

A REVIEW OF THE GENUS *PSEUDEVOPLITUS* RUCKES, (HETEROPTERA: PENTATOMIDAE) WITH THE DESCRIPTION OF THREE NEW SPECIES

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Abstract.—*Pseudevoplitis* Ruckes is revised on the basis of morphological characters with emphasis on the genitalia of both sexes. Four species are recognized, three of them new: *P. paradoxus* Ruckes, 1958, *P. costalimai*, n. sp., *P. peruvianus*, n. sp., and *P. vittatus*, n. sp. The species *P. longicornis* Ruckes, 1959, *P. casei* Thomas, 1980, and *P. mexicanus* Brailovsky and Barrera, 1982 are transferred to a new genus, described in another paper.

Key Words.—Pentatomidae, *Pseudevoplitis*, neotropical, taxonomy, stinkbug.

The genus *Pseudevoplitis* was described by Ruckes (1958) for *P. paradoxus* based on male and female specimens from Peru. Ruckes (1959) later described a second species, *P. longicornis* from Panama. More than two decades later two species were added, one by Thomas (1980), *P. casei* from Guatemala, and another by Brailovsky and Barrera (1982), *P. mexicanus*, from Mexico. The last two species are closely allied to *P. longicornis*. A detailed examination of the genitalia of both sexes, as well as the discovery of three new species, allied to *P. paradoxus*, has persuaded us to exclude *P. longicornis*, *P. casei*, and *P. mexicanus* from *Pseudevoplitis* and erect a new genus described in a separate paper. Grazia et al. (1993) have previously discussed the relationship between *Evoplitis* Amyot and Serville and *Pseudevoplitis*.

Members of the genus *Pseudevoplitis* possess an anteriorly-directed spine on the 3rd abdominal sternite in apposition to a posteriorly-directed, bifid process on the metasternite, thus placing the genus in section three of the Pentatomini (*sensu* Rolston et al., 1980).

Pseudevoplitis has a mainly northern distribution in South America, being represented in Peru, Bolivia and northern Brazil. *P. paradoxus* has the widest known distribution of any species, ranging from Peru to central Argentina.

MATERIAL AND METHODS

Measurements are given in millimeters and correspond to the mean for all specimens studied. Length was measured along the midline from the tip of the tylus to the apex of the seventh abdominal segment. Length and width of each gonocoxite 8 of the female genital plates were taken on the extreme, maximal points touched by imaginary lines. The terminology for the structure of the genitalia was adopted from Dupuis (1970) and Schaefer (1977). The genitalia were treated with 10% KOH, and stained in Congo Red.

Specimens are deposited with the following institutions with their acronyms as they appear in the text: AMNH—American Museum of Natural History, New York, NY; DAR—David A. Rider Collection, Fargo, ND; DBT—Donald B. Thomas Collection, Weslaco, TX; LACM—Los Angeles County Museum of Natural History, Los Angeles, CA; MCNZ—Museu de Ciências Naturais, FZBRS, Porto Alegre RS, Brasil.

Pseudevoplitis Ruckes, 1958

Pseudevoplitis Ruckes, 1958:8-9; Thomas, 1980:293; Brailovsky and Barrera, 1982: 231-232; Brailovsky, 1988:131.

Type species: *Pseudevoplitis paradoxus* Ruckes, 1958, by original designation.

Ruckes' (1958) description is augmented as follows: Length of head almost half the width across eyes. Jugal and tylus equal in extent or jugal slightly longer than tylus.

Antennal segment I almost attaining or clearly exceeding apex of head. Bucculae moderately prominent, rectilinear in profile, margins elevated anteriorly, parallel, then gradually becoming lower, in ventral view divergent posteriorly. Humeri produced; antero-lateral margins thick, obtuse, irregularly crenulate or subtuberculate. Rostrum with segment I lying in sulcus between bucculae; II arcuate, surpassing procoxae; last two segments dorso-ventrally depressed. Venation of membrane brown; intervenal membrane mostly transparent. Connexivum widely exposed, apical angles acutely produced; segments III to VI with attendant minute spine immediately mesad to each apical angle; angle of segment VII subacuminate, also bearing acute, dorsal, rearwardly projecting spinous process. Posterior margin of metasternal plate excavated in triangular notch to receive anteriorly directed protuberance of third abdominal segment. Spiracles oval.

Male genitalia: Pygophore widely open, anterior chamber of genital capsule (*sensu* Schaeffer, 1977) ample; posterolateral angles expanded; dorsal border deeply excavated, fully exposing segment X (proctiger); ventral rim deeply U-shaped excavated, ventral wall depressed behind excavation; infolding of ventral rim dilated on each side of excavation. Diaphragm very finely striated, striae parallel; 1 + 1 keel-like, strongly sclerotized processes projecting from dorsal border of pygophore to base of parameres; processes in dorsal view, noticeable halfway between midline of dorsal border and posterolateral angles of pygophore. Longitudinal axis of proctiger perpendicular to sagittal plane of pygophore; anal tube opening ventrally; basal part of proctiger expanded into ample, nearly bilobate process; distal portion of process visible in ventral view, obscuring body of proctiger in dorsal view. Parameres simple, elongate, semi-erect, acutely tipped and curving toward proctiger. *Phallosome* cylindrical, open posteriorly, bearing two processes: basal one (*processus phallosomae* 1), subrectangular, posterior margin notched at midline, and second one (*processus phallosomae* 2), at distal aperture, projecting dorsally, voluminous, resembling stretched tongue. Basal plates of articulatory apparatus with two pairs of connectives on dorsal side; internal pair flat, large relative to basal plates when combined with *processus capitati*. *Ponticulus transversalis* projecting as long, semi-membranous sheath, laterally continuous with dorsal connectives. *Ductus seminis distalis* short, enveloped by voluminous vesica which bears dorsally a pair of recurved arms (*processus vesicae*). **Female genitalia:** Sternite VII produced into strong, spine-like projection; imaginary

transverse line touching apices of laterotergites 9 crosses sternite VII far from its apex. Distance between this imaginary line to apex of sternite VII about twice medial length of segment X. Posterior border of sternite VII semicircularly excavated on gonocoxites 8, oblique, truncate on laterotergites 9. Abdomen in profile, forming an obtuse angle between intersection of two imaginary planes tangential respectively to midlongitudinal abdominal keel, and gonocoxites 8. Gonocoxites 8 feebly tumescent or almost flat, surface bearing faint, linear rugulae emitting obliquely from sutural borders which are parallel for $\frac{2}{3}$ to $\frac{3}{4}$ of length basally, divergent distally; posterior border truncated. Laterotergites 9 narrowly triangular, well surpassing transverse band uniting laterotergites 8 dorsally. Posterior border of laterotergites 8 produced into acute lobe. Anterior margin of gonocoxites 9 nearly uniformly concave; anterolateral angles somewhat expanded anteriorly. Thickening of vaginal intima not uniformly sclerotized, sclerotization restricted to wide basal ring. *Chitinellipsen* large, lying on each side of thickening of vaginal intima. Portion of *ductus receptaculi* preceding vesicular area about twice as long as portion after. *Capsula seminalis* subconical bearing three digitoid projections. *Pars intermedialis* constricted at distal third; anterior and posterior annular crests, each with well developed flange.

KEY TO THE SPECIES OF *PSEUDEVOPLITUS*

1. Humeri strongly produced into cornute spines. Posterior borders of gonocoxites 8 obliquely truncate, sutural borders truncately divergent distally (Figs. 19, 21) 2
- Humeri acutely produced. Posterior borders of gonocoxites 8 transversely truncate, sutural borders arcuately divergent distally (Fig. 20) 3
2. Dorsal surface matte, tan, with dark brown, longitudinal vitta on midline of pronotum and scutellum (Fig. 1). Pygophore with minute spine immediately dorsad of each posterolateral angle (Figs. 13, 15). Outline of diaphragm process in form of a quadrangular projection at dorsal border of pygophore, projecting nearly to base of paramere (Fig. 13). Posterior border of gonocoxites 9 bilobate (Fig. 21) *P. vittatus* n. sp.
- Dorsal surface tan with dark brown markings nebulous, irregularly distributed on pronotum, scutellum and hemelytra. Pygophore without minute spine near posterolateral angles. Diaphragm process in form of a spatulate projection at dorsal border of pygophore, not projecting to base of paramere (Figs. 6, 11). Posterior border of gonocoxites 9 arcuately concave (Fig. 19) *P. paradoxus* Ruckes
3. Jugs slightly but distinctly longer than tylus (Fig. 2). Basal antennal segment not quite attaining apex of head. Eyes smaller, diameter approximately half width of head at anterior one-third. Diaphragm process oblique at dorsal border of pygophore, projecting about one-third distance from dorsal border to base of paramere (Figs. 4, 10) *P. costalimai* n. sp.
- Jugs and tylus equal in apical extent (Fig. 3). Basal antennal segment clearly exceeding apex of head. Eyes large, diameter approximately equal to width of head at anterior one-third. Outline of diaphragm process in a triangular projection at dorsal border of pygophore (Fig. 8), halfway from dorsal border to base of paramere (Fig. 12) *P. peruvianus* n. sp.

Pseudevoplitis paradoxus Ruckes, 1958
(Figs. 6, 7, 11, 16-19, 22)

Pseudevoplitis paradoxus Ruckes', 1958:9-12; Ruckes, 1959:17; Thomas, 1980:296;
Brailovsky and Barrera, 1982:231-234.

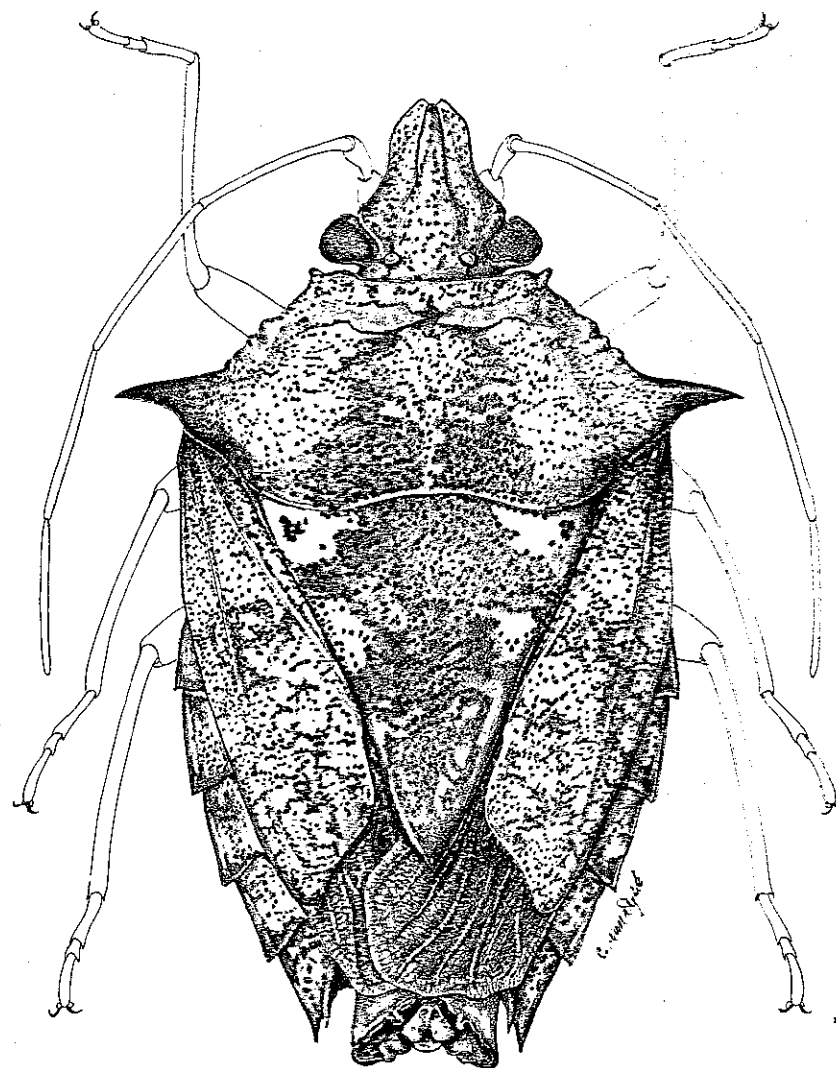
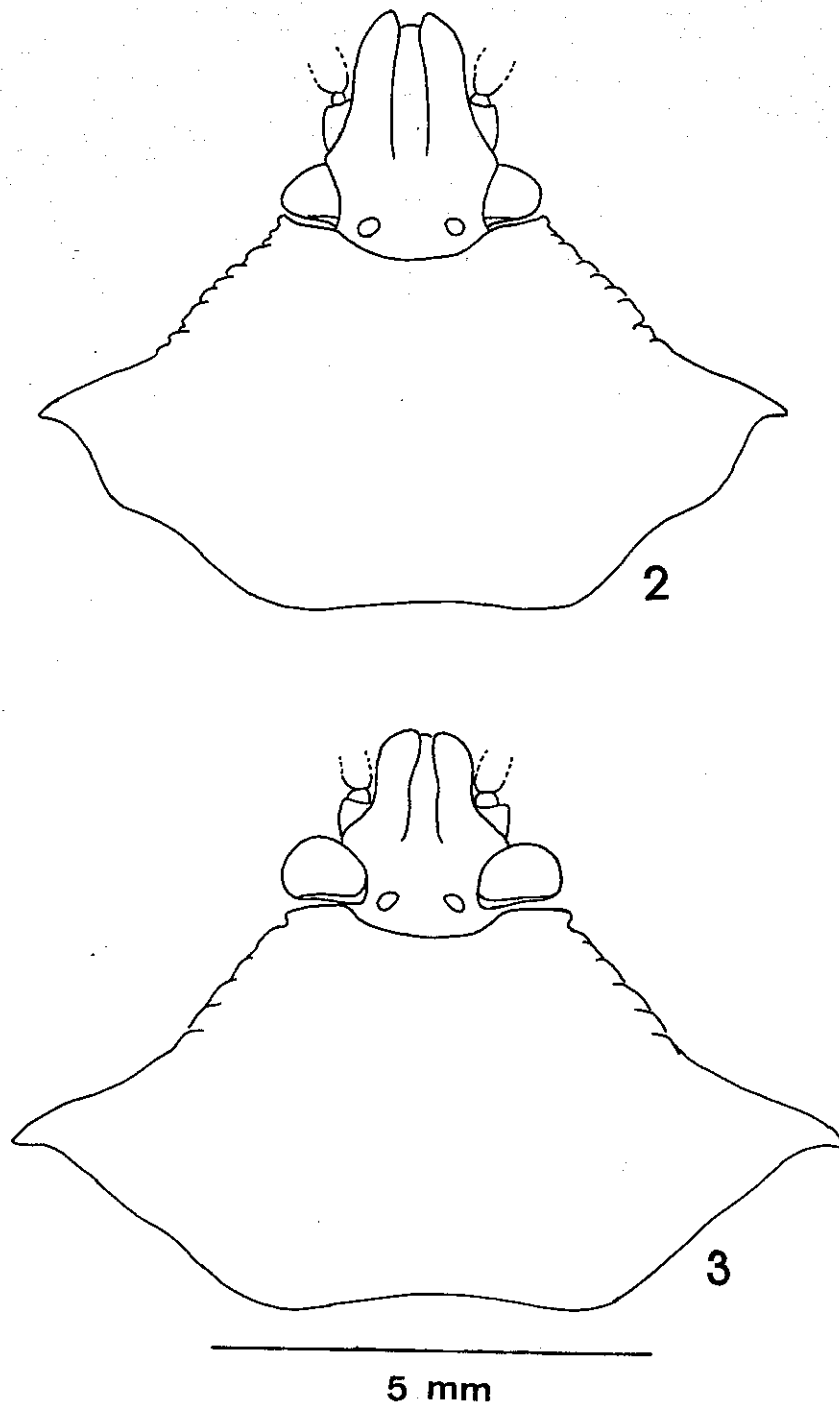


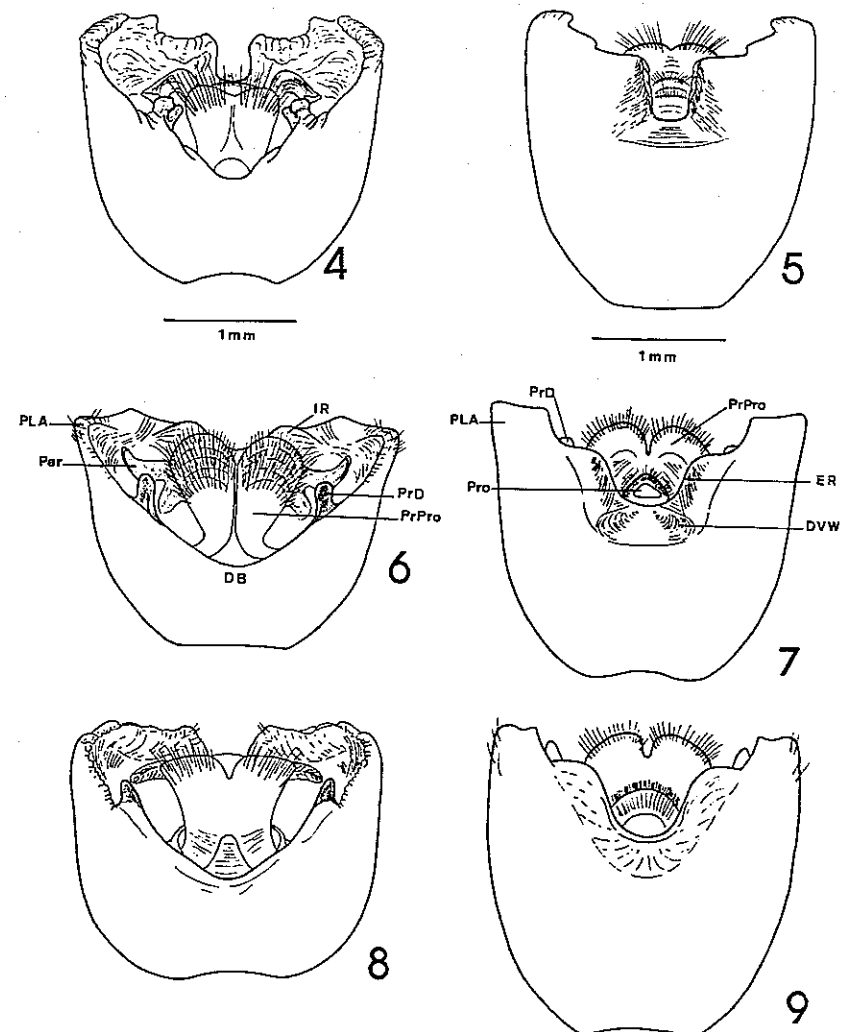
Fig. 1. *Pseudevoplitis vittatus*, n. sp., dorsal habitus.

We make the following correction to Ruckes' (1958) description for the length of the antennal segments: segment IV longest, segments II, III, and V subequal, each more than twice the length of segment I (basal).

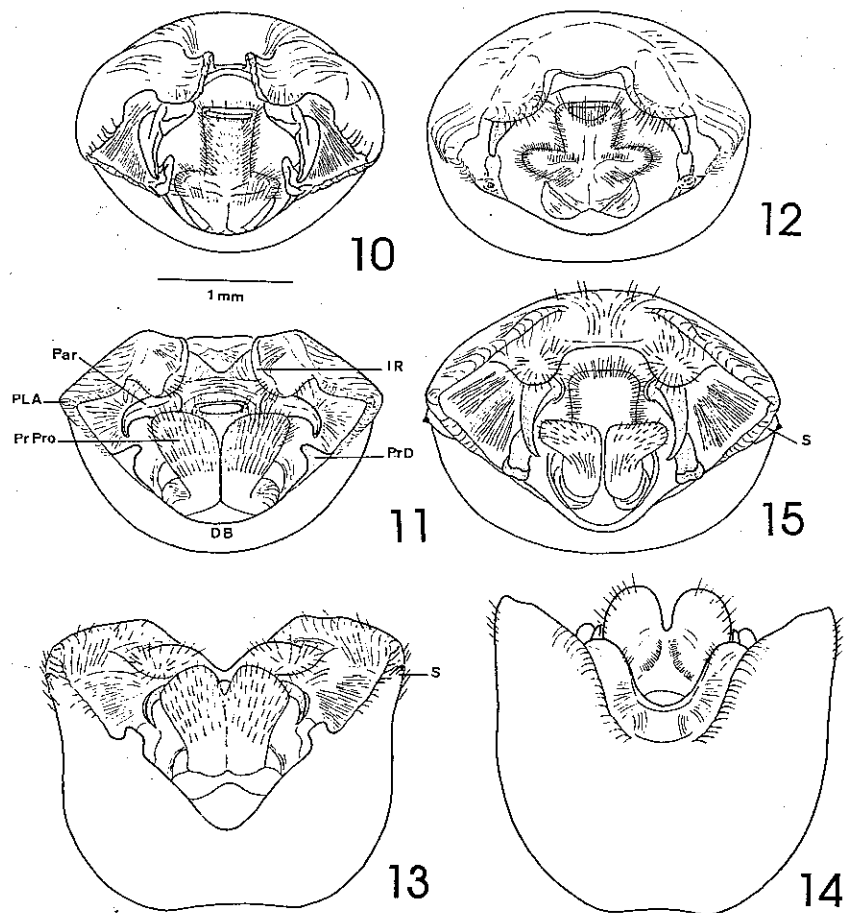
Male: Postero-lateral angles of pygophore obliquely truncate in ventral view (Fig. 7); lateral borders of median excavation of ventral rim incrassate. Diaphragm process



Figs. 2, 3. Head and pronotum. 2. *Pseudevoplitus costalimai*, n. sp. 3. *P. peruvianus*, n. sp.



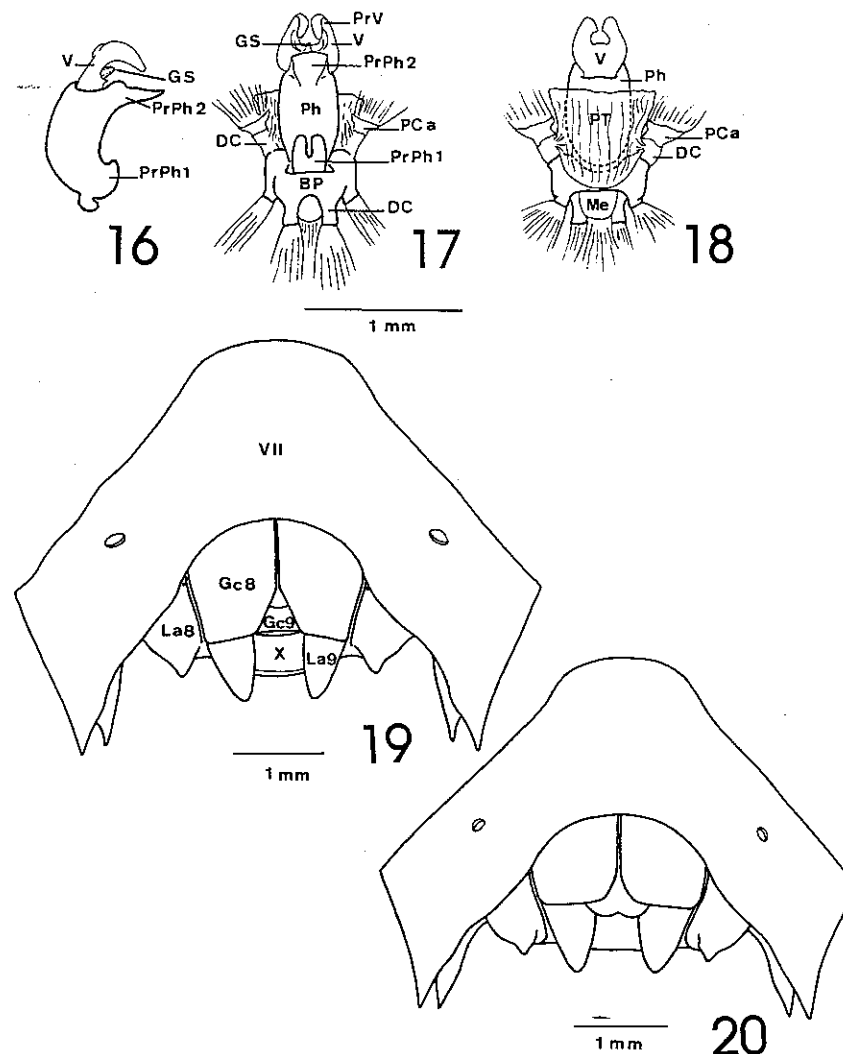
Figs. 4-9. Male pygophore. 4, 5. *P. costalimai*, n. sp. 4. Dorsal view. 5. Ventral view. 6, 7. *P. paradoxus* Ruckes. 6. Dorsal view. 7. Ventral view. 8, 9. *P. peruvianus*, n. sp. 8. Dorsal view. 9. Ventral view. (DB = dorsal border, DVW = depression of ventral wall, ER = excavation of ventral rim, IR = infolding of ventral rim, Par = paramere, PLA = postero-lateral angles, PrD = process of diaphragm, Pro = proctiger, PrPro = process of proctiger, S = spine of dorsal border.)



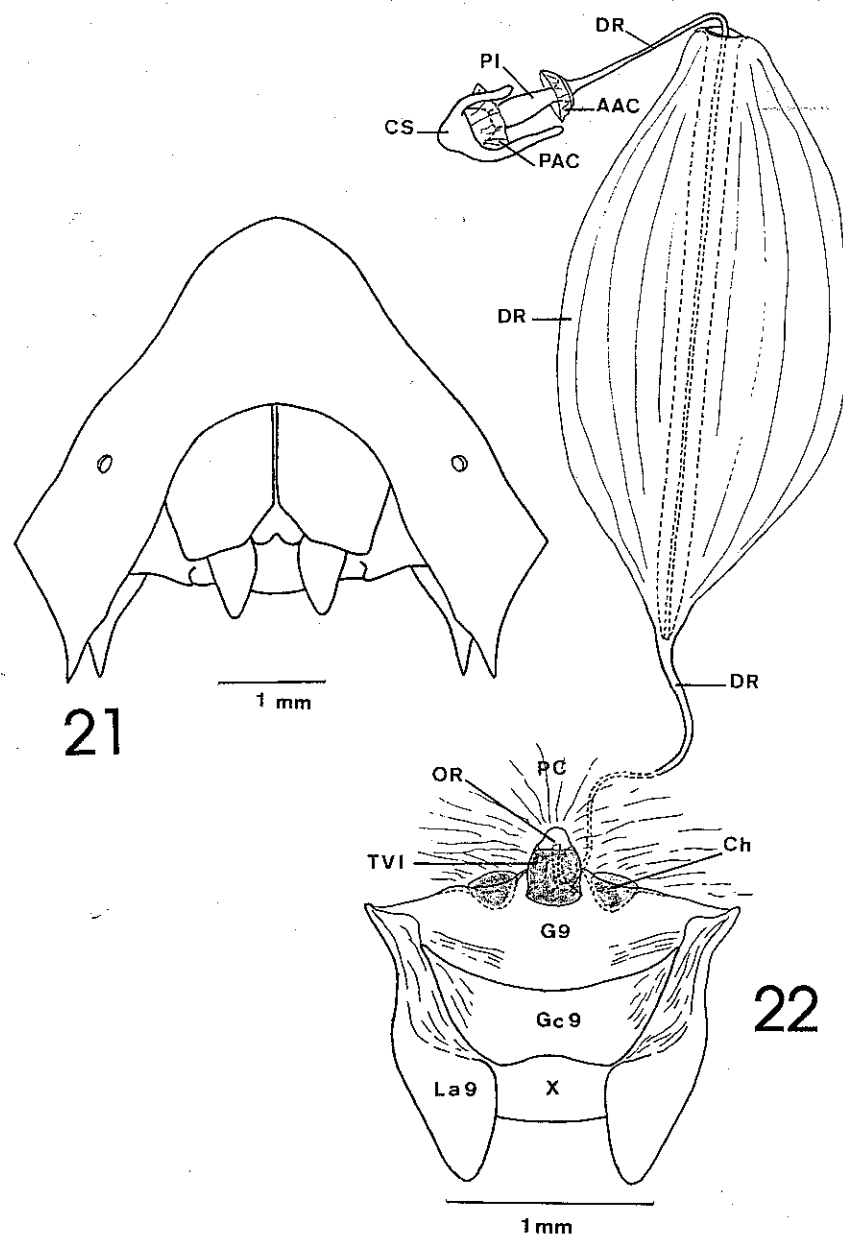
Figs. 10-15. Male pygophore. 10. *P. costalimai*, n. sp., posterior view. 11. *P. paradoxus* Ruckes, posterior view. 12. *P. peruvianus*, n. sp., posterior view. 13-15. *P. vittatus*, n. sp. 13. Dorsal view. 14. Ventral view. 15. Posterior view.

in form of a spatulate projection at dorsal border of pygophore, not projecting to base of paramere (Figs. 6, 11). Paramere scythe-shaped. Basal process of proctiger in dorsal view apparently bilobate, each lobe slightly convex, posterior margin convexly arcuate. Phallus as illustrated (Figs. 16-18).

Female: Gonocoxites 8 approximately one-fourth longer than wide, disc flat, rugulose; sutural borders parallel along basal two-thirds, distal third truncately divergent; posterior border obliquely truncate, external angle more posteriorly projected than sutural angle; external borders nearly rectilinear (Fig. 19). Spiracles of laterotergites 8 present, visible. Gonocoxites 9 flat, posterior border nearly concave. Ectodermal genital ducts as illustrated (Fig. 22).



Figs. 16-20. Male genitalia of *Pseudovoplitus paradoxus* Ruckes. 16. *Phallosome*, lateral view. 17. *Phallus*, dorsal view. 18. *Phallus*, ventral view. 19, 20. Female genital plates, ventral view. 19. *P. paradoxus* Ruckes. 20. *P. peruvianus*, n. sp. (BP = basal plates, DC = dorsal connectives, Gc8 = gonocoxites 8, Gc9 = gonocoxites 9, GS = secondary gonopore, La8 = laterotergites 8, La9 = laterotergites 9, Me = Membranblase, PCa = *processus capitati*, Ph = *phallosome*, PrPh1 = *processus phallosomae* 1, PrPh2 = *processus phallosomae* 2, PrV = *processus vesicae*, PT = *ponticulus transversalis*, V = vesica, VII = sternite VII, X = segment X.)



Figs. 21, 22. Female genitalia. 21. Genital plates of *P. vittatus*, n. sp. 22. Female ectodermal genital ducts of *P. paradoxus*. (AAC = anterior annular crest, Ch = Chitinnelipsen, CS = capsula

Distribution: Peru, Brazil, Bolivia, and Argentina.

Holotype: Male deposited in AMNH was examined, labeled: (a) Tingo Maria, Huan., Peru, November 23, 1946, Alt. 2,200 ft (b) J. C. Pallister Coll. Donor Frank Johnson (c) AMNH (d) *Pseudevoplitus paradoxus* Ruckes Holotype.

Allotype: Female deposited in AMNH also examined, labeled: (a) Peru, Monson Valley, Tingo Maria, X-12-1954 (b) E. I. Schlinger and E. S. Ross collectors (c) *Pseudevoplitus paradoxus* Ruckes Allotype.

Paratypes: One male, same data as allotype except date X-9-1954; one female same data as holotype except date January 11, 1947 both deposited in AMNH.

Additional material: One male, BRAZIL, Rondonia, 62 km SW Ariquemes nr Fazenda Rancho Grande, XII-6/15-1990, D. A. Rider and J. E. Eger, collected at light (DBT); one male, BOLIVIA, Chuguisaca, 30 km SE Carandaity, VIII-1957, Stephen C. Bromley (LACM); one male, ARGENTINA, Misiones, Puerto Iguazu, XII-1991 (DAR).

Pseudevoplitus costalimai, new species

(Figs. 2, 4, 5, 10)

Description: Elongate oval, dorso-ventrally depressed with pronotum somewhat gibbous and humeral angles prominent. Dorsal color mottled tan.

Male: Measurements. Length of head 2.72; anteocular length 1.60; width of head 2.88; width between eyes 1.56; width between ocelli 0.76; antennal segment I 1.04, II 1.40, III 2.20, IV 2.80, V missing; pronotal length 3.77; width across humeri 6.72 (without spines), 8.11 (with spines); scutellar length 5.24; basal width 4.59; total length 13.94; width across third abdominal segment 7.62.

Head: Yellow-tan dorsally with irregularly disposed reddish-brown punctures. Juga slightly longer than tylus with internal margins subparallel, external margins slightly convergent, mildly reflexed, dark brown, apices obtuse (Fig. 2). Width across eyes about equal to length along midlongitudinal line. Anterior border of bucculae in lateral view slightly convex. Rostrum very long, attaining base of abdominal sternite VII in repose, segment III almost 1.5 times length of IV. Antennal segment I almost attaining apex of head, segment IV longest, slightly longer than V. Ocelli large, each separated from adjacent eye by diameter of ocellus.

Thorax: Pronotum yellow-tan with many reddish-brown, irregularly disposed punctures over posterior half, large, transverse band of concentrated ferrugineous punctures behind cicatrices. Humeri produced as triangular spine, curving posteriorly; anterior two-thirds of anterolateral pronotal margins irregularly crenulate (Fig. 2). Scutellum yellow-tan with reddish-brown punctures irregularly distributed, darker and more concentrated basally and laterally; apex acute. Hemelytra yellow-tan with reddish-brown punctures irregularly distributed. Mesosternal keel mainly yellow; metasternum castaneous. Legs yellow; femora with brown freckling, tibiae with brown blotches.

seminalis, DR = ductus receptaculi, G9 = gonapophyses 9, Gc9 = gonocoxites 9, La9 = laterotergites 9, OR = orificium receptaculi, PAC = posterior annular crest, PC = pars communis, PI = pars intermedialis, TVI = thickening of vaginal intima, X = segment X.)

Abdomen: Venter tan, with dense dark-brown freckling except midline infuscated; anterior margins of sternites and angles dark shiny brown.

Genitalia: Posterolateral angles of pygophore subtruncate in ventral view; median excavation of ventral rim rectangular, lateral borders incassate-carinate in ventral view (Fig. 5). Diaphragm process oblique at dorsal border of pygophore, projecting about one-third distance from dorsal border to base of paramere. Paramere with percurrent carinae (Figs. 4, 10). Posterior margin of basal process of proctiger bisinuate in dorsal view. Females unknown.

Types: Holotype: male, labeled: (a) BRAZIL, Minas Gerais, Laisance, VIII-1934, E. Dias coll., em ninho de ave, ex-coll. Costa Lima. Deposited MCNZ.

Etymology: This species is dedicated to the late Dr. Angelo da Costa Lima in recognition of his great contributions to entomology in Brazil.

Remarks: This species, along with *P. peruvianus* described below, has the humeri acute, but not cornute. It is distinguished from *P. peruvianus* by having proportionately smaller eyes and the juga longer than the tylus.

***Pseudevoplitis peruvianus*, new species**
(Figs. 3, 8, 9, 12, 20)

Description: Elongate, ovate, dorso-ventrally depressed with prominent humeral angles. Dorsal color mottled tan.

Male: Measurements. Length of head 2.35; anteocular length 1.21; width of head 3.02; width between eyes 1.61; width between ocelli 0.54; antennal segment I 1.0, II 2.18, III 2.58, IV and V missing; pronotal length 3.78; width across humeri 7.22 (without spines), 8.82 (with spines); scutellar length 5.67; basal width 4.45; total length 13.86; width across third abdominal segment 7.30.

Head: Yellow-tan dorsally with scattered reddish punctures. Juga and tylus equal in length; juga slightly convergent apically, apices obtuse, lateral margins dark brown, mildly reflexed (Fig. 3). Width across eyes about one-third greater than length of head. Eyes large; diameter about equal to width of head at anterior one-third. Ocelli large, each separated from adjacent eye by diameter of ocellus. Anterior border of bucculae moderately convex in lateral view. Rostrum attaining apex of abdominal sternite IV in repose; segment III more than twice length of IV. Antennal segment I clearly exceeding apex of head; segment IV longest, approximately $1.4 \times$ length of V.

Thorax: Pronotum tan with many reddish-brown, irregularly disposed punctures; narrow reddish-brown band uniting bases of cicatrices. Humeri acutely produced, apices curving posteriorad; antero-lateral pronotal margins irregularly crenulate on anterior half (Fig. 3). Scutellum yellow-tan with reddish-brown punctures on disc and small, irregular, dull brown blotches towards margins; apex acute. Hemelytra yellow-tan with dark brown infuscation over most of surface. Mesosternal keel yellow. Metasternum yellow with black blotches laterally. Evaporatorium yellow with brown freckling. Legs yellow with reddish-brown blotches.

Abdomen: Venter tan with dark brown freckling, denser laterally; midline, anterior margins of sternites and angles dark, shiny brown. Laterotergites yellow with reddish-brown freckling.

Genitalia: Posterolateral angles of pygophore subtruncate in ventral view (Fig. 9). Outline of diaphragm process in a triangular projection at dorsal border of pygophore,

projecting halfway from dorsal border to base of paramere. Posterior margin of basal process of proctiger subtruncate, notched medially in dorsal view (Figs. 8, 12).

Female: Measurements. Length of head 2.52; anteocular length 1.51; width of head 3.27; width between eyes 1.51; width between ocelli 0.67; antennal segment I 1.34, II 1.93, III 2.77, IV 3.36, V 2.68; pronotal length 4.03; width across humeri 8.23 (without spines), 10.08 (with spines); scutellar length 6.72; basal width 4.87; total length 16.29; width across third abdominal segment 8.40.

Genitalia: Laterotergites yellow with reddish-brown freckling, as well as anterior half of gonocoxites 8; posterior half of gonocoxites 8 dark brown. Gonocoxites 8 about as long as wide; thinly carinate sutural borders parallel for three-fourths length basally, distal fourth arcuately divergent; posterior borders truncate, parallel to transverse band uniting dorsally laterotergites 8. Spiracles of laterotergites 8 hidden. Gonocoxites 9 bilaterally feebly tumescent, posterior border bilobate.

Types: Holotype: male, labeled: (a) PERU, Iquitos, III-14-1969, B. K. Dozier, L. H. Rolston Coll. Deposited AMNH.

Paratypes: One male, one female, labeled: (a) PERU, Avispa, X-10-1962, L. Pena coll. Deposited AMNH.

Etymology: *peruvianus*, latinized, "of Peru."

Remarks: This species can be separated from *P. costalimai* by the tylus and juga being of equal length, and the large eyes, which are as wide as the head at anterior one-third.

***Pseudevoplitis vittatus*, new species**
(Figs. 1, 13-15, 21)

Description: Elongate-oval, dorso-ventrally depressed with pronotum somewhat gibbous and pronotal humeri strongly produced as cornute spines. Dorsal surface matte, tan, with dark brown longitudinal mesial vitta on pronotum and scutellum (Fig. 1).

Male: Measurements. Length of head 2.68; anteocular length 1.68; width of head 3.52; width between eyes 1.68; width between ocelli 0.84; antennal segment I 1.17, II 2.52, III 2.85, IV 3.27, V 2.35; pronotal length 3.86; width across humeri 7.72 (without spines), 10.75 (with spines); scutellar length 5.79; basal width 4.53; total length 15.45; width across third abdominal segment 7.89.

Head: Yellow-tan dorsally with irregularly disposed reddish-brown punctures. Tylus and juga of equal length, apices of juga slightly convergent; lateral margins dark-brown and mildly reflexed. Ocelli large, distance from ocellus to eye subequal to ocellar diameter. Anterior border of bucculae nearly straight in lateral view. Rostrum attaining apex of abdominal sternite V; segment III longest, nearly $2 \times$ length of segment IV. Antennal segment I almost attaining apex of head, segment IV longest, about $1.4 \times$ length of segment V.

Thorax: Pronotum yellow-tan with humeral angles and irregular central quadrate spot dark fuscous; surface with many dark brown punctures tending to be contiguous. Posterior margins of cicatrices united by thin, sinuate, dark-castaneous line. Humeral angles strongly produced as cornute spines. Anterolateral pronotal margins with anterior half irregularly rugose, subtuberculate. Scutellum yellow-tan laterally, darkly infuscated mesially; lateral angles and apex dark brown; apex acute. Hemelytra yellow with many contiguous dark-brown punctures. Mesosternal keel yellow; elevated metasternum dark shiny brown. Legs yellow with dark brown blotches.

Abdomen: Venter yellow-tan with vitta on midline, posterior angles and anterior margin of each sternite dark, shiny brown. Laterotergites yellow-tan with scattered brown freckling and irregular blotch at posterior margins.

Genitalia: Posterolateral angles of pygophore acute in ventral view, bearing minute spine just dorsad of each angle (Figs. 14, 15), ventral rim incrassate each side of median excavation. Outline of diaphragm process in a quadrangular projection at dorsal border of pygophore, projecting nearly to base of paramere; parameres fang-shaped. Basal process of proctiger incrassate, bilobate, deeply notched between lobes in dorsal view (Fig. 13).

Female: Measurements. Length of head 3.20; anteocular length 1.84; width of head 3.72; width between eyes 1.88; width between ocelli 0.92; antennal segment I 1.28, II-V missing; pronotal length 4.34; width across humeri 7.70 (without spines) 10.75 (with spines); scutellar length 6.64; basal width 5.16; total length 16.96; width across third abdominal segment 8.44.

Genitalia: Gonocoxites 8 slightly tumescent, about one-fourth longer than wide; sutural borders parallel for three-fourths length, distal fourth truncate, divergent; external borders slightly reflexed, incrassate, rectilinear; posterior border oblique, truncate, external angles extending posteriorly more than sutural angles (Fig. 21). Posterior border of gonocoxites 9 bilobate. Spiracles of laterotergites 8 partially hidden under gonocoxites 8.

Types: Holotype: male, labeled: (a) BRAZIL, Rondonia, 62 km SW Ariquemes nr Fazenda Rancho Grande, XII-6/15-1990, D. A. Rider and J. E. Eger, collected at mercury vapor and blacklight. (b) D. A. Rider Collection. Deposited AMNH.

Paratype female, labeled: (a) BRAZIL, Amazonas, Manicore, margem do Rio Madeira, VIII-1941, Parko coll. Deposited MCNZ.

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