end of discal cell, vein M_2). Additionally, the forewing cream band spans from costa to inner margin in *P. paphos* and is oval, spot-like, largely confined between Sc and 2A veins in *P. hirta*. Differences in genitalia have been mentioned and illustrated by Evans (1953). End of valva of *P. paphos* holotype (Plate III, Fig. 35) is, using Evans's words "tapered and rounded", and end of valva in *P. hirta* is "turned in and pointed". Taking into account the combination of the sympatry of *paphos* and *hirta* with their morphological distinctness in wing patterns and genitalia, *P. paphos* is hereby raised to species status.

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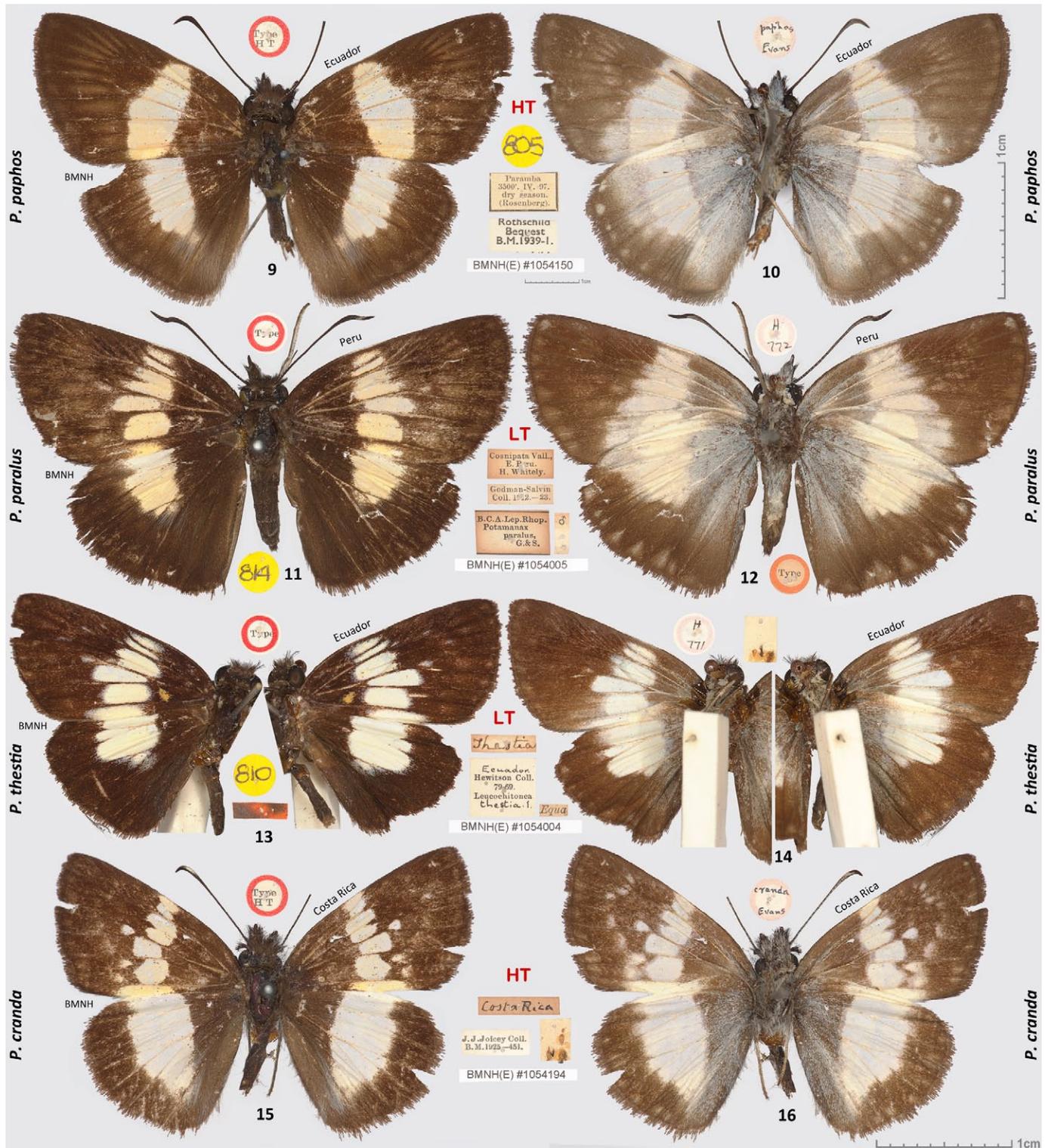
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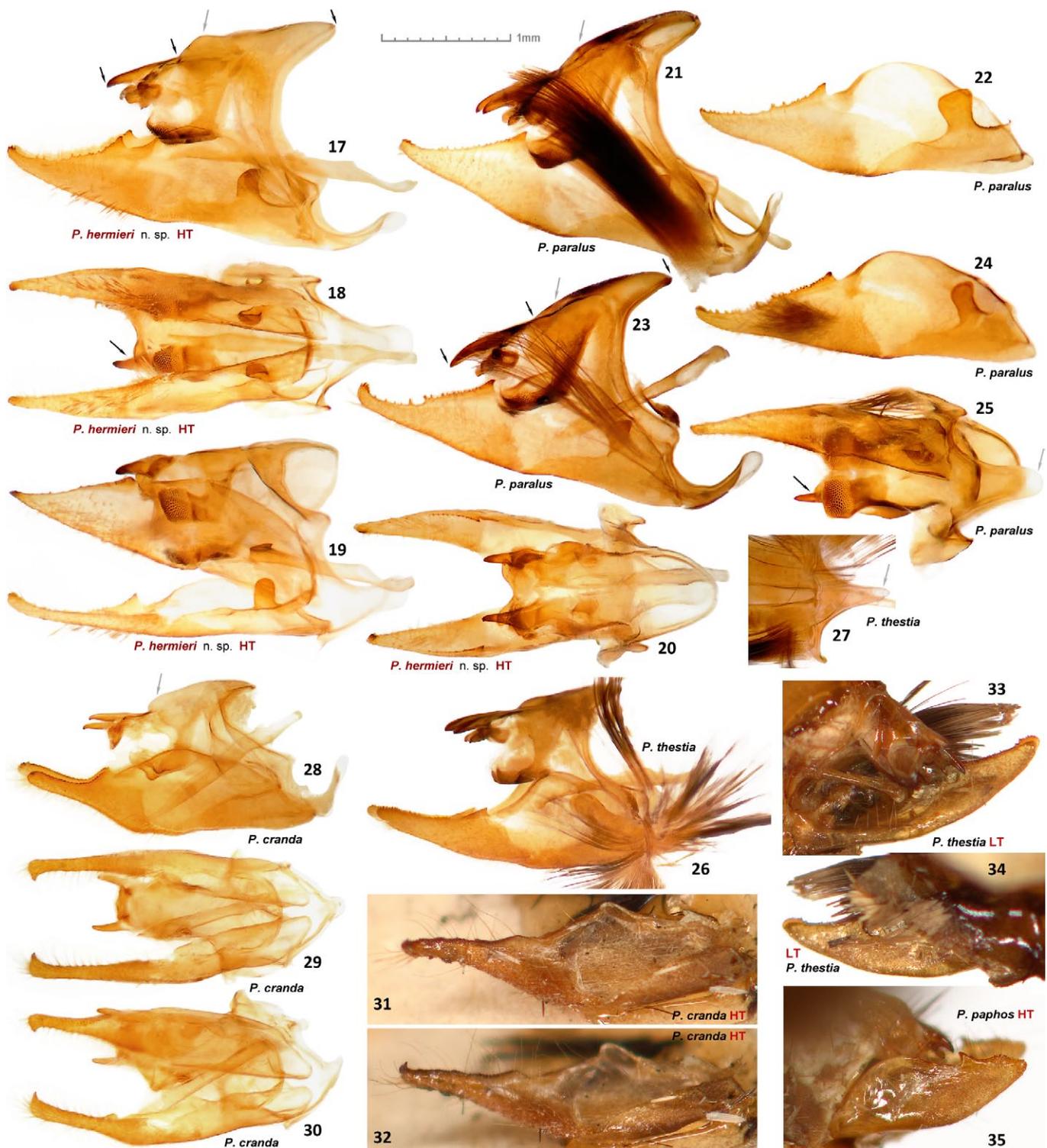
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Figs. 1–8. *Potamanaxas* specimens. 1–2. - *P. hermierei* n. sp. holotype with labels, data in text (genitalia Plate III, Figs. 17–19); 3–4. - *P. paralus* Peru: Huánuco Region, Tingo María, 23-Jun-1982, 800 m, leg. S. S. Nicolay; 5–6. - *P. thestia* Ecuador: Napo, Tena-Pano Road, 21-Sep-1987, 700 m, leg. S. S. Nicolay; 7–8. - *P. cranda* Panama: Panama Province, Cerro Jefe 9° 14'N 79° 22'W, 28-Mar-1977, 800 m, leg. G. B. Small. Labels are reduced 2.5 times compared to specimens: small scale bar below the labels refers to labels, and larger scale bars refer to specimens. All specimens are males and are in USNM collection.



Figs. 9–16. *Potamanaxas* primary type specimens. 9–10. - *P. paphos* [holo]type, Ecuador: Paramba, dry season, Apr-1897, 3500', leg. Rosenberg, Rothschild Bequest B.M. 1939-1, specimen No. BMNH(E) #1054150 (genitalia *in situ* Plate III, Fig. 35). 11–12. - *P. paralus* lectotype, designated herein, Peru: Cosnipata Valley, leg. H. Whiteley, Godman-Salvin Collection 1912-23, type H 772, specimen No. BMNH(E) #1054005; 13–14. - *P. thestia* lectotype, designated herein, Ecuador: Sarayaco, leg. Buckley, Hewitson Collection 79-69, type H 771, specimen No. BMNH(E) #1054004, because left and right wings of the specimen are far from a single plane, each side was photographed and is shown separately (genitalia Plate III, Figs. 33–34); 15–16. - *P. cranda* holotype, Costa Rica, J. J. Joicey Collection B.M. 1925-451, specimen BMNH(E) #1054194 (genitalia Plate III, Figs. 31–32). Dorsal and ventral surfaces are shown on odd- and even-numbered figures, respectively. Labels are shown near and in-line with each specimen. Round white type labels above the head of each specimen are shown in dorsal (above dorsal side of a specimen) and ventral (above ventral side) views. Small "Equa" label for *P. thestia* is glued to the back side of the large square label shown to the left of it. Labels are reduced 2.5 times compared to specimens: small scale bar refers to labels, and larger scale bars refer to specimens. All specimens are males and are in BMNH collection. Copyright (©) of all images: Trustees of the Natural History Museum, London; used with permission.



Figs. 17–35. *Potamanaxas* male genitalia. 17–20. - *P. hermierei* n. sp. holotype, genitalia NVG120922-46, data in text (specimen Plate I, Figs. 1-2); 21–25. - *P. paralus*: 21–22. - Colombia: Meta Department, Rio Negro, 26-Jan-1972, 2400', genitalia #H473 by S. S. Nicolay, 23–25. - Peru: Huánuco Region, Tingo María, 23-Jun-1982, 800 m, genitalia #H747 by S. S. Nicolay; 26–27. - *P. thestia*; Ecuador: Rio Yandía, 18-Feb-1966, 600 m, leg. Velastiqui, genitalia NVG120922-11; 28–30. - *P. cranda* Panama: Panama Province, Cerro Jefe 9° 14'N 79° 22'W, 13-May-1977, 900 m, leg. G. B. Small, genitalia NVG120922-47; 31–32. - *P. cranda* holotype (specimen and data Plate II, Figs. 15–16), interior view of left valva: 31 - lateral, 32 - ventrolateral; 33–34. - *P. thestia* lectotype, designated herein (specimen and data Plate II, Figs. 13–14): 33 - left lateral view, left valva removed, 34 - right lateral view; 35. - *P. paphos* [holo]type (specimen and data Plate II, Figs. 9–10), left lateral view of the abdomen posterior: left valva exterior, uncus with caudal part of the tegumen and dorsal edge of right cucullus interior are visible; 17–30. - preparations in glycerol [USNM]; 31–34. - dry mounts glued to carton cards [BMNH]; 35. - *in situ* on a specimen, scales brushed off [BMNH]; 17, 21, 23, 26, 28. - right lateral views; 20. - dorsal view, 18, 25, 29. - ventral views, genitalia slightly tilted to show gnathos, 25. left valva removed; 19, 30. - right lateroventral view; 22, 24. - medial view of left valva; 27. - ventral view of anterior segment of genitalia with saccus and bases of penis and valvae visible. Almost complete (24, 26) and partially removed (23) tufts of hair-like scales at the bases of valvae are seen, expanded (and image truncated on the sides to fit the allotted space) on Fig. 26. Black arrows on Figs. 17 and 23 mark the points between which measurements are taken: distal end of uncus, indentation between uncus and tegumen, and proximal end of tegumen. Black arrows on Figs. 18 and 25 point at the left uncus arm (the right arm is not visible below the right valva). Gray arrows on Figs. 17, 21, 23, 26, 28 indicate apical portion of tegumen that may develop diagnostic bulges. Gray arrows on Figs. 25 and 27 point at the end of saccus. All images are to scale. Copyright (©) of photographs shown as Figs. 31–35: Trustees of the Natural History Museum, London; used with permission.