



## Contributions to the systematics of the genera *Dipseudopsis*, *Hyalopsyche* and *Pseudoneureclipsis* (Trichoptera: Dipseudopsidae), with descriptions of 19 new species from the Oriental Region.

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## Abstract

Nineteen new species of Dipseudopsidae from the Oriental Region are described and illustrated, including 6 new species of the genus *Dipseudopsis*: *D. cocon*, *D. oliveri*, *D. gunung*, *D. rathnotoia*, *D. vienha*, and *D. viklundi*; 2 new species of the genus *Hyalopsyche*: *H. trunga* and *H. orissa*; and 11 new species of the genus *Pseudoneureclipsis*: *P. bonkybin*, *P. boquan*, *P. cauky*, *P. congkem*, *P. dongian*, *P. hailan*, *P. halongensis*, *P. loang*, *P. puyah*, *P. quancong*, and *P. vetcat*. The genus *Hyalopsychella* Ulmer, 1930, is recognized as a new synonym of *Hyalopsyche* Ulmer, 1904. *Hyalopsyche parvispinosa* Schmid, 1959, and *H. parvula* Martynov, 1935, are recognized as new synonyms of *H. sachalinica* Martynov, 1910; *Hyalopsyche similis* Martynov, 1935, is recognized as a new synonym of *Hyalopsychodes rivalis* Betten, 1909; and *Hyalopsychella haplotes* Neboiss, 1989, is recognized as a new synonym of *Hyalopsyche winkleri* (Ulmer, 1930). New records of 14 other species are provided.

**Key words:** Dipseudopsidae, *Dipseudopsis*, *Hyalopsyche*, *Pseudoneureclipsis*, new species

## Introduction

The first described species of Dipseudopsidae was *Dipseudopsis capensis* Walker, 1852, from South Africa, a species subsequently recorded from all Afrotropical mainland subregions (Tobias & Tobias 2007). The family is currently divided into 8 recognized genera (Morse 2008) and has been recorded from all major biogeographical regions, but represented by only a few species in the Australian, Nearctic, Palearctic, and Neotropical Regions. The greatest species diversity occurs in the Oriental Region, having over 100 species, and the Afrotropical Region, having over 50 species. Ulmer (1904) first erected the subfamily Dipseudopsinae in Polycentropodidae. Ross (1967) elevated the Dipseudopsidae to family status based on a combination of adult characters: 1) posterior border of prosternum with narrow, sclerotized, mesal point, 2) apical segment of palps annulated, 3) dorsotentorial arms (supratentorium of Ross 1967) absent, 4) front and hind wings with crossvein *m* present, 5) ocelli absent, 6) Y-shaped suture of mesopleuron absent, 7) inferior appendages 1-segmented, and 8) prescutal suture atrophied. These characters also fit the Polycentropodidae and Psychomyiidae. Weaver (1984) presented the following synapomorphies for the Dipseudopsidae: 1) larvae with dilated forelegs; 2) larvae constructing long, narrow tubes within the bottom substrate; 3) larvae with spinneret extending far beyond other mouthparts; and 4) adult labial palps reduced.

Kjer *et al.* (2001) suggested that Dipseudopsidae are closely related to Polycentropodidae and Ecnomidae. Holzenthal *et al.* (2007) stated that the phylogenetic relationships among genera in the family are not well defined, and the genera of the Pseudoneureclipsinae are doubtful members of the family due to dissimilar morphology and ecology with respect to the remaining genera. Johanson & Espeland (2010) stated that the family Dipseudopsidae including *Pseudoneureclipsis* is not a monophyletic group, and instead concluded that the genus is more closely related phylogenetically to Ecnomidae than to *Dipseudopsis* and *Protodipseudopsis*.

## Material and methods

This study is based on the examination of 223 males, 5 females and 14 pharate male pupae of *Dipseudopsis* (15 species); 16 males and 4 females of *Hyalopsyche* (5 species); and 60 males of *Pseudoneureclipsis* (13 species). All specimens are stored in 70–80% alcohol. The preparation and illustration of the specimens follows the procedure of Oláh & Johanson (2008) and Oláh *et al.* (2006, 2008). The terminology for setal warts follows that of Oláh & Johanson (2007). The terminology applied to genitalic structures mainly follows Li *et al.* (2001). Descriptions herein are based on the examination of specimens with abdomens cleared and

then placed in glycerine, and other body parts placed in alcohol but not cleared.

**Depositories.** Types are deposited in the following institutions, using the abbreviations by Evenhuis & Samuelson (2004). NHML, The Natural History Museum, London, England, U.K.; NHMB, Natural History Museum, Budapest, Hungary; NMNH, National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.; OPC, Oláh Private Collection, to be transferred for permanent retention to the Hungarian Natural History Museum, Hungary; and SMNH, Swedish Museum of Natural History, Stockholm, Sweden.

### *Dipseudopsis* Walker

*Dipseudopsis* Walker, 1852: 91. Type species: *Dipseudopsis capensis* Walker, 1852: 91 (monotypic); type locality: South Africa (Port Natal).

*Bathytinodes* Iwata, 1927: 209. Type species: *Bathytinodes alba* Iwata (monotypic); type locality: Japan. Synonym according to Tsuda, 1942: 266.

*Dipseudopsodes* Lestage, 1936: 170. No type species designated. Invalid according to Fischer, 1962: 3.

*Esperona* Navás, 1915: 397. Type species: *Esperona orientalis* Navás (monotypic); type locality: Vietnam (Tongking). Synonym according to Lestage, 1925: 39.

*Nesopsyche* McLachlan, 1866: 268. Type species: *Nesopsyche flavisignata* McLachlan (monotypic); type locality: Sulawesi (Celebes). Synonym according to Mosely, 1933: 499.

The genus *Dipseudopsis* Walker is remarkable in having siphoning mouthparts and conspicuous sexual dimorphism. Many males and females have contrasting colour patterns in their wings and bodies. Males have twisted and/or branched mesoapical spurs on their hind tibiae. The proboscis siphoning organ is formed by the elongate terminal lobes of the maxillae which are probably the laciniae. The galeae are reduced and suppressed. The elongate laciniae are not held together in preserved specimens, but variously curled away from each other distally. The sucking apparatus is operated by a stomodaeal pump and positioned by the cranial and stipital flexor muscles. The apparatus in use has not yet been observed. However, a pollinium attached to the mouthparts of a male *D. doehleri* Ulmer, 1929, was discovered (John S. Weaver III, personal communication), indicating that the species might feed on flowering plants. The enlarged stipital flexor muscles are inserted on the bases of the laciniae. The presence of a proboscis resulted in 2 characteristics of the head: 1) the extreme enlargement of the stipes serving for attachment of the stipital flexor muscle, and 2) the highly convex and enlarged clypeus covering the stomodaeal pump.

An additional feature of the genus is the presence of glabrous cephalic and thoracic surfaces. The setal areas are not elevated into typical setaceous warts but are flush with surrounding sclerites (Weaver & Malicky 1994). The typical setal warts are present. A detailed description of the cephalic groove and setal wart patterns and tentorium of *Dipseudopsis oliveri*, new species is provided herein, and only minor specific alterations are observed in the other species. Based on the observations of the un-cleared head of various species, we conclude that the cephalic groove and setal wart patterns are stable and persistent in *Dipseudopsis*.

The new species in *Dipseudopsis* described below share the following characters, except when stated otherwise.

Adult. Head shorter than wide. Antennae stout, about as long as each forewing; scapes short, half as long as head, almost touching; distance between antennae shorter than length of each scape; membranous antennal sockets large, depressed, wrinkling with scape movements, delineated by elevated, strongly sclerotized rim of antennal and frontal grooves. Eyes small, interocular distance on vertex more than 2 times longer than eyes. Maxillary palp formula I-IV-II-III-V; first 3 segments dilating apically. Stipes moderately large. Labrum bipartite, basal part transversally elongate, quadrangular; sclerotized; fused with clypeus, fixed; apical portion membranous, flexible, hanging freely. Enlarged bulging clypeus sparsely covered by setae. Frons narrowing posteriorly from above theoretical line of frontoclypeal groove (epistomal suture) between anterior tentorial pits; stretching posterad between scapes. Subgenal process forming narrow tapering, dark tooth. Two branches of frontal grooves visible on face and on head dorsum, delineating frons, stretching between membranous antennal sockets. Short, sinuous frontogenal and long clypeogenal grooves well-pigmented;

clypeolabral grooves weakly discernible. Proboscis longer than first 4 segments of maxillary palps. Haustellum reduced, forming narrow band with bifid apex. Coronal groove visible along entire vertex. Basal sclerotized part of labrum and entire clypeus covered with short setae; remnant of frontal setal warts shifted posterad and dorsad between scapes, nearly invisible, represented by few setae; pair of setose warts, probably representing vertexal interantennal warts, attached to rim of antennal sockets. Occipital and postgenal setal warts compact and setose. Setose wart attached to dorsum of anterior arm of each cervical sclerite, central ridge of cervical sclerites covered by long setae.

Thorax. Pronotum raised to head level, divided by deep longitudinal furrow; raised surface sparsely covered with short setae or alveoli. Setal warts on mesonotum variable (see below). Metanotum without setal warts. Spur formula 2, 4, 4. Claws on all legs symmetrical.

**Remarks.** In making species identifications of *Dipseudopsis*, the precise orientation of the modified hind leg spur is a crucial factor, because slight rotation of the tibiae produces different perspectives of the spur (Weaver & Malicky 1994). Here we chose the left leg and ventral view for examination and drawing, and we illustrated the modified spur together with the adjacent anteroapical unmodified spur and a part of both tibia and tarsus. Similarly, the drawings of the large, preanal appendages are auriform and sensitive to observation angle, especially in dorsal view. We illustrate the more stable lateral views herein. The male genitalia are rather blunt and often lack conspicuous characters. We found the sclerotized structures of the phallocrypt, or the mesosuperior processes of sternum IX (Weaver & Malicky 1994), useful in differentiating species. This structure may possibly represent the paraproctal processes (intermediate appendages) fused at the extreme base of the basodorsal bulging corners of sternum IX, and hinged with tergite IX and the preanal appendages. Their lower inner angles extend medially into a bridge around and under the phallobase. This character is often difficult to observe because often it is weakly sclerotized and the heavily sclerotized sternum IX and inferior appendages obstruct it from view. However, removing the inferior appendages and the apodeme exposes the mesosuperior processes (paraproctal process) in caudal view.

Ross & Kingsolver (1959) speculated about the phylogeny of the genus, and postulated the length of forewing veins  $R_2$  and  $R_3$  as well as the shape of inferior appendages in ventral or caudal views for recognition of proposed phylogenetic lines. After more species were examined and described (Weaver & Malicky 1994), the length of forewing  $R_2$  and  $R_3$  of fork I proved to be unstable, between and within species, and a plesiomorphic character. For instance, the stalk/fork  $R_{2+3}$  ratio varies in the range of 2–10 in *D. rathnotoia*, new species.

### *Dipseudopsis benardi* Navás

*Dipseudopsis benardi* Navás, 1930: 141.

**Material examined.** VIETNAM: Tamdao, 200 m 12.x.1986, at light [J. Oláh], 1 male (OPC).

### *Dipseudopsis cocon*, new species

Figs 1–6

This species is similar to *D. collaris* McLachlan, 1863, and *D. robustior* Ulmer, 1929, but it differs by having pronotum and mesonotum uncoloured and the modified spur more deeply bifid.

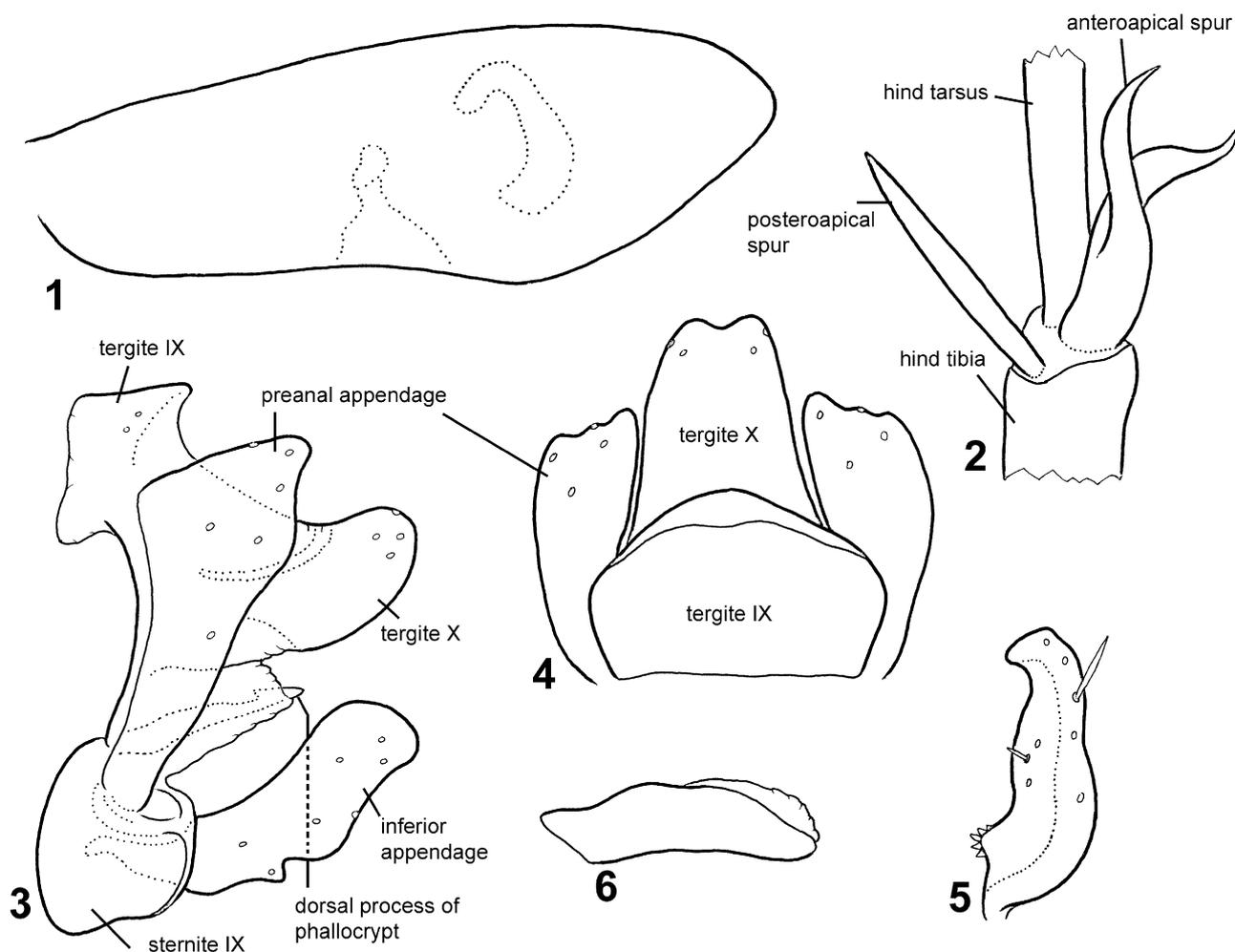
Male. Body uniformly light brown, only edges or margins darker brown; mesonotum not darker brown than pronotum; antennae, palpi and legs slightly lighter brown, almost ochraceous.

Head. Labrum dark brown. Pair of large, setose, mesal, longitudinal bands present, representing fused vertexal lateroantennal and vertexal ocellar warts. Each lateral cervical sclerite broadly triangular.

Thorax. Mesoscutum sparsely covered by small alveoli, divided medially by longitudinal, shallow furrow. Mesoscutellum with pair of fragmented compact setal warts. Spur formula 2, 4, 4; mid leg posterior spurs

longer than anterior spurs; hind leg modified spur branching from apical 2/3rds, crescent-shaped, with 2 sinuate, sub-equal branches directed mesad after basal overcrossing.

Forewing length 11.3 mm; membrane brown, with 2 inconspicuously faded spots; 1 spot semicircular, located distally of cord; 1 large spot located above arculus.



**FIGURES 1–6.** *Dipseudopsis cocon*, new species, holotype male. 1—right forewing, dorsal; 2—left hind leg apical tibial spurs; 3—genitalia, left lateral; 4—genitalia, dorsal; 5—left inferior appendage, ventral; 6—phallus, left lateral.

Male genitalia. Segment IX with large tergite and slightly larger sternite connected; these 2 sclerites connected by narrow strip on each side composed of antecostal ridge and fused base of large preanal appendage. Tergite IX subquadrangular in lateral view, with small dorsoapical rim triangular in lateral view; rounded in dorsal view, slightly overhanging segment X; setose fields absent. Sternite IX subquadrangular in lateral view, with bulging basodorsal corners articulating with antecostal ridge, preanal appendages and mesosuperior processes. Phallocrypt composed of long, sclerotized pair of dorsal processes embedded in conjunctive membranes encircling dorsum of phallobase, connecting to venter of segment X; pair of short lateral, weakly sclerotized lobes fixed to short phallic apodeme. Basal plate below phallocrypt complex, forming long rod of apodemes of inferior appendages, not attached by sclerotized connection to phallocrypt or to phallobase, moving freely according to clasping movement of inferior appendages. Apicodorsal corners of sternite IX with small areas of microtrichia. Segment X as long as inferior appendages, slightly overlapped by tergite IX, forming heavily pigmented hood notched apically in dorsal view with weakly discernible setose area on each apex; thumb-shaped, slightly concave dorsally in lateral view. Intersegmental depression between segment IX and segment X forming short vertical concavity in lateral view by slightly overhanging tergite IX. Preanal appendages triangular, auriform, narrowing dorsoapicad. Preanal appendages fused with

antecostal ridge of segment IX along wide basal part, hinged dorsally to tergite IX, ventrally to basodorsal corner of sternite IX. Inferior appendages each as long as segment X, sinuous, with regularly concave dorsum and irregularly convex venter in lateral view and with triangular projection visible near base. Phallic apparatus small; phallosome forming heavily sclerotized, broad, basal tube and slightly narrowing ventroapical lobe; no minute setae visible on basal part. Delineation of membranous dorsal part, apical endotheca, and aedeagus obscured; weakly sclerotized phallosomal sclerite complex present, position varying according to level of aedeagus erection.

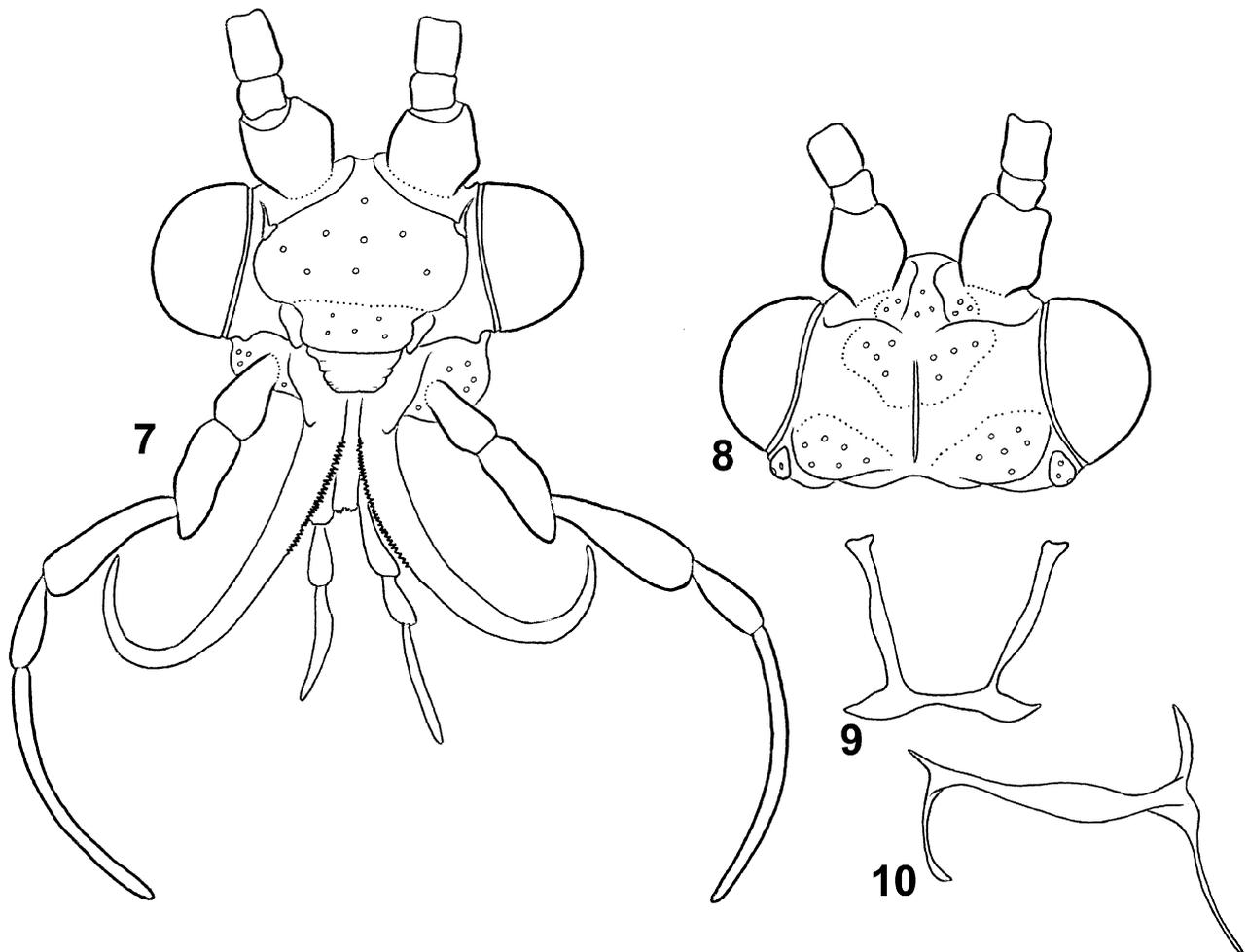
**Holotype male:** VIETNAM: Hanoi, West Lake, 28.x.1986, at light [J. Oláh], (OPC).

**Etymology.** *Cocon*, from Vietnamese “co con,” meaning collar, referring to the similarity between this species and *D. collaris* McLachlan.

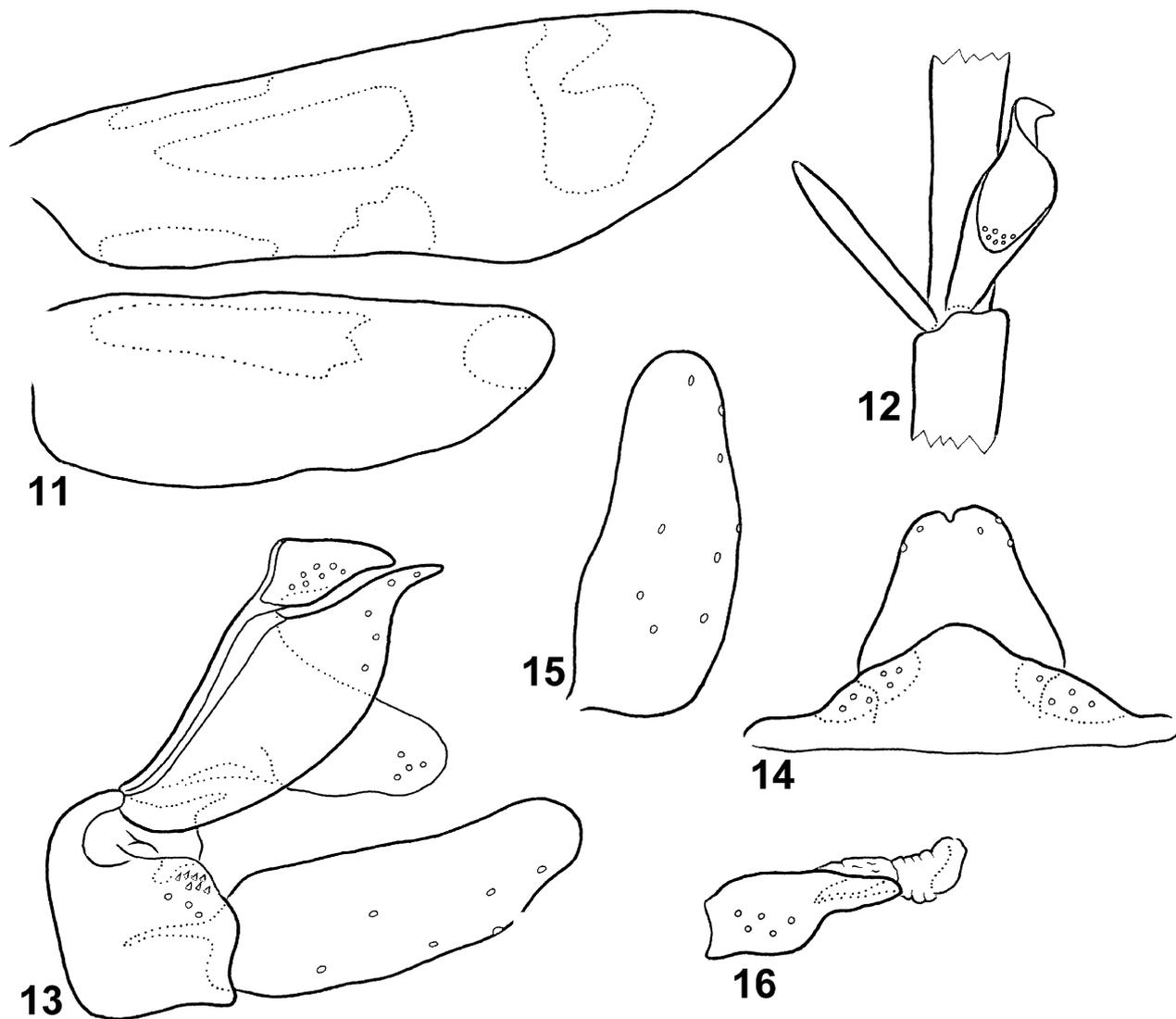
***Dipseudopsis oliveri*, new species**

Figs 7–16

This species is bright coloured with a characteristic pattern on the forewings. It is similar to *D. doehleri* Ulmer. *Dipseudopsis oliveri* has 5 translucent spots on each forewing, while *D. doehleri* has 3 spots. The modified spur has a twisted, apical part being 2/3 as long as the spur, not 1/3 as long as the spur as in *D. doehleri*. The head is yellowish, while in *D. doehleri* it is dark brown.



**FIGURES 7–10.** *Dipseudopsis oliveri*, new species, holotype male. 7—head, frontal; 8—head, dorsal; 9—head tentorium, dorsal; 10—head tentorium, lateral.



**FIGURES 11–16.** *Dipseudopsis oliveri*, new species, holotype male. 11—right wings, dorsal; 12—left hind leg apical tibial spurs; 13—genitalia, left lateral; 14—genitalia, dorsal; 15—inferior appendage, ventral; 16—phallus, left lateral.

Male. Wing and body colour patterns highly contrasting. Head, cervical sclerites, prothorax, apical half of foreleg femur, coxae, trochanter and femur of mid legs and hind legs, as well as abdomen bright yellow.

Head. Antennae, maxillary palps, labial palps, mesonotum, metanotum, forelegs (except apical half of femur), tibiae and tarsi of mid and hind legs, mid leg episterna and precoxale, abdominal tergum III, and genitalia dark chestnut brown. Tentorium simple, dorsal arms absent, vestigial structures invisible; anterior tentorial arms slender in dorsal view, slightly broadening at middle in lateral view. Frontoclypeogenal septum well developed; anterior tentorial pits located dorsolaterally; frontogenal arms extending dorsad from anterior tentorial pits to margin of circumantennal sclerites, shorter than clypeogenal arms; posterior tentorial arms short, robust; tentorial bridge shifted posterad almost to posterior tentorial pits. Antennae stout, as long as forewings; scapes short, half as long as head, closely set, almost touching, interantennal distance narrower than length of scapes; membranous antennal sockets large, providing space for movement of scapes, characteristically depressed and delineated by elevated and strongly sclerotized rim of antennal and frontal grooves. Stipes large. Enlarged bulging clypeus covering stomodaeal pump, dominating face. Coronal groove well developed, visible along almost entire vertex, except anterior section diverging into frontal branches indiscernible. Lateral cervical sclerites long, triangular, forming narrow anterior arms articulating anterad

with occipital condyles near posterior tentorial pits, fusing with posterior cervical sclerites; posterior cervical sclerites broadening slightly posterad, forming elongate triangular plates reaching and articulating to prothoracic episternum and to weakly sclerotized anteromedian band of prothoracic eusternum by narrow ventral intercervical sclerites.

Thorax. Mesoscutum bearing pair of broad, mesal bands of tiny alveoli, separated by longitudinal, median, shallow furrow; similar pattern visible on mesoscutellum, except alveoli in 2 bands separated by median groove forming diamond-shaped elevated surfaces. Foreleg posteroapical spurs slightly longer than anteroapical spurs; mid leg posterior spurs longer than anterior spurs; modified hind leg spurs un-branched, slightly longer than adjacent anteroapical spur; basal 1/3 unmodified, apical 1/3 twisted 180° into short, spiral-shaped ridge with mesad-directed apical point; median 1/3 excavated and twisted concavity filled by closely set setal bundle; alveoli located on bottom of twisted concavity.

Forewing length 16.0 mm. Forewing and hind wing membranes dark chestnut brown with translucent, contrasting pattern; entire membrane surfaces densely covered by short, dark, decumbent setae; setae on translucent patterns whitish; wing pattern including 7 spots, 5 on each forewing and 2 on each hind wing. Forewing spots present on basal costal narrow stripe, in basal 1/5th of costal cell between costa and subcosta; in postanal band on basal half of postanal area; basally between  $R_1$  and  $Cu_1$  to fork I on  $R_s$  and  $M$ ; in arculus; in subapical, irregularly transverse patch distal of cord. Hind wing spots weak; basal triangular spot present from  $R_1$  to  $Cu_2$  and  $A$ ; rounded spot located at apex.

Male genitalia. Abdominal segment IX consisting of weakly developed tergite and well-developed sternite connected by narrow strip on each side composed of antecostal ridge and fused base of large preanal appendage. Tergite IX triangular, with 2 lateral setose fields visible in lateral and dorsal views, deeply overhanging segment X; sternite IX quadrangular in lateral view, with complex bulging basodorsal corner articulating with antecostal ridge and preanal appendages; additional complex sclerotized structures hinged to meeting point of basodorsal corner, forming mesosuperior processes *sensu* Weaver and Malicky (1994), forming complete complex ring encircling phallobase; composed of narrow ventral, wide lateral, and long mesosuperior parts, beneath partially sclerotized basoventral part of segment X; all possibly representing complete, sclerotized phallocrypt complex. Phallobase somehow fixed by short phallic apodeme to phallocrypt complex; free basal plate, or rather long unattached rod of apodeme of inferior appendages present below phallocrypt complex; apicodorsal corner of sternite IX densely packed with microtrichia and sharp cuticular denticles, this region delineated ventrally by longer setae. Segment X shorter than inferior appendages, half as long, originating deeply beneath overhanging tergite IX, forming well-pigmented hood above phallus, with weakly discernible setose areas, thumb-like in lateral view, bluntly sagittate in dorsal view, with small apicomeral excision. In lateral view, intersegmental depression between segment IX and segment X forming deep concavity beneath overhanging tergite IX. Preanal appendages elongate auriform, each with dorsoapical, slender, finger-like, digitate process, fused to antecostal ridge of segment IX along wide basal part, hinged dorsally to tergite IX and ventrally to basodorsal corner of sternite IX. Inferior appendages almost 2 times longer than segment X; clearly thumb-like in lateral and dorsal view. Phallic apparatus small; phallosome with heavily sclerotized, broad basal half and narrowing apical half; basal half interspersed with short setae; delineation of membranous dorsal and apical endotheca and aedeagus weakly discernible; apical portion ending in dark cap of very densely packed microtrichia.

**Holotype male: VIETNAM:** Quangtri Province, Da Krong Nature Reserve, headquarters, 17.v.2007, at light [G. Csorba], (OPC).

**Paratypes:** Same data as holotype, 4 males, 2 females (OPC); Quangtri Province, Huong Hoa District, A Xoc village, 350 m, 16°53' 11"N, 106°34' 15"E, 6.xi.2007, at light [G. Csorba], 1 male (OPC).

**Etymology.** This species is dedicated to Dr. Oliver S. Flint, Jr. (NMNH) in recognition of his enormous contributions to caddisfly systematics.

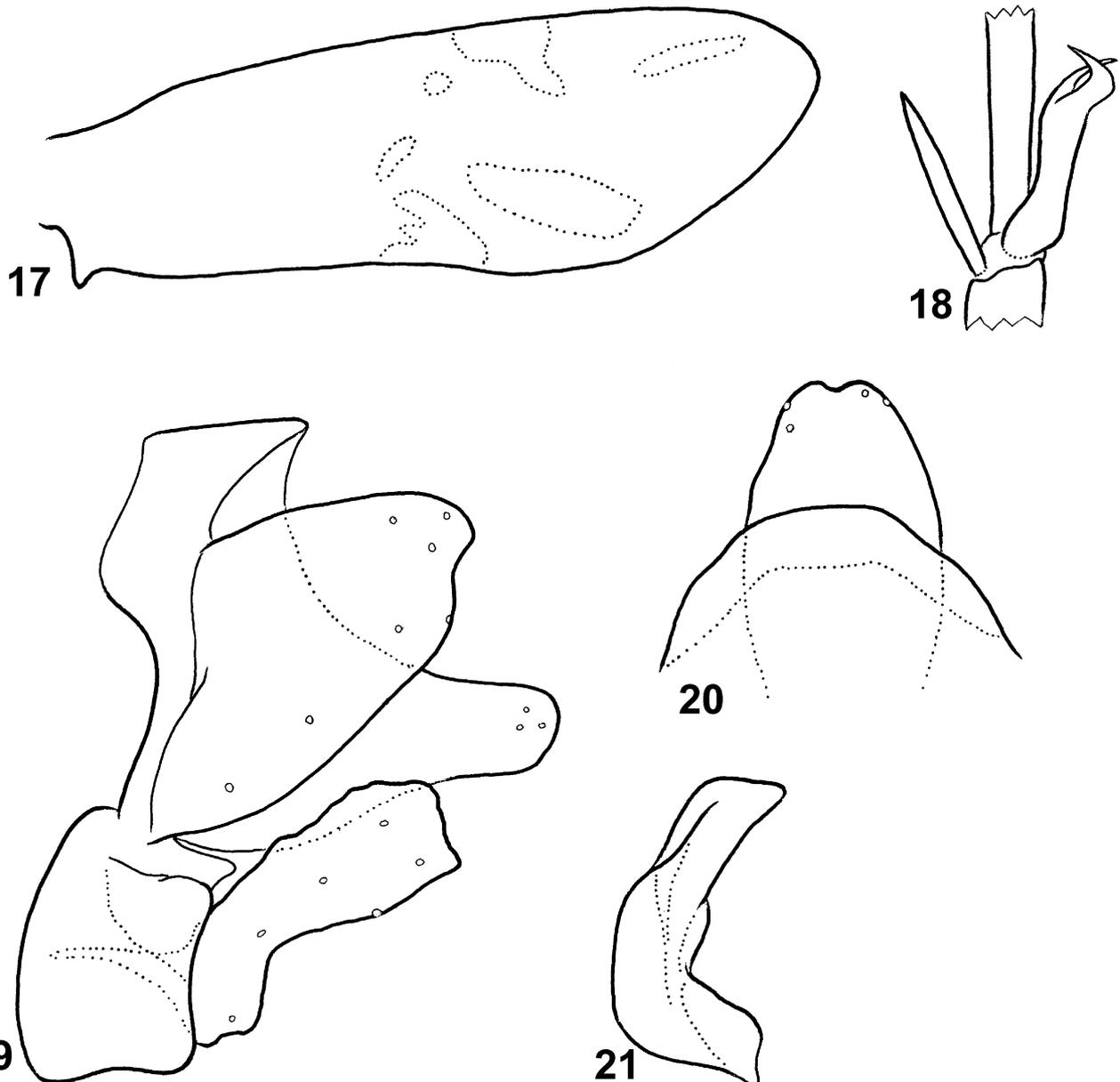
*Dipseudopsis gunung*, new species

Figs 17–21

This species is similar to *D. contorta* Banks, 1931, and *D. triclavata* Martynov, 1935. However, the modified hind leg spurs are bifid, not trifid as in both *D. contorta* and *D. triclavata*, and the forewings each have 6 differently shaped, weakly hyaline spots.

Male. Entire body rather uniformly dark brown; pronotum, antennae, palps and legs slightly lighter.

Head. Maxillary palp segment III originating subapically on segment II. Labrum dark brown, sclerotized. Interantennal part of frons very narrow. Pair of large, setose, mesal longitudinal bands present, probably representing fused vertexal lateroantennal and vertexal ocellar diffuse setose warts. Lateral cervical sclerites widely triangular.



FIGURES 17–21. *Dipseudopsis gunung*, new species, holotype male. 17—right forewing, dorsal; 18—left hind leg apical tibial spurs; 19—genitalia, left lateral; 20—genitalia, dorsal; 21—inferior appendage, ventral.

Thorax. Pronotum pale. Mesoscutum sparsely covered by tiny alveoli, separated by shallow median longitudinal furrow; mesoscutellum with pair of fragmented compact setal warts. Mid leg posterior spurs longer than anterior spurs; hind leg modified spurs bifid from distal 2/3rds their lengths: each with mesal point directed laterad, crescent-shaped; lateral point slender, less sinuous, directed mesad.

Forewing length 11.0 mm. Brown forewing membrane with 6 weakly hyaline spots: (1) pterostigmal spot sub-triangular; (2) small spot adjacent to base of pterostigma rounded; (3) subapical radial spot elongate; (4) spot at arculus nearly triangular; (5) spot dorsally adjacent to arculus small, elongate; (6) sub-cordal spot largest, obliquely elongate.

Male genitalia. Segment IX with equally large tergite and sternite, connected by narrow strip on each side composed of antecostal ridge and of fused base of large preanal appendage; tergite vertically tall, subquadrangular in lateral view, with small dorsoapical overhanging triangular rim, rounded in dorsal view, slightly overhanging segment X; setose fields invisible; sternite IX subquadrangular in lateral view, with bulging basodorsal corners articulated with antecostal ridge, preanal appendages and phallocrypt, forming mesosuperior process. Phallocrypt weakly sclerotized, embedded in conjunctive membranes encircling dorsum of phallobase, connecting to venter of segment X. Pair of short, lateral, weakly sclerotized lobes fixed to short phallic apodeme; basal plate forming long rod of apodeme of inferior appendages below phallocrypt complex, not attached by sclerotized connection either to phallocrypt or to phallobase. Segment X longer than inferior appendages, originating beneath overhanging tergite IX, forming heavily pigmented hood above phallus, dorsum deeply concave in lateral view, setose areas on apex weakly discernible; starting from broad base, thumb-shaped in lateral view; apex excised in dorsal view. Intersegmental depression between segment IX and segment X forming short, vertical concavity in lateral view beneath slightly overhanging tergite IX; produced into deeply rounded step. Preanal appendages nearly triangular auriform, with slightly excised apical portion; venter not narrowing basally; preanal appendages fused with antecostal ridge of segment IX along wide basal part; hinged dorsally to tergite IX and ventrally to basodorsal corner of sternite IX. Inferior appendages shorter than segment X; sinuous, with convex dorsum and deeply concave venter; dilating apicad in lateral view. Phallic apparatus small. Phallosome composed of heavily sclerotized, broad basal tube and of slightly narrowing ventroapical lobe; basal part without phallosome; delineation of membranous dorsal and apical endotheca and aedeagus obscured; weakly sclerotized phallosomal sclerite complex present, position varying.

**Holotype male: MALAYSIA:** Sarawak, Gunung Mulu National Park, v.1977 [J. D. Holloway, R.G.S. Exp.], (NHML).

**Etymology.** *Gunung*, named after the type locality, Gunung Mulu National Park.

### ***Dipseudopsis indica* Martynov**

*Dipseudopsis indica* Martynov, 1935: 18.

**Material examined. INDIA:** Orissa, Bhubaneswar, marsh, ii.1983, at light [J. Oláh], 5 males (OPC); Orissa State, Bhubaneswar, marsh, 20–28.ii.1987, at light [J. Oláh], 9 males (OPC).

### ***Dipseudopsis lamellata* Martynov**

*Dipseudopsis lamellata* Martynov, 1935: 160.

**Material examined. INDIA:** Orissa, Bhubaneswar, Dhauli, marsh, ii.1983, at light [J. Oláh], 38 males (OPC); same data, except 20–28.ii.1987, 41 males (OPC); same data, except 14 males (OPC).

### *Dipseudopsis modesta* Banks

*Dipseudopsis modesta* Banks, 1911: 105.

**Material examined.** INDIA, Orissa, Bhubaneswar, River Daya, 21.ii.1985, at light [J. Oláh], 7 males, 3 females (OPC).

### *Dipseudopsis nebulosa* Albarda

*Dipseudopsis nebulosa* Albarda, 1881: 19.

**Material examined.** MALAYSIA: Sarawak, Gunung Mulu National Park, v.1977 [J.D. Holloway, R.G.S. Exp.], 4 males (OPC); W. Pahang, Genting Tea Estate, 2000 ft. 1–8.xi.1981, at M.V. light [K.R. Truck], 1 male (NHML).

### *Dipseudopsis rathnotoia*, new species

Figs 22–27

This species is darker than many other Oriental species in the genus. It is close to *D. varians* Ulmer, 1929, from which it is separated by having almost no translucent spots on the forewings (only small, faded, lighter spots are visible); modified hind leg spurs that are each twisted into a short spiral; and inferior appendages that are triangular, not elongate oblong, each exhibiting a sharp basodorsal corner, and lacking the conspicuous central tooth seen in *D. varians*.

Male. Body generally dark; head dorsum, cervical sclerites, prothorax orange brown, proboscis and abdomen faded white. Antennae, maxillary palps, labial palps, mesonotum, metanotum, legs, abdominal segments VII and VIII, and genitalia dark chestnut brown.

Head. Clypeolabral grooves barely discernible. Occipital and postgenal compact setose warts covered by short, black setae; setae on occipital compact setose warts stiff. Pair of large, setose, mesal longitudinal bands present, probably representing fused vertexal lateroantennal, and vertexal ocellar, diffuse setose warts. Lateral cervical sclerites long, triangular. Central ridge of cervical sclerites covered by diffuse setae.

Thorax. Mesoscutum sparsely covered by small alveoli; divided by shallow median longitudinal furrow; mesoscutellum with 2 bands of alveoli separated by median groove, together forming diamond-shaped surface. Foreleg posteroapical spurs little longer than anteroapical spurs; mid leg posterior spurs longer than anterior spurs; hind leg with modified spur un-branched, slightly longer than adjacent anteroapical spur, large basal half unmodified, small apical half twisted 180° into short spiral ridge with small, mesad-directed apical point; modified apical part excavated, concavity filled with closely set setal bundle with alveoli situated on bottom surface of furrow. Forewing length 12.0 mm. Forewing and hind wing membranes dark chestnut brown, slightly darker along veins; all membrane surfaces densely covered by short, dark, decumbent setae; basal triangular spot present between *R1* and *Cu1* to first fork on *Rs* and *M*; spot of subapical irregular transverse patch located distally to cord almost indiscernible.

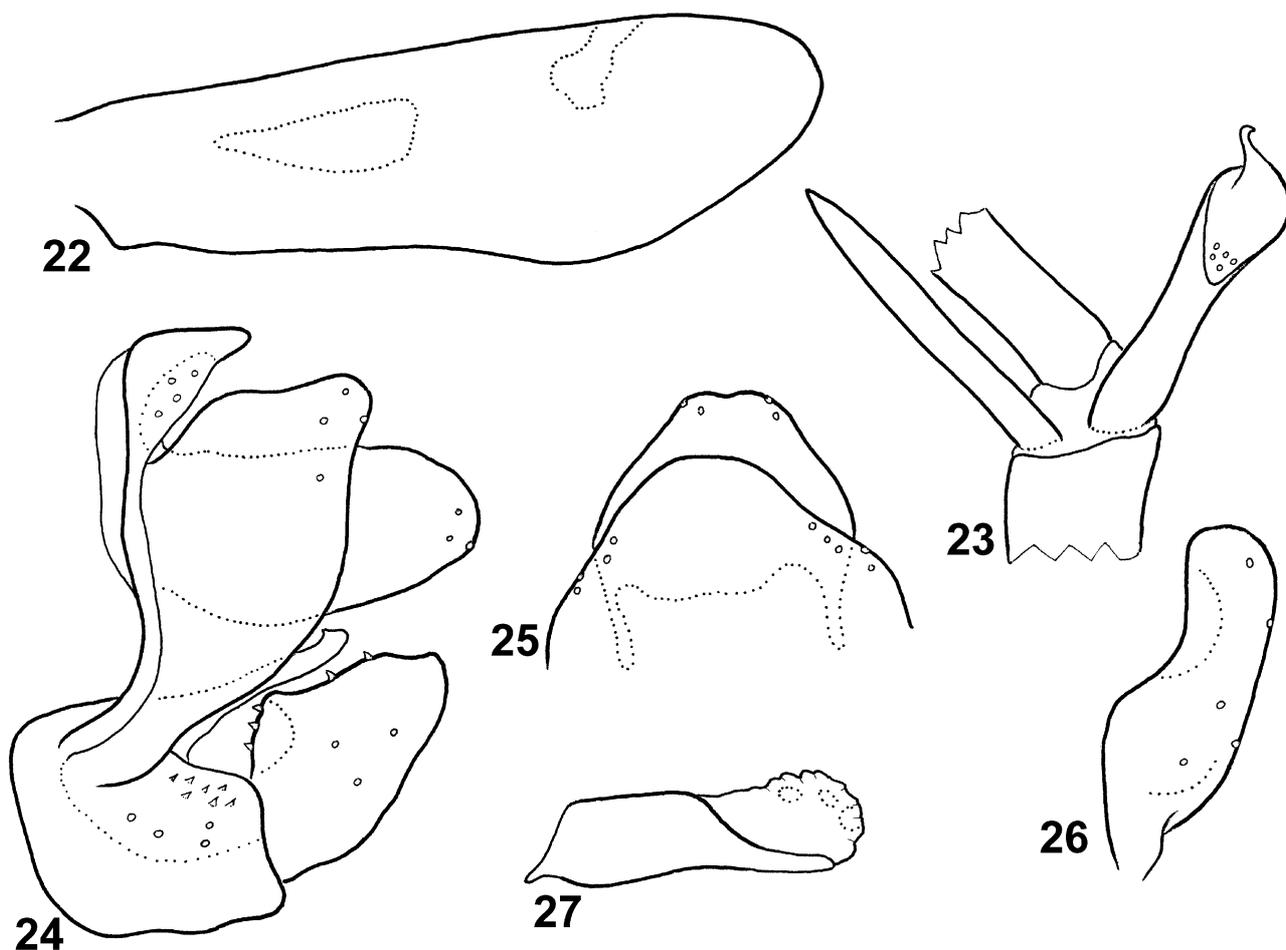
Male genitalia. Segment IX with small tergite and large sternite, connected by narrow strip on each side composed of antecostal ridge and fused base of large preanal appendage; tergite triangular in lateral view, rounded in dorsal view, overhanging segment X; 2 lateral setose areas visible in lateral and dorsal view; sternite IX quadrangular in lateral view, with bulging basodorsal corners being complex, articulating with antecostal ridge and preanal appendages; mesosuperior processes arising from phallocrypt and exhibiting complete and complex ring encircling phallobase; composed of short, ventral pair of elongate lateral, and short, weakly sclerotized mesosuperior parts, beneath membranous basoventral part of segment X. Phallobase fixed by short phallic apodeme to phallocrypt complex; basal plate or long rod of apodeme of inferior appendages apparently not attached below phallocrypt complex, moving free. One-quarter of apicodorsal

corner of sternite IX densely packed with microtrichia and sharp cuticular denticles, interspersed with long setae. Segment X longer than inferior appendages, originating deeply beneath overhanging tergite IX, forming well-pigmented hood above phallus with weakly discernible setose areas on apex; broad thumb-like in lateral view; blunt sagittate with constricted base and small apicomesal excision in dorsal view. Intersegmental depression between segment IX and segment X forming deep concavity in lateral view beneath overhanging tergite IX. Preanal appendages broadly auriform, each with dorsoapical blunt lobe. Preanal appendages each fused to antecostal ridge of segment IX along wide basal part, hinged dorsally to tergite IX, and ventrally to basodorsal corner of sternite IX. Inferior appendages shorter than segment X; triangular, each with sharp basodorsal corner in lateral view. Phallic apparatus small. Phallosome forming heavily sclerotized broad basal tube and narrowing ventroapical lobe; basal part with few minute alveoli; delineation of membranous dorsal and apical endotheca and aedeagus obscure, with few small, weakly sclerotized phallosomal sclerites with microtrichia, position varying according to erection state of aedeagus.

**Holotype male: MALAYSIA:** Perak, Halong stream, ix–x. 1993, at light [G.S. Robinson], (NHML).

**Paratypes: MALAYSIA:** Perak, Tasek Temengor, Sungei Halong, 230m, MNS Belum, Rothamsted, trap site 1, 2.vii.1994, 3 males (OPC); Perak, Halong stream, ix–x.1993, at light [G.S. Robinson], 18 males (NHML).

**Etymology.** *Rathnotoia*, from Vietnamese word “rathno,” meaning minute, referring to the minute terminal hook on the modified hind leg spur; and from Vietnamese “toi,” meaning dark, referring to the overall dark colour of the body and wings.



**FIGURES 22–27.** *Dipseudopsis rathnotoia*, new species, holotype male. 22—right forewing, dorsal; 23—left hind leg apical tibial spurs; 24—genitalia, left lateral; 25—genitalia, dorsal; 26—inferior appendage, ventral; 27—phallus, left lateral.

### *Dipseudopsis recta* Martynov

*Dipseudopsis recta* Martynov, 1935: 163.

**Material examined. INDIA:** Karnataka, Tunga River, 18.iv.1992, at light [J. Oláh], 2 males (OPC). Rajasthan, Udaipur, Lake Pichola, 29.iv.1992, at light [J. Oláh], 1 male (OPC).

### *Dipseudopsis robustior* Ulmer

*Dipseudopsis robustior* Ulmer, 1929: 185.

**Material examined. MALAYSIA:** Perak, Ipoh, River Kinta 1913 [J. Henderson], 3 males (NHML); Perak, Halong stream, ix–xii.1993 [G.S. Robinson], 5 males (NHML); Perak, Temengor Lake, ix–x.1993, at light [G.S. Robinson], 15 males (NHML); Perak, Tasek Temengor, Sungei Halong, 230m, viii.1993, at light [G.S. Robinson], 4 males (NHML); Perak, Tasek Temengor, Sungei Halong, 230 m, MNS Belum, Rothamsted, trap site 2, 3.vii.1994, 17 males (in NHML and OPC); Perak, Tasek Temengor, Sungei Halong, 230 m, MNS Belum, Rothamsted, trap site 2, 17.iii.1994 [B. Hellmud], 12 males (OPC); Perak, Tasek Temengor, Sungei Halong, 230 m, MNS Belum, Rothamsted, trap site 2, 12.v.1994 [B. Hellmud], 12 males (OPC); Perak, Tasek Temengor, Sungei Halong, 230 m, MNS Belum, Rothamsted, trap site 1, 2.vii.1994, 9 males (OPC).

### *Dipseudopsis triclavata* Martynov

*Dipseudopsis triclavata* Martynov, 1935: 161.

**Material examined. INDIA:** Karnataka, Tunga River, 18.iv.1992, at light [J. Oláh], 1 male (OPC).

### *Dipseudopsis varians* Ulmer

*Dipseudopsis varians* Ulmer, 1929: 191.

**Material examined. VIETNAM:** Lam Dong Province, Baoloc, River Dai Binh, 22.x.1988, at light [J. Oláh], 2 males (OPC); Nva Gut, River Suoi, 22–23.i.1991, at light [S. Andrikovics], 1 male (OPC).

### *Dipseudopsis vienha*, new species

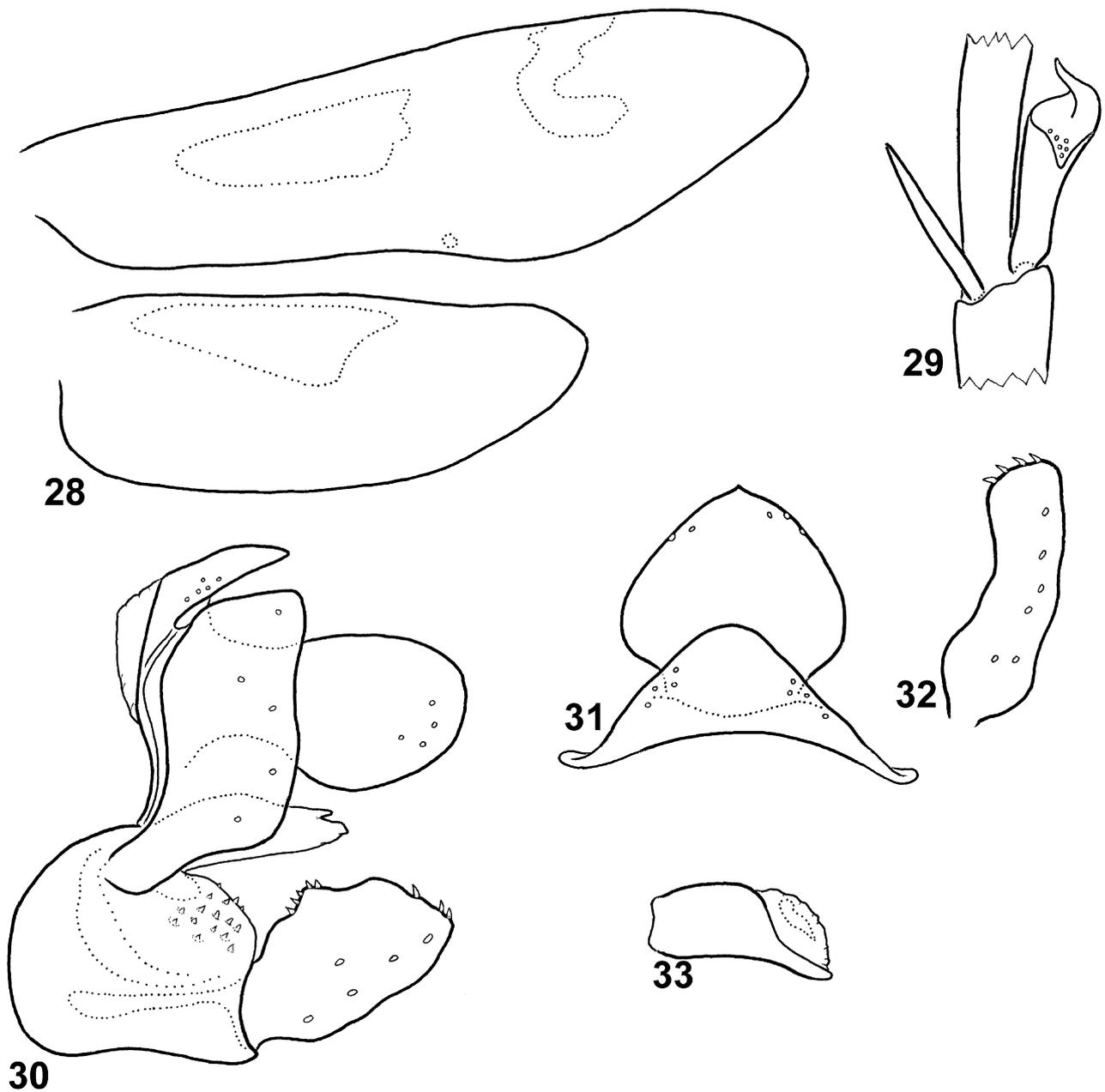
Figs 28–33

This species is dark with contrasting wing-pattern. It resembles *D. varians* Ulmer, from which it is easily discriminated by its globular segment X that lacks apical excisions in dorsal view, and by its vertically quadrangular elongate preanal appendages.

Male. Body dark chestnut brown with contrasting yellow body parts and wing pattern. Head dorsum, scapes, genae, cervical sclerites, prothorax yellow; proboscis, intersegmental and intersclerite conjunctive membranes and articulations, as well as anterior part of abdomen whitish. Antennae, maxillary palps and labial palps, mesonotum, metanotum, legs, abdominal segments VII and VIII, and genitalia dark chestnut brown. Labrum dark chestnut brown. Occipital warts covered by short, blackish, stiff setae; setae on postgenal compact setose warts long; pair of large, setose mesal longitudinal bands possibly representing fused vertexal lateroantennal and vertexal ocellar diffuse setose warts. Lateral cervical sclerites long, triangular. Mesoscutum sparsely covered by small alveoli, divided by shallow longitudinal, median furrow;

mesoscutellum with 2 bands of setal alveoli separated by median groove, forming diamond-shaped, elevated surface; lateral alveoli large. Foreleg posteroapical spurs slightly longer than anteroapical spurs; mid leg posterior spurs longer than anterior spurs; hind leg with modified posteroapical spur simple, slightly longer than adjacent anteroapical spur, basal half unmodified, apical half twisted 180° into short spiral ridge with laterad-pointing apex; large basal part of modified apical half excavated; twisting concavity filled with closely set setal bundle, alveoli located on bottom of concavity.

Forewing length 12.0 mm. Forewing and hind wing membrane dark chestnut brown, slightly darker along veins; all membrane surfaces densely covered by short, dark, decumbent setae; forewings each with 2 hyaline spots: basal triangular spot between *R1* and *Cu1* to first fork on both *Rs* and *M*, and spot of subapical irregular transverse patch distal to cord translucent and contrasting. Hind wings each with single basal triangular hyaline spot.



**FIGURES 28–33.** *Dipseudopsis vienha*, new species, holotype male. 28—right wings, dorsal; 29—left hind leg apical tibial spurs; 30—genitalia, left lateral; 31—genitalia, dorsal; 32—inferior appendage, ventral; 33—phallus, left lateral.

Male genitalia. Segment IX consisting of weakly developed tergite and strongly developed sternite, connected on each side by very narrow strip composed of antecostal ridge and fused base of large preanal appendage; tergite triangular in lateral view, rounded triangular in dorsal view, deeply overhanging segment X; 2 lateral setose fields visible in lateral and dorsal views; sternite IX quadrangular in lateral view, with complex bulging basodorsal corner, articulating with antecostal ridge, preanal appendages and bases of mesosuperior processes in phallocrypt. Phallocrypt forming complete and complex ring encircling phallobase; composed of short ventral part, pair of elongate lateral parts, and short, weakly sclerotized mesosuperior part; covered dorsally by membranous basoventral part of segment X; phallobase fixed by short phallic apodeme to phallocrypt complex. Basal plate or long rod of apodeme of inferior appendages below phallocrypt complex not attached, moving freely; nearly 1/4th of apicodorsal corner of sternite IX densely packed with microtrichia and sharp cuticular denticles, this region bordered ventrally by long setae. Segment X longer than inferior appendages, originating deeply beneath tergite IX, forming heavily pigmented hood over phallus, with weakly discernible setose area on apex; globular in lateral view; globular-sagittate with constricted base and without apicomeral excision in dorsal view. Intersegmental depression between segment IX and segment X forming deep concavity in lateral view by overhanging tergite IX. Preanal appendages quadrangular auriform, without dorsoapical lobes; preanal appendages each fused to antecostal ridge of segment IX along wide basal part, hinged dorsally to tergite IX and ventrally to basodorsal corner of sternite IX. Inferior appendages shorter than segment X; irregular, slightly elongate in lateral view, with small triangular projection dorsally at middle. Phallic apparatus small; phallosome composed of heavily sclerotized, broad basal tube and narrowing ventroapical lobe; basal part with numerous, minute alveoli and small setae; delineation of membranous dorsal and apical endotheca and aedeagus obscure, with few weakly sclerotized phallosome sclerites, their position varying according to erection state of aedeagus.

**Holotype male: VIETNAM:** Nam Bai Cat Tien National Park, 9.ii.2006, at light [J. Oláh, Jr. & Z. Ecsedi], (OPC).

**Paratypes:** Nam Bai Cat Tien National Park, 9.ii.2006, at light [J. Oláh, Jr. & Z. Ecsedi]—1 male (OPC).

**Etymology.** *Vienha*, from “vien nho,” globule in Vietnamese, referring to the globular shape of segment X.

### ***Dipseudopsis viklundi*, new species**

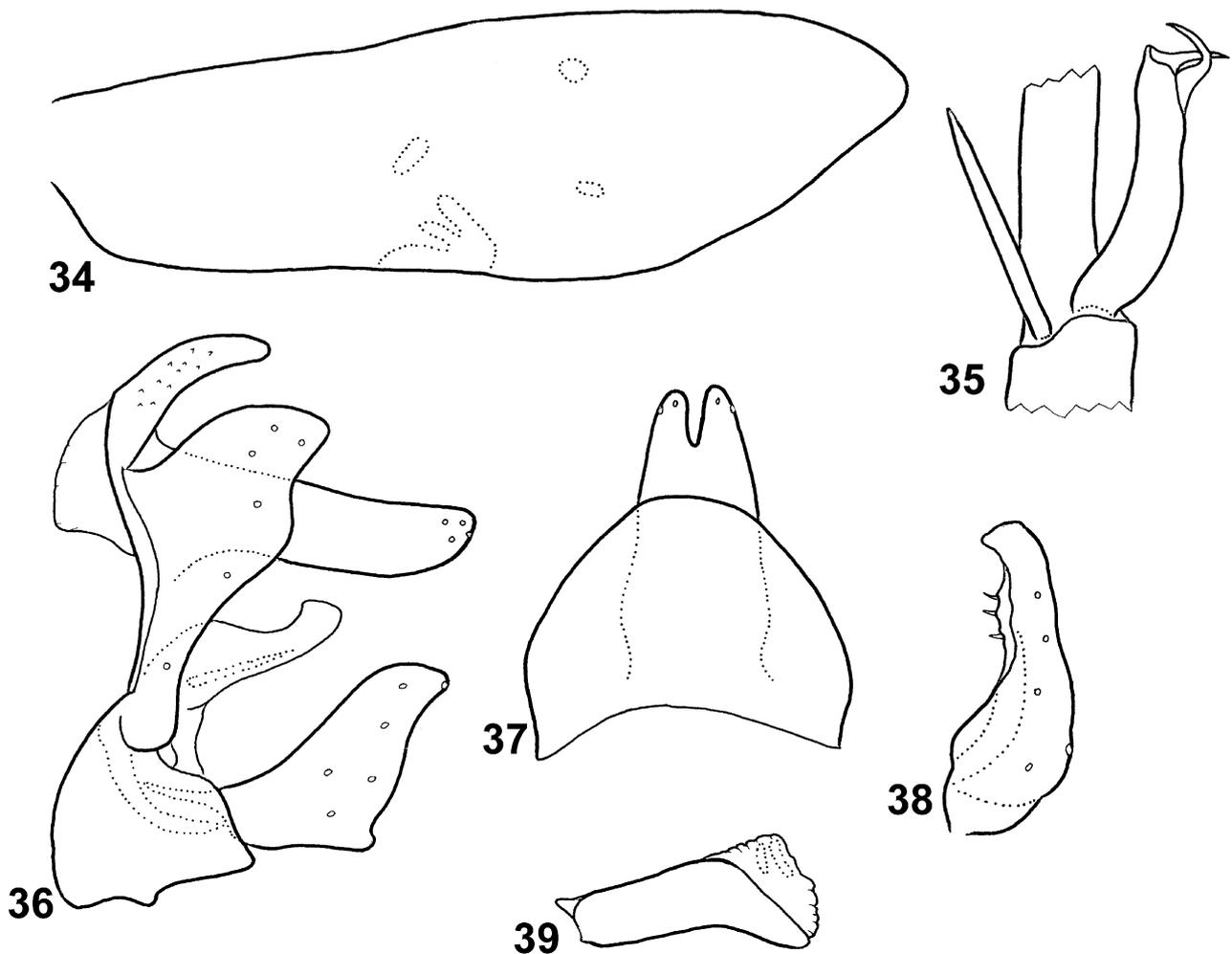
Figs 34–39

The forewing pattern and the genital structures of this species resemble those of *D. benardi* Navás. However, the modified hind leg spurs are different in having only their mesal point crescent-shaped, and their lateral point being directed mesad, in right angle, and less sinuous. There are differences also in the genitalia: Segment X is much longer than the preanal appendages; the preanal appendages are nearly triangular auriform, excised apically; and the inferior appendages are almost triangular in lateral view.

Male. Body dark chestnut, cervical sclerite, pronotum, mesonotum and metanotum dark; occipital warts, postgenal warts, frontoclypeus, antennae, palps and legs lighter. Maxillary palp segment 3 originating subapically on segment 2. Lateral cervical sclerites broadly triangular; setose wart attached to dorsum of anterior arm of each cervical sclerite; entire central ridge of cervical sclerites covered by long setae. Pronotum dark. Mesoscutum sparsely covered by setae with very small alveoli in mesal bands, separated by longitudinal, median, shallow furrow. Mesoscutellum with pair of fragmented, compact setal warts. Mid leg posterior spurs longer than anterior spurs. Hind leg, modified, posteroapical spurs bifid at apical 1/4th, mesal branch crescent-shaped, pointing laterad in right angle, weakly sinuous; mesal branch directed laterad; lateral branch directed mesad. Forewing length 11.0 mm. Brown forewing membranes with 4 small contrasting translucent spots: (1) *m-cu* hyaline lunula (2) rounded spot distally of *s*, (3) rounded elongate posteriorly of cord, and (4) large arculus patch.

Male genitalia. Abdominal segment IX with nearly equally sized, shallow tergite and deep sternite connected on each side by narrow strip composed of antecostal ridge and fused base of large preanal appendage; tergite horizontally elongate, narrow, sinuous in lateral view, overhanging segment X; rounded in

dorsal view; setose fields on tergite absent; entire surface covered by microtrichia; sternite nearly triangular in lateral view, bulging dorsobasal corners each forming articulation with antecostal ridge, preanal appendages and phallocrypt. Mesosuperior processes projecting from phallocrypt with long, sclerotized pair of dorsal processes embedded in conjunctive membranes encircling dorsum of phallobase, connecting it to venter of segment X. Pair of lateral sclerotized straps of phallocrypt complex visible, fixed to short phallic apodeme and apicodorsal corners of sternite IX. Basal plate forming long rod of apodeme of inferior appendages below phallocrypt complex, apparently not attached by sclerotized connection to phallocrypt or phallobase. Sinuous, internal ridge running from each basodorsal corner to middle of posterior margin. Apicodorsal corners of sternite IX each with small microtrichous area. Segment X longer than inferior appendages, originating deeply beneath tergite IX, forming heavily pigmented, slender, thumb-like hood above phallus in lateral view, with deep, narrow interlobular gap; setose area on apex weakly developed. Intersegmental depression between segment IX and segment X forming deep concavity in lateral view beneath overhanging tergite IX. Preanal appendages nearly triangular auriform, each slightly excised apically; venter narrowing in ventral view, broad in coronal plane. Preanal appendages each fused with antecostal ridge of segment IX along wide basal part, hinged dorsally to tergite IX and ventrally to basodorsal corner of sternite IX. Inferior appendages shorter than segment X; in lateral view sinuous, almost triangular, with concave dorsum and triangular venter. Phallic apparatus small; phallosome forming heavily sclerotized, broad basal tube and slightly narrowing ventroapical lobe; basal part with minute alveoli; delineation of membranous dorsal and apical endotheca and aedeagus obscured; weakly sclerotized phallosomal sclerite complex present, its position varying according to erection state of aedeagus.



**FIGURES 34–39.** *Dipseudopsis viklundi*, new species, holotype male. 34—right forewing, dorsal; 35—left hind leg apical tibial spurs; 36—genitalia, left lateral; 37—genitalia, dorsal; 38—inferior appendage, ventral; 39—phallus, left lateral.

**Holotype male:** LAOS: Luang Phrabang Province, Nam Khan River, 500 m upstr. Mekong River, 293 m, UTM 48Q0200517, 2202237, 27.iv.2005, at light trap, loc 14 [N. Jönsson, T. Malm & B. Viklund], (SMNH).

**Etymology.** This species is named after Mr. Bert Viklund (SMNH), one of the collectors of the species.

### *Hyalopsyche* Ulmer

*Hyalopsyche* Ulmer, 1904: 357. Type species: *Hyalopsyche palpata* Ulmer (monotypic); type locality: "French Congo" (Ogowe Faktorei).

*Hyalopsychodes* Betten, 1909: 237–238. Type species: *H. rivalis* Betten (monotypic); type locality: India (East Bengal).  
Synonym according to Martynov, 1914: 20.

*Hyalopsychella* Ulmer, 1930: 422. Type species: *H. winkleri* Ulmer (monotypic); type locality: Malaysia (Borneo). **New Synonym.**

This genus is known from the Palearctic, Oriental, Australasian and Afrotropical Biogeographical Regions. All species have similar cephalic, thoracic and genital characters.

**Adult.** The cephalic and thoracic groove and setal wart patterns are very stable and persistent in all examined species and we present the head structures of *Hyalopsyche sachalinica* Martynov to represent the generic characteristics.

**Head:** Tentorium without dorsal arms and vestigial structures; rounded broadened flange present mesoventrally on middle of anterior arms. Frontogenal septa (i.e., internal folds of frontogenal and clypeogenal grooves) well-developed, with dorsal frontogenal arms extending dorsad from anterior tentorial pits to margin of circumantennal sclerites; posterior tentorial arms very short, extending and giving support to internal occipital ridges; tentorial bridge shifted posterad to posterior tentorial pits. Maxillary palps reduced in size (i.e., abbreviated to length of facial area) and adhering to frontogenal and clypeogenal surfaces in resting position; segment 5 of each maxillary palp shortened and annulations reduced. Laciniae reduced in size. Labial palps absent. Labrum with elongate, freely hanging apex. Single facial groove (short and fused frontal groove) visible only on face, its fusion being mediated by enlargement of scapes pressing interantennal area into narrow strip; coronal groove well-developed and visible along almost entire vertex. Central clypeal wart and labral posterior central warts weakly discernible on face and covered only scarcely with minute setae. Vertexal lateroantennal, occipital and postgenal compact setose warts present and visible on head dorsum. Vertexal medioantennal wart visible in limited area compressed by antennal groove and circumantennal sclerites of enlarged scapes.

**Thorax:** Pronotum and mesonotum variable. Spur formula 3(2), 4, 4. Number of apical forks in the forewings and hind wings variable among species.

**Remarks.** The description of *Hyalopsyche* was based originally on *H. palpata* Ulmer on the basis of having reduced wing venation, with reduced number of apical forks in the forewing and absence of hind wing forks I and IV. Marlier (1962) reported that forewing fork I and hind wing forks I, III and IV are absent in *H. palpata* Ulmer. New monotypic genera related to *Hyalopsyche* have been established based primarily on the presence or absence of apical wing forks. The genus *Hyalopsychodes* was described by Betten (1909) based on presence of forewing fork I. This genus was synonymised with *Hyalopsyche* by Martynov (1914). The genus *Hyalopsychella* was distinguished by the presence of a short forewing discoidal cell and the absence of forewing fork I and hind wing forks I and III. We observed a range in the length of the discoidal cell among species in the genus *Hyalopsyche*, being longest in *H. trunga*, new species and shortest in *H. winkleri* (Ulmer). Below we describe *H. trunga*, new species from Vietnam, having only hind wing forks II and V present, and with a long discoidal cell in the forewings. The loss of apical forks, especially in the hind wings, occurs in some species, but these species are otherwise similar to species with intact wing forks, particularly in male genitalia. As the character states used for separating *Hyalopsychella* and *Hyalopsyche* are found also in *Hyalopsyche*, the genus *Hyalopsychella* is synonymised with *Hyalopsyche*.

## *Hyalopsyche sachalinica* Martynov

*Hyalopsyche sachalinica* Martynov 1910: 397.

*Hyalopsyche amurensis* Martynov, 1934: 245–246, f 178. Synonym according to Arefina *et al.* 1996: 10.

*Hyalopsyche parvispinosa* Schmid 1959; 322, pl 2 f 6–7. **New Synonym.**

*Hyalopsyche parvula* Martynov 1935: 169–170, 207, f 73a–c. **New Synonym.**

**Material examined. VIETNAM:** Hanoi, Song Hong, 17.i.1986, picked from the bare riparian zone of Red River [J. Oláh], 6 males, 4 females (OPC); Ngoclac, 25.i.1986, at light [J. Oláh], 1 male (OPC); Hoabinh, 12 km to Dabac, 30.i.1986, at light [J. Oláh], 2 males (OPC); Hanoi, La Thanh Hotel, 6.v.1987, at light [J. Oláh], 1 male (OPC).

**Remarks.** Schmid (1959) noted that *H. parvispinosa* Schmid is a possible synonym of either *H. amurensis* Martynov or *H. parvula* Martynov. The apex of the phallic apparatus has 1 pair of spines on the ventral lobe and 3–5 pairs of spines on the dorsal lobes of the aedeagus or endotheca. Arefina *et al.* (1996) synonymised *H. amurensis* Martynov with *H. sachalinica* Martynov due to identical genitalia. The drawings presented by Martynov (1910, 1934) and the drawings by Arefina *et al.* (1996) reflect the genitalia of the Vietnamese specimens.

## *Hyalopsyche rivalis* (Betten), new combination

*Hyalopsychodes rivalis* Betten, 1909: 238, pl 16 f 5–7.

*Hyalopsyche similis* Martynov, 1935: 167–169, 207, f 71a–c. **New Synonym.**

**Material examined. INDIA:** Orissa, Bhubaneswar, Dhauli, 20–28.ii.1987, at light [J. Oláh], 1 male (OPC); Rajasthan State, Udaipur, Lake Pichola, 29.iv.1992, at light [J. Oláh], 1 male (OPC).

**Remarks.** The apex of the phallic apparatus has 3 pairs of spines on the ventral lobe and 4 pairs of spines on the dorsal lobes of the aedeagus or endotheca. A comparison of the wing venation in the newly collected specimens from Orissa and Rajasthan states in India confirms that they belong to *H. rivalis* Betten, earlier known from a single female only.

## *Hyalopsyche trunga*, new species

Figs 40–44

This species is small and brown, with well-pigmented and thick veins. The species is unique in having complete forewing venation and reduced hind wing forks I and fork III. In *H. winkleri* Ulmer from Borneo and Sulawesi a similar reduction of the hind wing venation is accompanied by the reduction of forewing fork I. The type species of the *Hyalopsyche*, *H. palpata* Ulmer described from “French Congo,” has complete forks in the forewing and reduced hind wing fork I. Another unique feature in *H. trunga* is the absence of the foreleg preapical spur. The phallic apparatus has an apical patch of small spines and the dorsal endothecal lobe is elongate and directed ventrad.

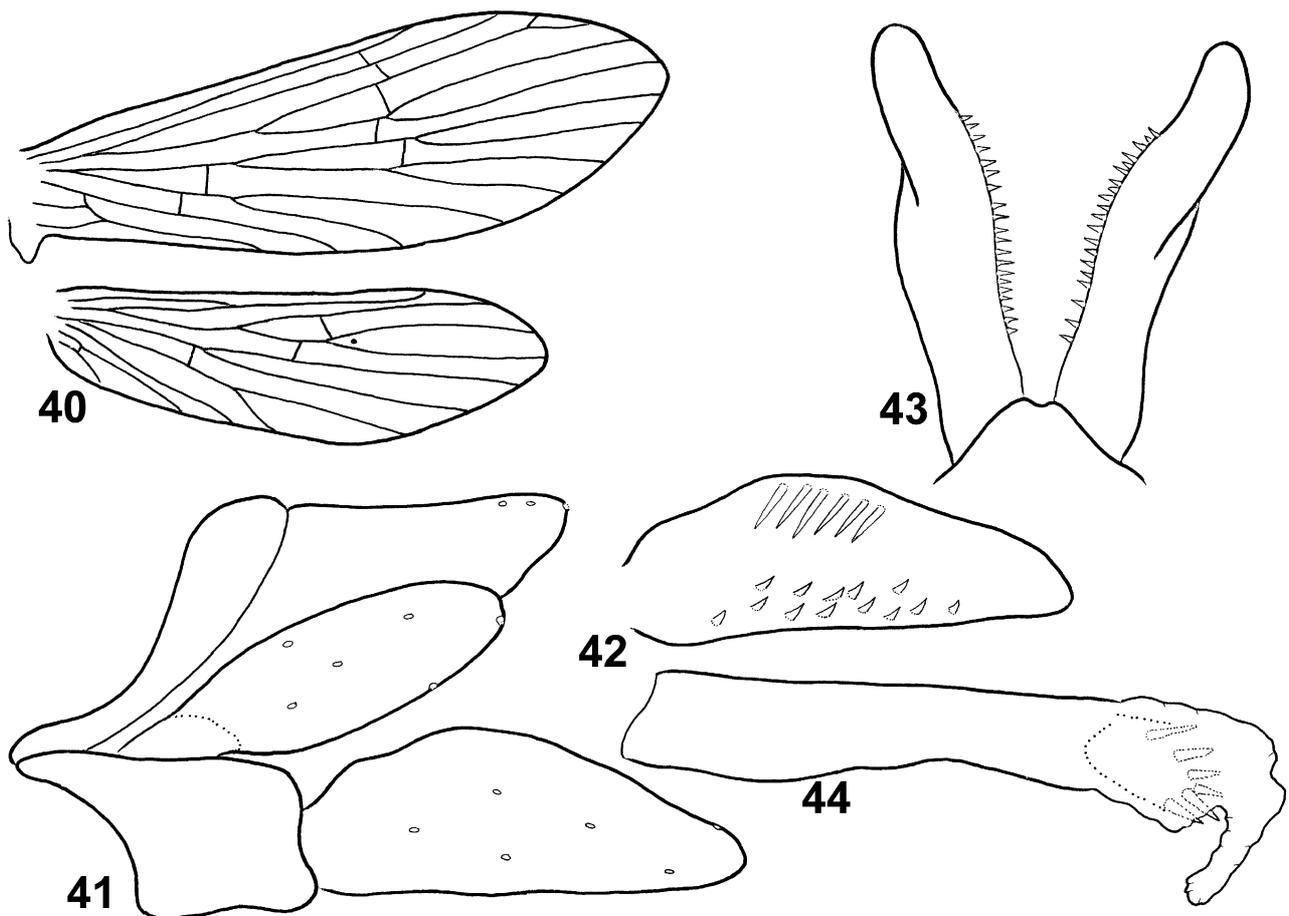
**Male.** Head shorter than wide. Eyes large; interocular distance narrow on face of frontoclypeal and labral area, wider on vertex. Epicranial groove, especially groove stem, coronal groove, well developed; frontal grooves short, almost indiscernible. Vertexal or frontal medioantennal and vertexal lateroantennal compact setose warts partially fused, vertexal medioocellar diffuse setose warts present; pair of occipital compact setose warts dominating on posterodorsal region of head; postgenal compact setose warts present. Maxillary palp formula I-II-IV-III-V. Antennae stout, 1.3 times longer than forewings; scapes short, less than half as long as head; closely set, almost touching. Interantennal distance short. Lateral cervical sclerites with narrow anterior arms articulating anteriorly with back of head with occipital condyle above posterior tentorial pits; fused to posterior cervical sclerites. Posterior cervical sclerites forming broad triangular plates reaching

prothoracic episternum, articulating to weakly sclerotized anteromedian band of prothoracic eusternum. Two pairs of rounded pronotal compact setose warts present, lateral warts slightly smaller than dorsal warts. Pair of mesoscutal compact setose warts longitudinally ovoid; pair of mesoscutellar compact setose warts triangular, longitudinally elongate, narrowing posterad. Spurs 2, 4, 4. Foreleg posteroapical spur small. Leg claws small, symmetrical. Forewing length 4.4 mm. Forewing membrane and veins light brown, covered by scarce, cinereus setae. Forewing venation complete, discoidal cell long; hind wing venation without apical forks I, III and IV.

Male genitalia. Segment IX with well-developed tergite and sternite; tergite half as long as sternite, long triangular, narrowing ventrolaterad; sternite quadrangular, narrowing anterodorsad; narrowing tergal and sternal straps hinge together longitudinally. Segment X forming less-pigmented hood with weakly discernible setose area. Depression between segments IX and X almost filled, weakly stepwise in lateral view. Preanal appendages elongate filiform in dorsal and lateral views. Inferior appendages long, triangular in lateral view; elongate in ventral view; mesal surfaces each armed with dorsal row of long spines and ventral patch of short spines. Outer lateral surfaces covered by fine setae. Phallic apparatus forming slender tube consisting of phallosome and endothenca; tip of endothenca or aedeagus obscurely structured, depending on state of erection; in holotype dorsal spines absent and ventral pair of spines present; patch of 8–10 spines almost indiscernible, spines not set in pair of lines as usual but collected in single group in dorsal view.

**Holotype male: VIETNAM:** Lam Dong Province, Baoloc, River Trungrieng, 23.x.1988, singled [J. Oláh], (OPC).

**Etymology.** *Trunga*, from the type locality, River Trungrieng.



**FIGURES 40–44.** *Hyalopsyche trunga*, new species, holotype male. 40—right wings, dorsal; 41 —genitalia, left lateral; 42—left inferior appendage, mesal; 43—inferior appendages, ventral; 44—phallus, left lateral.

*Hyalopsyche orissa*, new species

Figs 45–48

This species is medium-sized, brown, with well-pigmented, thick veins. The wing venation includes a complete set of apical forks, like in *H. sachalinica* Martynov, *H. similis* Martynov and the Australian *H. disjuncta* Neboiss, 1980. The species is close to *H. plurispinosa* Schmid, 1959, from China (Guangdong), from which it is separated by the different shape of the inferior appendages and the fact that the apex of the phallic apparatus is not bent vertically and has fewer spines.

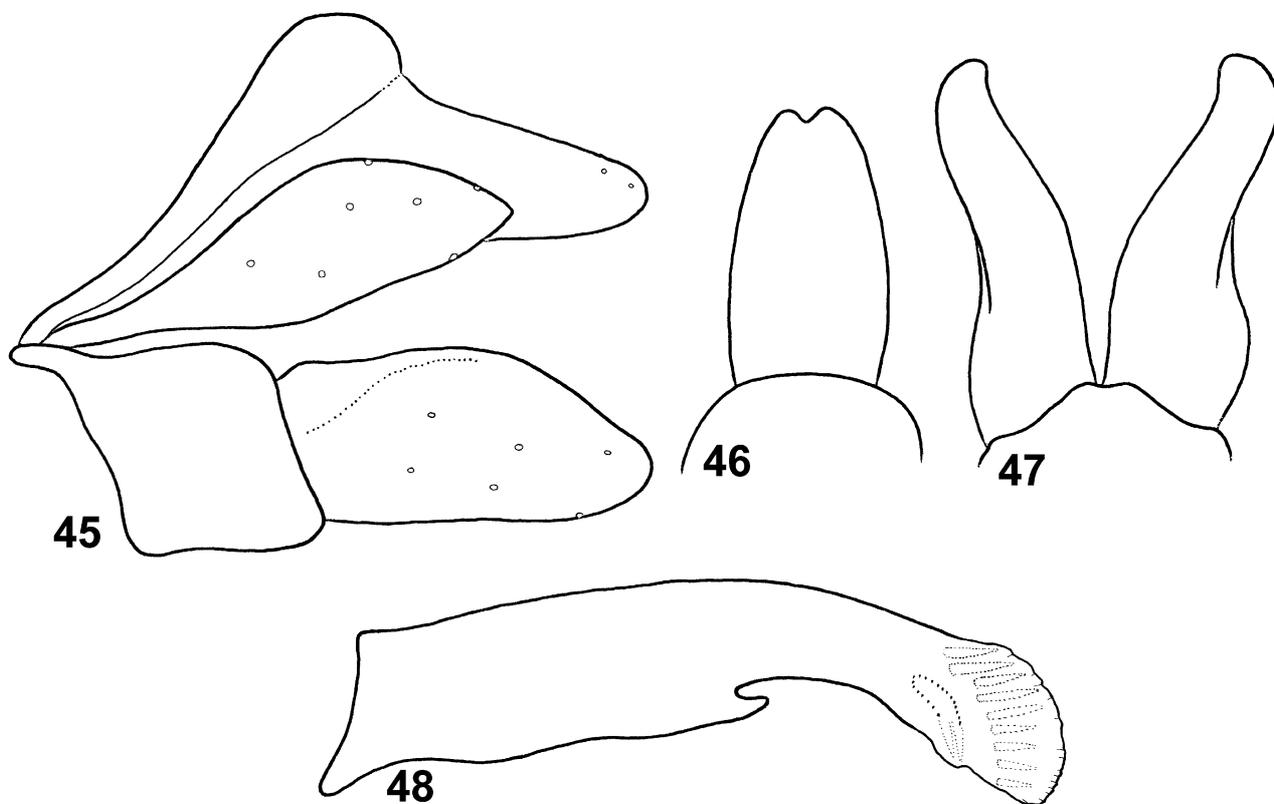
Male. Head and thoracic characters identical with those of *H. trunga*, new species (above), except with spur formula 3, 4, 4. Forewing length 5.8 mm; membrane and veins light brown, covered by scarce cinereus setae. Forewing and hind wing venation complete.

Male genitalia. Segment IX with well-developed tergite and sternite; tergite half as long as sternite, long, triangular, narrowing ventrolaterad; sternite quadrangular, with short, narrowing anterodorsal corners; long, narrow tergal and short sternal straps hinged together longitudinally. Segment X relatively large, forming less-pigmented hood over phallus with weakly discernible setose area. Intersegmental depression between segments IX and X well-developed, stepwise in lateral view. Preanal appendages elongate filiform in dorsal and lateral views, with pointed apices. Inferior appendages short, sub-quadrangular in lateral view; elongate in ventral view; mesal surfaces each armed with dorsal row of long spines and ventral patch of short, strong spines; outer lateral surfaces covered by fine setae. Phallic apparatus slender, tubular, consisting of phallosome and endothenca; tip of endothenca or aedeagus obscurely structured, possible aedeagus visible in dorsoapical trough filled with 9 spines arranged in 2 rows, ventral lobe bearing 2 spines.

**Holotype male:** INDIA: Orissa State, Bhubaneswar, marsh, ii.1983, at light [J. Oláh], (OPC).

**Paratype:** Same data as holotype, 1 male (OPC).

**Etymology.** *Orissa*, from the Indian state Orissa, the type locality of the species.



**FIGURES 45–48.** *Hyalopsyche orissa*, new species, holotype male. 45—genitalia, left lateral; 46—segment X, dorsal; 47—inferior appendages, ventral; 48—phallus, left lateral.

### *Hyalopsyche winkleri* (Ulmer), new combination

*Hyalopsychella winkleri* Ulmer, 1930: 422–424, 480, 495, f 66–68.

*Hyalopsychella haplotes* Neboiss, 1989: 108, figs 22–25. **New Synonym.**

**Material examined.** “O. Borneo, Tangaron 115e” [Mjöberg], 1 male (SMNH).

**Remarks.** Neboiss (1989) described *H. haplotes* from Sulawesi and distinguished it from *H. winkleri* based on Ulmer’s drawings, rather than actual specimens, because the 3 syntypes of *H. winkleri* from Borneo were destroyed during World War II and the neotype from Sumatra (Ulmer 1951) has not been found. The specimen examined has the arrangements of spines on the inner surfaces of the inferior appendages and on the apex of the phallic apparatus identical to those of *H. haplotes*.

### *Pseudoneureclipsis* Ulmer

*Pseudoneureclipsis* Ulmer, 1913: 84. Type species: *Pseudoneureclipsis ramosa* Ulmer (monotypic); type locality: Indonesia (Java).

Ulmer (1913) originally placed this genus in the Polycentropodidae because it had the combination of wing venation characters of other then-known polycentropodids: (1) forewing lacking fork V; (2) forewing lacking an additional costal crossvein; and (3) hind wing with fork III, the latter character relating it to *Neureclipsis*. All species described below exhibit the following characters:

Adult. Head. In dorsal view, head almost quadrangular and eyes about half as wide as vertex width. Maxillary palp formula II-I-III-IV-V. Antennae stout, 1.4 times as long as forewings; scapes short, about 1/4th as long as head; distance between antennae longer than length of scapes. Labrum bipartite, posterior part sclerotized, anterior part membranous. Mandibles enlarged, broad, surfaces granulated papillose. Some species with modified mandibles as described below. Laciniae elongate setiferous, curving mesad. Anterior tentorial pits located laterally near eyes. Pregenae narrow. Clypeus and frons wide; epistomal suture connecting tentorial pits nearly invisible; theoretical line separating clypeus and frons detectable by setose frons and bare clypeus. Frontal grooves almost indiscernible; possibly represented by heavily sclerotized posterior margin of bulging frons near antennal sutures of antennal sockets. Vertical section of sclerotized lateral margin of frontoclypeus constituting frontogenal grooves above anterior tentorial pits and clypeogenal grooves below anterior tentorial pits. Clypeolabral groove well-developed, encircling mandibles. Coronal groove (stem of epicranial groove) forming mid-line along vertex and occiput. Occipital grooves well developed, forming unique primary intersegmental suture; postoccipital groove visible between occipital warts. Pairs of vertexal lateroantennal setose warts and vertexal ocellar compact setose warts differentiated. Vertexal medioantennal and vertexal medioocellar diffuse setose warts partially fused into mesal bands on vertex. Pair of occipital compact setose warts dominating on posterodorsal region of head. Narrow postgenal compact setose warts present, visible in caudal and ventral views. Pair of vertexal tubercles, sensory papillae or sensillae basiconica present posterior of crossing of coronal and occipital grooves. Cervical sclerites forming narrow, long, rod-like anterior arms articulating anteriorly with elongate occipital condyles immediately above posterior tentorial pits. Cervical sclerites fused with posterior cervical sclerites. Posterior cervical sclerites about half as long as anterior cervical sclerites; forming triangular plates; each with one corner reaching and articulating with prothoracic episternum; other 2 corners forming rod-like ventral intercervical sclerites articulating to weakly sclerotized anteromedian band of prothoracic eusternum. Cervical sclerites without setae. Large cervical setose warts attached to dorsum of anterior, rod-like, sclerites near posterior cervical sclerites.

Thorax. Two pairs of large, rounded, pronotal compact setose warts; lateral pronotal warts slightly smaller than mesal warts; mesal warts nearly tangential mesally, separated by narrow gap. Pair of mesoscutal compact setose warts rounded, indistinct; pair of longitudinally elongate mesoscutellar compact setose warts slightly triangular, narrowing posterad, nearly occupying mesoscutellar area. Spur formula 2, 4, 4. Each foreleg

posterior spur being half as long as anterior spur; mid and hind leg posterior spurs about 1/3rd as long as anterior spurs. Leg claws small, symmetrical. Forewing membrane and veins light brown, covered by scarce cinereous setae. Forewing forks I, II, III and V present; discoidal cell, median cell and thyridial cells closed; crossvein *m-cu* not reaching point of bifurcation of *M*; and forewing fork I smaller than fork III, except when otherwise stated. Hind wing forks II, III and V present; discoidal and median cells open; thyridial cell closed, narrow.

**Remarks.** The detailed head and thoracic structures, including tentorium, grooves, sutures and setal warts of the genus are described for the first time below in *P. quancong*, new species, and proved stable in the genus. However, the sclerites, spines and microtrichia of the phallic apparatus were difficult to describe precisely. There is a wide size range of the phallic microtrichia, from almost invisible to large spine-like structures. In addition, there are probably indistinctly discernible phallotremal sclerites among the pale structures. A standard description of the microtrichia structure is hindered by the erection and eversion state of the endotheca. All phallic processes (rod-like processes of tergite and sternite IX, preanal appendages, and paraproctal processes) meet at the lateral fulcra. The phallic apparatus is fixed to this complex by paraproctal straps.

### *Pseudoneureclipsis abia* Malicky & Chantaramongkol

*Pseudoneureclipsis abia* Malicky & Chantaramongkol, 1993: 446.

**Material examined.** VIETNAM, Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], 17 males (OPC); Bach Thai Province. Phuluong, River Dongdat, 26.v.1987, at light [J. Oláh], 1 male (OPC).

### *Pseudoneureclipsis bon* Malicky

*Pseudoneureclipsis bon* Malicky, 1995: 861.

**Material examined.** VIETNAM, Tamdao, singled along small left tributary of the main stream, 10.v.1987 [J. Oláh], 1 male (OPC).

### *Pseudoneureclipsis bonkybin*, new species

Figs 49–52

This small-sized, brown species is most similar to *P. philemon* Malicky & Prommi (Malicky *et al.* 2000) from Thailand. In *P. bonkybin* the sclerotized basal lobe of segment X has 2 longer median setose finger-like processes that are absent in *P. philemon*; the lance-like process on each preanal appendage is long and slender, not short and broad; and the coxopodites are longer. The cephalic and thoracic grooves and setal warts follow the general pattern of the genus.

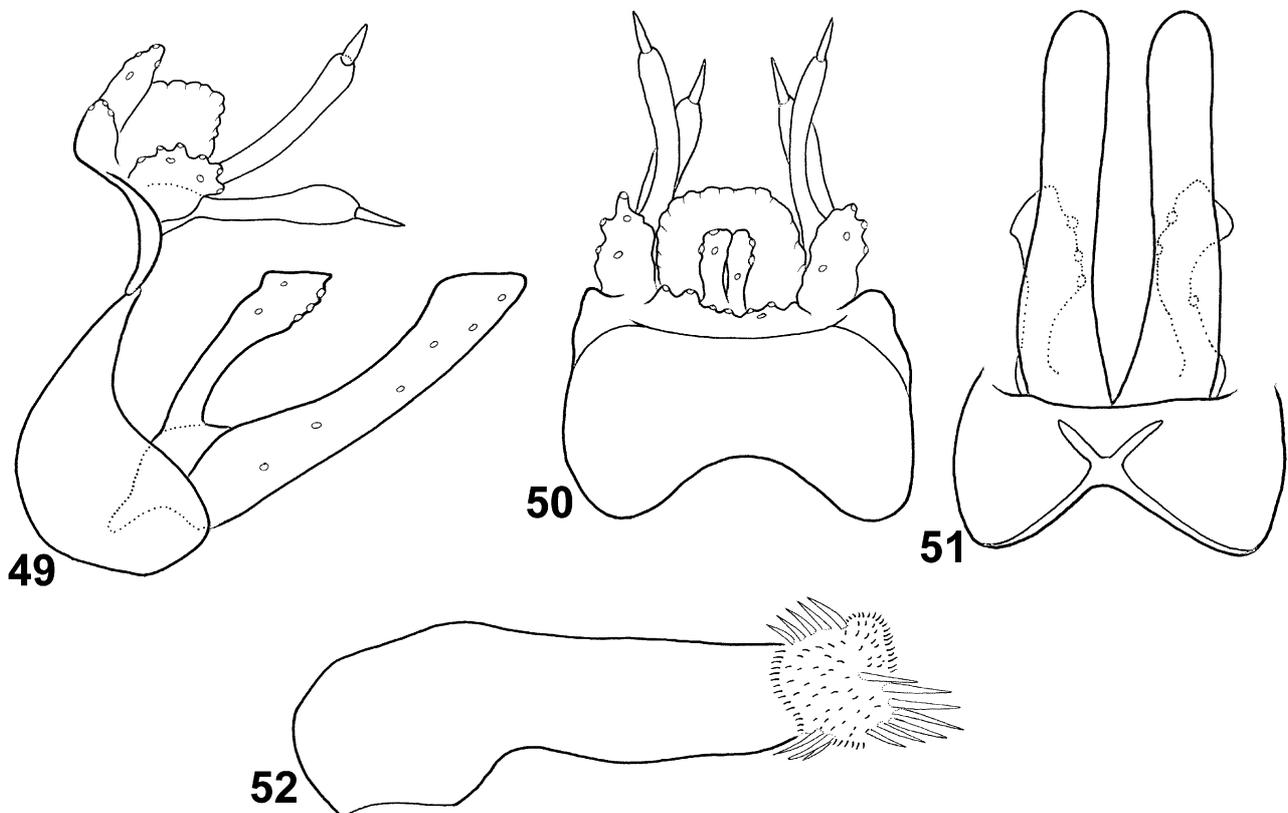
Male. Forewing length 5.0 mm.

Male genitalia. Segment IX with narrow tergite and compact sternite, tergite reduced to antecostal ridge articulating to narrow dorsal rod of sternite IX in hinge; narrow lateral rods of tergite IX directed ventrad, slightly broadening into small, flank-like plate at point of articulation. Segment X produced into multidigitate, setose, papillate, sclerotized dorsal lobe and membranous hood, dorsally covering phallic apparatus; basal sclerotized and setose lobe of segment X forming pair of long, median, finger-like parallel processes and smaller, irregular protrusions, each with 4–5 digits, present on either side of these processes in dorsal view; finger-like processes and digits ending in terminal setae and additional buds, these protuberances or setose tubercles making surface of segment X more complicated. Pair of paraproctal processes (intermediate appendages) hinged to bases of preanal appendages, producing pair of straight, broad rods directed posterad

on each side, each armed with strong terminal spine-like seta. Basic structural plan of preanal appendages similar to multidigitate and papillose basal part of segment X, except each also with single, long, filiform process with strong terminal spine-like seta instead of irregular, small digits and tubercles with terminal setae. Coxopodites of inferior appendages forming long rods, each slightly dilated and with dorsad-curving apex. Harpagones located dorsobasally, forming long, mesad-curving rods with clavate apices, each bearing strong spine-like setae on mesal surface of apical half. Each inferior appendage with intersegmental membrane (i.e., articulation line between coxopodite and harpago) well-developed. Phallic apparatus with ventrad-curving bulbous phallobase and broad and straight horizontal phallosome with transparent, almost hyaline, apical half on venter; endotheca densely covered by 3 types of microtrichia; terminal pair of clusters with large microtrichia visible in ventral and dorsal views; rounded membranous matrix covered with densely packed, minute microtrichia; protruding endotheca margined anterodorsally and anteroventromesally by medium-sized microtrichia clusters.

**Holotype male: VIETNAM:** Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], (OPC).

**Etymology.** *Bonkybin*, from Vietnamese “bon,” 4, and “kybin,” lancer, referring to the pair of processes on the preanal appendages and the pair of processes on the paraprocts, altogether 4 long rods each having a large and strong terminal seta, like 4 lancers.



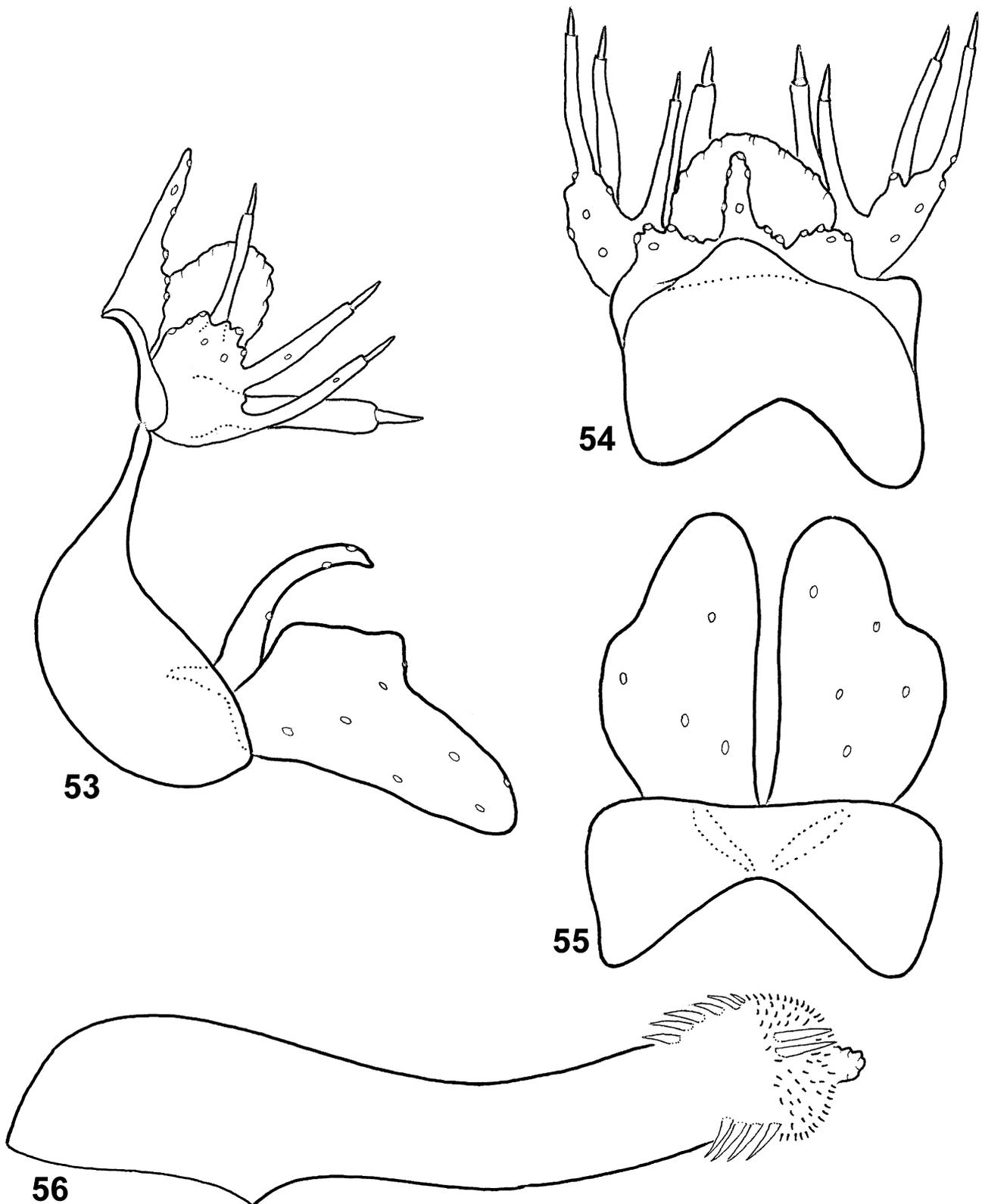
**FIGURES 49–52.** *Pseudoneureclipsis bonkybin*, new species, holotype male. 49—genitalia, left lateral; 50—genitalia, dorsal; 51—genitalia, ventral; 52—phallus, left lateral.

***Pseudoneureclipsis boquan*, new species**

Figs 53–56

This species is similar to *P. quancong*, new species, and *P. usia* Malicky & Chantaramongkol, 1993, from Thailand from which it is separated by the presence of a more discernible sclerotized basal part of segment X and more developed membranous terminal part of segment X; a longer median finger-like process on segment X, not short; preanal appendages armed with 3 long processes instead of 2 processes in *P. quancong* and 4 + 3

processes in *P. usia*; and the harpagones and the quadrangular basolateral flanks of the coxopodites are longer than those of *P. quancong* and the harpagones are more slender and the basolateral flanks of the coxopodites are more developed than those of *P. usia*.



**FIGURES 53–56.** *Pseudoneureclipsis boquan*, new species, holotype male. 53—genitalia, left lateral; 54—genitalia, dorsal; 55—genitalia, ventral; 56—phallus, left lateral.

Male. Tentorium H-shaped in dorsal view, with long and slender posterior arms; tentorial bridge slender, with small mesal triangular projection; anterior tentorial arms with large mesoventrad-oriented lamella. Entire labrum freely hanging. Haustellum forming broad, granulate plate without channels on most of dorsum, channels present at base along sitophore. Epistomal sutures connecting pits not observed. Forewing length 4.0 mm.

Male genitalia. Segment IX with narrow tergite and well-developed compact sternite, tergite reduced to antecostal ridge articulating to narrow dorsal rod of sternite IX in hinge-joints; narrow lateral rod of tergite IX directed ventrad; slightly broadening into small flank-like plate at articulation. Segment X produced into setose and papillate sclerotized dorsal lobe, and into membranous hood over phallic apparatus; anterobasal part of membranous hood well-developed, discernible in caudal view and hinged laterally to fulcra; dorsobasal sclerotized and setose lobe of segment X composed of long median finger and small, irregular protrusions on each side of finger, each with 4–5 digits in dorsal view; finger and digits ending in terminal setae and additional buds, protuberances or setose tubercles. Pair of paraproctal processes (intermediate appendages) hinged to base of preanal appendages, forming pair of straight, broad rods directed posterad, each armed with strong terminal, spine-like, seta. Basic structural plan of preanal appendages similar to multidigitate basal part of segment X, except each with 3 long, filiform processes each with strong terminal spine-like seta: dorsal process almost straight, directed slightly dorsad; 2 ventral processes sinuous, directed posterad. Coxopodites large, broad, sub-triangular in lateral and ventral views, each with basolateral flank nearly rectangular, large, occupying basal half of coxopodite in lateral view, well visible in ventral view; harpagones positioned basidorsally, each forming long, slender, posterad-curving, setose spine-like process; intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) visible. Phallic apparatus narrowing and turning dorsad toward apex, with 2 terminal, less pigmented processes embedded into membranous apex; endotheca densely covered by small terminal microtrichia and long sub-terminal microtrichia.

**Holotype male: VIETNAM:** Hoabinh, towards Dabac, 21.x.1986, at light [J. Oláh], (OPC).

**Etymology.** *Boquan*, from Vietnamese “boquan,” meaning army, referring to the 3 processes on each preanal appendage and 1 process on each paraproct, each armed with a large and strong terminal seta, like 8 lances.

### ***Pseudoneureclipsis cauky*, new species**

Figs 57–60

This small-sized brown animal from Vietnam is similar to *P. linos* Malicky & Bunlue (Malicky *et al.* 2004) from Thailand. The new species differs in the genitalia, particularly in the presence of setose segment X being bilobed with a wide quadrangular interlobular gap; the preanal appendages each with a very long filiform dorsal process and a shorter, broad-based ventral process, not short, robust and hook-shaped; the paraproctal processes each with a small ventral branch; the coxopodites being slightly excised at the broadened apices, each with a small ventral lobe, not straight-cut; and the coxopodites each having a triangular apex, not rounded. The cephalic and thoracic grooves and setal warts follow the general pattern of the genus.

Male. Forewing length 4.0 mm.

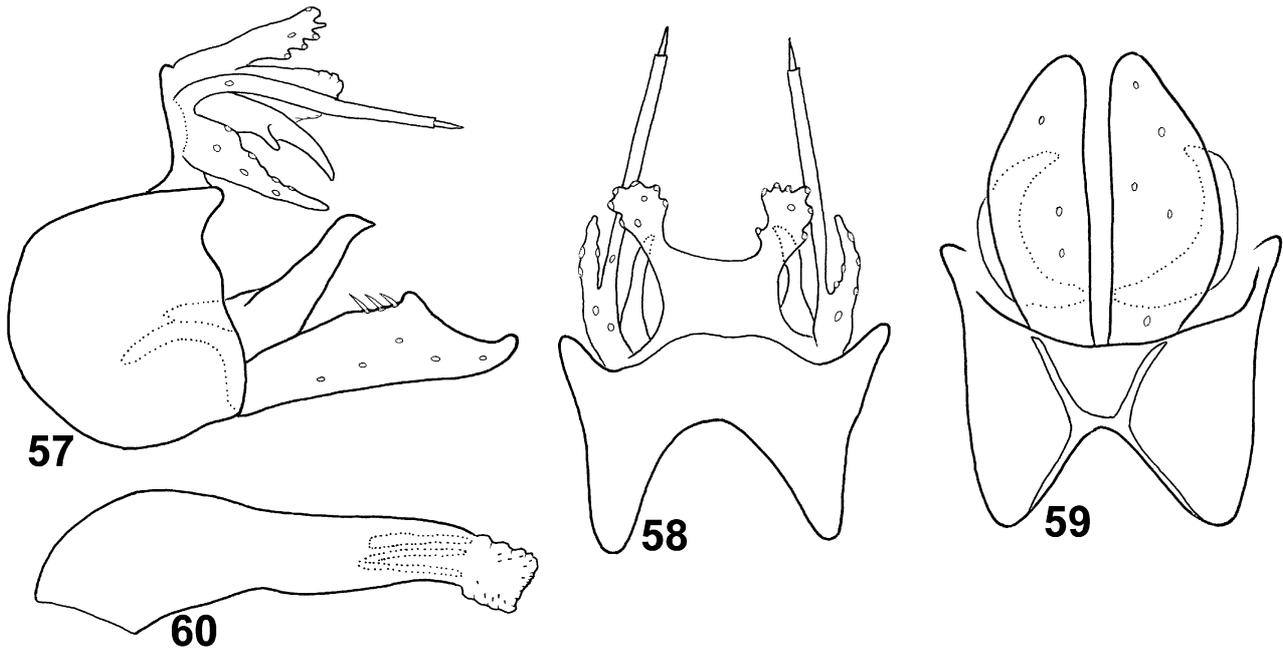
Male genitalia. Segment IX consisting of short tergite and robust sternite, semicircular in lateral view; sternite without long, narrow, dorsal projections; tergite hinged directly to apicodorsal corner of sternite. Segment X setose, with large, quadrangular, basal plate and 2 hand-shaped lobes in dorsal view; interlobular gap wide, quadrangular. Pair of paraproctal processes spine-shaped, without setae, curving slightly mesoventrad, each supplied with small ventral process; basal parts of paraproctal processes meeting under phallic apparatus, forming discernible U-shaped strap beneath phallic apparatus. Preanal appendages bilobed: dorsal lobe long, filiform, with terminal spine; ventral lobe short, with broad base in lateral view. Inferior appendages with coxopodites slightly broadening apicad; each with apex concave and with small apicoventral lobe in lateral view; armed with strong anterad-curving spines at middle of mesal face; in ventral view with

triangular apex. Harpagones located basidorsally, each forming strong, straight process in lateral view, curving mesad in ventral view; intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well-visible. Phallic apparatus with broad phallobase continuing in straight, horizontal, tube-like phallosome; slightly constricted at midway, apically curving ventrad; end of phallosome and protruding endothenca discernible; sclerotized structures visible inside apex: 1 separate sclerotized rod; 1 pair of long sclerotized rods meeting anteriorly; protruded endothenca covered by minute, densely-packed microtrichia.

**Holotype male:** VIETNAM: Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], (OPC).

**Paratype:** Same data as holotype, 1 male.

**Etymology.** *Cauky*, from Vietnamese “cauky,” complex, referring to the complexity of the genitalia.



**FIGURES 57–60.** *Pseudoneureclipsis cauky*, new species, holotype male. 57—genitalia, left lateral; 58—genitalia, dorsal; 59—genitalia, ventral; 60—phallus, left lateral.

***Pseudoneureclipsis congkem*, new species**

Figs 61–64

This species is small-sized and with a brown body. The genitalia resemble those of *P. boquan*, new species, *P. erebos* Malicky & Sangpradub (Malicky *et al.* 2001), *P. quancong*, new species, *P. usia* Malicky & Chantaramongkol, particularly by the presence of a lateral flank of each inferior appendage coxopodite. *Pseudoneureclipsis congkem* is separated from the other species by possessing a single lanceolate finger-like process on each preanal appendage; a pair of sinuous paraproctal processes, not straight; and a broader segment X, forming a longitudinally elongate quadrangular plate with setose triangular ridges and membranous venter, a structure that is more narrow or digitate in the other species.

Male. Forewing length 4.0 mm.

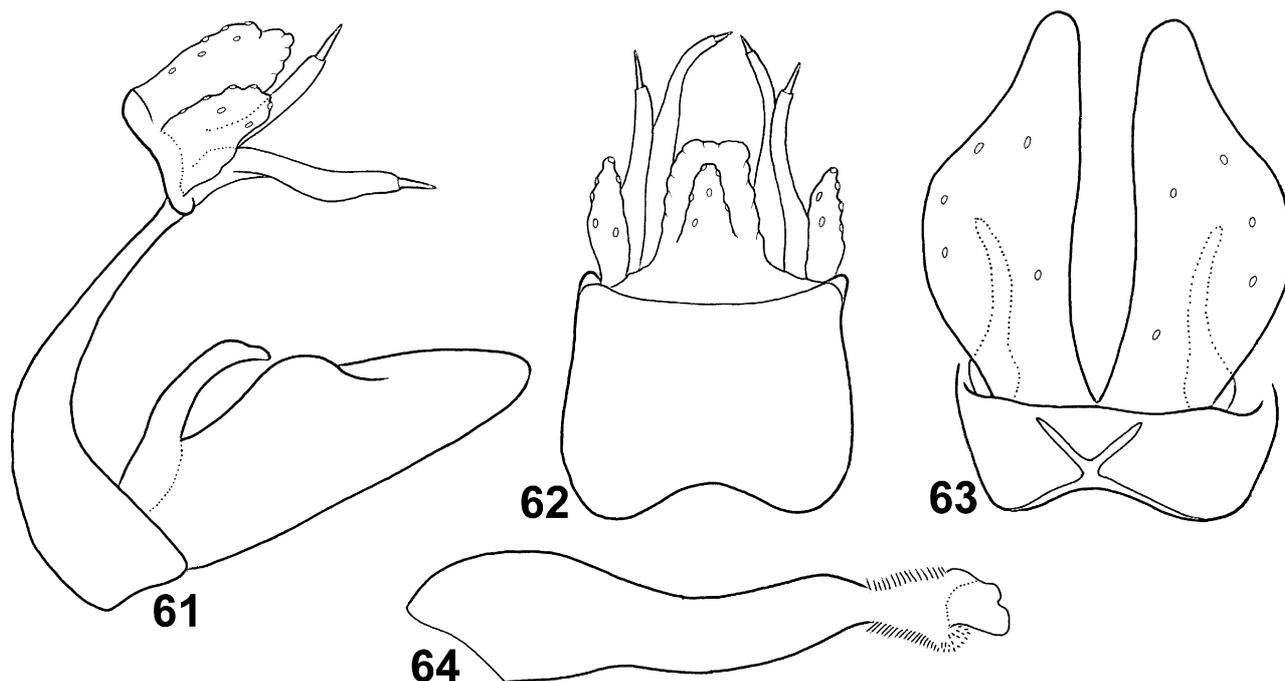
Male genitalia. Segment IX with short tergite and large sternite with rod-like dorsal strap hinged directly to narrow tergite. Segment X forming large elongate quadrangular plate with triangular setose median ridge and membranous venter. Pair of paraproctal processes spine-like, without setae, curving slightly mesoventrad, each with terminal spine-like seta, their basal parts fusing under phallic apparatus forming U-shaped strap beneath phallic apparatus. Preanal appendages slightly elongate papillose flaps; each with lanceolate, rod-like process arising from middle of mesal face. Coxopodites elongate filiform, each with lateral flank and

narrowing apex in lateral view; broad at middle laterally and with apex triangular in ventral view. Harpagones located basodorsally, curving slightly ventrad and laterad, each with tapering apex; intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with broad phallobase continuing in dorsad-curving, tube-like phallosome, slightly constricted at apex; end of phallosome and protruding endothenca discernible; sclerotized structures invisible; protruded endothenca covered by minute, densely packed microtrichia of 2 distinct sizes.

**Holotype male:** VIETNAM: Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], (OPC).

**Paratypes:** Same data as holotype, 18 males.

**Etymology.** *Congkem*, from Vietnamese “quancong kem,” less arm, referring to the fewer arm-like, lanceolate processes on the dorsal complex of the genitalia.



**FIGURES 61–64.** *Pseudoneureclipsis congkem*, new species, holotype male. 61—genitalia, left lateral; 62—genitalia, dorsal; 63—genitalia, ventral; 64—phallus, left lateral.

***Pseudoneureclipsis dongian*, new species**

Figs 65–68

This species from North Vietnam resembles *P. hai* Malicky, 1995, from South Vietnam (Nam Ct Tien). It is separated from *P. hai* by its clearly triangular inferior appendages, not long and oval; the setiferous segment X being deeply excised medially in dorsal view, with 2 lateral, triangular lobes; and the phallic apparatus with a single, long spine, not 2 broad spines as in *P. hai*.

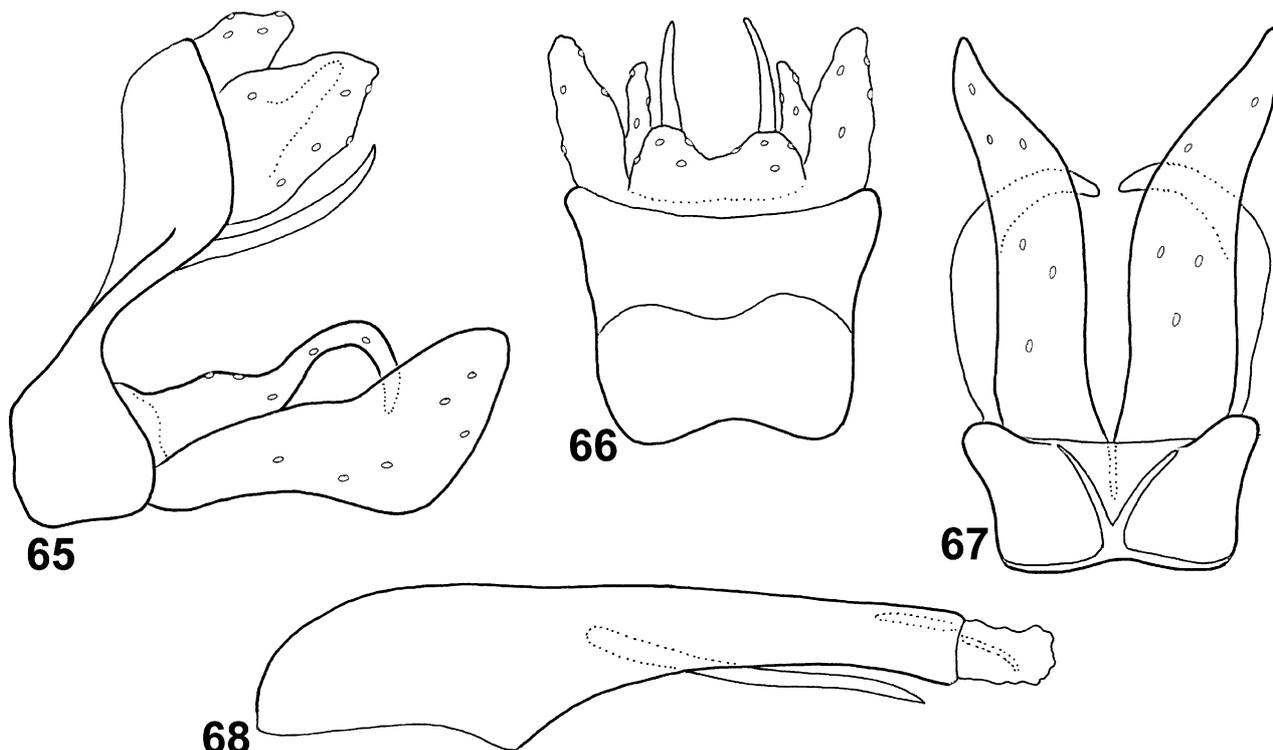
Male. Forewing length 4.0 mm.

Male genitalia. Segment IX with about equally large tergite and sternite, both with narrowing lateral rods articulating in lateral hinge joints. Segment X setose, sub-triangular in lateral view, deeply excised mesally and produced into 2 triangular lobes in dorsal view; interlobular gap triangular. Pair of paraproctal processes spine-like, bare, without setae, curving slightly dorsad apically, their bases located ventrally and laterally of phallic apparatus, articulating with bases of preanal appendages. Preanal appendages broad, nearly triangular in lateral view; narrowly triangular in dorsal views. Coxopodites broadening distad, nearly triangular in lateral view; narrowing, sharply triangular, with laterad-curving apices in ventral view. Harpagones positioned

basidorsally, basal part robust; distal part setose and forming long, slender hook curving posterad, then ventromesad. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with broad phallobase continuing into straight, horizontal, tube-like phallosome; end of phallosome and protruding endothenca discernible; long, slender, single spine associated with phallic apparatus.

**Holotype male: VIETNAM:** Tamdao, 200 m, 12.x.1986, at light [J. Oláh], (OPC).

**Etymology.** *Dongian*, from Vietnamese “don gian,” single, referring to the single specimen collected of this species.



**FIGURES 65–68.** *Pseudoneureclipsis dongian*, new species, holotype male. 65—genitalia, left lateral; 66—genitalia, dorsal; 67—genitalia, ventral; 68—phallus, left lateral.

***Pseudoneureclipsis hailan*, new species**

Figs 69–72

This small-sized, brown animal from Vietnam is similar to *P. linos* Malicky & Bunlue from Thailand. It is easily distinguished from *P. linos* by having an extremely long tergite X; a bifid segment X; setose preanal appendages each with a single process; seta-less paraproctal processes with 2 sinuous spines; and harpagones that are longer and more slender.

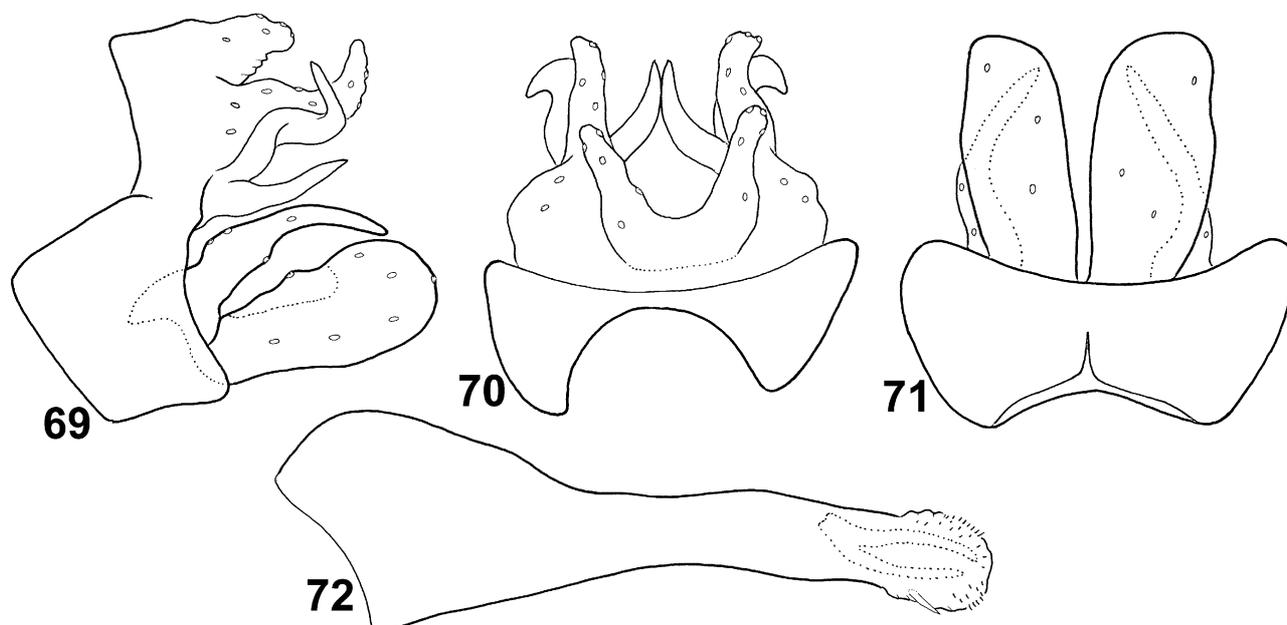
Male. Forewing length 4.0 mm.

Male genitalia. Segment IX in lateral view with quadrangular sternite and rectangular tergite. Segment X setose, bilobed, with wide triangular dorsal interlobular gap. Pair of paraproctal processes each with 2 spine-like, sinuous processes, without setae; ventral spines curving mesad and meeting under phallic apparatus. Preanal appendages broad-based, each with elongate, single, dorsad-curving process. Inferior appendages with coxopodites short, broad, broadly rounded apically in lateral view; in ventral view long, nearly quadrangular. Harpagones located basodorsally on their coxopodites, each broad and with long setae basally, curving ventrad and mesad to tapering apex. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) short. Phallic apparatus with broad phallobase continuing

into almost straight, horizontal, tube-like phallosome; end of phallosome and protruding endotheca discernible; 2 long, thin sclerites visible internally at border of phallosome and endotheca; protruded endotheca covered by minute, densely packed microtrichia; pair of medium-sized, black spines located ventrally before apex.

**Holotype male: VIETNAM:** Cuc Phuong, 12.x.1963 [T. Pócsi], (NHMB).

**Etymology.** *Hailan*, from Vietnamese “hai lan,” double, referring to the 2-spined paraprot of the genitalia.



**FIGURES 69–72.** *Pseudoneureclipsis hailan*, new species, holotype male. 69—genitalia, left lateral; 70—genitalia, dorsal; 71—genitalia, ventral; 72—phallus, left lateral.

### *Pseudoneureclipsis halongensis*, new species

Figs 73–76

This small-sized, brown species from Vietnam is similar to *P. arimaspos* Laudee & Malicky, 1999, from Thailand, particularly due to the presence of a mesal process on each preanal appendage having strong terminal spine-like setae. The new species differs in several genitalic characteristics: segment IX, especially the tergite, is much shorter and strap-like; the setose segment X is long and narrow in dorsal view, not short and broad; the preanal appendages have a small ventroapical lobe, easily seen in lateral view; the paraprotal process is slender and spine-like, not bifid; the coxopodites are shorter, only slightly longer than the harpagones; and the coxopodites are almost parallel-sided in ventral view, each having a short apicomeral narrowing part, not long.

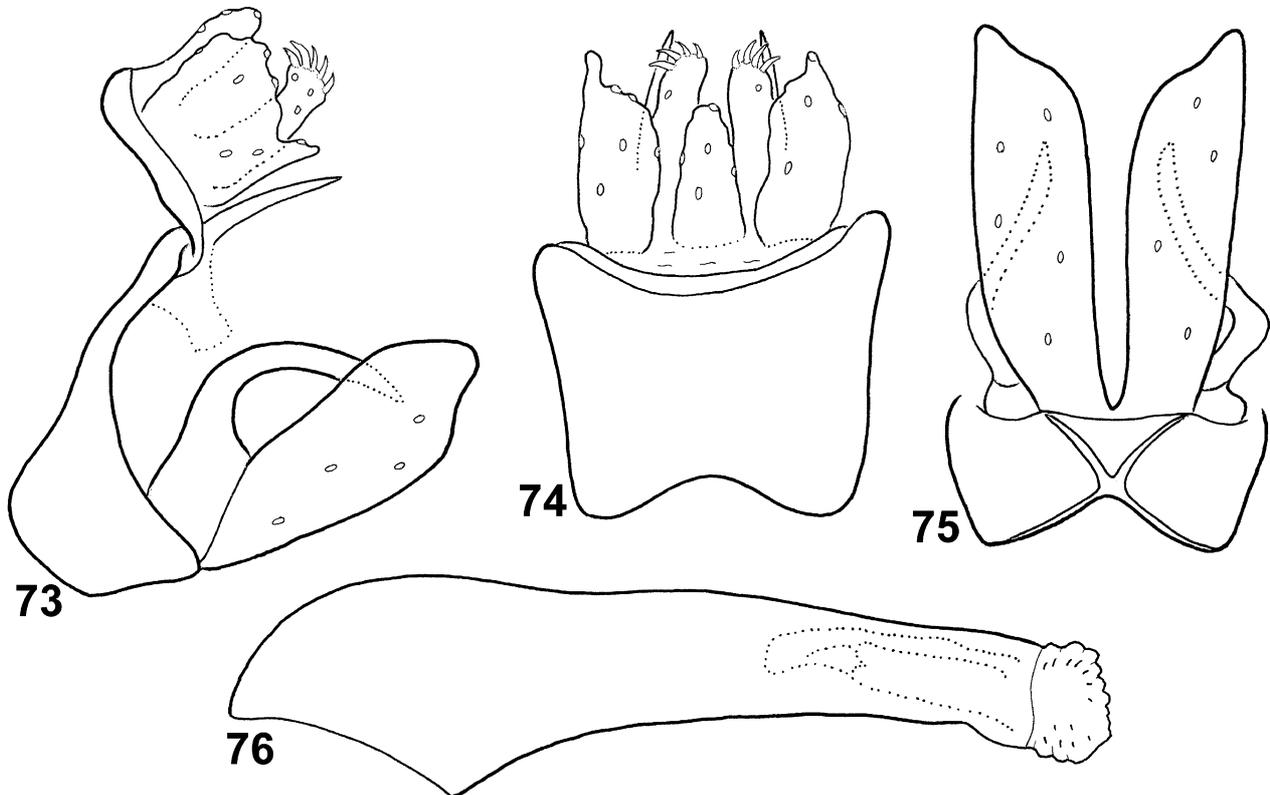
Male. Forewing length 4.5 mm.

Male genitalia. Segment IX extremely short; tergite short, strap-like; sternite slightly longer than tergite; entire segment forming narrow strap, except at venter. Setose segment X long, parallel-sided along its length, except slightly narrowing apically in dorsal view. Preanal appendages forming broad, auriform flaps, each with small ventroapical lobe, and with stout setose process projecting from ventromesal surfaces of flaps and visible in lateral and dorsal views. Pair of paraprotal processes slender, spine-like, with broad bases; without setae; basal parts extending ventrad, fusing under phallic apparatus; forming U-shaped, wide strap beneath phallic apparatus. Inferior appendages with coxopodites sub-triangular in lateral view, slightly longer than harpagones; tapering just before rounded apices in lateral and ventral views. Harpagones located basodorsally,

forming mesoventrad-curving spines with broad bases. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with short, broad phallobase continuing into straight, horizontal, tube-like phallosome; end of phallosome and protruding endothenca discernible; 2-part and elongate sclerotized structures scarcely visible inside phallosome, ending in protruding endothenca; protruded endothenca covered by minute, densely packed microtrichia.

**Holotype male: VIETNAM:** Halong Archipelago, Cat Ba Island, 17.v.1987, at light [J. Oláh], (OPC).

**Etymology.** *Halongensis*, derived from the type locality.



**FIGURES 73–76.** *Pseudoneureclipsis halongensis*, new species, holotype male. 73—genitalia, left lateral; 74—genitalia, dorsal; 75—genitalia, ventral; 76—phallus, left lateral.

***Pseudoneureclipsis loang*, new species**

Figs 77–80

This small-sized, brown animal from Vietnam is similar to *P. josia* Malicky & Chantaramongkol, 1993, from Thailand in having a very short segment IX. The new species differs in several genitalic structures: setose segment X narrows apicad, not forming a broad plate; the preanal appendages have a long, digitiform ventral lobe, not short; the paraproctal processes are slender, spine-like, with broad bases; and the coxopodites are nearly triangular apically in lateral view, not bluntly rounded, and almost parallel-sided in ventral view, not tapering.

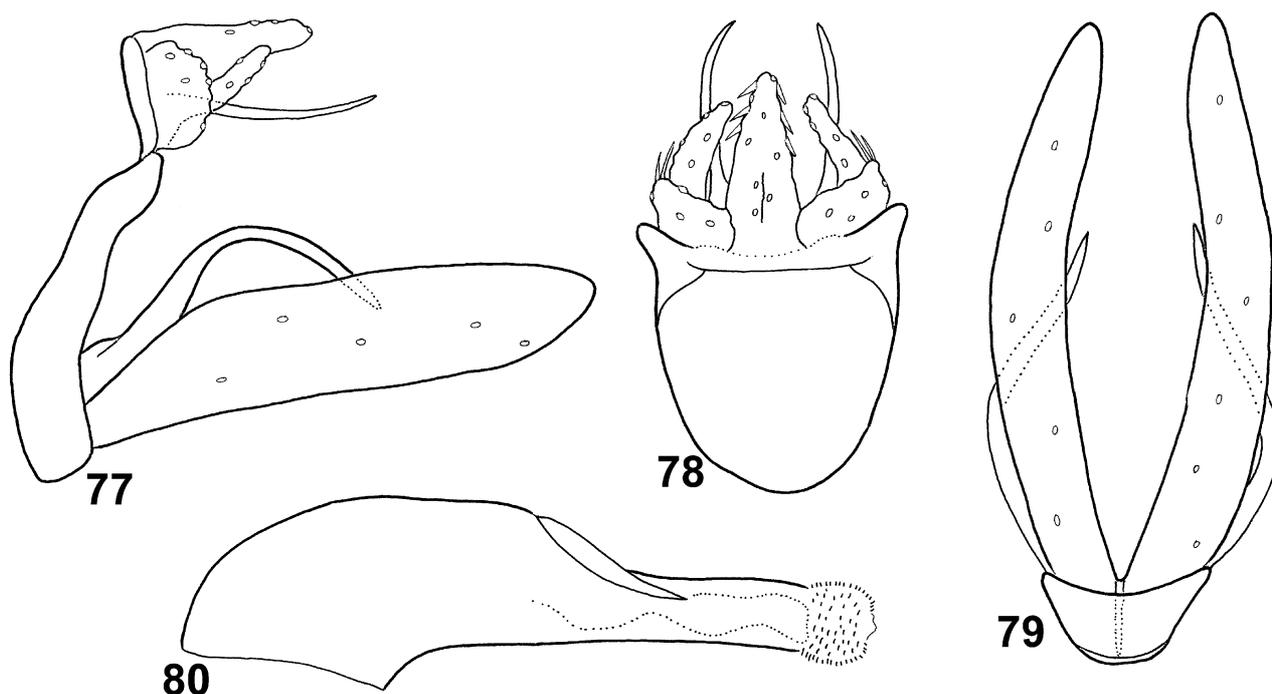
Male. Forewing length 4.5 mm.

Male genitalia. Segment IX short, consisting of short tergite and short, sinuous sternite; segment looks like narrow sclerotized strap. Segment X setose, long, triangular, with dorsomesal ridge, entire surface covered with strong setae, strongest setae located mostly on lateral margins and along dorsomesal ridge. Paraproctal processes slender, spine-like, with broad bases, without setae, curving slightly dorsomesad; basal parts meeting under phallic apparatus, forming U-shaped strap beneath phallic apparatus. Preanal appendages

each consisting of broad, auriform flap and long, digitiform process arising from ventromesal surface of flap, visible in lateral and dorsal views. Inferior appendages with coxopodites long, parallel-sided, apically triangular. Harpagones located basodorsally on coxopodites, each forming mesoventrad-curving, slender spine. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with broad, long phallobase continuing into straight, horizontal, tube-like phallosome. Dorsal, posteriorly acute spine present at end of broad phallobase. End of phallosome and protruding endotheca discernible; sclerotized structure scarcely visible inside phallosome, ending in protruding endotheca; protruding endotheca covered by minute, densely packed microtrichia.

**Holotype male: VIETNAM:** Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], (OPC).

**Etymology.** *Loang*, from Vietnamese “loan,” thin, referring to the slender harpagones in the genitalia.



**FIGURES 77–80.** *Pseudoneureclipsis loang*, new species, holotype male. 77—genitalia, left lateral; 78—genitalia, dorsal; 79—genitalia, ventral; 80—phallus, left lateral.

***Pseudoneureclipsis puyah*, new species**

Figs 81–84

This species resembles *P. cincinnatus* Malicky & Chantaramongkol, 2000, from Thailand. The new species is easily distinguished by the preanal appendages being shorter; the preanal appendages having a small lobe on the ventroapical corners; the paraproctal processes being very slender, not broad and robust; and the coxopodites lacking the apicomeral narrowing.

Male. Forewing length 4.0 mm.

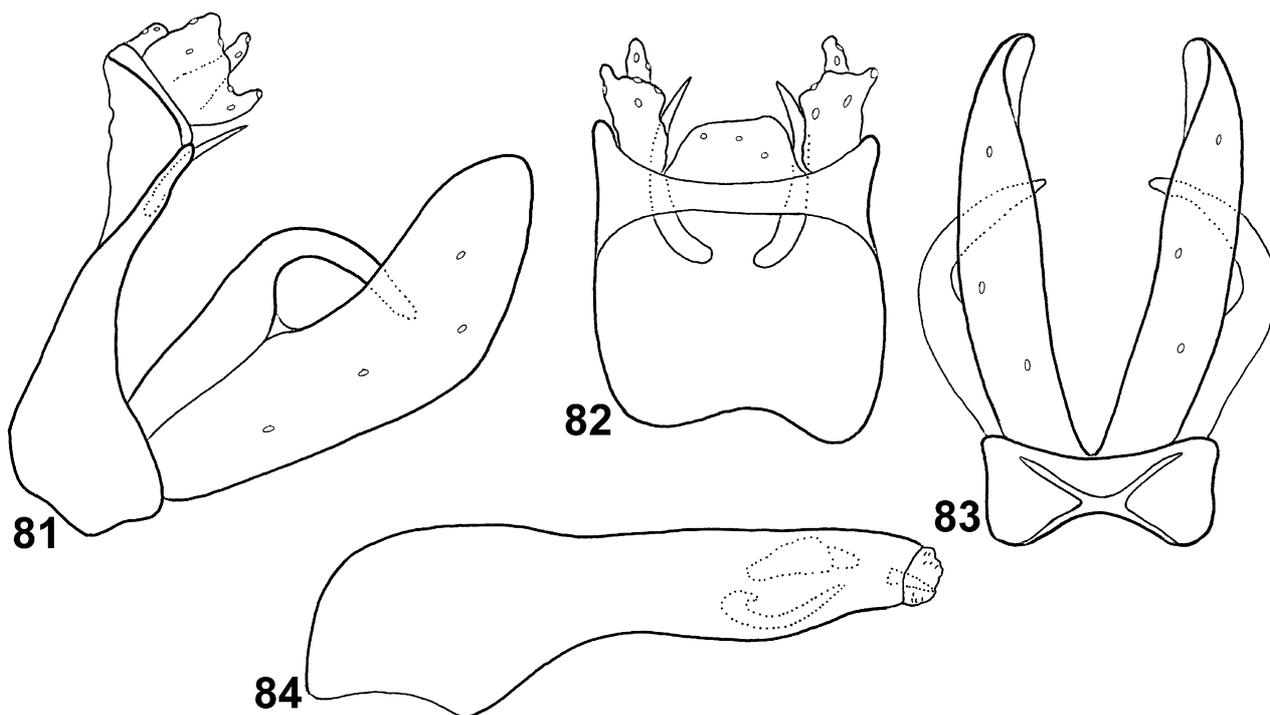
Male genitalia. Segment IX with large, triangular, weakly pigmented or semi-membranous acrotergite and sclerotized sternite with long, narrowing lateral rods articulating with tergite in hinge joints near preanal appendages. Segment X setose, short, rounded, with small medial excision in dorsal view. Preanal appendages short, each with small, ventroapical lobe; mesal setose processes slightly longer. Pair of paraproctal processes slender, spine-like, without setae, curving slightly mesad, apically tapered; proximal ends slightly bulbous, embracing venter of phallic apparatus. Inferior appendages with coxopodites large, broadening, curving dorsad at apices in lateral view. Harpagones located basodorsally on coxopodite; each with robust basal part

continuing into long, slender distal part curving mesoventrad. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with broad phallobase continuing into straight, horizontal, tube-like phallotheca; slightly broadening before apex. End of phallotheca and protruding endotheca discernible; strong, curving spine embedded together with sclerotized structure, possibly representing phallostremal sclerite.

**Holotype male:** INDIA: Karnataka, Tunga Rives at Shimoga, 18.iv.1992, at light [J. Oláh], (OPC).

**Paratypes:** Same data as holotype, 5 males.

**Etymology.** *Puyah*, from Puyah, the name of the young son of the cow farmer helping to collect at the light among the cattle.



**FIGURES 81–84.** *Pseudoneureclipsis puyah*, new species, holotype male. 81—genitalia, left lateral; 82—genitalia, dorsal; 83—genitalia, ventral; 84—phallus, left lateral.

### *Pseudoneureclipsis quancong*, new species

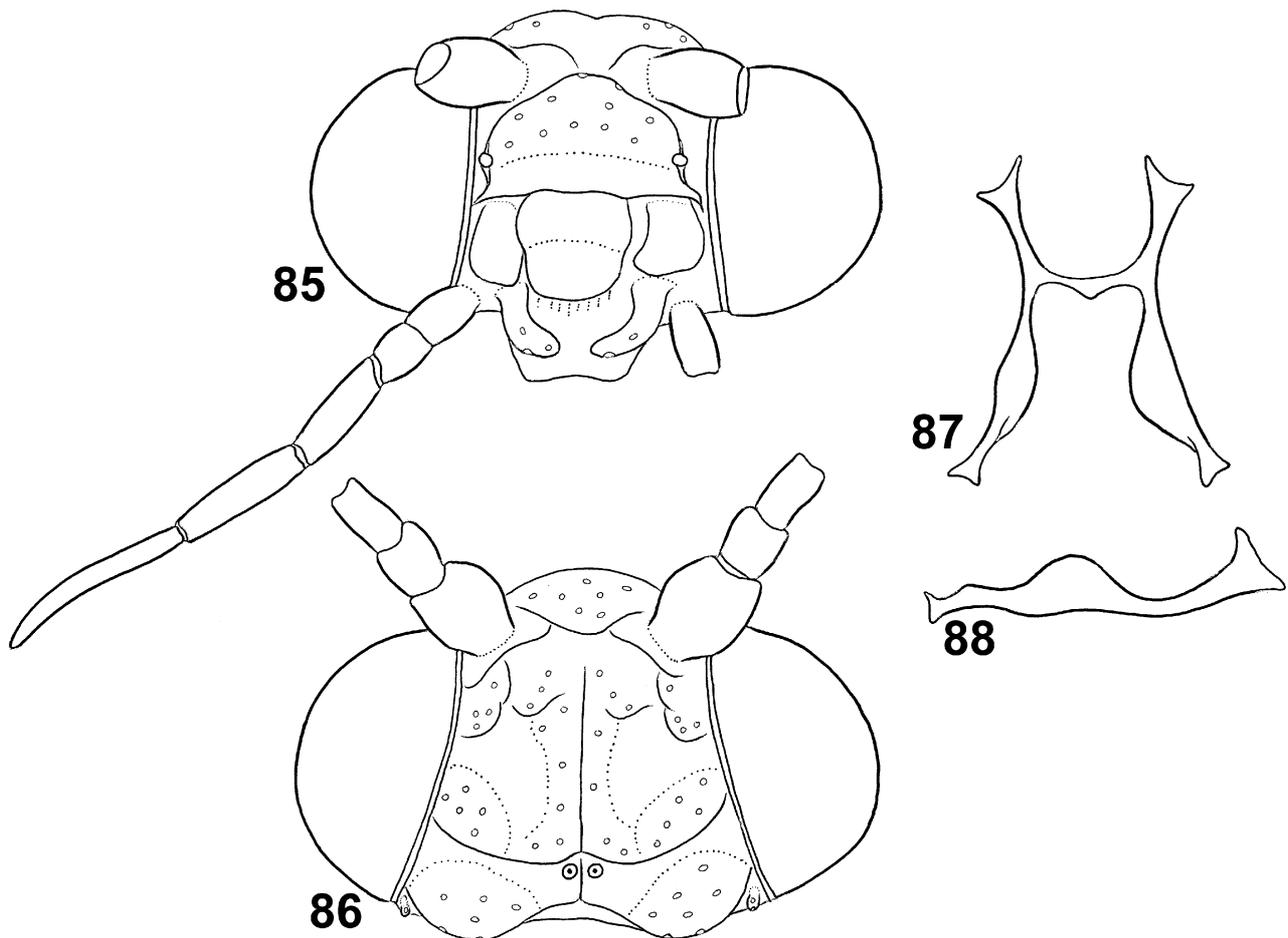
Figs 85–92

This small, brown animal from Vietnam is similar to *P. boquan*, new species. It is easily separated from *P. boquan* in having the terminal part of segment X less-developed, membranous; the sclerotized basal part of segment X is less discernible; the median digitiform process on segment X is short; the preanal appendages are armed with only 2 long processes; and the harpagones and the quadrangular basolateral flanks of the coxopodites are shorter.

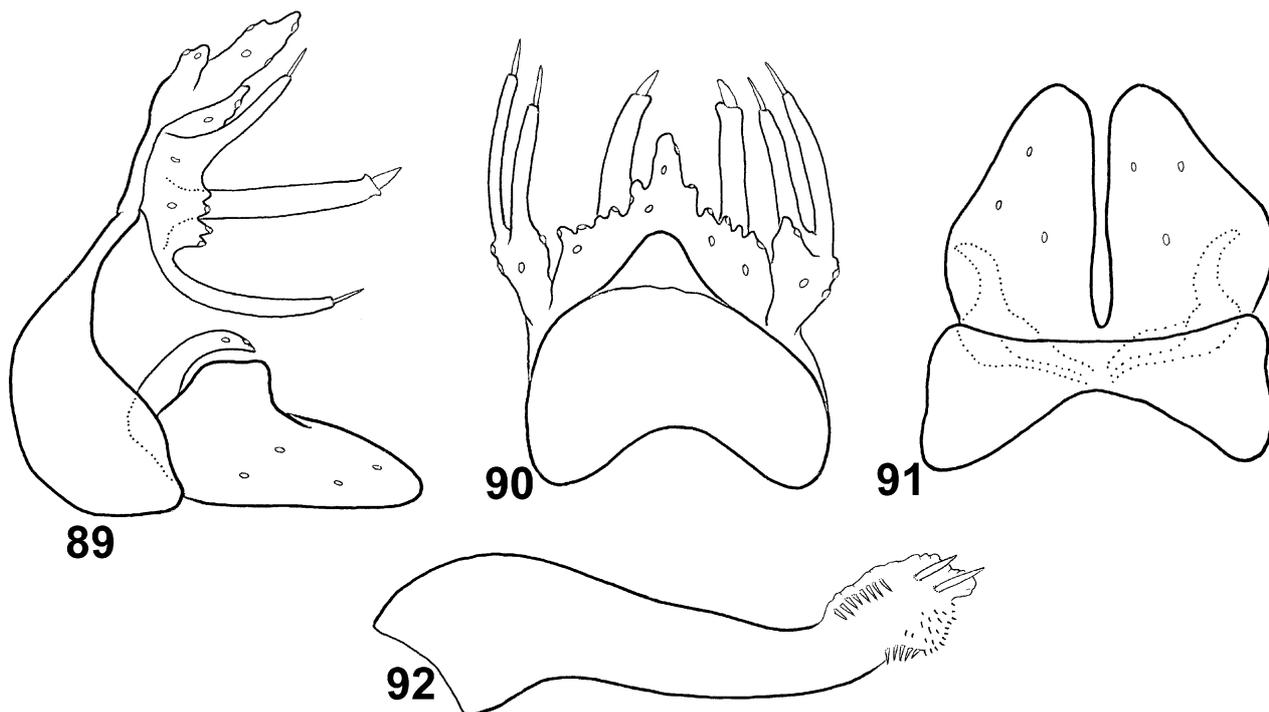
**Male.** Head tentorium H-shaped in dorsal view, with long, slender posterior arms; tentorial bridge slender, anteriorly with small, mesal, triangular projection; anterior tentorial arms each with large, mesoventral lamella. Entire labrum hanging freely. Mandibles extremely large, broad; surface granulate papillose. Haustellum broad, granulate, without channels on most of dorsum; channels present at base along sitophore. Tubercles located along posterior end of coronal groove, between occipital compact setal warts; rather pale, membranous, like dome or cupola organs; *sensillae campaniformia* or *sensillae placodea* with slightly more-pigmented, central rounded area. Forewing length 4.0 mm; fork I as large as fork III.

**Male genitalia.** Segment IX with narrow tergite and well-developed, compact sternite; tergite reduced to

antecostal ridge articulating with narrow dorsolateral rods of sternite IX; lateral rod of tergite IX directed ventrad, slightly broadening into small, flank-like plate at point of articulation. Segment X produced into digitate, setose, papillate, sclerotized dorsal lobe and membranous hood over phallic apparatus; anterior basal part of membranous hood well-developed, hinged laterally to fulcra in caudal view; basal sclerotized and setose lobe of segment X with long, median process and 4–5 small, irregular digits on either side of median process; process and digits ending in terminal setae and additional buds, protuberances or setose tubercles. Pair of paraproctal processes (intermediate appendages) hinged to bases of preanal appendages; producing pair of broad, straight rods directed posterad, each armed with strong terminal spine-like seta. Basic plan of preanal appendages similar to basal part of segment X; 2 long, filiform processes with strong terminal spine-like setae present: dorsal process almost straight, directed slightly dorsad; ventral process sinuous, directed posterad. Inferior appendages with coxopodites large, broad, nearly triangular in lateral and ventral views; each with basolateral flank nearly rectangular in lateral view. Harpagones located basodorsally, forming robust, posterad-curving, setose spine-like process. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well developed. Phallic apparatus narrowing distally; curving dorsad before apex; 2 less-pigmented terminal processes embedded in membranous apex. Endotheca densely covered by microtrichia of 2 sizes; terminal microtrichia small; microtrichia before terminal area long.



**FIGURES 85–88.** *Pseudoneureclipsis quancong*, new species, holotype male. 85—head, frontal; 86—head, dorsal; 87—head tentorium, dorsal; 88—head tentorium, left lateral.



**FIGURES 89–92.** *Pseudoneureclipsis quancong*, new species, holotype male. 89—genitalia, left lateral; 90—genitalia, dorsal; 91—genitalia, ventral; 92—phallus, left lateral.

**Holotype male: VIETNAM:** Tamdao, 200 m, 12.x.1986, at light [J. Oláh], (OPC).

**Paratype:** Same data as holotype, 1 male.

**Etymology.** *Quancong*, from Vietnamese “quancong,” arms, referring to the 2 pairs of processes on the preanal appendages and 1 pair of paraproct processes, each having a large and strong terminal seta, like 6 lances.

### *Pseudoneureclipsis vetcat*, new species

Figs. 93–96

This small-sized, brown species from Vietnam is similar to *P. abia* Malicky & Chantaramongkol from Thailand. *Pseudoneureclipsis vetcat* is easily separated from *P. abia* in the genitalia, particularly by possessing a short median finger on segment X; preanal appendages with papillose apical margins; simple coxopodites each with their distal part curving dorsad; and inferior appendages curving slightly mesad and wider at apical 1/4th.

Male. Forewing length 4.0 mm.

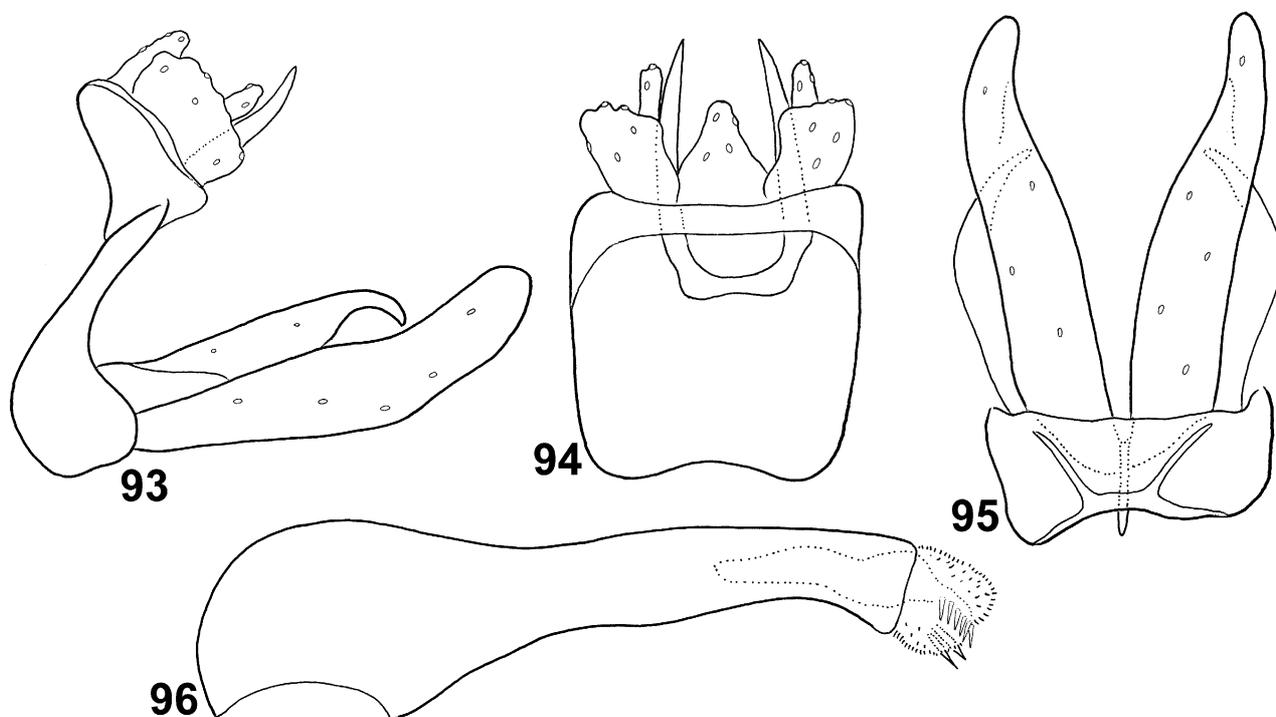
Male genitalia. Segment IX with equally large tergite and sternite, both with narrowing lateral rods articulating in lateral hinge joints. Segment X setose, long, triangular in dorsal view. Pair of paraproctal processes spine-like, without setae, distal parts curving slightly dorsad; basal parts fusing into U-shaped strap beneath phallic apparatus. Preanal appendages rounded quadrangular in lateral view; prolonged quadrangular in dorsal view; papillose along apical margins. Inferior appendages with coxopodites parallel-sided, rod-like, each with slightly dorsad-curving apical half in lateral view; apical 1/4th narrowing, slightly curving mesad in ventral view. Harpagones located basodorsally, each composed of elongate basal part with straight-cut dorsum articulating to coxopodite, and slender, posterad-hooked distal part; curving part spine-like with setae. Intersegmental membrane of each inferior appendage (articulation line between coxopodites and harpago) well visible. Phallic apparatus with broad phallobase continuing into straight, horizontal, tubular phallosome;

slightly constricted at mid-length; apical part curving ventrad; end of phallosome and protruding endotheca visible; sclerotized structures visible inside apex. Protruding endotheca densely covered by minute microtrichia, 2 long horizontal spines, and group of short vertical microtrichiae in endothecal matrix.

**Holotype male:** VIETNAM: Bac Thai Province, Quang Chu, 24–25.v.1987, at light [J. Oláh], (OPC).

**Paratypes:** Same data as holotype, 7 males.

**Etymology.** *Vetcat*, from Vietnamese “vet cat,” cut, referring to the straight-cut dorsum of each harpago of the inferior appendages.



**FIGURES 93–96.** *Pseudoneureclipsis vetkat*, new species, holotype male. 93—genitalia, left lateral; 94—genitalia, dorsal; 95—genitalia, ventral; 96—phallus, left lateral.

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