

**Two new freshwater crabs of the genus *Ptychophallus* Smalley, 1964
(Crustacea: Decapoda: Brachyura: Pseudothelphusidae) from
Panamá, with notes on the distribution of the genus**

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Abstract.—Two new species of freshwater crabs of the genus *Ptychophallus* Smalley, from Panamá, *P. uncinatus* and *P. kuna*, are described and illustrated. The addition of these two species means the genus now includes 13 species, all of which are distributed in Panamá and Costa Rica. The species are distinguished primarily by differences in characters of the male first gonopod. A summary of the geographic distribution of the species in the genus is presented.

The systematics of the genus *Ptychophallus* Smalley, 1964a, were reviewed by Rodríguez (1982, 1994) who found that a number of characters of the male first gonopod in species of this genus were homologous with those of *Hypolobocera* Ortmann, 1897 and *Neostrengeria* Pretzmann, 1965. These characters are the presence of a caudal crest, a lateral lobe, and a central papilla on the spermatid channel. Rodríguez (1982) considered *Ptychophallus* to be transitional between Andean and Central American Pseudothelphusidae because species of this genus present a fusion of the cephalic and caudal borders forming a mesial process, a morphological characteristic present in all pseudothelphusid species from Central America (including Mexico), but absent in species of *Hypolobocera* and *Neostrengeria* from South America.

Species of *Ptychophallus* are distinguished primarily by characteristics of the third maxilliped and male first gonopod. The exognath of the third maxilliped is 0.6 to 0.7 as long as the ischium. The male first gonopod has a prominent apex that is bent cephalically and is joined to the gonopod by a narrow peduncle; the lateral projection is large, and usually divided into two lobes;

and the caudal ridge extends longitudinally on the distal half of the caudal surface.

A study of freshwater crabs in the National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM), revealed two new species of *Ptychophallus* from Panamá, bringing to 13 the total number of species currently recognized in this genus. This number excludes *P. campylos* Pretzmann, 1965, a species that was originally briefly described, without illustrations (Pretzmann 1965). This species was listed by Pretzmann (1971), and he (Pretzmann 1972) subsequently added details with illustrations and photographs. Rodríguez (1982:80) indicated in a footnote that based on the information provided by Pretzmann (1965, 1971, 1972), *P. campylos* could not be separated from *P. tristani* (Rathbun, 1896); however, Rodríguez did not formally synonymize Pretzmann's taxon with Rathbun's and excluded *P. campylos* from his treatment of *Ptychophallus* species. The type of *P. campylos*, deposited in the Naturhistorisches Museum, Vienna, needs to be examined in order to properly evaluate the validity of Pretzmann's taxon.

The terminology used for the morpholo-

gy of the male first gonopod follows that of Smalley (1964b) and Rodríguez (1982). The abbreviations cb and cl stand for carapace breadth (measured at the widest point) and carapace length (measured along the midline), respectively. Color nomenclature used follows Smithe (1975).

Family Pseudothelphusidae Rathbun, 1893
 Tribe Hypolocerini Pretzmann, 1971
 Genus *Ptychophallus* Smalley, 1964a
Ptychophallus uncinatus, new species
 Figs. 1, 2, 5

Material.—Holotype: ♂, cl 16.4 mm, cb 26.5 mm, Rio San Pedro, Bocas del Toro, Panamá, Jan 1978, leg. B. L. Gordon (USNM 276164). Paratype: ♂ (juvenile) cl 9.5 mm, cb 15.2 mm, same locality as holotype (USNM 276165).

Type locality.—Rio San Pedro, Bocas del Toro, Panamá.

Diagnosis.—First male gonopod with very broad lateral projection divided into 2 subequal lobes by deep depression on caudal surface and lateral notch; distal lobe with crest-like flange; distocaudal ridge short and narrow, with lateral crest; subapical mesial process with triangular base and hook-like projection; central papilla of spermatic channel robust, swollen.

Description of holotype.—Carapace (Fig. 1) with narrow, deep cervical groove curving posteriorly and not reaching lateral margin. Anterolateral margin with shallow sinus just posterior to anteroexternal orbital angle; rest of margin with papillae. Postfrontal lobes wide, delimited anteriorly by transverse depression; median groove narrow, deep, with incision on upper margin of front. Surface of carapace in front of postfrontal lobes flat and inclined anteriorly. Upper border of front thin, marked with row of tubercles; lower margin sinuous in frontal view. Surface of front between upper and lower borders high and slightly excavated. Upper and lower orbital margins each with row of tubercles. Surface of carapace covered with small papillae; limits

between regions demarcated. Third maxilliped (Fig. 2E) with merus of endognath regularly curved, with shallow depression on distal part of external margin; exognath approximately 0.6 times length of ischium of third maxilliped.

First pereopods absent in holotype. In paratype, right cheliped slightly larger than left. Merus with 3 crests as follows: upper crest with rows of tubercles, internal lower crest with rows of teeth, and external lower crest with few tubercles. Carpus with 4 tubercles on internal crest and prominent blunt spine distally. Palm of both chelipeds smooth, moderately swollen. Fingers of chelae not gaping when closed, tips crossing, with rows of tubercles on dorsal side.

Surface of walking legs (pereopods 2–5; Fig. 1) with rows of minute setae. Dactyls each with 5 rows of large spines slightly diminishing in size proximally, rows arranged as follows: anterolateral and anteroventral rows each with 5 spines, external row with 5 spines plus 2 proximal papillae, posteroventral row with 4 spines, and posterolateral row with 5 spines.

First male gonopod (Fig. 2A–C) wide in caudal view. Lateral projection very wide, divided in 2 subequal lobes by deep depression on caudal surface and lateral notch; distal lobe with crest-like flange directed distally; proximal lobe almost rounded; margins with minute setae; distocaudal ridge short and narrow, with lateral crest, reaching only to middle of deep depression dividing lateral projection. Subapical mesial process with triangular base and hook-like projection; apical mesial process triangular (Fig. 2C, D). Apex bent cephalolaterally, with field of spines directed cephalolaterally; caudal border of apex with shallow notch near middle, and deep notch near lateral side; central papillae of spermatic channel robust, swollen (Fig. 2B, C, D).

Color.—In alcohol, the dorsal side of the carapace is light brown (near 239, Ground Cinnamon). The walking legs are Buff (124). The chelae are True Cinnamon (139)

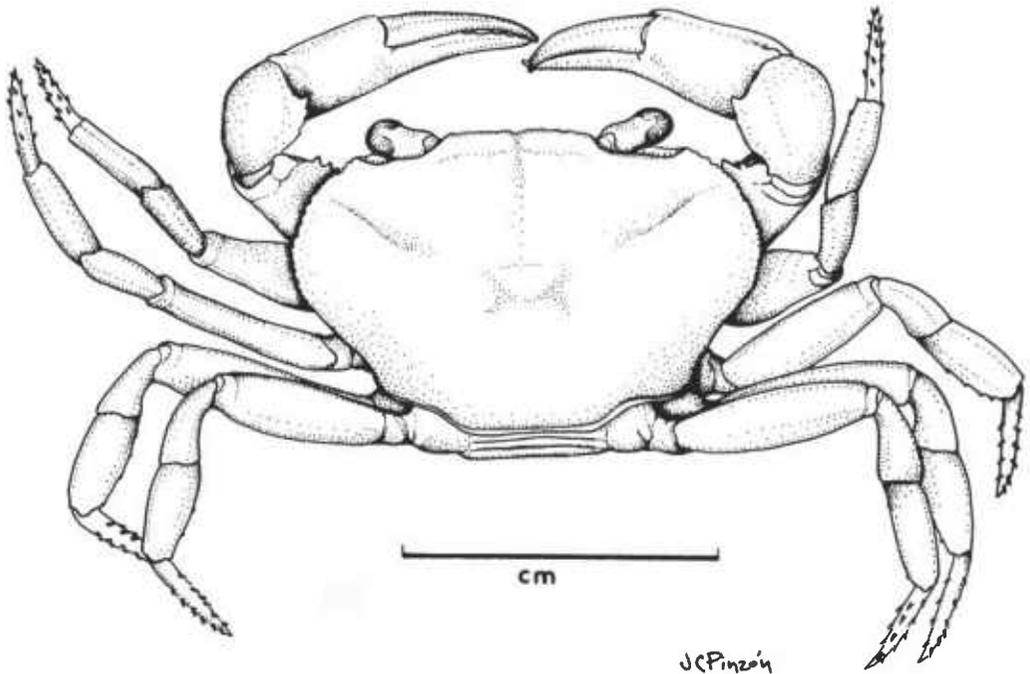


Fig. 1. *Ptychophallus uncinatus*, new species, male paratype, cl 9.5 mm, cb 15.2 mm, dorsal view (USNM 276165).

dorsally, and Buff (124) ventrally. The ventral surface of the carapace is Buff (124).

Etymology.—The specific name is from the Latin *uncinatus*, meaning hooked, and is given in reference to the form of the subapical mesial process of the first gonopod.

Remarks.—This new species is most similar to *Ptychophallus tumimanus* (Rathbun, 1898). The two can be distinguished by differences in the male first gonopod. In the new species the distal lobe of the lateral projection is a crest-like flange directed distally, and the lateral border of the proximal lobe has minute setae (not shown in Fig. 2A–C); in *P. tumimanus* the distal lobe is rounded, and the lateral border of the proximal lobe has rows of long setae. In the new species the distocaudal ridge has a lateral crest, and the subapical mesial process has a triangular base and hook-like projection; in *P. tumimanus* the distocaudal ridge has a rounded surface, the subapical mesial process is subtriangular, almost rounded.

Ptychophallus uncinatus, new species, is

also similar to *P. montanus* (Rathbun, 1898). The male first gonopod of the new species differs markedly from that of *P. montanus* in the shape of the apex. In the new species the apex is wide, the caudal border has a notch near the middle, and the central papilla of the spermatic channel is robust and swollen (Fig. 2D); in *P. montanus* the apex is narrow, the caudal border is entire and lacks a median notch, and the central papilla of the spermatic channel is thin and curved. In addition, the male first gonopod of the new species has lateral projections that extend laterally beyond the distal end of the laterocaudal expansion (Fig. 2A), whereas the lateral projections do not exceed the laterocaudal expansion in *P. montanus*.

Ptychophallus kuna, new species
Figs. 3–5

Material.—Holotype: ♂, cl 15.6 mm, cb 24.9 mm, Portobelo, Panamá, 25 Feb 1973: (USNM 184340).

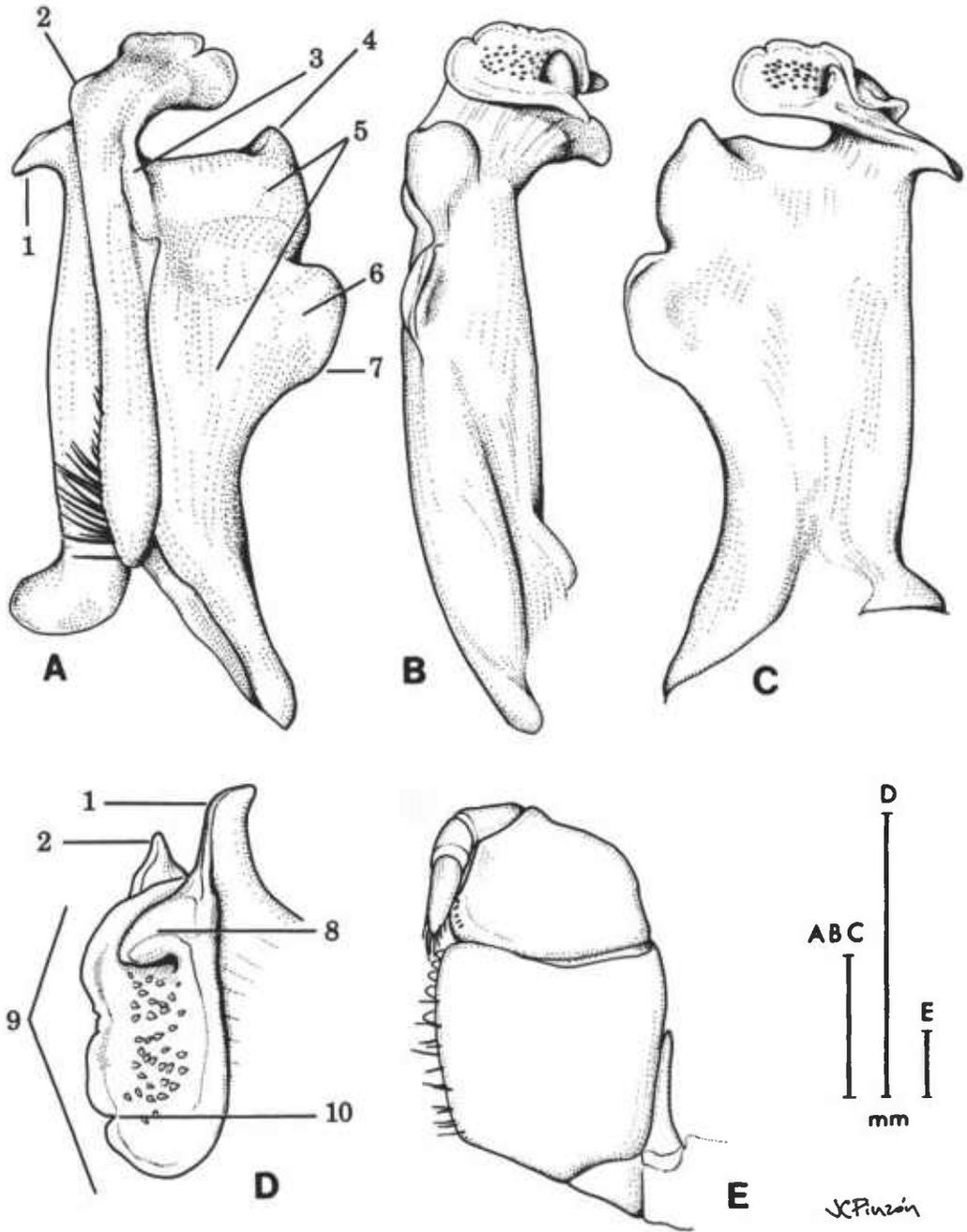


Fig. 2. *Ptychophallus uncinatus*, new species, male holotype, cl 16.4 mm, cb 26.5 mm (USNM 276164). A, left first gonopod, caudal view; B, same, lateral view; C, same, cephalic view; D, apex of same, distal view; E, left third maxilliped, external view. 1, subapical mesial process; 2, apical mesial process; 3, distocaudal ridge; 4, distal lobe of lateral projection; 5, lateral projection; 6, proximal lobe of lateral projection; 7, lateral border of proximal lobe; 8, central papilla of spermatic channel; 9, caudal border of apex; 10, notch of caudal border.

Diagnosis.—First male gonopod with lateral projection narrow, divided into 2 subequal lobes by shallow notch; distal lobe small, subtriangular and with distal surface close to gonopod axis; proximal lobe subtriangular; distocaudal ridge short, weakly defined, almost continuous with distal lobe of lateral projection; subapical mesial process robust, flange-like; central papilla of spermatic channel thin, delicate.

Description of holotype.—Carapace (Fig. 3A) with narrow, shallow cervical groove curved posteriorly and not reaching lateral margin. Anterolateral margin with shallow sinus just posterior to anteroexternal orbital angle; remaining margin with papillae. Postfrontal lobes wide, delimited anteriorly by transverse depression; median groove narrow. Surface of carapace in front of postfrontal lobes flat, inclined anteriorly. Upper border of front thin, marked with row of tubercles; lower margin visible in dorsal view, sinuous in frontal view. Surface of front between upper and lower borders high, slightly excavated. Upper and lower orbital margins each with row of conspicuous tubercles. Surface of carapace covered with small papillae; limits between regions well demarcated. Third maxilliped (Fig. 3D) with merus of endognath strongly curved and with deep depression on distal part of external margin; exognath approximately 0.6 times length of ischium of third maxilliped.

First pereopods heterochelous; right cheliped larger than left. Merus with 3 crests as follows: upper crest with rows of tubercles, internal lower crest with rows of teeth, and external lower crest with rows of tubercles. Carpus with 4 tubercles on internal crest, and prominent blunt spine distally. Palm smooth, swollen. Fingers of chelae (Fig. 3B) not gaping when closed, tips crossing and with rows of tubercles on dorsal surface.

Walking legs (pereopods 2–5; Fig. 3C) strong. Dactyls each with 5 rows of large spines diminishing in size proximally, rows arranged as follows: anterolateral and an-

teroventral rows each with 5 spines, external row with 5 spines and 2 proximal papillae, and posteroventral and posterolateral rows each with 3 spines.

First male gonopod (Fig. 4) narrow in caudal and cephalic views. Lateral projection narrow, divided in 2 subequal lobes by shallow notch; distal lobe small, subtriangular, distal surface close to gonopod axis; proximal lobe subtriangular, lateral border sinuous and with proximal papilla; distocaudal ridge very short, weakly defined and almost continuous with distal lobe of lateral projection. Subapical mesial process robust, flange-like (Fig. 4C, D); apical mesial process subtriangular, almost rounded. Apex bent cephalolaterally, with field of spines directed cephalolaterally; caudal border of apex with deep incision near lateral side; central papilla of spermatic channel thin, delicate (Fig. 4B, C, D).

Color.—In alcohol, dorsal surface of the carapace brown (near Kingfisher Rufous, 240). Walking legs Raw Sienna (136) dorsally, and True Cinnamon (139) ventrally. Chelae Kingfisher Rufous (240) dorsally, and True Cinnamon (139) with Olive-Brown specks (28) ventrally. Ventral surface of carapace Robin Rufous (340).

Etymology.—The species is named in honor of the Kuna Indians, in whose territory this new species was found.

Remarks.—This new species can be differentiated from other congeners by the first male gonopod. The gonopod is distinct in that it has a short, weakly defined caudal ridge which is almost continuous with the distal lobe of the lateral projection.

Distribution of *Ptychophallus* Species

Distribution records of species of *Ptychophallus* can be found in the original descriptions as well as in various freshwater crab reports from central America (Pretzmann 1965, 1968, 1971, 1972, 1980; Rodríguez 1982, 1994; Smalley 1964a; Villalobos 1974). The species of this genus are known exclusively from Central America between

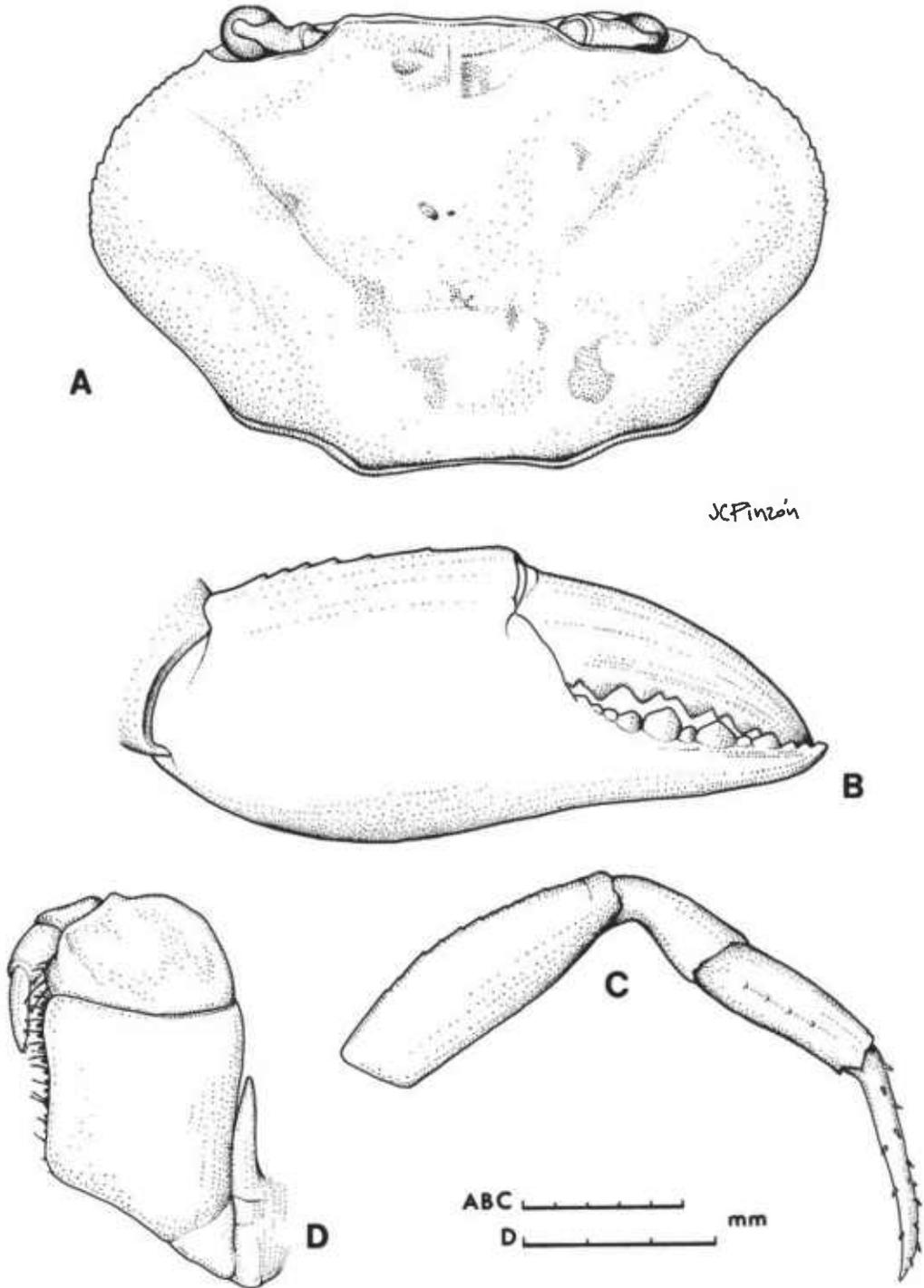


Fig. 3. *Ptychophallus kuna*, new species, male holotype, cl 15.6 mm, cb 24.9 mm (USNM 184340). A, carapace, dorsal view; B, chela of large cheliped, external view; C, left third pereiopod, lateral view; D, third maxilliped, external view.

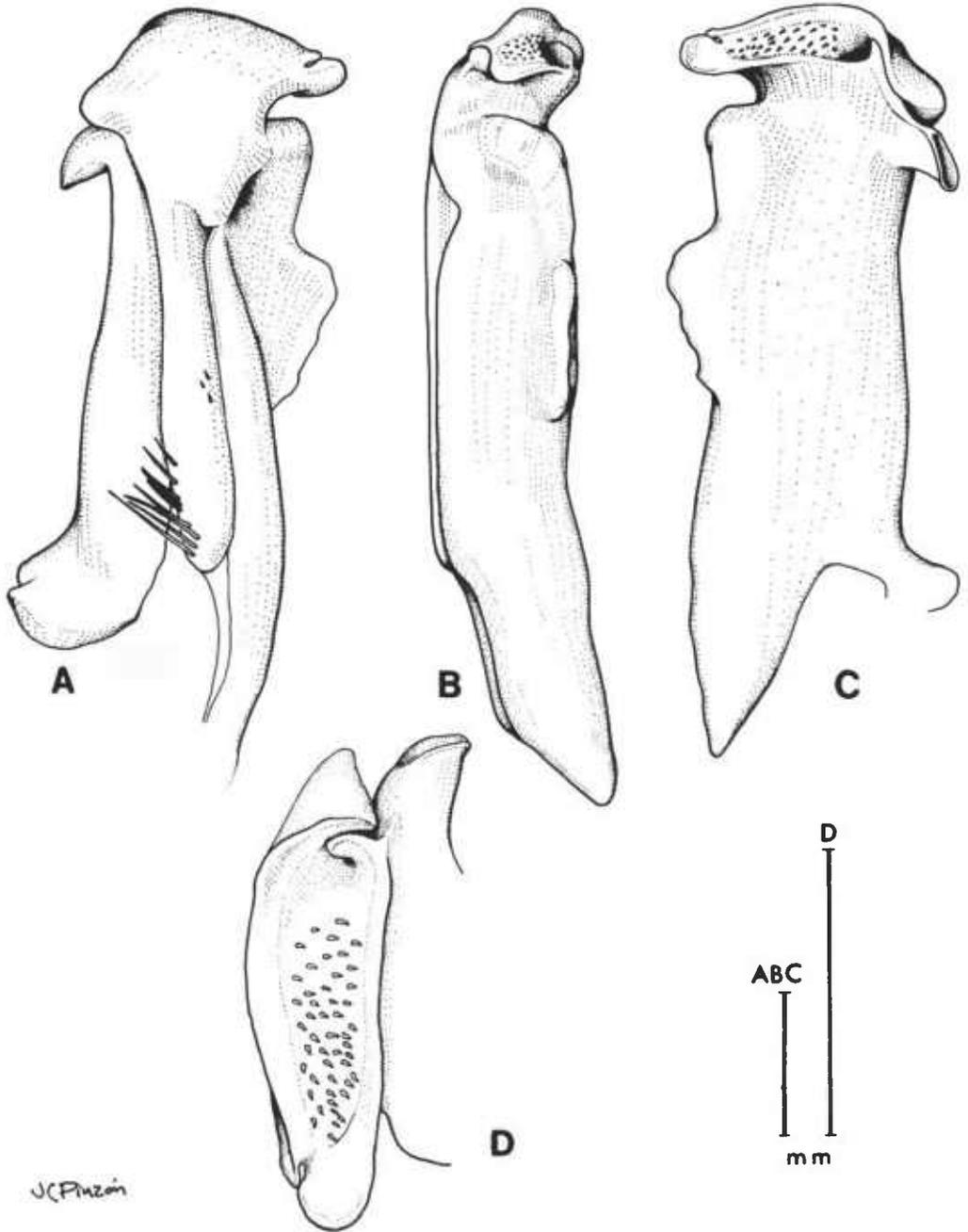


Fig. 4. *Ptychophallus kuna*, new species, male holotype, cl 15.6 mm. cb 24.9 mm (USNM 184340), left first gonopod: A, caudal view; B, lateral view; C, cephalic view; D, apex, distal view.

Cana Mount, Darién Province, Panamá, and Monteverde, Puntarenas Province, Costa Rica (Fig. 5). Six species occur in localities of the Atlantic drainage: *P. cocleensis*

Pretzmann, 1965, *P. exilipes* (Rathbun, 1898), *P. lavallensis* Pretzmann, 1978, *P. tumimanus*, *P. kuna*, new species, and *P. uncinatus*, new species. Six species occur

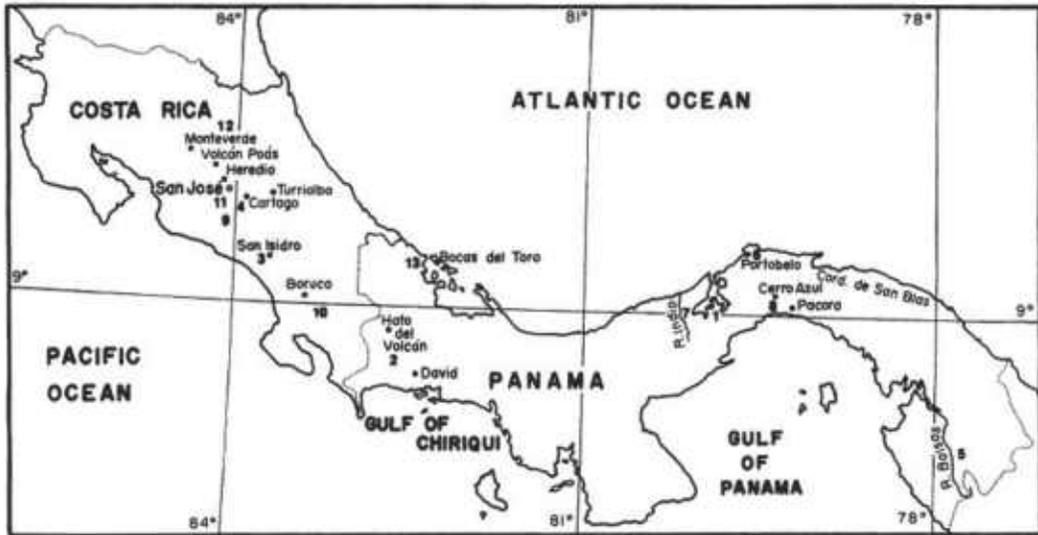


Fig. 5. Distribution of species of *Ptychophallus* Smalley, 1964: 1, *P. cocleensis* Pretzmann, 1965; 2, *P. colombianus* (Rathbun, 1893); 3, *P. costaricensis* Villalobos, 1974; 4, *P. exilipes* (Rathbun, 1898); 5, *P. goldmanni* Pretzmann, 1965; 6, *P. kuna*, new species; 7, *P. lavallensis* Pretzmann, 1978; 8, *P. micracanthus* Rodríguez, 1994; 9, *P. montanus* (Rathbun, 1898); 10, *P. paraxanthusi* Bott, 1968; 11, *P. tristani* (Rathbun, 1896); 12, *P. tumimanus* (Rathbun, 1898); 13, *P. uncinatus*, new species.

in localities of the Pacific drainage: *P. colombianus* (Rathbun, 1893); *P. costaricensis* Villalobos, 1974, *P. goldmanni* Pretzmann, 1965, *P. micracanthus* Rodríguez, 1994, *P. paraxanthusi* Bott, 1968, and *P. tristani*. One species, *P. montanus*, has been found in both Atlantic and Pacific drainages.

Species of Pseudothelphusidae are usually found at altitudes ranging from 100 to 3000 m. However, when they occur in coastal mountain ranges such as those found along the Pacific or Atlantic coasts of Panamá and Colombia, some species can reach sea level. Species of *Ptychophallus*, for example, range from 0 to 2000 m above sea level.

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