

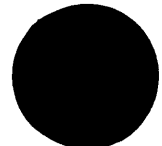
Campos, 1990  
 E. Campos  
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PARTIAL REVISION OF PINNOTHERID CRAB GENERA WITH  
 A TWO-SEGMENTED PALP ON THE THIRD MAXILLIPED  
 (DECAPODA: BRACHYURA)

Ernesto Campos

ABSTRACT

Two new genera in the Pinnotheridae are recognized from the northwestern Atlantic, *Gemmothers*, new genus (type species *Pinnotheres chamae* Roberts, 1975) and *Tunicotheres*, new genus (type species *Pinnotheres moseri* Rathbun, 1918). These genera shared a 2-segmented palp on the third maxilliped with *Calyptraeotheres* Campos, 1990, *Dissodactylus* Smith, 1870, *Ostracotheres* H. Milne Edwards, 1853, and *Xanthasia* White, 1846. They differ in shape, texture, and hardness of the carapace, shape and relative length of third maxilliped articles, relative length of the walking legs, and relative length and shape of their articles. Comparisons among these genera are provided in a dichotomous key based on adult female characters.



During the last five years I have studied the systematics of a subgroup of pinnotherid crabs which are characterized by a two-segmented palp on the third maxilliped (lacking a dactylus). The first result of this study was the erection of the genus *Calyptraeotheres* Campos, 1990 (type species *Fabia granti* Glassell, 1933) from the Mexican Pacific. This work led to the systematic reassessment of the remaining American Pinnotheridae with a two-segmented palp on the third maxilliped, *Pinnotheres moseri* Rathbun, 1918, and *P. chamae* Roberts, 1975. The analysis of several morphological and ecological features has led to the conclusion that: (1) *P. moseri* and *P. chamae* do not belong in the genus *Pinnotheres* Bosc, 1802 [type species *P. pisum* (Linnaeus, 1767)] or any other named genera in the Pinnotheridae, and (2) several autapomorphies separate these taxa at the generic level.

MATERIALS AND METHODS

All nominal genera in the Pinnotherinae sensu lato (see Rathbun, 1918; Tesch, 1918; Schmitt *et al.*, 1973) were analyzed, most by study of actual specimens. In some cases, e.g., *Durkheimia besutensis* Serène, 1967, *Ostracotheres affinis* H. Milne Edwards, 1853, and those genera named in Manning (1993b), it was necessary to rely on descriptions and figures in current literature.

Specimens of *Pinnotheres chamae*, *P. moseri*, and *Dissodactylus mellitae* Rathbun, 1900, were studied from material deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; *Ostracotheres tridacnae* (Rüppell, 1830) (type species of *Ostracotheres* H. Milne Edwards, 1853), *Ostracotheres cynthiae* Nobili, 1905b, and *O. spondyli* Nobili, 1905a, from the Nationaal Natuurhistorisch

Museum, Leiden, and Muséum National d'Histoire Naturelle, Paris; and *Calyptraeotheres granti* (Glassell, 1933), *O. subglobosus* (Baker, 1907), *O. holothuriensis* (Baker, 1907), *Epulothers* sp., and other genera with a three-segmented palp (see Campos, 1993; Manning, 1993a), including *P. pisum* (Linnaeus, 1767) (type species of *Pinnotheres* Bosc, 1802), from the Invertebrates Collection, Facultad de Ciencias, Universidad Autónoma de Baja California, México. Original figures were made with a camera lucida. Measurements are in mm. The third maxilliped is abbreviated to MXP3 and the walking legs are indicated as WL1-WL4. The diagnoses and key are based on adult females only.

SYSTEMATICS

*Gemmothers*, new genus

Figs. 1A-C, 2A-F

*Diagnosis*.—Carapace suborbicular, soft, smooth, membranous, widest medially, regions undefined, lacking both sharp anterolateral border and longitudinal depressions (sulci), front deflexed, narrow. Eyes not visible in dorsal view. MXP3 with ischium and merus indistinguishably fused, inner distal angle of merus absent; palp 2-segmented, carpus shorter but wider than styliform propodus. Exopod with incompletely bisegmented flagellum. WL symmetrical except second pair with left dactyl longer than right one; relative lengths of right WL 1 > 3 > 4 > 2, of left WL 1 > 2 > 3 > 4; relative lengths of right dactyli 4 > 3 > 2 = 1, of left dactyli 4 = 2 > 3 > 1. Abdomen wider than long, 6 somites and telson free.

Male.—Unknown.

*Type Species*.—By present designation and monotypy *Pinnotheres chamae* Roberts, 1975.

*Etymology*.—From the Latin *gemma*, jewel, and the ending *theres*.

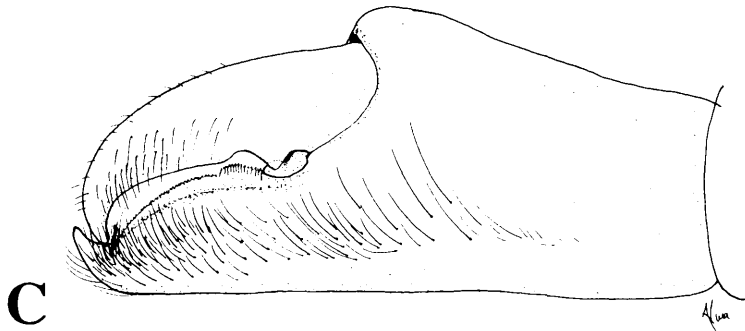
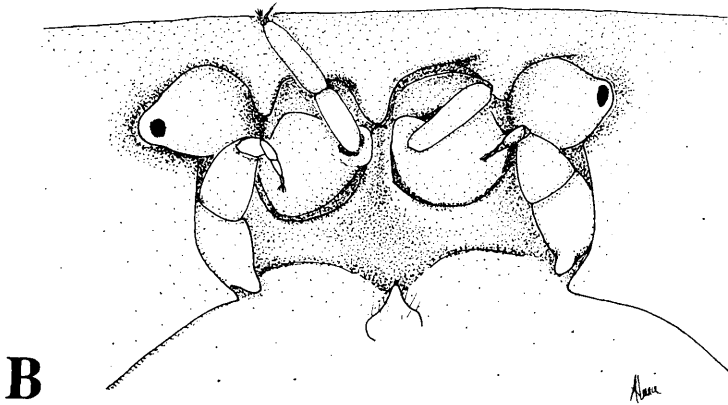
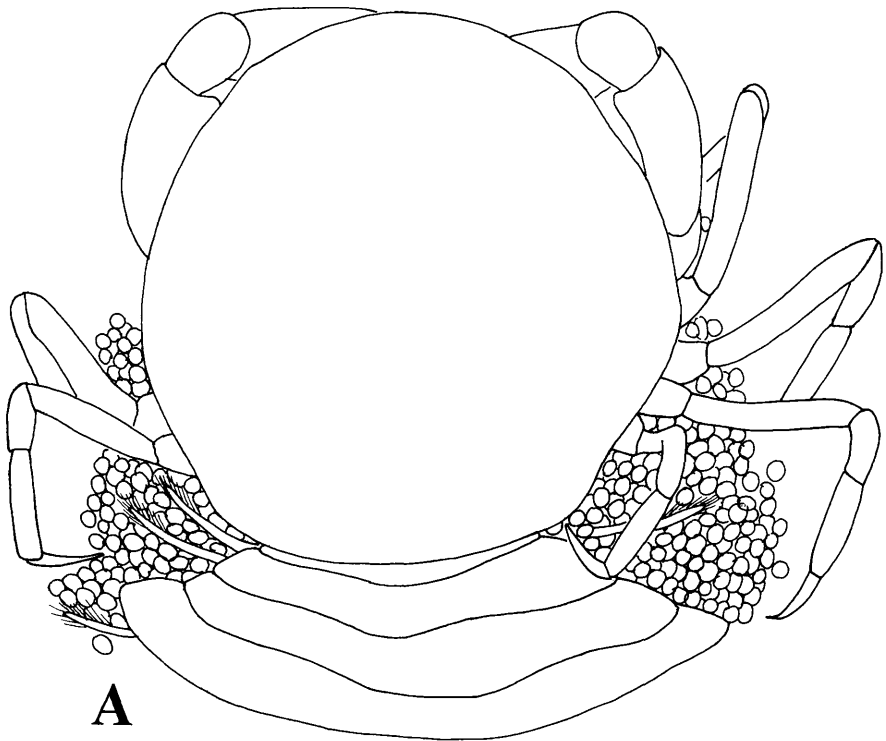


Fig. 1. *Gemmotheres chamae* (Roberts, 1975). Female. A, dorsal view; B, frontal view; C, chela. Carapace width = 5.0 mm.

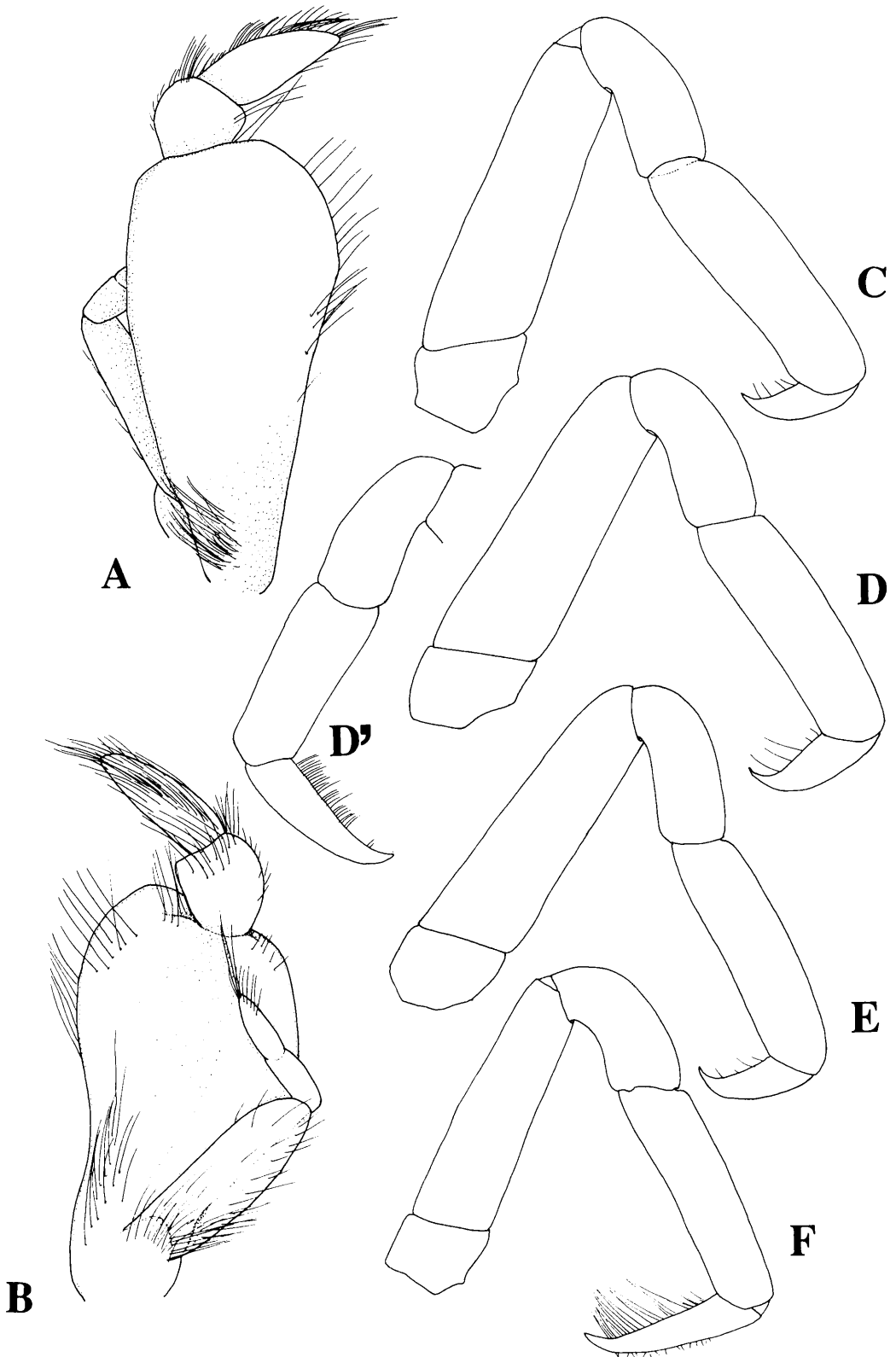


Fig. 2. *Gemmotheres chamae* (Roberts, 1975). Female. A, B, MXP3, outer and inner face, respectively; C-F, right WL 1-4; D', carpus, propodus, and dactylus of left WL2.

*Gender*.—Feminine.

*Host*.—In the jewel box *Chama congregata* (Bivalvia) attached to coral nodules (Roberts, 1975).

*Distribution*.—Known only from the type locality, off the North Carolina coast, U.S.A.

*Remarks*.—See below.

***Tunicotheres*, new genus**

Fig. 3A, B, 4A–F

*Diagnosis*.—Carapace subpentagonal, firm but not hard, uneven, dorsal regions elevated and well defined, front produced, arcuate, medially emarginated, anterolateral border rounded. Eyes visible in dorsal view. MXP3 with ischium and merus indistinguishably fused, inner angle of merus absent; carpus subquadrate with rounded distal angles, shorter than oblong propodus. Exopod with one-segmented flagellum. WL slender, symmetrical, relative length  $2-4 > 1$ , WL4 articulated to body dorsad to WL3, dactyli with straight base and curved spiniform tip, those of last pair longer, swimming setae on WL2 and WL3. Abdomen longer than width, with medial longitudinal elevation, of 6 somites and telson free.

Male.—Unknown.

*Type Species*.—By present designation and monotypy, *Pinnotheres moseri* Rathbun, 1918.

*Etymology*.—From Latin, *tunica*, tunic, and the ending, *theres*.

*Gender*.—Feminine.

*Hosts*.—Commensal in ascidians, *Ascidia nigra* Savigny, *Molgula occidentalis* Traustedt, and *Polycarpa obtecta* Traustedt (see Goodbody, 1960; Roberts, 1975). Also from sea squirts, dredged in 17 feet (5.5 m) from "... rocky bottom covered with grass and thin layers of sand and mud ... " (Rathbun, 1918).

*Distribution*.—Western Florida; Jamaica.

*Remarks*.—Campos (1990) pointed out that five genera in the Pinnotheridae contain one or more species with the palp of MXP3 composed by two segments (see below). *Durckheimia* should not have been included, since its type species, *D. carinipes* de Man, 1889, has a carapace with a longitudinal ridge, upturned margins, and three segments on the palp of MXP3 (see Bürger,

1895; Serène, 1967), but *D. besutensis* Serène, 1967, possesses a two-segmented palp. The species *besutensis* was erroneously assigned within *Durckheimia*. In addition to the two-segmented palp on MXP3, *besutensis* differs from *Durckheimia* spp., as follows: carapace dorsally and ventrally irregularly pitted, lacking longitudinal ridge and upturned margins; MXP3 with ischium and merus indistinguishably fused, lacking inner angle, and exopod tapering distally with inner and outer margins concave and flagellum one-segmented (see Serène, 1967, figs. 4, 5). The generic status of *besutensis* remains uncertain, but it definitely does not belong in *Durckheimia*.

Based on the material studied, and from accounts in Serène (1967) and Campos (1990), I recognize six genera in the Pinnotheridae sensu lato with a two-segmented palp on MXP3: *Calyptraeotheres* Campos, 1990, *Dissodactylus* Smith, 1870, *Gemmotheres*, new genus, *Ostracotheres* H. Milne Edwards, 1853, *Tunicotheres*, new genus, and *Xanthasia* White, 1846. The genus *Epulotheres* Manning, 1993c, has three segments in the palp of MXP3 instead of two as originally diagnosed (Manning, personal communication).

As noted in the taxonomic key given below, the genera *Gemmotheres* and *Tunicotheres* resemble *Ostracotheres*. Fundamental morphological differences between these genera including shape, texture and hardness of the carapace, shape and relative length of MXP3 articles, and relative length of WL and relative length and shape of their articles, particularly the propodus and dactylus. Manning (1993c) discussed several bioecological features of *T. moseri* (Rathbun) and *G. chamae* (Roberts). Both are symbionts of different kinds of host, Mollusca-Bivalvia and Urochordata-Ascidiacea, respectively. This is interpreted as divergent traits and provide support for the proposed new genera.

KEY TO PINNOTHERID CRAB GENERA WITH 2-SEGMENTED PALP ON MXP3, BASED ON ADULT FEMALES

1. Dactyli of WL bifurcated in both male and female  
 . . . . . *Dissodactylus* Smith, 1870 (West Atlantic [U.S.A. to Brasil]; East Pacific [Mexico to Peru]; type species *Dissodactylus nitidus* Smith, 1870; hosts, Echinodermata–Echinoidea: *Clypeaster*, *Echiarachnius*, *Encope*, *Leodia*, *Mellita*, *Plagiobrissus*)

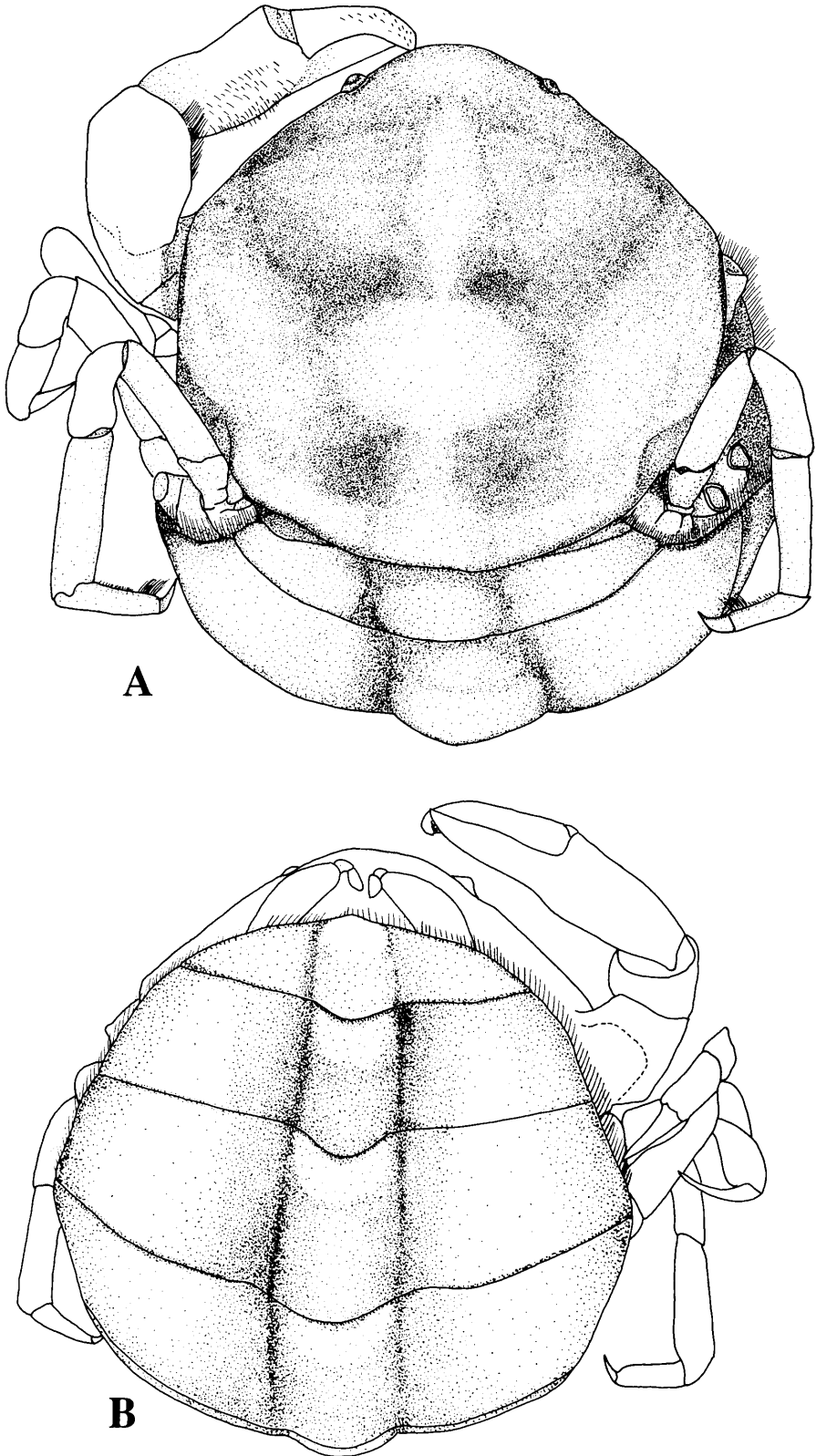


Fig. 3. *Tunicotheres moseri* (Rathbun, 1918). Female. A, dorsal view; B, ventral view. Carapace width = 7 mm.

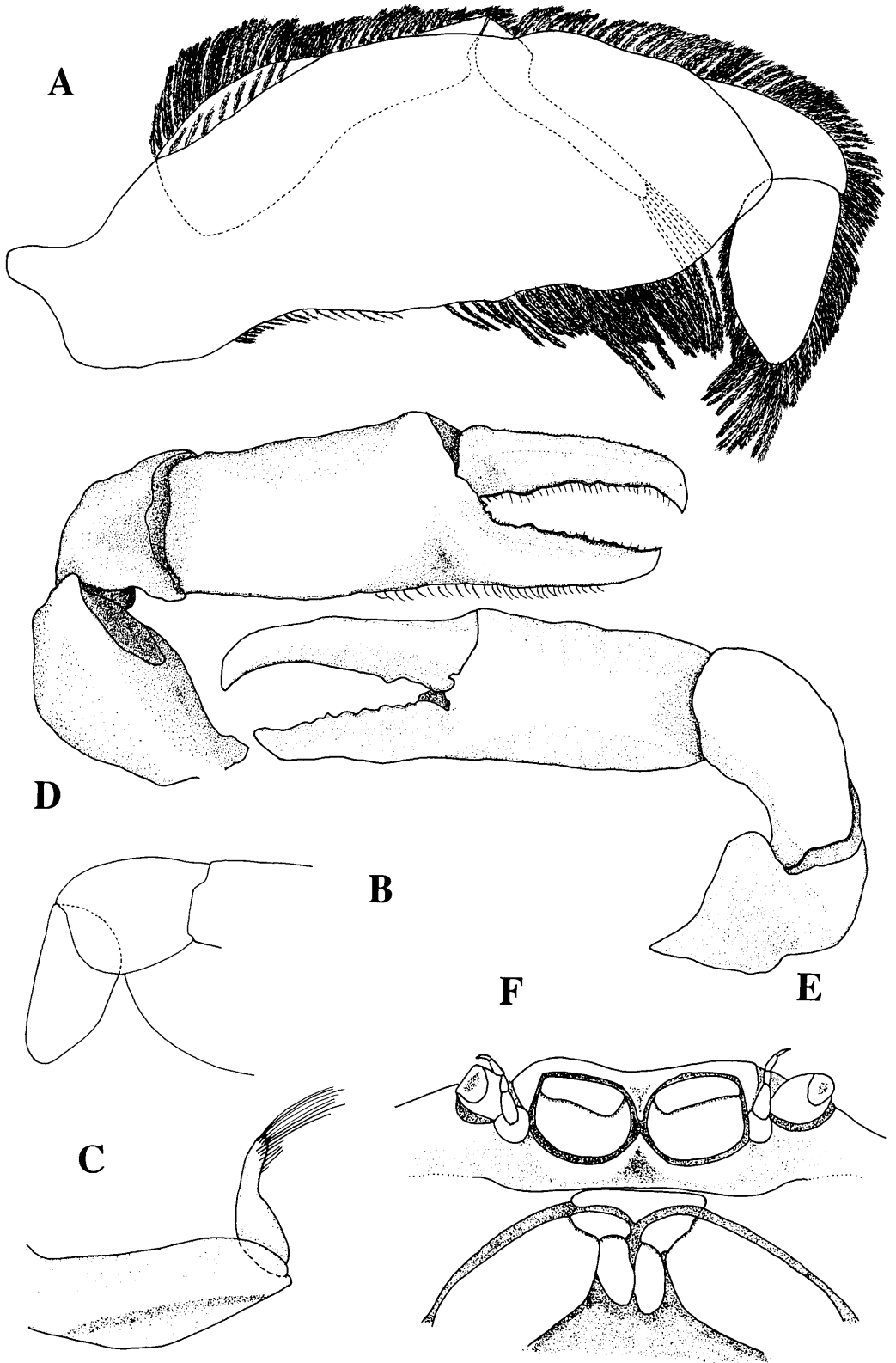


Fig. 4. *Tunicotheres moseri* (Rathbun, 1918). Female. A, B, MXP3, outer and inner face, respectively; C, exopod of MXP3; D, E, right cheliped, outer and inner face, respectively; F, frontal view.

- Dactyli of WL simple . . . . . 2
- 2. Carapace rounded, with upturned lateral margins and medial mushroom-shape tubercle . . . . .  
*Xanthasia* White, 1846 (Indo-west Pacific region; type species, *X. murigera* White, 1846; hosts, Mollusca-Bivalvia: *Mytilus*, *Tridacna*).
- Carapace without upturned lateral margins . . . 3
- 3. Carapace with sharp lateral margins, dorsally with 2 longitudinal depressions (sulci); carpus of MXP3 larger than propodus . . . *Calyptraeotheres* Campos, 1990 (Mexican Pacific region; type species *Fabia granti* Glassell, 1933; hosts, Mollusca-Gastropoda: *Crucibulum*, *Crepidula*, *Acmaea*).
- Carapace without sharp lateral margins and sulci . . . . . 4
- 4. Carapace suborbicular in shape, soft, membranous, regions undefined, eyes not visible in dorsal view, front not emarginated; MXP3 with inner distal angle of merus absent, propodus styliform . . . . *Gemmotheres*, new genus (Northwest Atlantic region; type species, *Pinnotheres chamae* Roberts, 1975; host, Mollusca-Bivalvia: *Chama*).
- Carapace firm but not hard, regions defined . . 5
- 5. Carapace subpentagonal in shape, antennae overreaching upper margin of orbits; MXP3 with inner distal angle of merus absent, carpus subquadrate in shape; WL4 articulated to body dorsad to WL3 . . . . . *Tunicotheres*, new genus (Caribbean Sea region; type species *Pinnotheres moseri* Rathbun, 1918; hosts, Chordata-Ascidiacea: *Ascidia*, *Molgula*, *Polycarpa*).
- Carapace broadly rounded; antennae minute; MXP3 with inner distal angle of merus curved, carpus rounded; WL4 articulated to body not dorsad to WL3 . . . . *Ostracotheres* H. Milne Edwards, 1853 (Northwestern Indian Ocean Region; type species *Pinnotheres tridacnae* Rüppell, 1830; host, Mollusca-Bivalvia: *Pinna*, *Tridacna*; questionably in ascidians).

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