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A NEW PSEUDOTHELPHUSID CRAB FROM A CAVE IN SOUTHERN COSTA RICA (DECAPODA: BRACHYURA)

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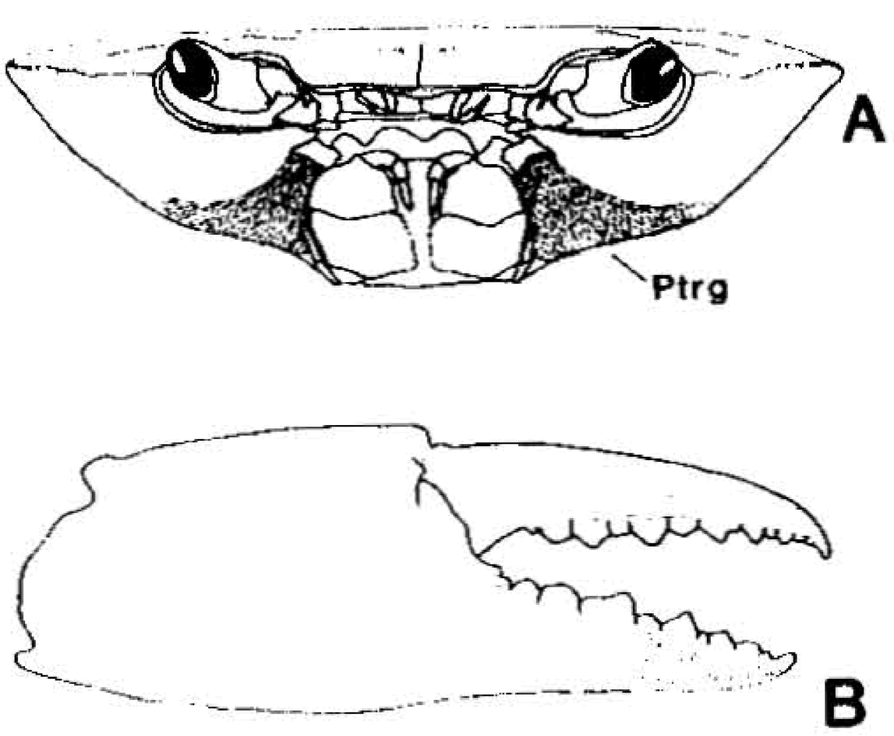
Abstract.—A new species of troglophilic freshwater crab, *Pseudothelphusa puntarenas*, is described from Emus Cave in Provincia de Puntarenas, Costa Rica, Central America. This crab lacks any obvious external troglomorphic modifications, but is not yet known from epigean waters. The affinities of *P. puntarenas* with other pseudothelphusids are discussed.

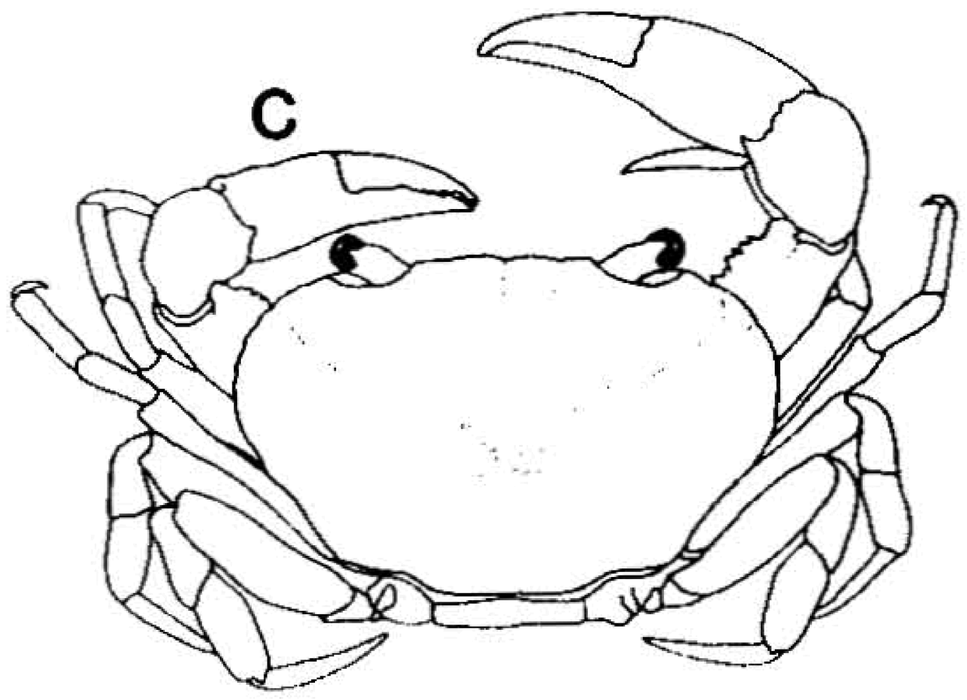
Since the publication of the monograph on the Pseudothelphusidae by Rodríguez (1982), only three new species of *Pseudothelphusa* have been described (Alvarez 1987, 1989; Alvarez & Villalobos 1990), all from southern Mexico. During a joint Asociación Espeleólogica Costarricense—National Speleological Society Expedition to Costa Rica, a fourth species, described herein, was discovered from Emus Cave in Provinicia de Puntarenas and represents the first cavernicolous pseudothelphusid known from Costa Rica. This species brings the total number of Central American (Mexico, Guatemala, Belize, and Costa Rica) cave pseudothelphusids to 16 (see also Reddell 1981, Rodríguez & Hobbs 1989a, 1989b). Information concerning other cavernicolous pseudothelphusids can be found in Rodríguez (1985, 1991) and Rodríguez & Bosque (1990). Terminology follows that used by Rodríguez (1982). The following abbreviations are employed: USNM, United States National Museum (Smithsonian Institution), Washington, D.C.; IVIC, Centro de Ecologia, Instituto Venezolano de Investigaciones Científicas, Caracas, Venezuela; CL, carapace length; CW, carapace width.

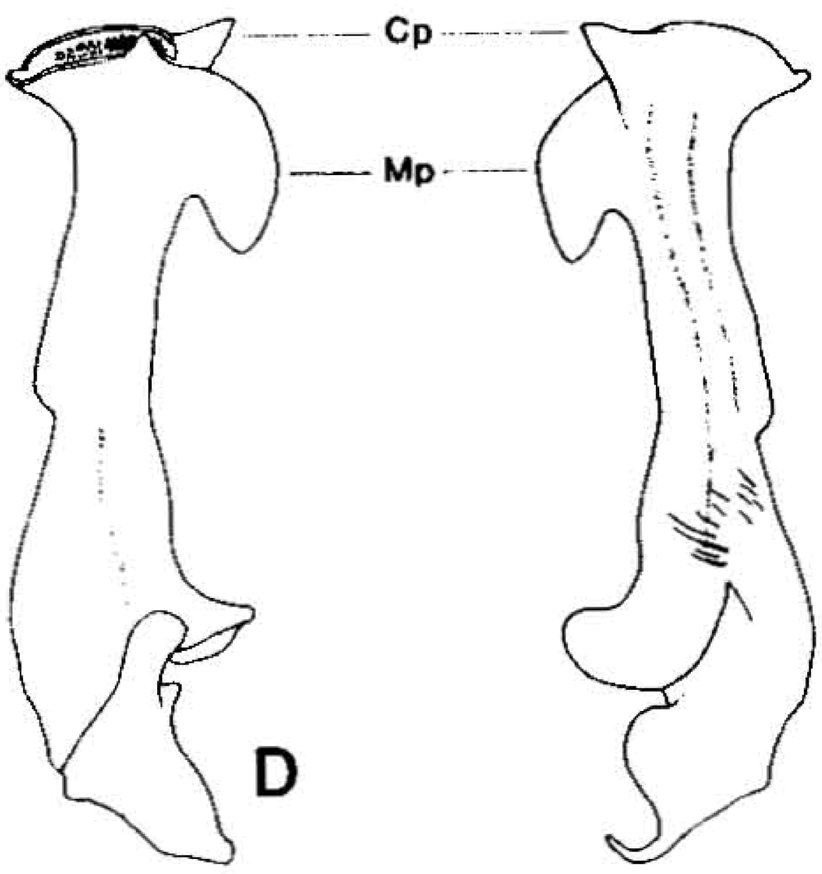
Pseudothelphusa puntarenas, new species
Fig. 1

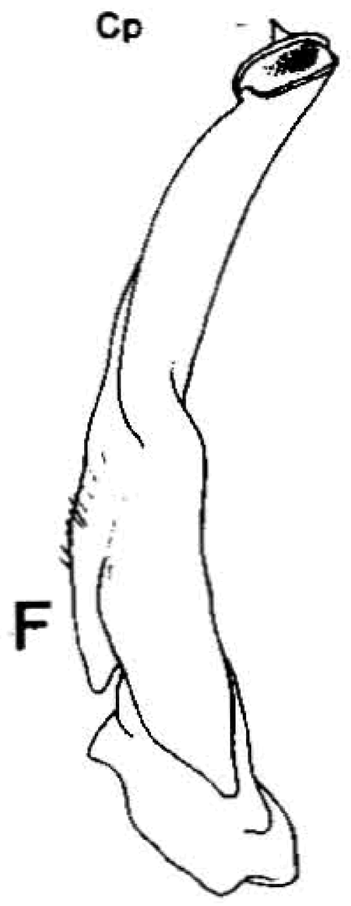
Description.—Superior frontal border of carapace (Fig. 1A, C) generally smooth, divided medially by notch continuous with median groove. Inferior frontal border well defined, formed by small tubercles from which carapace rising steeply. Carapace surface (Fig. 1C) weakly convex with regions moderately well defined, gastric and branchial regions elevated; limits of epigastric regions rather obscure; broadly V-shaped cervical groove prominent, not reaching anterolateral margin. Anterolateral margin rather evenly rounded with 8–12 small denticles between orbit and cervical groove. Pterygostomian region densely setose (Fig. 1A). Third maxilliped (Fig. 1A, L) with exopod greater than half length of ischium; ischium/exopod ratio varying from 53.4–64.3, average 59.3. Chelipeds unequal, right chela (Fig. 1B) generally more robust than left with mildly sinuous ventral margin; fingers of major chelae gaping, curved, and weakly punctate; teeth on opposable cutting surfaces of finger of moderate size. Ventral view of body as in Fig. 1K. Eyes well developed, pigmented; carapace mottled with tan, brown, and reddish-brown pigmentation.

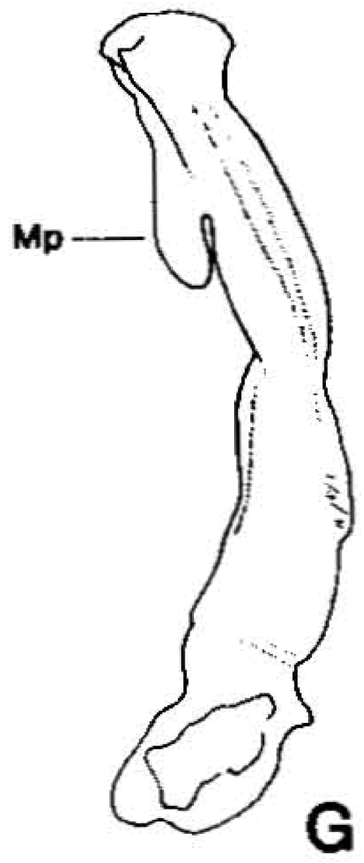
First male gonopod (Fig. 1D–G) with distal half arched laterally and with prominent triangular-shaped cephalic process; reniform mesial process well developed. Gonopod bearing short, stiff setae on middle part of mesial margin and few long setae on proximal half; apical cavity (Fig. 1J) elongated along caudo-cephalic axis, bearing se-

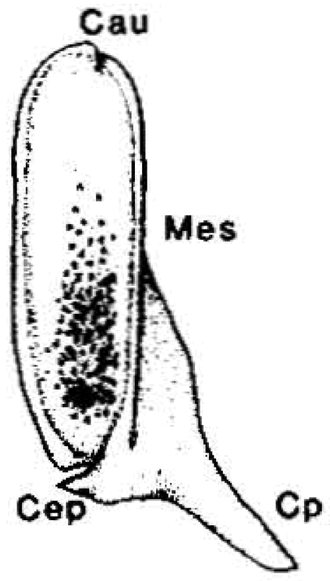


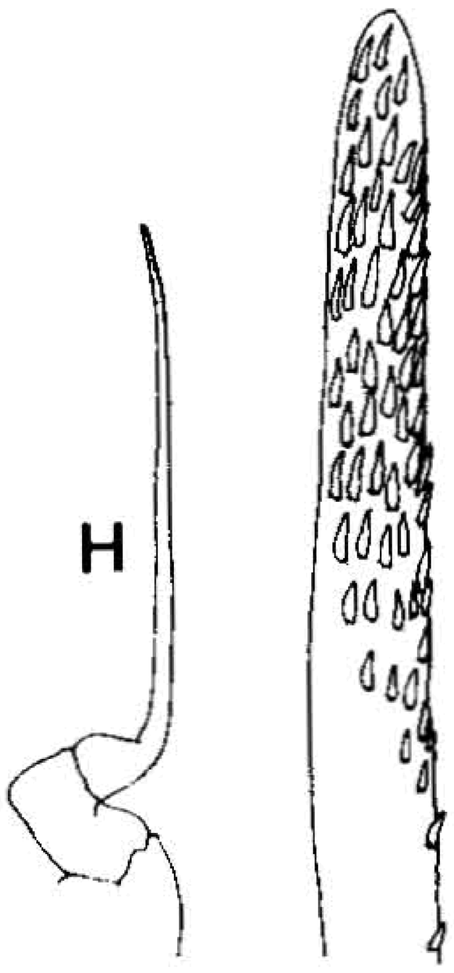


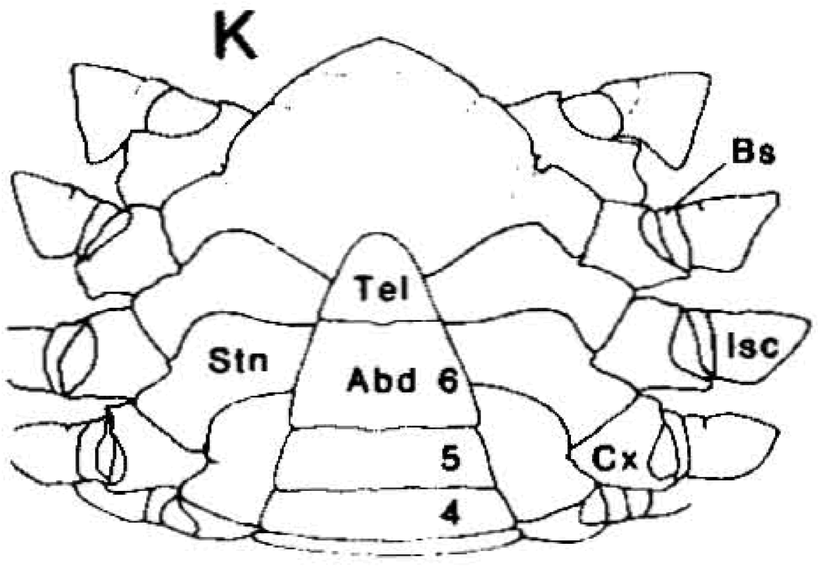












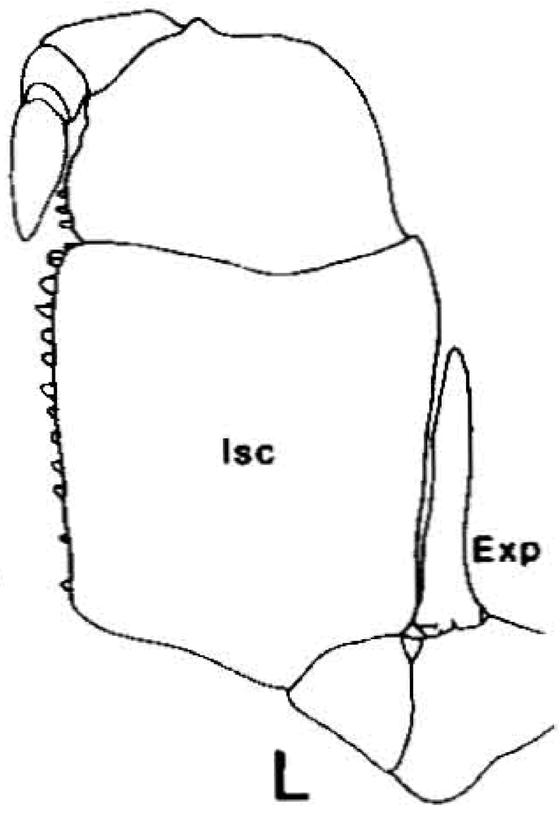


Fig. 1. *Pseudothelphusa puntarenas*, new species: A, frontal view of carapace, orbital and buccal region; B, right chela; C, dorsal view of crab; D, lateral view of left first gonopod of male; E, mesial view of same; F, caudal view of same; G, cephalic view of same; H, caudal view of male second gonopod; I, distal part of male second gonopod; J, apical view of male left first gonopod; K, sternum and abdomen, ventral view; L, left third maxilliped (setae not shown). (Abd: Abdomen; Bs: Basis; Cau: Caudal; Cep: Cephalic; Cp: Cephalic process; Cx: Coxa; Exp: Exopod; Isc: Ischium; Lat: Lateral; Mes: Mesial; Mp: Mesial process; Ptrg: Pterygostomian region with setae; Stn: Sternite; Tel: Telson).

tae over middle and cephalic end of cavity; terminal pore setae most densely distributed toward cephalomesial portion of cavity; borders of cavity of equal thickness with mesial one slightly elevated above lateral border; opening of sperm channel situated cephalically. Second male gonopod (Fig. 1H, I) extending to or slightly beyond apical end of gonopod; terminal part covered by numerous oblique rows of closely arranged spinules.

Type material.—Holotype: male, CL = 11.7 mm, CW = 18.3 mm, USNM 250555; paratypes: 3 males, CL = 9.7, 12.95, 8.3 mm, CW = 15.4, 21.5, 13.0 mm; 7 females, CL = 8.2, 10.5, 13.9, 15.9, 13.5, 11.2, 13.7 mm, CW = 12.9, 16.0, 22.6, 25.9, 22.1, 18.1, 22.1 mm, USNM; 1 male, IVIC.

Type locality.—Small stream in Emus Cave, Provincia de Puntarenas, Costa Rica. The crabs were found approximately 120 m from the entrance in pools and small riffle areas with rubble-cobble-gravel limestone substrates. The stream in Emus Cave on 1 January 1989 (temperature 24.3°C) resurged about 23 m in elevation below the entrance and flowed directly into the Rio Claro. A species of *Macrobrachium* (probably *M. carcinus* (Linnaeus)) was observed but not collected, as were individuals of an unidentified catfish.

Etymology.—This species is named for the Province, Puntarenas, where the cave is located in southwestern Costa Rica.

Relationships.—Although few external morphological characteristics have been demonstrated to have taxonomic value within the pseudothelphusids (Rodríguez 1982), the gonopod, however, has proven to be an important structure for distinguishing species. The distal part of the gonopod of the male of *P. puntarenas* shows similarities to that of *P. leiophrys* Rodríguez & Smalley, 1969, *P. galloi* Alvarez & Villalobos, 1990, *P. granatensis* Rodríguez & Smalley, 1969, *P. jouyi* Rathbun, 1893, *P. parabelliana* Alvarez, 1989, and *P. mexicana* Alvarez, 1987. The gonopods of all these species have a well developed mesial process but in *P. puntarenas, P. galloi,* and *P. leiophrys* the outer margin is smooth, whereas it is serrate in the other species. The apex of the gonopod of *P. mexicana, P. parabelliana,* and *P. granatensis* has a well developed lateral lobe with three, two, and two projections, respectively, while *P. puntarenas* lacks a well developed lateral lobe. In general, the gonopod morphology of *P. puntarenas* is closer to that of *P. leiophrys,* but can easily be separated from it by the well developed cephalic process in *P. puntarenas.*

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