

A NEW SPECIES OF *PONTOPHILUS* (CRUSTACEA:
NATANTIA: CRANGONIDAE) FROM THE GULF OF
MEXICO AND THE WESTERN ATLANTIC¹

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Abstract.—*Pontophilus gorei*, a new species of caridean shrimp, is described from the Gulf of Mexico and the western Atlantic. It differs from other Gulf of Mexico species in lacking an exopod on the first pereopod and in the form of the rostrum. The synonymy of *Philocheras* with *Pontophilus* is discussed.

In a review of the genus *Pontophilus* in the Gulf of Mexico, Pequegnat (1970) listed three species, *P. brevirostris* Smith, 1881, *P. gracilis* Smith, 1882 and *P. abyssi* Smith, 1884. Specimens discussed as *P. abyssi* later proved to be *P. talismani* Crosnier and Forest, 1973 (pers. comm., L. H. Pequegnat). Examination of specimens collected during "Project Hourglass," a biological sampling program on the continental shelf off central western Florida (see Joyce and Williams, 1969), revealed that a fourth species of *Pontophilus*, described herein, occurs in the Gulf of Mexico.

Pontophilus gorei, new species

Figs. 1-4

Material examined.—Specimens are deposited in invertebrate collections at the U.S. National Museum of Natural History, Washington, D.C. (USNM); Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands (RMNH); Florida Department of Natural Resources Marine Research Laboratory, St. Petersburg, Florida (FSBC I); Texas A&M University, College Station, Texas (TAMU); Indian River Coastal Zone Study Reference Museum, Fort Pierce, Florida, (IRCZS); and Marine Environmental Sciences Consortium, Dauphin Island, Alabama (MESC). The abbreviation cl refers to carapace length, measured in mm from the level of the posterior margin of the orbits to the posterior margin of the carapace.

Holotype.—1 ovig. ♀, cl 2.5; 26°24'N, 83°22'W, 55 m; 6 Aug. 1966, trawl; USNM 172417.

Allotype.—1 ♂, cl 1.9; 27°37'N, 83°58'W, 55 m; 2 Aug. 1966, trawl; USNM 172418.

Paratypes.—West coast of Florida, off Tampa Bay: 1 ♂, cl 1.8; 2 ♀, cl 1.8, 1.7; 3 juv., cl 0.6-1.2; 27°37'N, 84°13'W, 73 m; 2 Dec. 1966, dredge; USNM 172419. 1 ♂, cl 1.8; 1 ovig. ♀, cl 2.1; 27°37'N, 84°13'W, 73 m; 2

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Aug. 1966, trawl; RMNH D31979. 1 ♂, cl 1.9; 27°37'N, 83°58'W, 55 m; 6 Feb. 1967, trawl; IRCZS 89:3474. 1 ovig. ♀, cl 2.1; 27°37'N, 83°28'W, 37 m; 2 June 1967, trawl; FSBC I 21454. West coast of Florida, off Sanibel Island; 1 ovig. ♀, cl 2.1; 26°24'N, 83°43'W, 73 m; 13 Oct. 1966, trawl; TAMU 2-5944. 1 ♂, cl 1.8; 26°24'N, 83°43'W, 73 m; 8 Aug. 1967, trawl; TAMU 2-5943. 1 ♂, cl 1.8; 26°24'N, 83°22'W, 55 m; 12 Oct. 1967, trawl; FSBC I 21455. 1 ovig. ♀, cl 2.0; 26°24'N, 82°58'W, 37 m; 7 Apr. 1967, dredge; IRCZS 89:3475. 1 ovig ♀, cl 2.2; 26°24'N, 82°58'W, 37 m; 6 June 1967, dredge; IRCZS 89:3476. Coast of northwest Florida, off Cape San Blas: 1 juv., cl 1.4; 28°25'N, 85°15'W, 182 m; 29 Sept. 1977, trawl; MESC. East coast of Texas, off Padre Island: 1 ♂, cl 1.9; 27°37'N, 96°33'W, 59 m; 5 June 1971, from fish stomach; TAMU 2-5942. Western Atlantic, off Georgia: 1 ♂, cl 1.9; 30°55'N, 81°18'W, 9 m; 9 Sept. 1973, small biological trawl; USNM 172420.

Diagnosis.—Rostrum short, extending slightly beyond cornea, with pair of lateral spines midway along length; tip spatulate with expanded rounded apex. Carapace smooth with single, strong dorsomedial spine behind rostrum; hepatic spines lacking. Merus of first pereopod with strong spine midway on flexor margin; subchelar spine simple.

Description.—A robust, smooth-bodied crangonid shrimp (Fig. 1a). Rostrum (Fig. 1c) short, depressed, extending slightly beyond cornea; 2 blunt lateral spines midway along length; tip spatulate, expanded club shape. Carapace (Fig. 1b) slightly depressed, smooth, with 2 very faint longitudinal carinae and single, strong, dorsomedial spine behind rostrum; suborbital spine dorsal and posterior to antennal spine; pterygostomian spine strong, equal to or extending slightly beyond eyes; a minute spine posteroventral to pterygostomian spine, directed somewhat medially; hepatic spine lacking; orbital notch present; eyes well developed.

Stylocerite (Fig. 2a) broad at base, tip acute, reaching nearly to end of basal article of antennule; antennular article 1 longer than 2, with minute distolateral spine; article 2 longer than 3; flagella overreach antennal scale, inner slightly longer than outer, both ending in a tuft of setae. Antennal blade (Fig. 2b) slightly broader proximally, tapering to subquadrate tip; lateral border of antennal scale almost straight, ending in robust distolateral spine, spine may or may not exceed antennal blade. Antennal articles 1–4 compressed; article 5 longer than combined lengths of articles 1–4, falling just short of distal margin of antennal blade; flagellum tapering to slender tip.

Mouthparts as illustrated (Figs. 2c–g).

Pereopod 1 (Fig. 3a) strong, subchelate; dactyl slender; propodus broad, width $\frac{1}{3}$ length, with serrate spinules proximally on flexor margin, subchelar spine simple; carpus short, $\frac{1}{5}$ length of propodus, small spine on distolateral portion of extensor margin, large medial spine ventrally, overreaching prox-

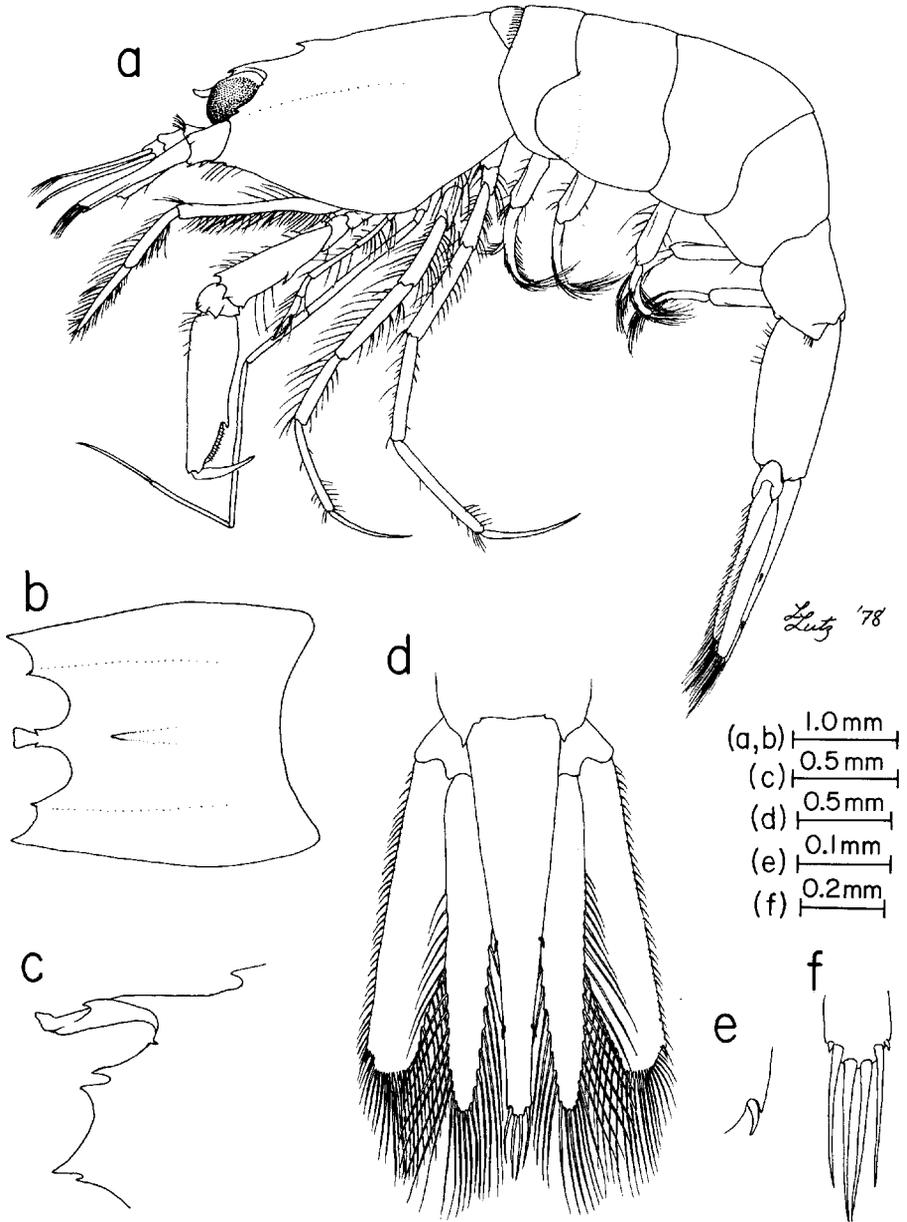


Fig. 1. *Pontophilus gorei*, paratype, ovigerous female (eggs not shown), cl 2.1, RMNH D31979: a, Whole animal, lateral view. Paratype, ovigerous female, cl 2.1, TAMU 2-5944; b, Carapace, dorsal view; c, Same, lateral view. Holotype, ovigerous female, cl 2.5, USNM 172417; d, Telson and uropods; e, Same, distolateral margin of exopod; f, Same, tip of telson.

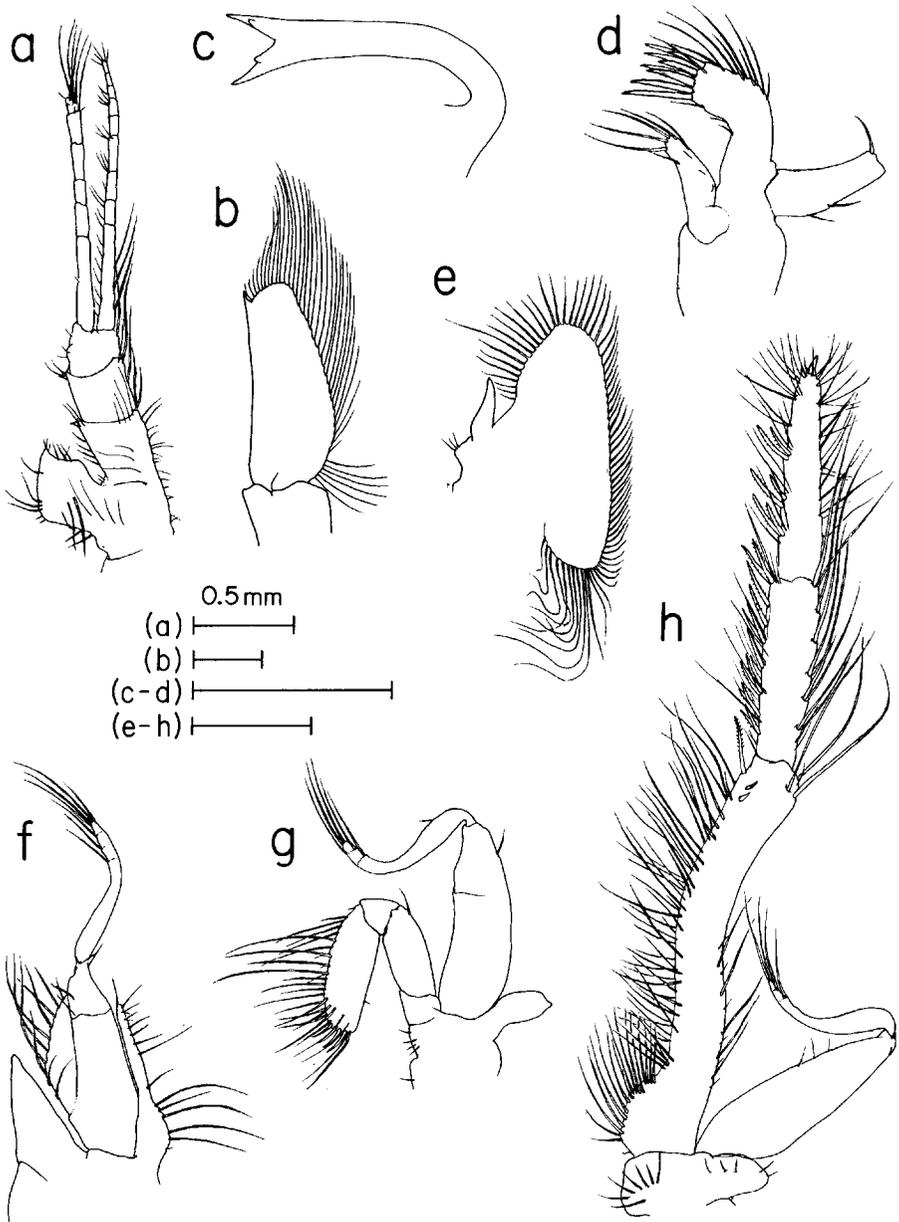


Fig. 2. *Pontophilus gorei*, holotype, ovigerous female, cl 2.5, USNM 172417: a, Left antennule; b, Left antennal scale; c, Left mandible; d, Left maxillula; e, Left maxilla; f, Right maxilliped 1; g, Left maxilliped 2; h, Left maxilliped 3.

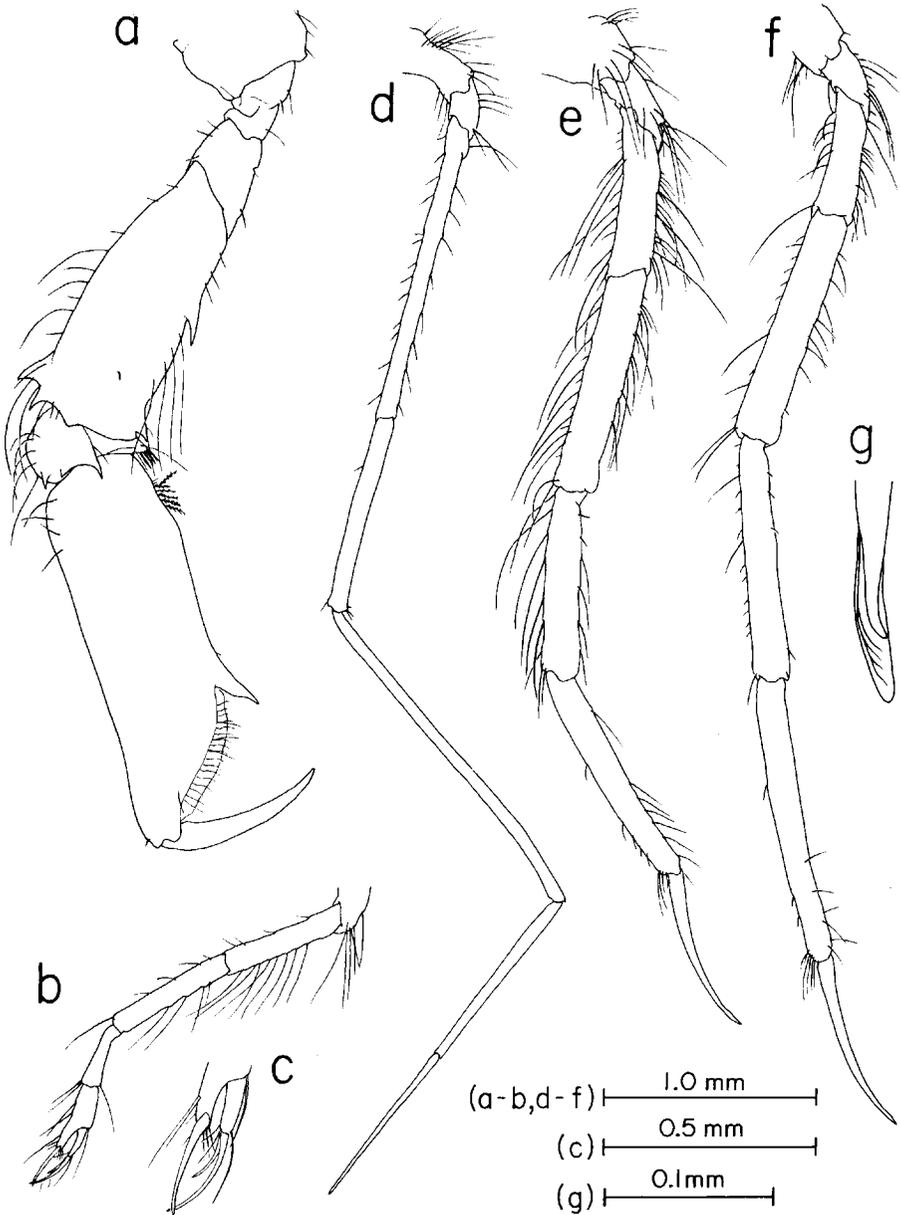


Fig. 3. *Pontophilus gorei*, holotype, ovigerous female, cl 2.5, USNM 172417: a, Left pereopod 1; b, Left pereopod 2; c, Same, dactyl and propodus; d, Left pereopod 3; e, Left pereopod 4; f, Left pereopod 5; g, Left pereopod 3, tip of dactyl.

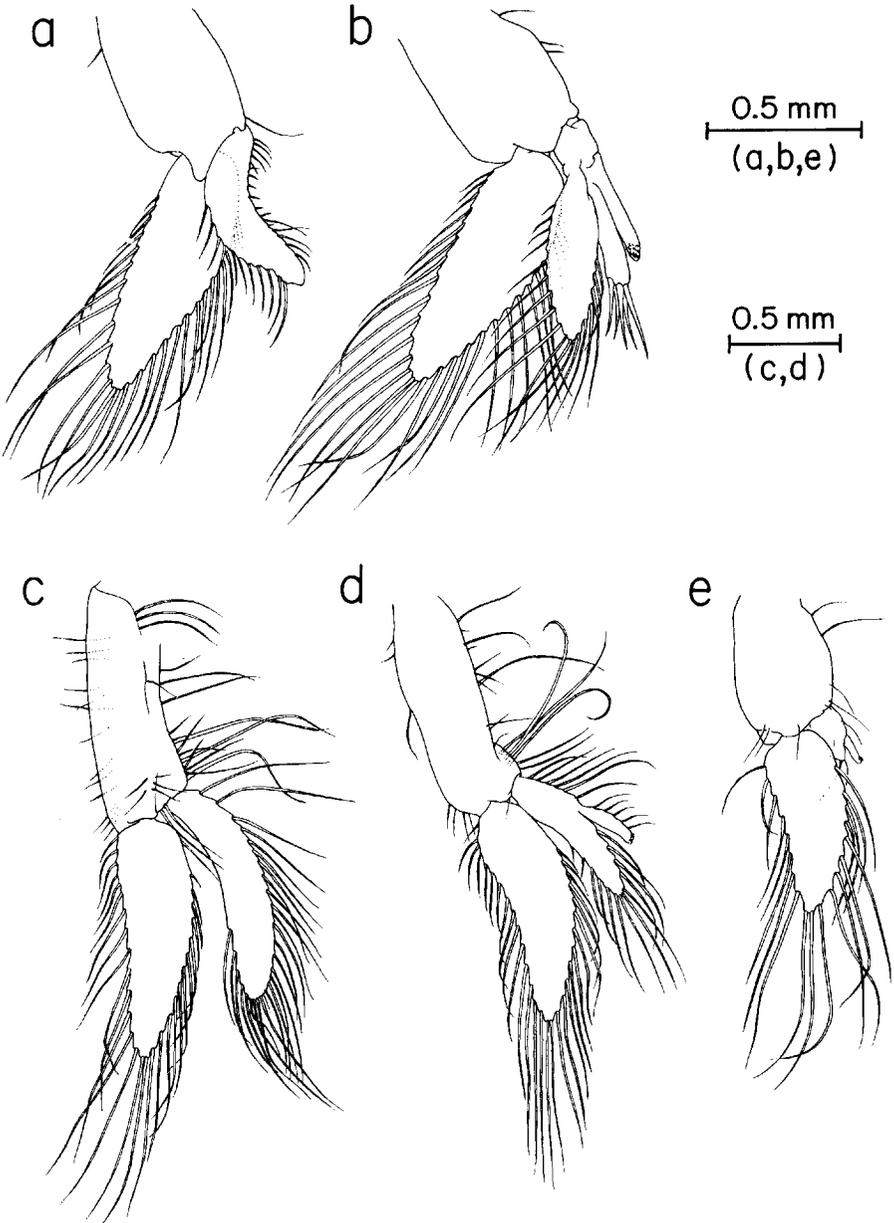


Fig. 4. *Pontophilus gorei*, allotype, male, cl 1.9, USNM 172418: a, Left pleopod 1; b, Left pleopod 2. Holotype, ovigerous female, cl 2.5, USNM 172417; c, Left pleopod 1; d, Left pleopod 2. Paratype, ovigerous female, cl 2.1, FSBC 1 21454; e, Left pleopod 5.

imal portion of propodus, rounded lobe with serrate spinules on flexor margin; merus slightly shorter than propodus, bearing two spines on distal extensor margin, distal flexor margin terminating in weak spine, strong spine about midway on flexor margin; ischium and basis short, combined length $\frac{1}{3}$ that of merus. Pereopod 2 (Fig. 3b) setose, short, reaching nearly to distal margin of merus of first; chela minute, internal margins of fingers concave, meeting only at tips (Fig. 3c). Pereopod 3 (Fig. 3d) long, slender, overreaching antennal scale by length of dactyl and propodus; dactyl with tuft of hairs on flexor margin (Fig. 3g). Pereopod 4 (Fig. 3e) shorter and stouter than third, only tip of dactyl overreaching antennal scale; dactyl with tuft of hairs on flexor margin. Pereopod 5 (Fig. 3f) reaching as far as fourth when both extended anteriorly; dactyl with tuft of hairs on flexor margin. All pereopods lacking exopods and epipods.

Six branchiae (pleurobranchs) present; inferior apices directed posteriorly.

Abdomen (Fig. 1a) tapering to long, narrow sixth segment; pleura of all segments broadly rounded ventrally; posterolateral angle of segments 1–4 bluntly rounded, that of segment 5 developed into a blunt tooth; all segments lack sculpturing.

Pleopods as illustrated (Fig. 4a–e). Endopods of each unsegmented; length ratio of latter to exopods in female holotype as follows: first $\frac{4}{5}$; second, $\frac{3}{5}$; third, $\frac{1}{2}$; fourth, $\frac{2}{5}$; fifth, $\frac{1}{5}$. Subapical appendix internae on pleopods 2–5. For comparisons of relative lengths in the sexes see remarks below.

Telson (Fig. 1d, f) long, narrow, truncate terminally, bearing 3 pairs of terminal spines; lateral pair minute, intermediate pair $\frac{4}{5}$ length of mesial pair; 2 pairs of minute dorsal spines on lateral margins at about $\frac{1}{2}$ and $\frac{4}{5}$ length. Uropod long, narrow, setose; endopod slightly overreaching telson; exopod falling just short of telson, lateral margin straight, terminating in fixed tooth proximal to movable spine at distal end of margin (Fig. 1e).

Eggs 0.3–0.5 mm in diameter, depending on development.

Type-locality.—The ovigerous female holotype was taken 135 km due west of Sanibel Island Light in the eastern Gulf of Mexico.

Distribution.—Most specimens were from the two “Project Hourglass” transects over the continental shelf of the west coast of Florida, off Sanibel Island and Tampa Bay. A single specimen was taken 167 km off the north-west coast of Florida in the central Gulf. The single specimen from a fish stomach (*Prionotus rubio*) from the Texas coast extends the range of this species into the western Gulf of Mexico. A single male specimen captured off Georgia represents the only record for this species from the east coast of the United States. Although this specimen was taken in 9 m, all Gulf specimens were taken at greater depths ranging from 37 to 182 m.

Etymology.—This species is named in honor of Dr. Robert H. Gore in recognition of his many contributions to the field of carcinology and his unselfish aid to others in the field.

Remarks.—The outer flagella of the antennules of males are broad, thickened and distinctly shorter than the inner flagella. Outer flagella of females are only slightly shorter and thicker than the inner flagella (Fig. 2a).

Sexual dimorphism is also exhibited in the form and development of the pleopods. Margins of the endopod of the first pleopod of males (Fig. 4a) are sinuous, terminating about $\frac{3}{4}$ the length of the exopod, but in females (Fig. 4c) the margins are evenly curved and the tip is more lobate, the latter reaching about $\frac{4}{5}$ the length of the exopod. The second pleopod of males bear a well developed appendix masculina and an appendix interna (Fig. 4b); females bear only an appendix interna (Fig. 4d). The relative lengths of the endopods of pleopods 2–4 of both males and females are somewhat variable but generally decrease in size sequentially from $\frac{3}{5}$ to $\frac{1}{4}$ the lengths of the exopods in females and from $\frac{4}{5}$ to $\frac{3}{5}$ the lengths of the exopods in the males. The appendix interna arises near the base of the endopod in males but has a more distal origin in females. The endopod of the fifth pleopod of adult males is relatively long, varying from $\frac{4}{5}$ to $\frac{1}{2}$ the length of the exopod; the appendix interna is in the usual basal position. In females, however, the appendix interna is positioned subapically on the fifth pleopod, and may extend beyond the endopod; the endopod is reduced, never exceeding $\frac{1}{4}$ the length of the exopod (Fig. 4e).

Relative lengths of the endopods are a function of size as well as sex. Ovigerous females, from 1.8 to 2.2 mm carapace length (cl), vary little. In non-ovigerous females (recognizable at 1.5 mm cl), relative lengths of the endopods increase in specimens of up to 1.8 mm cl, whereupon the relative lengths remain consistent. Between 1.5 and 1.7 mm cl, the appendix interna may be missing on the posterior pairs of pleopods. The appendix masculina of the male is present at 1.5 mm cl, although it may be somewhat reduced. Relative lengths of endopods show the same progressive increase as in females but continue to increase in specimens up to 2.2 mm cl. Juveniles, less than 1.4 mm cl, may or may not possess an appendix interna.

Comparisons.—The strong spine on the flexor margin of the first pereopod easily distinguishes this species from all other western Atlantic species of *Pontophilus*. *P. dimorphus* Fujino and Miyake, 1971 from Sagami Bay, Japan, seems to be the only described species with such a spine. A similar spine is figured on the extensor margin by Bate (1888) for *P. gracilis* Bate, 1888 (= *P. challengerii* Ortmann, 1893) but Calman (1939) remarks in a footnote that none of the type-series of *P. challengerii* possess this spine. Although *P. dimorphus*, like *P. gorei*, lacks an exopod on the first pereopod the extensive spination on the carapace does not substantiate a close relationship.

Table 1.—Generic characters of *Pontophilus* and *Philocheras* exhibited by Gulf of Mexico specimens (adapted from Kemp, 1911).

	Characters typical of <i>Pontophilus</i>						Characters typical of <i>Philocheras</i>					
	Stylocerite acute	Exopod on pereopod 1	Pereopod 2 not reaching distal end of merus of first	Endopod of pleopods 2-5 only a little shorter than exopod	Endopod of pleopods unsegmented	Appendix interna present	Stylocerite rounded	Exopod lacking on pereopod 1	Pereopod 2 reaching distal end of carpus of first	Endopod of pleopods 2-5 little more than half length of exopod	Endopod of pleopods segmented	Appendix interna absent
<i>Pontophilus gorei</i> n. sp.	x	-	x	♂	x	x	-	x	-	♀	-	-
<i>Pontophilus brevirostris</i> Smith, 1881	x	x	x	x	x	x	-	-	-	-	-	-
<i>Pontophilus gracilis</i> Smith, 1882	x	x	x	x	x	x	-	-	-	-	-	-
<i>Pontophilus talismani</i> Crosnier & Forest, 1973	x	x	x	x	x	x	-	-	-	-	-	-

The present species is most closely related to a small group of extra-American species which lack an exopod on pereopod 1, possess a single spine in the dorsal midline of the carapace and lack hepatic spines. These species, however—*Pontophilus monacanthus* Holthuis, 1961 from Turkey, *P. opici* Crosnier, 1971 from West Africa, *P. megalochair* (Stebbing, 1915) from South Africa and *P. hendersoni* Kemp, 1915 from South Africa and India—all possess a bifid subchelar spine while that of *P. gorei* is simple. *P. gorei* also differs from each in the form of the rostrum which is blunt, expanded at the apex and possesses strong lateral spines midway along its length.

Discussion.—Kemp (1911), using data on intergrades of the characters shown in Table 1, concluded that in Asiatic waters it was impossible to distinguish between the genera *Pontophilus* and *Philocheras*. More recently European workers (Zariquiey Álvarez, 1968; Lagardère, 1971), using the same characters, regarded the two genera as distinct in Atlantic and Mediterranean waters. In view of the ambiguous nature of some of the features of *P. gorei*, expressed in Table 1, we can only follow Kemp (1911) and consider *Philocheras* Stebbing, 1900 to be a synonym of *Pontophilus* Leach, 1817. As Kemp (1916) recognized, several natural groupings exist and one solution to the systematic confusion in this unwieldy genus may lie in the recognition of several genera.

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