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*GERYON FENNERI*, A NEW DEEP-WATER CRAB FROM  
FLORIDA (CRUSTACEA: DECAPODA: GERYONIDAE)

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*Abstract.*—*Geryon fenneri*, a species from off Florida formerly identified with *G. affinis* A. Milne Edwards and Bouvier, is described. This new species supports a newly established commercial fishery in the Gulf of Mexico. Characters are given to help distinguish *G. fenneri* from *G. quinquedens* Smith, which also occurs off Florida.

In 1940, Fenner A. Chace, Jr., identified a crab taken off the east coast of Florida with the East Atlantic *Geryon affinis* A. Milne Edwards and Bouvier, and showed the features distinguishing this species from the similar but distinct *Geryon quinquedens* Smith, reported from localities between Nova Scotia and Brazil (Rathbun 1937). Until then all West Atlantic specimens of *Geryon*, with the exception of the problematic *G. incertus* Miers from off Bermuda (see comments in Chace 1940:39), had been identified with *G. quinquedens* (see Rathbun 1937:271 and Table 87); all of the material from Florida identified by Rathbun with *G. quinquedens*, including the figured specimen, proved to belong to the new species described below. Most authors have overlooked the fact that A. Milne Edwards and Bouvier (1894:41), in their original account of *G. affinis*, had pointed out that *G. affinis* differed from *G. quinquedens* in the form of the dactyli of the walking legs. In *G. affinis* the dactyli are narrow and compressed anteroposteriorly, with the height greater than the width, whereas in *G. quinquedens* the dactyli are broad and depressed dorsoventrally, with their width much greater than their height. In her account of *G. quinquedens*, Rathbun had included material with distinctly different dactyli on the walking legs.

The species characterized below is forming the basis for a newly developed and rapidly expanding fishery in the Gulf of Mexico, where it and *G. quinquedens* are known to occur. Because of its potential commercial importance, we present here a preliminary account to make the name available to those working on its biology and the development of the fishery. A fuller account will be provided in a review of all of the species of *Geryon* now in progress.

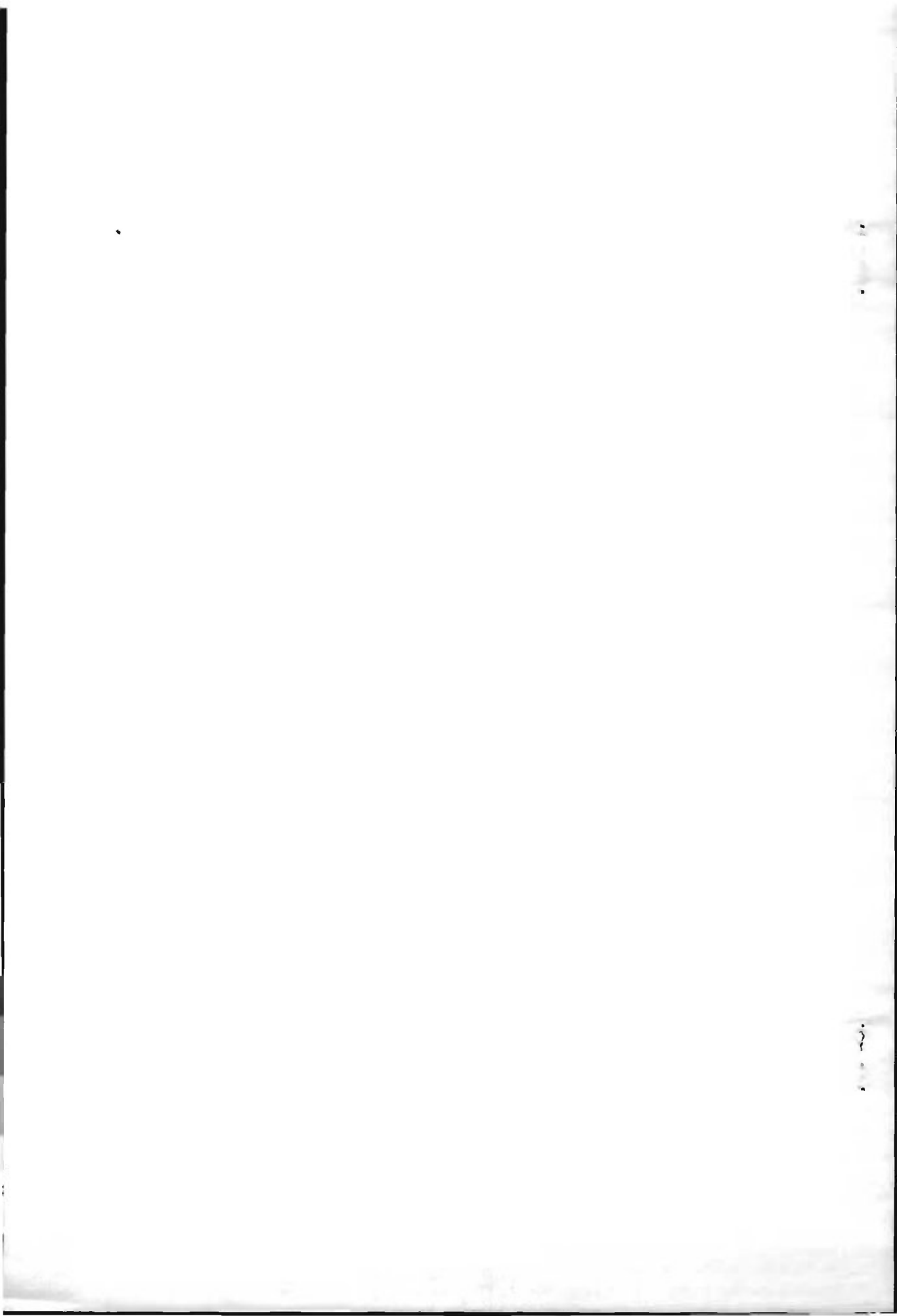
In the account below, carapace length is abbreviated to cl.

*Geryon fenneri*, new species

Figs. 1, 2a, b, 3a-c, 4a, b

*Geryon quinquedens*.—Rathbun, 1937:271, pls. 85, 86 [part: specimens from Florida, including figured specimen].—Boone, 1938:199, 201, 236, pls. 93-95. [Not *Geryon quinquedens* Smith, 1879.]

*Geryon affinis*.—Chace, 1940:39.—Springer and Bullis, 1956:20.—Schroeder, 1959:275.—Christiansen, 1969:87 [part].—Pequegnat, 1975:46.—Wigley, Theroux, and Murray, 1975:3. [Not *Geryon affinis* A. Milne Edwards and Bouvier, 1894.]



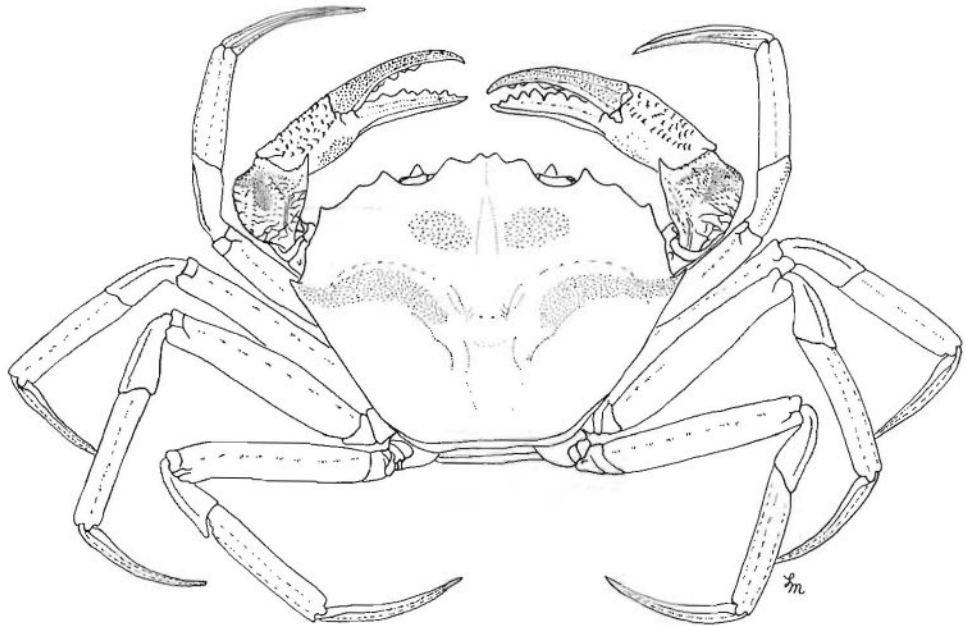


Fig. 1. *Geryon fenneri*, male, cl. 87 mm, USNM 11363: dorsal view.

*Material.*—EAST FLORIDA: Off Fernandina; 31°09'N, 79°33'30"W; 352 fms (644 m); gray sand, dead coral; *Albatross* Sta 2669; 5 May 1886: 1 ♂, cl. 121 mm (USNM 14373).—Off Fernandina; 30°47'30"N, 79°49'W; 270 fms (494 m); gray sand; *Albatross* Sta 2666; 5 May 1886: 1 ♂, cl. 124 mm (holotype; USNM 14376).—Off St. Augustine; 29°38'N, 79°53'W; 520 m; Bureau of Land Management survey; 3 Sep 1977: 2 ♀, cl. 47–83 mm (USNM 174458).—Off Daytona Beach; 29°24'N, 79°50'W; 400 fms (732 m); *Oregon* Sta 5755; 19 Nov 1965: 1 ♂, cl. 34 mm, 2 ♀, cl. 31–39 mm (USNM 210900).—Off Daytona Beach; 29°17'N, 80°03'W; 200–202 fms (366–370 m); *Silver Bay* Sta 3076; 29 Apr 1961: 1 ♀, cl. 53 mm (USNM 210901).—About 5.4 nautical miles ESE of Ponce de Leon Inlet; 415–421 m; *Delaware II* Sta 113; 26 Jun 1982: 2 ♀, cl. 87–94 mm (FSBC I 30811).—Off Fort Pierce; 27°42.5'N, 79°45.6'W to 27°37'N, 79°46.5'W; 417–425 m; *Gosnold* Sta 262/777; 13 Aug 1975: 5 ♂, cl. 47–97 mm, 2 ♀, cl. 67–85 mm (IRCM 89:2295).—Off Fort Pierce; 27°27'N, 79°45.6'W to 27°37'N, 79°46.5'W; 379–392 m; *Gosnold* Sta 262/776; 13 Aug 1975: 1 ♀, cl. 69 mm (IRCM 89:2296).—Off Carysfort; 25°20'30"N, 79°58'W; 217 fms (397 m); gray sand; *Albatross* Sta 2642; 9 Apr 1886: 1 ♂, cl. 87 mm, 1 ♀, cl. 69 mm (USNM 11363).—Off Cape Florida; 3.5 miles E of Fowey Rocks Light; 160 fms (293 m); fine gray sand; *Fish Hawk* Sta 7515; 30 Mar 1903: 1 ♂, cl. 122 mm (USNM 33464).—Off Cape Florida; 3 7/8 miles SE × E 1/2 E of Fowey Rocks Light; 170 fms (311 m); soft bottom; *Fish Hawk* Sta 7512; 25 Mar 1903: 1 ♂, cl. 135 mm (USNM 33465).—Off Cape Florida; 6 miles E of Fowey Rocks Light; 200 fms (366 m); gray mud; *Fish Hawk* Sta 7514; 5 Mar 1903: 1 ♂, cl. 134 mm, 1 ♀, cl. 83 mm (USNM 33466).

KEY WEST/DRY TORTUGAS: Off Key West; 24°23'N, 82°42'W; 200 fms

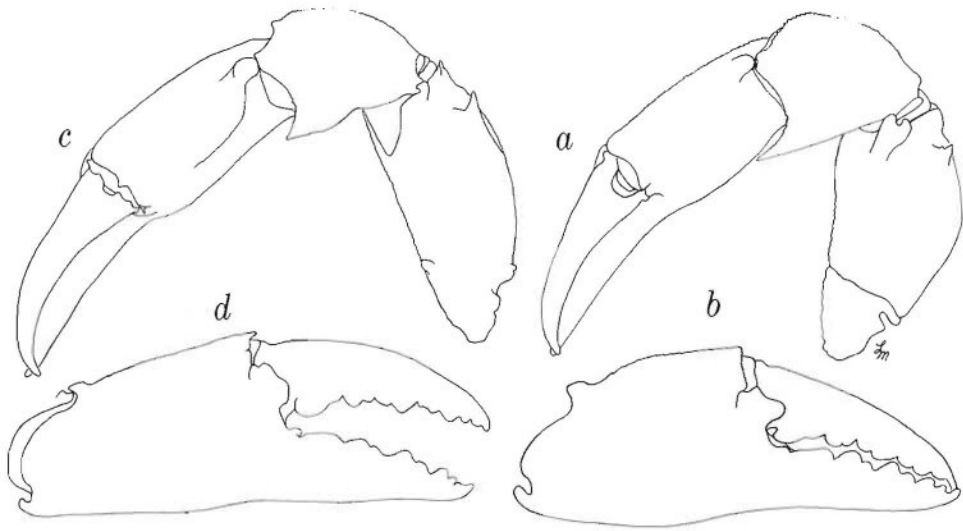


Fig. 2. Cheliped (a, c) and chela (b, d) of: a, b, *Geryon fenneri*, and c, d, *G. quinquedens*.

(366 m); *Oregon* Sta 5791; 27 Nov 1965: 1 ovigerous ♀, cl. 104 mm (USNM 210899).—Gulf Stream, off Key West; 24°15'N, 81°47'30"W; 306 fms (560 m); sand; *Fish Hawk* Sta 7285; 19 Feb 1902: 1 ♂, cl. 121 mm (USNM 54047).—S of Key West; 24°11'N, 81°36'W to 24°15'N, 81°20'W; 594–604 m; *Gerda* Sta 289; 3 Apr 1964: 1 ♂, cl. 137 mm, 1 ♀, cl. 81 mm (USNM 151084).—Dry Tortugas; 220–237 fms (403–434 m); W. L. Schmitt #38; 31 Jul 1930: 2 ♂, cl. 91–93 mm (USNM 71112).—Dry Tortugas; Paul Bartsch; 1931: 1 ovigerous ♀, cl. 105 mm (USNM 68204).—Dry Tortugas; 205–221 fms (375–404 m); W. L. Schmitt; 3 Jul 1931: 1 ♂, cl. 133 mm (USNM 171397).—Dry Tortugas; 18 miles due S from no. 2 red buoy; 205–221 fms (375–404 m); W. L. Schmitt #18; 3 Jul 1931: 1 ♂, cl. 134 mm, 1 ovigerous ♀, cl. 101 mm (USNM 68205).—Dry Tortugas; 197 fms (361 m) and deeper; W. L. Schmitt #60-32; 1 Aug 1932: 1 ♂, cl. 132 mm (USNM 71004).—Dry Tortugas; 334 fms (611 m); W. L. Schmitt #69; 3 Aug 1932: 1 ♂, 136 mm (USNM 107017).—S of Dry Tortugas; 135–156 fms (247–285 m); W. L. Schmitt #30-32; 2 Jul 1932: 2 ♂, cl. 91–102 mm (USNM 71003).—S of Dry Tortugas; 295–315 fms (540–576 m); W. L. Schmitt #54-32; 19 Jul 1932: 2 ♂, cl. 84–88 mm (USNM 71005).—S of Dry Tortugas; 250 fms (458 m); commercial fisherman; 10 May 1969: 2 ♂, cl. 136–139 mm (FSBC I 30809).—Due S of Tortugas Light; 210–237 fms (384–434 m); *Anton Dohrn*; 6 Jun 1939: 1 ♂, cl. 93 mm (USNM 78363).—SW of Dry Tortugas; 24°N, 83°W; 200–220 fms (366–403 m); *Oregon* Sta 1537–1551; 15–18 Jun 1956: 1 ♀, cl. 80 mm (USNM 99733).

GULF OF MEXICO, OFF FLORIDA: About 120 miles W of Florida coast; 26°50'N to 27°50'N; 240–300 fms (439–549 m); traps; W. Steven Otwell; 1982: 3 ♂, cl. 125–132 mm, 3 ♀ (2 ovigerous), cl. 97–100 mm (2 ♂, 2 ♀ USNM 210903; 1 ♂, 1 ♀ UF/FSM 123, 124).—Off St. Petersburg; 27°30'N to 27°45'N, 85°10'W; 1500 ft to 355 fms (457–629 m); M/V *Margarita B.*, Capt. O. G. Oakleaf; Sep 1980: 3 ♂, 125–133 mm (FSBC I 30810).—Off St. Petersburg; 27°44'N, 85°09'W; 254 fms (465 m); *Oregon* Sta 489; 29 Sep 1951: 3 ovigerous ♀, cl. 97–114 mm

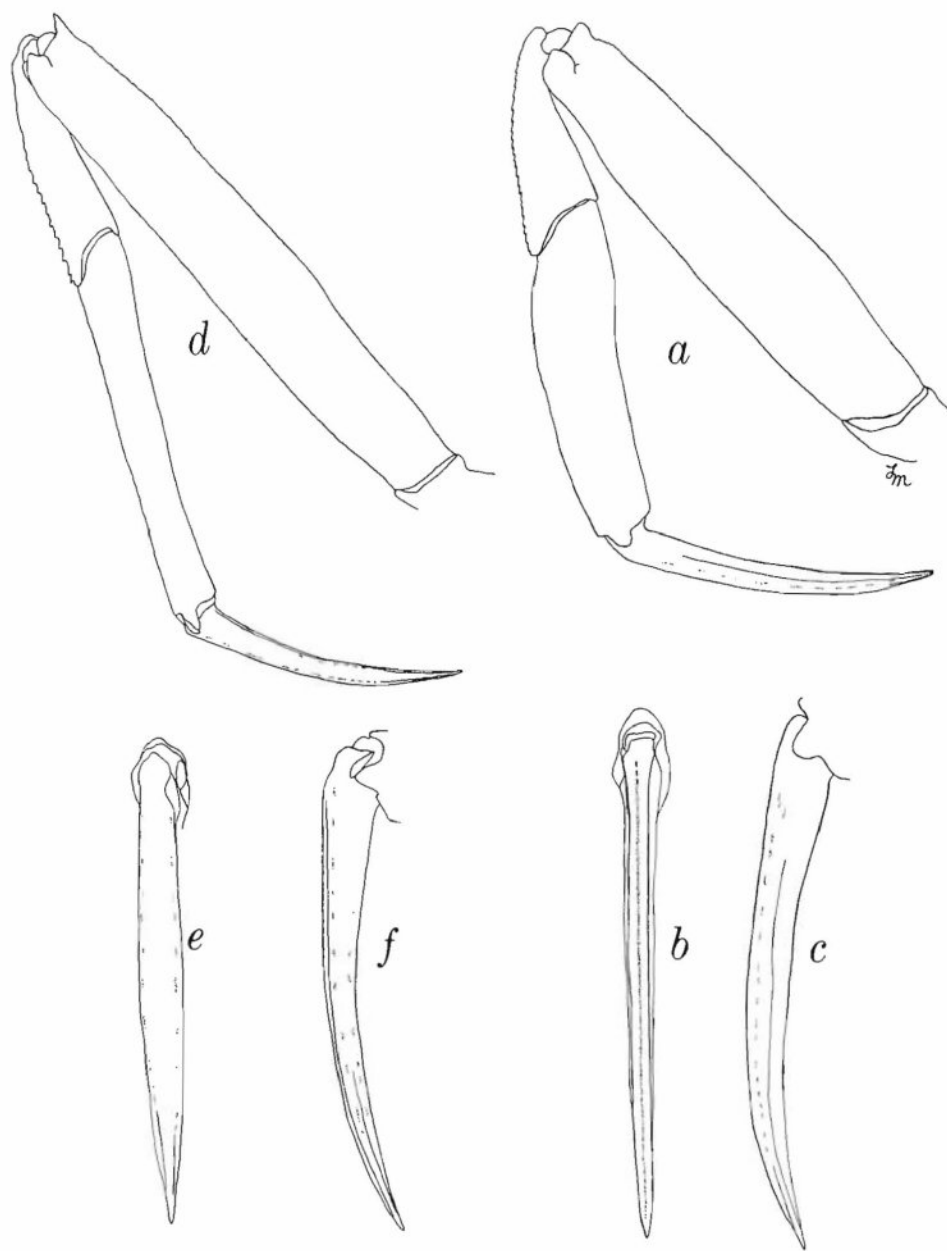


Fig. 3. Fifth pereopod (*a, d*) and dactyls of fifth pereopod in dorsal (*b, e*) and lateral (*c, f*) views of: *a-c*, *Geryon fenneri*, and *d-f*, *G. quinquedens*.

(USNM 92652).—Off Clearwater; 28°01'N, 85°27'W; 275 fms (503 m); *Oregon II* Sta 10168; 9 Sep 1968: 1 ovigerous ♀, cl. 103 mm (USNM 210902).—Off Clearwater; 28°04'N, 85°34'W; 549 m; *Oregon II* Sta 10169, W. Lyons; 9 Sep 1968: 1 ovigerous ♀, cl. 94 mm (FSBC I 6670).

*Diagnosis.*—A large *Geryon*, carapace length to at least 150 mm in adults. Carapace broader than long, length 0.74 to 0.88, usually 0.79–0.82, times width. Median pair of frontal teeth separated by a wide sinus, teeth scarcely overreaching obtuse lateral frontal teeth. Orbits usually more than  $\frac{3}{4}$  frontal width. Anterolateral teeth 5, second and fourth reduced, distance between first and third usually smaller than distance between third and fifth (range 0.84–1.10). Cheliped with blunt lobe on upper margin of merus, carpus lacking outer spine, propodus lacking distal dorsal spine. Meri of walking legs lacking distal dorsal spine. Fifth leg: merus broad, less than  $\frac{2}{3}$  carapace width (range 0.42–0.58); propodus broad, length less than 4.5 times width (range 2.8–4.1 times); propodus and dactylus subequal in length, or dactylus slightly longer. Dactyli of walking legs compressed, narrow, height at midlength much greater than width.

*Size.*—Carapace lengths of examined specimens: males 34–139 mm, non-ovigerous females 31–102 mm, ovigerous females 94–114 mm. Maximum carapace widths of males 185 mm, of females 147 mm (W. Steven Otwell, pers. comm.).

*Color.*—A cream to tan colored species, often mottled with darker pigment, in contrast with the deep sea red crab *G. quinquedens*, which is red to deep orange in life (Schroeder 1959:275).

*Remarks.*—*Geryon fenneri*, the western Atlantic counterpart of *G. affinis* A. Milne Edwards and Bouvier, with which it has been identified in the past, differs from the latter species as follows:

1. The frontal teeth of *G. fenneri* are closer together than those of *G. affinis*. In *G. fenneri* the distance between the frontal teeth is  $\frac{1}{2}$  to  $\frac{3}{4}$  the distance between each frontal tooth and the nearest inner orbital tooth. In *G. affinis* these two distances are about equal. In *G. fenneri* the gap between the frontal teeth is shallower than in *G. affinis*. In *G. fenneri* the frontal teeth are much smaller and narrower than the inner orbital teeth; in *G. affinis* this difference is much less noticeable.

2. In *G. fenneri* the orbits appear to be shallower and wider than in *G. affinis*. In *G. fenneri* the orbits usually are more than  $\frac{3}{4}$  the width of the front, whereas in *G. affinis* they are less than  $\frac{3}{4}$  the frontal width.

3. The distance between the outer orbital tooth (=first anterolateral tooth) and the third anterolateral tooth in *G. fenneri* is smaller to slightly larger than that between the third and fifth anterolateral teeth (range 0.84–1.10); in *G. affinis* the distance between the first to third and that between the third to fifth anterolateral teeth is larger (range 1.11–1.21). In *G. fenneri* the anterolateral teeth are broader and less conspicuous than in *G. affinis*, where they are more triangular.

4. In *G. fenneri* the granules on the protogastric region are larger and fewer than in *G. affinis*.

5. In *G. affinis* there is a second, narrower ridge behind the ridge that extends inward from the fifth anterolateral tooth. This second ridge is completely absent in *G. fenneri*.

6. The fourth (=penultimate) segment of the antennal peduncle is more slender in *G. fenneri* than in *G. affinis*.

7. Granules on the pleural ridge (separating the subhepatic from the pterygostomial region) before the pleural suture are more conspicuous and in a single row in *G. fenneri*, smaller and more irregularly placed in *G. affinis*.

8. Granules on the upper surface of the palm and carpus of the cheliped are more conspicuous in *G. fenneri* than in *G. affinis*.

9. The dactyli of the second to fifth pereopods are more slender in *G. affinis* than in *G. fenneri*, but the grooves are narrower and deeper in the latter species. In *G. fenneri* the dorsal groove appears to be wider distally.

10. The male gonopods of *G. affinis* are more strongly curved laterally, pointing to the base of the second or third leg; in *G. fenneri* the gonopods are directed more anteriorly, in the direction of the base of the chelipeds.

11. The sixth abdominal segment is somewhat higher and less wide in *G. affinis* than in *G. fenneri*.

Chace (1940:40) listed the differences he observed between this species (as *G. affinis*) and *G. quinquedens*; the major differences can be summarized as follows:

<i>G. quinquedens</i>	<i>G. fenneri</i>
1. Color in life pink to reddish brown.	1. Color in life tan to cream.
2. Carpus of cheliped with sharp tooth on outer half of upper anterior margin (blunt and inconspicuous in older specimens) (Fig. 2c).	2. Carpus of cheliped lacking tooth on outer half of upper anterior margin (Fig. 2a).
3. Palm of cheliped with dorsal margin ending anteriorly in a tooth (often reduced or absent in old specimens) (Fig. 2c, d).	3. Palm of cheliped with dorsal margin unarmed anteriorly (Fig. 2a, b).
4. Dactyli of walking legs dorsoventrally flattened, wider than high (Fig. 3e, f).	4. Dactyli of walking legs laterally compressed, higher than wide (Fig. 3b, c).
5. Merus of walking legs bearing anterodorsal tooth (Fig. 3d). (Tooth sometimes indistinct, often so on second and fifth legs).	5. Merus of walking legs lacking anterodorsal tooth (Fig. 3a).
6. Merus of fifth leg about $\frac{3}{4}$ carapace width.	6. Merus of fifth leg less than $\frac{3}{5}$ carapace width.
7. Propodus of last leg 5 to 7 times as long dorsally as high (Fig. 3d).	7. Propodus of last leg less than 4.5 times as long dorsally as high (Fig. 3a).

Some of the characters that distinguish *G. fenneri* and *G. quinquedens* are shown together in Figs. 2-4, which are based on the following specimens: *G. fenneri*, ♀, cl. 47 mm, USNM 174458, from off Florida; *G. quinquedens*, ♀ 36 mm, and ♂, cl. 46 mm, USNM 18751, from off Martha's Vineyard, Massachusetts.

We have reexamined the material from Florida identified with *G. quinquedens* by Rathbun (1937), and all of those specimens proved to be *G. fenneri* rather than *G. quinquedens*. We have seen no material of this species from outside the waters of the continental shelf off Florida, where it occurs in depths ranging from

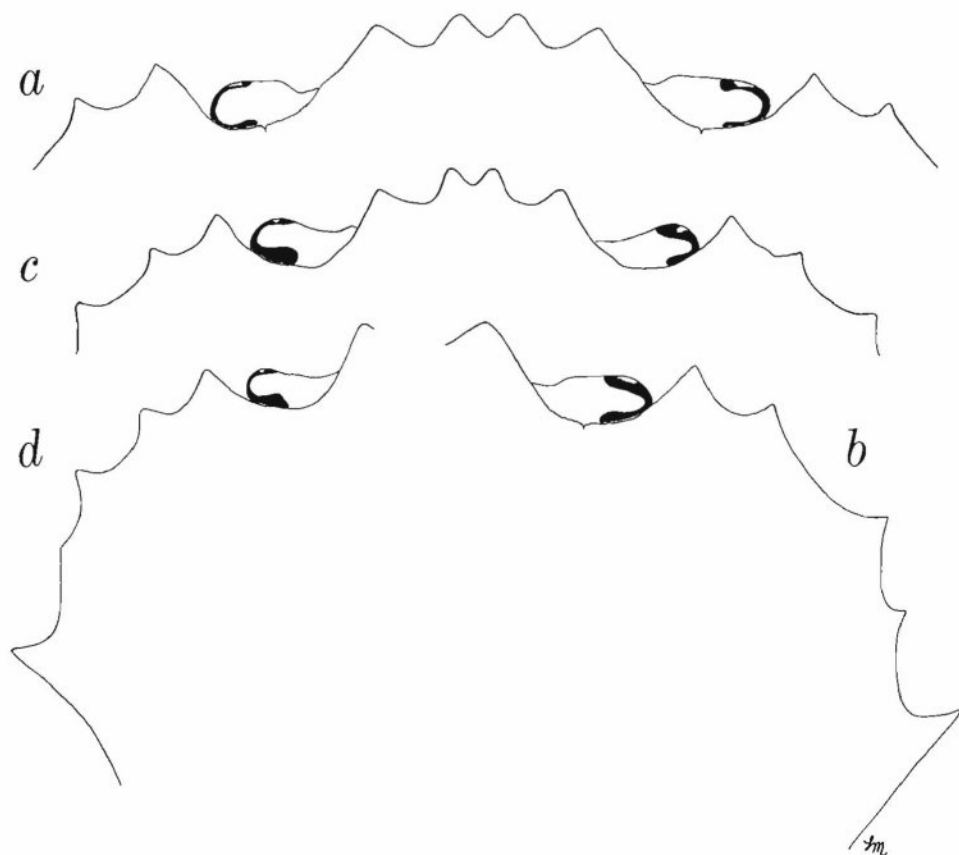


Fig. 4. Outlines of front (*a, c*) and anterolateral margin of carapace (*b, d*) of: *a, b, Geryon fenneri*, and *c, d, G. quinquedens*.

as shallow as 247–285 m to as deep as 778–787 m. Most of our records for this species come from depths between 350 and 500 m.

*Etymology.*—We take great pleasure in dedicating this species to our colleague, Fenner A. Chace, Jr., who was the first to recognize it in the western Atlantic.

*Types.*—The holotype is the male specimen from *Albatross* Sta 2669, off Fernandina, Florida (USNM 14376); it is the specimen figured by Rathbun (1937: pls. 85, 86). Other specimens from the collections of the National Museum of Natural History, Smithsonian Institution (USNM), and six lots collected in the Straits of Florida by the R/V *Gerda* deposited in the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands, as well as all other specimens listed are paratypes.

*Records in the literature.*—In addition to the records from Florida given by Rathbun (1937) and cited above under "*Material*," we have found only the following records, all from off Florida: 2 ♂, E of St. Augustine, 30°58'N, 79°34'W, 265–290 fms (485–531 m), and 30°03'N, 78°37'W, 425–430 fms (778–787 m) (Chace 1940); 1 ♂, 1 ♀, off Fowey Rocks, 100–200 fms (183–366 m) (Boone 1938); Florida Straits (Christiansen 1969); Gulf of Mexico, off St. Petersburg, 27°44'N, 85°09'W, 254 fms (465 m) (Springer and Bullis 1956).



The species also was mentioned by Schroeder (1959), Pequegnat (1975), and Wigley, Theroux, and Murray (1975), but no records were given by these authors.

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