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Gore, 1986

***Fabia felderi* SPECIES NOVUM, A NEW PINNOTHERID CRAB FROM THE CENTRAL EASTERN COAST OF FLORIDA (CRUSTACEA: DECAPODA: BRACHYURA)**

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ABSTRACT: *Fabia felderi*, a new species of pinnotherid crab collected from oculinid coral rubble in 80 m of water off the central eastern Florida coast, is described and illustrated from the unique holotypic male. The crab shows morphological similarities to some *Pinnotheres* species, as well as to two eastern Pacific species in the genus *Fabia*. All share a more or less subcircular carapace, a produced frontal region rimmed with a heavy fringe of hair, well developed setae along all pereopodal borders, and a generally similar positioning of the palp on the merus of maxilliped 3.

A single male specimen of a small pinnotherid crab was collected from *Oculina* coral rubble in 80 m of water during a series of diving operations off Sebastian Inlet on the central eastern Florida coast in April, 1981, by the Research Submersible SEA LINK I. Examination showed that the specimen was closely related to a number of species, including *Pinnotheres depressus* Say, 1817, and *P. barbatus* Desbonne, 1867 from the western Atlantic, *Pinnotheres malaguena* Garth, 1948 from Malaga Bay on the Pacific coast of Colombia, as well as to at least two eastern Pacific species in the genus *Fabia*, *F. subquadrata* Dana, 1851 and *F. concharum* (Rathbun, 1893). The Floridian specimen, however, could be distinguished from all of these on the basis of features of the carapace, outer maxillipeds, pereopods, abdomen and gonopods. Description of the new species, herein provisionally assigned to the genus *Fabia* (see discussion below) was held in abeyance in the hope that a female specimen, or other material might become available. Such has not been the case and so the species is described and illustrated on the basis of the single

holotypic specimen. It is compared to other closely related species in the genus *Fabia* and to those species putatively assigned to the genus *Pinnotheres* to which it exhibits morphological similarities.

PINNOTHERIDAE *Fabia felderi* species novum (Figure 1)

Material Examined — 1♂, HOLOTYPE. Florida; Sebastian Pinnacles, off Sebastian Inlet, Indian River County, 27°50.2'N, 79°58.0'W, 28 April 1981; Research Submersible JOHNSON SEA LINK I, R/V Johnson Cruise 121, Dive 1023; 80 m; within *Oculina* rubble; coll. J. Miller. USNM 228615 [IRCZM 89:5063].

Measurements.: 2.2 x 1.9 mm (cl x cw), fronto-orbital width 1.06 mm.

Diagnosis. — A small, smooth-bodied crab with a fringe of hair along the frontal and anterolateral margins; margins of all pereopods heavily hirsute. Carapace suboctagonal, front noticeably produced, margins oblique, with heavy fringe of hairlike setae extending posteriad dorsal to fringe on anterolateral border; merus of maxilliped 3

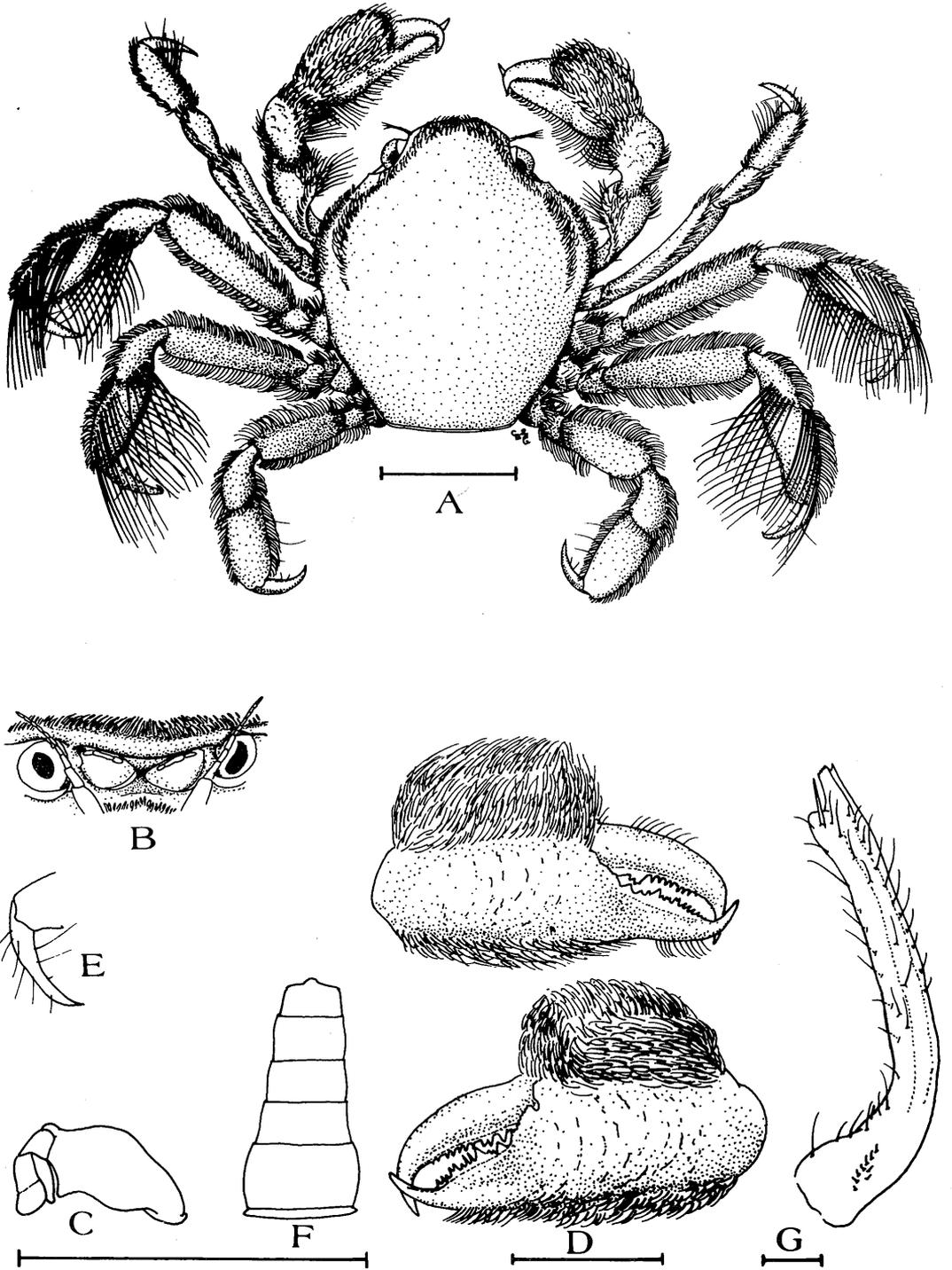


Figure 1. *Fabia felderi* species novum, HOLOTYPE MALE. A, Dorsal view; B, Front, antennular and antennal region; C, Left maxilliped 3; D, Cheliped left and right manus, frontal view; E, Left walking leg 2 dactyl; F, Abdomen, somites 2-7*; G, Left male first gonopod, mesial view. Scales lines indicated in mm except G in 0.1 mm. *setae omitted

elongate, truncate, propodus broad, flat, with transverse ridge, dactyl attached at anterointernal angle of latter, articular extension just barely reaching tip; walking legs symmetrical, decreasing in order 2, 3, 1, 4; abdominal somites 6 and 7 appearing distinct but on close examination seen to be partially fused.

Description.— Carapace (Fig. 1A) 1.2X longer than broad, smooth, suboctagonal, faintly angular, moderately inflated, sides sloping gradually downward from gently rounded gastroducardiac midline; regions completely undefined. Front (Fig. 1B) noticeably produced, shelflike, margins broadly truncate, oblique, with heavy fringe of anteriorly-directed hairlike setae, this continuing backward along anterolateral margins, becoming reduced in height above orbits, increasing again progressing posteriorly to greatest length at epibranchial region.

Anterolateral carapace margin shorter than posterolateral, sloping gradually outward toward anteroventral carapace margin; latter fringed with thick tuft of hairlike setae; carapace widest here. Branchial region bare, sloping outward, flattened ventrad. Posterior margin very gently convex, rimmed, bare.

Orbits (Fig. 1A, B) circular, dorsal margins widely concave; eyestalks short, robust, completely filling sockets, corneas visible in dorsal view. Antenna short, first peduncular article fused to lower orbital margin, remaining articles adjacent to, but without distinct access to, orbit; flagellum reaching from about orbital midpoint to shortly beyond frontal margin.

Merus of maxilliped 3 (Fig. 1C) obliquely transverse, closely appressed to buccal region, about 2.6X longer than high, distally truncate; carpus dorsal margin convex, longer than wide, broadening distally; propodus longer and wider than carpus, widening distally, a

transverse ridge medially; dactylus truncate, about as long as propodus, half as wide as same, attached at anterointernal angle of propodus, lying closely along same.

Chelipeds (Fig. 1D) thin, relatively stout compared to walking legs, subequal. Merus laterally compressed, smooth, unarmed, with continuous tuft of curved hairlike setae along dorsal margin, another along ventral margin, plus larger, longer tuft of straight setae on mesial surface; lateral surface naked; carpus inflated, globose, outer surface rugose, bearing a tuft of elongate pectinate setae dorsally and dorsomesially; manus with dorsal margin densely and thickly setose, tuft shaped generally like thatched hut and roof in dorsolateral view; mesial area inflated, nearly naked, obscurely rugose; ventral margin of manus with row of thick setae plus interspersed thin elongate hairs; fingers thin, slender, slightly compressed laterally, tapering; ventral margin of fixed finger not deflexed, hooked upward distally, with row of long thin setae; movable finger about equally robust, deflexed, hooked downward distally, crossing interiorly to propodal finger; cutting margins of both with irregular, jagged teeth, largest and widest proximally, thinner and needlelike distally.

Walking legs (Fig. 1A, E) smooth, laterally compressed; second longest, third, first and fourth respectively shorter; coxae and bases fringed with hair, meri more or less equal throughout, margins fringed dorsally and ventrally with lamellate longitudinal row of long, arcing setae; carpi slender proximally widening distally, dorsal marginal setae predominant, ventral setae smaller, thinner, a longitudinally oblique row of 8-10 long plumose setae on posterolateral surface of article in walking legs 2-3, this row lacking on walking leg 4;

propodi dorsally convex, about equal in width, that of walking leg 4 shortest, most inflated; dorsal borders of article in walking legs 1-3 with rows of short hairs, plus submarginal row of greatly elongate setae directed posterad to appendage; ventral border of propodi similarly clothed but with long setae directed ventrally; propodus of last walking leg (4) with very short marginal fringe but lacking elongate setae; dactyli of all walking legs long, tapering, hooklike, margins smooth, bearing scattered hairs as illustrated.

Sternal plastron flattened anteriorly, curved dorsad posteriorly, margins heavily fringed with hair. Abdomen (Fig. 1F) widest at somite 3, sides broadly rounded; fifth somite narrower than sixth, latter with lateral margins slightly expanded; somite 7 subquadrate, narrowest, appearing entirely fused but only partially so to sixth, distal margin rounded, distolateral angles subrectangular, both with setae.

Male pleopod (Fig. 1g) a sharply curved, cylindrical tube with flattened gutter-like tip, divided longitudinally for a short distance along its length; numerous thin setae laterally, a distinct daggerlike spine subapically.

DISCUSSION

Species of pinnotherid crabs in the genera *Fabia* and *Pinnotheres* are often morphologically similar, so that confusion arises in assigning specimens to the correct genus. In addition, males and females in both genera exhibit marked sexual dimorphism, with the females being more rounded or globular, relatively more lightly chitinized, and bearing more slender pereopods. Males are usually smaller, flatter or less inflated, more strongly chitinized, and bear relatively more robust pereopods than their

female counterparts. Moreover, females are confined for the most part to the interior of an invertebrate host, usually a bivalve mollusc, echinoderm, or tubicolous polychaete worm, whereas males are usually collected free-living (although they are occasionally found with females within a host animal).

Wells (1928) provided revised diagnoses for both *Fabia* and *Pinnotheres*. He distinguished the genus *Fabia* using the presence of longitudinal sulci leading back from the orbits, a subquadrate carapace, the merus of the outer maxilliped large and with the last joint of the palp attached to the preceding one on the inner margin, and with the second walking legs the longest. Contrarily, *Pinnotheres* was recognized by the lack of longitudinal sulci behind the orbits, a suborbicular carapace, the last palp joint attached to the preceding either at its inner margin or at the anteroexternal angle, and with all walking legs subequal. However, at least one of these characters, that of the longitudinal sulci (and one relied on primarily by Rathbun in her 1918 key to the genera of pinnotherids), may become obscure with hardening of the carapace in adult males of the genus *Fabia*. Another character, the positioning of the propodal-dactylar junction on the outer maxillipeds, also shows substantial and non-restricted variation among species of *Pinnotheres* and *Fabia*, as a perusal of Rathbun's (1918) monograph will show. Davidson (1969) in a re-examination of the *Pinnotheres concharum* complex showed that at least two species of *Fabia* were unrecognized within available specimens of the group, and that the type female should be reassigned as *Fabia concharum* (Rathbun, 1893).

Garth, in 1948, summarized the problem succinctly and his remarks are still worth quoting:

"Because of the dissimilarity of the sexes and the fact that many more *Pinnotheres* [or *Fabia*, my emphasis] species are known from the male than from the female, it is not possible to suggest the affinities of . . . new species within the genus." (Garth 1948:55).

In the new species most importance was placed on the morphology of the third maxilliped, and the relatively greater length of the second walking leg compared to the others. These characters, plus the general shape of the carapace, the fringes of hair on the carapace and pereopods, and abdominal somites (all of which were more equivocal) suggested that the crab be assigned to the genus *Fabia*. Because so few gonopods have been described or illustrated within the *Pinnotheres-Fabia* complex the morphology of this appendage was less useful at present.

Fabia felderi is thus another species in a small group of pinnotherid crabs which show at least superficial similarities among each other, including a suboctagonal, subhexagonal, subpen-

tagonal, subquadrate or subcircular carapace (depending on the author's considerations), a produced frontal region rimmed with a heavy fringe of hair, some type of pilosity on the anterolateral margins of the carapace, a well-developed fringe of setae along all pereopodal borders, and a similar general positioning of the palp on the merus of maxilliped 3. In the western Atlantic these include *Pinnotheres* (?*Fabia*) *depressus* Say, 1817, and *Pinnotheres* (?*Fabia*) *barbatus* Desbonne, 1867. In the eastern Pacific *Fabia* (ex. *Pinnotheres*) *concharum* (Rathbun, 1893), *Fabia subquadrata* Dana, 1851, and *Pinnotheres* (?*Fabia*) *malaguena* Garth show closest similarities.

Fabia felderi can be distinguished from all of these species by a number of characters (Table 1). But because only the male of *F. felderi* is known any comparisons must at present be restricted to the males of species just named. Inasmuch as several of the characters providing generic or even specific distinction are shared among both *Fabia* and

Table 1. Comparison of morphological characters in six species of pinnotherid male crabs.*

Characters	<i>F. felderi</i>	<i>P. barbatus</i>	<i>P. depressus</i>	<i>P. malaguena</i>	<i>F. subquadrata</i>	<i>F. concharum</i>
Carapace	Suboctagonal	Suborbicular	Suborbicular	Suboctagonal	Subhexagonal	Subpentagonal
	Smooth	Paired pits	Smooth	Smooth	Medially sulcate	Faint gastric sulcus
Front	Hirsute; prominent	Densely bearded; little advanced	With dense hair; advanced	Heavy fringe of hair; advanced	Coarse setae; projected	Thickly margined with hair, projected
Anterolateral	Fringed with hairlike setae	Without hair	Hairy	With shaggy hair	Coarse setae	Short dense pubescence
Chelipeds	Stout; heavily hirsute	Stout; pubescence covering chela	Very stout; margins hairy	Stout; dense fringing hairs	Stout; margined with hair	Stout; margined with band of coarse setae
Maxilliped 3	Propodus and dactylus parallel, subequal in size and length	Dactylus terminal to propodus, very much smaller, shorter	Propodus and dactylus parallel, dactylus very much reduced; shorter	Propodus and dactylus parallel, dactylus reduced, subequal in length	Propodus and dactylus parallel, dactylus smaller, subequal in length	Propodus and dactylus parallel, dactylus smaller, shorter
Propodus	With medial transverse ridge	No medial ridge	No medial ridge	With medial transverse ridge	No medial ridge	No medial ridge
Abdomen	Somites 6 and 7 partially fused	No fused somites	No fused somites	Somites 5-7 fused	No fused somites	No fused somites
Somite 7	Subrectangular	Rounded	Rounded	Semicircular	Semicircular	Trapezoidal
Greatest width	Somite 3	Somites 1,3	No data	Somite 3	Somite 2	Somite 3
Male gonopod	Curved cylinder, tip knifelike	No data	No data	Curved cylinder, tip undeveloped	Sinuuous cylinder tip undeveloped	Curved cylinder tip little developed
Other Features	Differs in each of the following features→ (see text)	Carapace undersurface densely bearded	Pereopod 5 propodus greatly expanded	Pereopod 2 dactylus with plumose hairs	Abdominal somite 6 constricted distally	Carapace dorsally flattened

*Data from Desbonne and Schram (1867), Rathbun (1918), Wells (1928), Garth (1948), Davidson (1968).

Pinnotheres (Table 1), a reassessment of the generic placement for *Fabia felderi* may be warranted at some future date. Of particular importance in this regard would be maxillipedal characters, especially the size of the merus and the relative size and positioning of the propodus and dactylus of the palp. Male gonopodal characters, so useful in phylogenetic assessment of other brachyurans, should also prove of value. One possible solution would be that at least some species of *Fabia* might eventually be relegated as subgenera to *Pinnotheres*, especially if the generic definition of that taxon is revised and expanded. On the other hand, the Pinnotheridae exhibit some diversity in larval forms, with at least three different zoeal morphologies recognized within *Pinnotheres* or *Fabia sensu lato*. Perhaps examination of larval stages from the various species will shed additional light on the taxonomic structuring of this interesting brachyuran family.

Etymology. — The species is named for Darryl L. Felder, friend, colleague and cajun-style gourmet extraordinaire.

ACKNOWLEDGMENTS

I thank members of the staff of Harbor Branch Foundation, Inc., Ft. Pierce, Florida for placing the specimen at my disposal. Charisse I. Baker made the preliminary illustrations of the specimen. Dr. Patsy A. McLaughlin, Florida International University, Miami, graciously loaned her camera lucida, thus allowing completion of the illustration herein. Suggested changes by two anonymous reviewers improved the quality of the manuscript.

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