

MITHRAX (MITHRACULUS) COMMENSALIS, A NEW WEST INDIAN
SPIDER CRAB (DECAPODA, MAJIDAE) COMMENSAL WITH A SEA
ANEMONE

BY

RAYMOND B. MANNING

Department of Invertebrate Zoology, Smithsonian Institution, Washington, U.S.A.

The crab described below was collected on the West Indian island of Dominica during my participation in the Bredin-Archbold-Smithsonian Biological Survey of Dominica in the spring of 1966. The assistance of Horton H. Hobbs, Jr., Smithsonian Institution, in promoting this opportunity and the support of the Biological Survey by J. Bruce Bredin and John D. Archbold are gratefully acknowledged. I also thank Fenner A. Chace, Jr., Horton H. Hobbs, Jr. and Henry B. Roberts for their comments on the manuscript. The figures are by the departmental illustrator, Carolyn Bartlett Gast.

Mithrax (Mithraculus) commensalis new species (pl. 1, pl. 2 figs. 1b, 2b)

Holotype. — 1 ♂, carapace length 13.6 mm; Rodney's Rock, north of Roseau, Dominica, West Indies; collected on disk of sea anemone, probably *Stoichactis* sp.; R. B. Manning, collector; 28 February 1966; USNM 127309.

Paratypes. — 1 ♂, carapace length 8.6 mm; 2 ♀, carapace lengths 12.1-12.7 mm; rocky point south of Mahaut village, Dominica, West Indies; collected on disc of sea anemone, probably *Stoichactis* sp.; R. B. Manning, collector; 2 March 1966; USNM 127310.

Other material. — 1 ♂, carapace length 12.2 mm; Mosquito Bay, Saint Thomas; 2 fathoms; C. R. Shoemaker Sta. 12; 21 July 1915; USNM 50374. — 1 ovigerous ♀, carapace length 19.4 mm; Groote Baai, Saint Martin; between stones and algae; August 1905; USNM 42997.

Diagnosis. — Carapace longer than broad; 3 tuberculiform anterolateral teeth; 2 teeth on anterior margin of basal antennal segment; chela densely pubescent, smooth, lacking sharp tubercles or spinules on inner and outer margin of merus or carpus.

Description. — Carapace oval, smooth to the unaided eye, length along midline 1.05 to 1.18 times greatest width, broadest in larger specimens; dorsal surface of carapace with few low, rounded tubercles, and with scattered pubescence, densest and longest anteriorly. Regions of carapace well marked, separated by shallow furrows. Cardiac region oval, with 3 smooth, low bosses. Intestinal region smooth, slightly inflated. Branchial regions with 2 shallow oblique sulci; mesobranchial region with 2 rounded bosses medially, posteriormost largest. Rostral spines short, rounded, with broad U-shaped median sinus; pair of rounded subfrontal prominences present at level of preorbital tooth. Prominent, rounded preocular and postocular teeth present. Hepatic region unarmed laterally but with low, obtuse pro-

minence in some specimens. Three distinct tubercles present on outer margin of branchial region, posterior 2 usually sharper, smaller than anteriormost. Basal antennal article longer than broad, anterolateral spine sharp or rounded, not exceeding preorbital tooth, inner tooth blunter, smaller. Pterygostomian region smooth, unarmed.

Chelipeds slightly longer than carapace, completely covered with short, dense pubescence, merus with low tubercles on outer margin, carpus smooth, sometimes with a low tubercle on inner distal margin. Fingers of cheliped gaping, dactylus with irregular, rounded tooth basally; spoon-shaped tips of fingers crenulated. Walking legs decreasing in length posteriorly, smooth, densely pubescent, with scattered longer setae; dactylus of walking legs with sharp tubercles on ventral margin.

Male abdomen and gonopods as figured.

Color. — Body light brown, with light yellow or white markings. Carapace with 3 whitish patches, anterolateral and posteromedian. Cheliped with ischium and merus brown, carpus whitish, most of propodus brown, darker near articulation of dactylus; dactylus whitish with dark brown band at midlength. Walking legs banded, merus with 1 brown band, carpus whitish with dark spot dorsally, propodus with 1 brown band, dactylus with 2 narrower brown bands. Most pigment retained in preservative, although banding of appendages and anterolateral spots of carapace difficult to detect in some specimens after three years in preservative (formalin used as a fixative, 70% ethyl alcohol as preservative).

Size. — Males, carapace lengths 8.6 to 13.6 mm, carapace widths (without spines) 7.3 to 12.2 mm; females, carapace lengths 12.1 to 19.4 mm, carapace widths (without spines) 10.8 to 18.5 mm.

Etymology. — The name alludes to the association of the crab with the anemone.

Discussion. — *Mithrax* (*Mithraculus*) *commensalis* new species agrees with *M. cinctimanus* (Stimpson) (pl. 2 figs. 1a, 2a) and differs from all other species of the subgenus *Mithraculus* in having the carapace elongate, with the median length greater than the maximum width (exclusive of spines). The new species is very similar to *M. cinctimanus*; even the color patterns of the two species are identical or nearly so. However, *M. commensalis* is a smoother species, with the body ornamentation less developed and the surface pubescence of the carapace and legs better developed than in *M. cinctimanus*. The new species can be distinguished from *M. cinctimanus* by the following characters: (1) There are only three rather than four anterolateral teeth, exclusive of the outer orbital tooth; the fourth or anteriormost tooth, on the hepatic region, is represented in *M. commensalis* by, at most, an obtuse prominence. (2) The carapace is smoother, less tuberculate, with the regions defined by shallower grooves, and the surface is densely pubescent. (3) The chelipeds and walking legs are densely pubescent and almost smooth,

lacking sharp tubercles or spines on the merus and carpus of the chelipeds and on the merus of the walking legs. The chelae and walking legs of *M. commensalis* and *M. cinctimanus* are contrasted in pl. 2 figs. 1 and 2; the disparity in proportions may be a result of the size difference of the two specimens figured, for the illustrated specimen of *M. cinctimanus* is almost half again as large as the illustrated specimen of *M. commensalis*, the holotype.

Of the specimens recorded by Rathbun (1925) from the Caribbean as *M. cinctimanus*, only two, those listed under Other Material, above, can be identified with *M. commensalis*; neither of the two is accompanied by habitat data. The remainder of Rathbun's specimens are clearly identifiable with *M. cinctimanus*.

Perhaps the most interesting feature of *Mithrax commensalis* is its habitat. It was collected from the surfaces of broad, short tentacled, brown anemones, probably *Stoichactis* sp.; it was not observed free living in adjacent areas. In the area near Mahaut Village, Dominica, the anemones were aggregated in broad colonies, each comprising 20 to 30 individuals, with the aggregation perhaps 10 to 15 feet in diameter or larger. In addition to the spider crabs, a palaemonid shrimp, *Periclimenes rathbunae* Schmitt, and possibly two species (or two color phases of one species) of the hippolytid genus *Thor* were also found to be associated with the anemones and were collected. The two hippolytids differed from one another in color pattern. One exhibited a pattern similar to that found in the littoral western Atlantic species, *Thor floridanus* Kingsley, with the body predominantly clear, marked with red and white. The other bore a color pattern similar to that found in the Indo-West Pacific *Thor amboinensis* (De Man) (= *Thor discosomatis* Kemp; see Holthuis, 1947), with a brown background, a white saddle on the carapace, and lateral white spots on the carapace and abdomen; the color pattern of this shrimp is similar to that found on the *Mithrax*, brown with white spots. *Thor amboinensis* is associated with similar sea anemones in the Indo-West Pacific. The specimens of *Thor* are being studied in more detail by Fenner A. Chace, Jr., who is preparing a report on the shallow-water carideans of the Caribbean.

A survey of the literature, primarily with the aid of recent general accounts of commensal decapods by Balss (1956) and Patton (1967), revealed no other references to a majid crab living as a commensal with an anemone; so far as I can determine, this is the first observation of such a relationship. In addition, no reports were found on other decapods living in association with *Stoichactis* in the Atlantic, although several species, including a palaemonid shrimp, *Periclimenes brevicarpalis* (Schenkel), a porcellanid crab, *Neopetrolisthes oshimai* Miyake, a snail, *Coralliophila stearnsii* Pilsbry, and fishes of the genera *Actinicola* and *Amphiprion*, are known to be associated with *Stoichactis* in the Indo-West Pacific region (Kemp, 1916; Miyake, 1937; Gordon, 1960; Jacquotte, 1964; Miyake & Hayashi, 1966). Gordon (1960) summarized references on the porcellanid-sea anemone relationship. In addition, Patton (1966) recorded *T. amboinensis* from corals in Australia; this species obviously has developed commensal relationships with a variety of hosts.

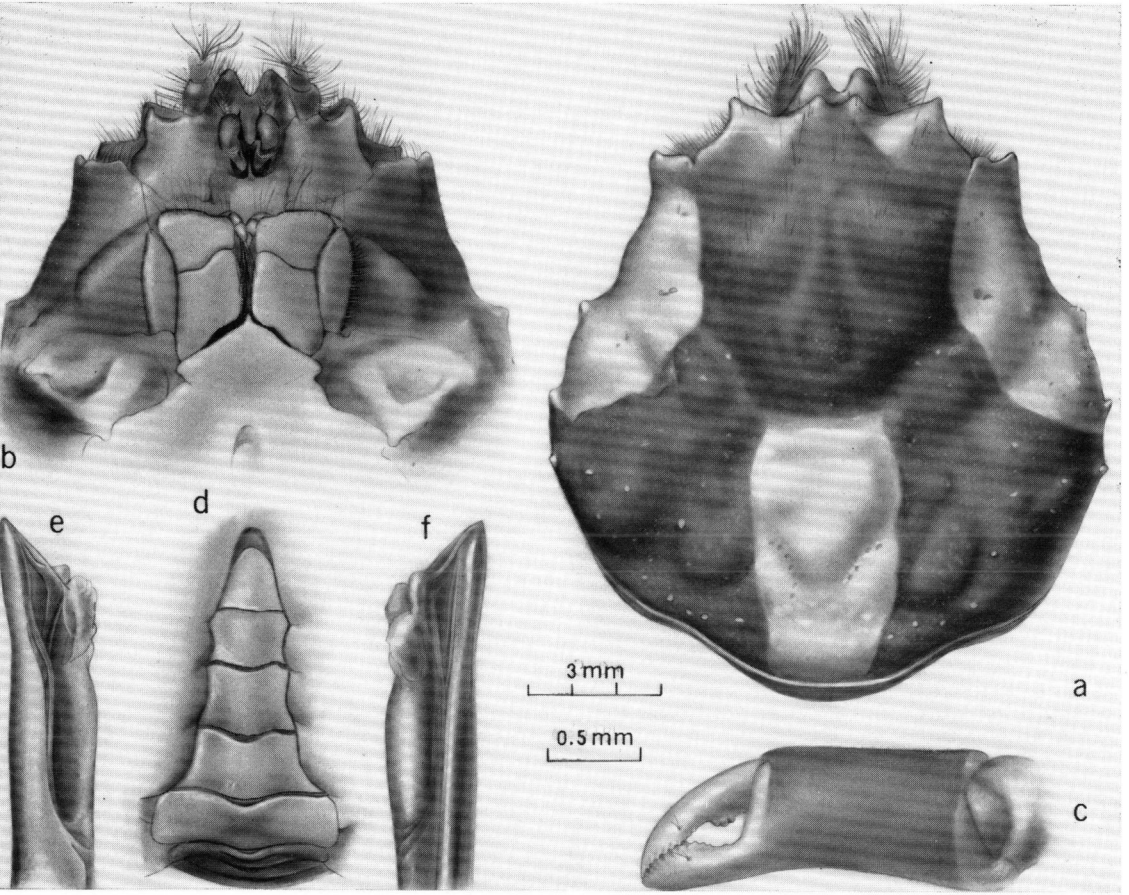
The biology of *M. commensalis* and its relationship to the free living *M. cinctimanus*, which it closely resembles and from which it may have been derived, should provide areas of fruitful investigation in the future. So far as I can determine, *M. cinctimanus* is a free living species the range of which in the Caribbean Sea encompasses that of *M. commensalis*.

ZUSAMMENFASSUNG

Eine neue Spinnenkrabbenart, *Mithrax (Mithraculus) commensalis*, wird aus westindischen Gewässern beschrieben. Die Unterschiede gegenüber der nahe verwandten Art *Mithrax (Mithraculus) cinctimanus* werden erörtert. Die neue Art ist dadurch besonders interessant, dass sie kommensal auf Seerosen gefunden wurde, die wahrscheinlich zur Gattung *Stoichactis* gehören.

LITERATURE CITED

- BALSS, H., 1956. Decapoda [Ökologie]. In: H. G. BRONN, Klassen und Ordnungen des Tierreichs, **5** (1) (7) (11): 1369-1504, figs. 1070-1130.
- GORDON, ISABELLA, 1960. Additional note on the porcellanid sea-anemone association. *Crustaceana*, **1** (2): 166-167.
- HOLTHUIS, L. B., 1947. The Hippolytidae and Rhynchocinetidae collected by the Siboga and Snellius Expeditions with remarks on other species. The Decapoda of the Siboga-Expedition, 9. Siboga-Expedition, Monogr., **39** (a) (10): 1-100, figs. 1-15.
- JACQUOTTE, R., 1964. Sur l'association de quelques Crustacés avec des Cnidaires récifaux dans la région de Tuléar (Sud-ouest de Madagascar). Notes de faunistique et de biologie marines de Madagascar, 1. Rec. Trav. St. mar. Endoume, **32** (48): 175-178.
- KEMP, S., 1916. Further notes on the Hippolytidae. Notes on Crustacea Decapoda in the Indian Museum, 7. Rec. Indian Mus., **12** (8): 385-405, pl. 36, text figs. 1-5.
- MIYAKE, S., 1937. A new crab-shaped anomuran living commensally with a gigantic sea-anemone (*Neopetrolisthes oshimai* gen. et sp. nov.). *Zool. Mag., Tokyo*, **49** (1): 34-36, figs. 1-2.
- MIYAKE, S. & K. HAYASHI, 1966. Some hippolytid shrimps living in coral reefs of the west Pacific. *Journ. Fac. Agric., Kyushu Univ.*, **14** (1): 143-159, figs. 1-10.
- PATTON, WENDELL K., 1966. Decapod Crustacea commensal with Queensland branching corals. *Crustaceana*, **10** (3): 271-295, figs. 1-3.
- , 1967. Commensal Crustacea. Symposium on Crustacea, mar. biol. Assoc. India, **3**: 1228-1243.
- RATHBUN, M. J., 1925. The spider crabs of America. *Bull. U. S. nation. Mus.*, **129**: i-xx, 1-613, pls. 1-283, figs. 1-153.



Mitbrax (Mitbraculus) commensalis new species, male holotype: a, carapace; b, frontal region, ventral view; c, left chela; d, abdomen; e, f, gonopod in caudal and cephalic views. a-d to upper scale, e-f to lower scale.

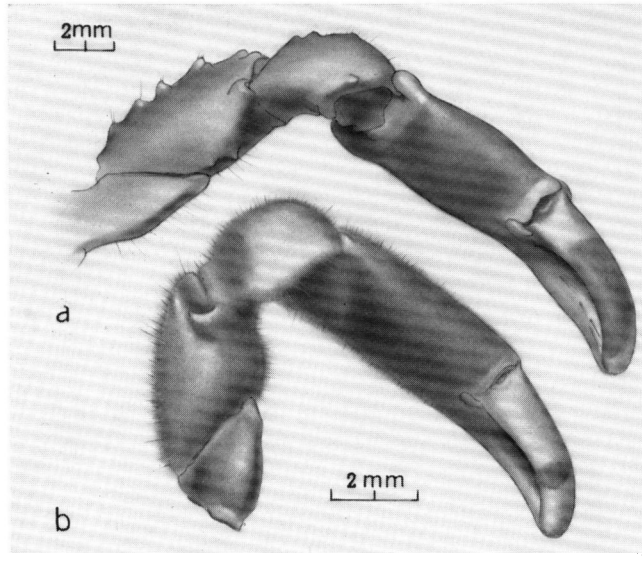


Fig. 1. Left chela. a, *Mitbrax (Mitbraculus) cinctimanus* (Stimpson), male, carapace length 18.7 mm, Jamaica, USNM 17963. b, male holotype of *Mitbrax (Mitbraculus) commensalis* new species.

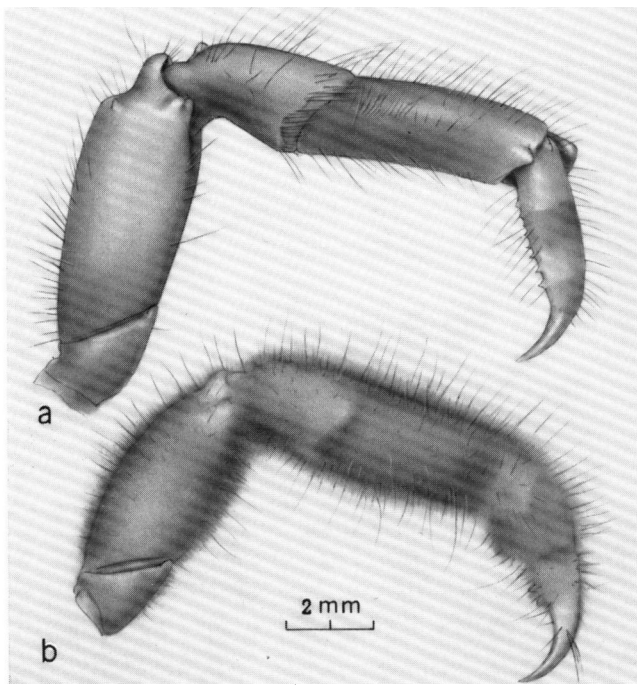


Fig. 2. Fifth pereiopod. a, *Mitbrax (Mitbraculus) cinctimanus* (Stimpson) (same specimen illustrated in fig. 1a); b, male holotype of *Mitbrax (Mitbraculus) commensalis* new species. a and b to same scale.