

North American harpacticoid copepods 9. A new *Mesochra* (Canthocamptidae) from the Gulf of Mexico with notes on a related Mediterranean form

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PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON

NORTH AMERICAN HARPACTICOID COPEPODS 9.
A NEW *MESOCHRA* (CANTHOCAMPTIDAE) FROM
THE GULF OF MEXICO WITH NOTES ON A
RELATED MEDITERRANEAN FORM

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The cosmopolitan genus *Mesochra* includes a few species seemingly restricted to marine, brackish or fresh waters, and many others exhibiting varying degrees of euryhalinity. Since the genus belongs to a family dominated by freshwater genera either cosmopolitan or hemispherical in their distribution, it is one of considerable ecological and phylogenetic interest.

The new species described herein is from a collection made by Dr. Joel W. Hedgpeth and deposited in the Smithsonian Institution (accession no. 179561). An unnamed species recognized as "probablemente nueva" was briefly described by Margalef (1953) from a Mediterranean island. This form appears to be either a variant of the new Gulf of Mexico species or the two constitute a geographically separate taxonomic species-pair. I am indebted to Dr. Margalef (Barcelona) for sending me a prepared slide of one of his specimens. Characters ascertained from this slide are given below.

CANTHOCAMPTIDAE SENSU LANG, 1948

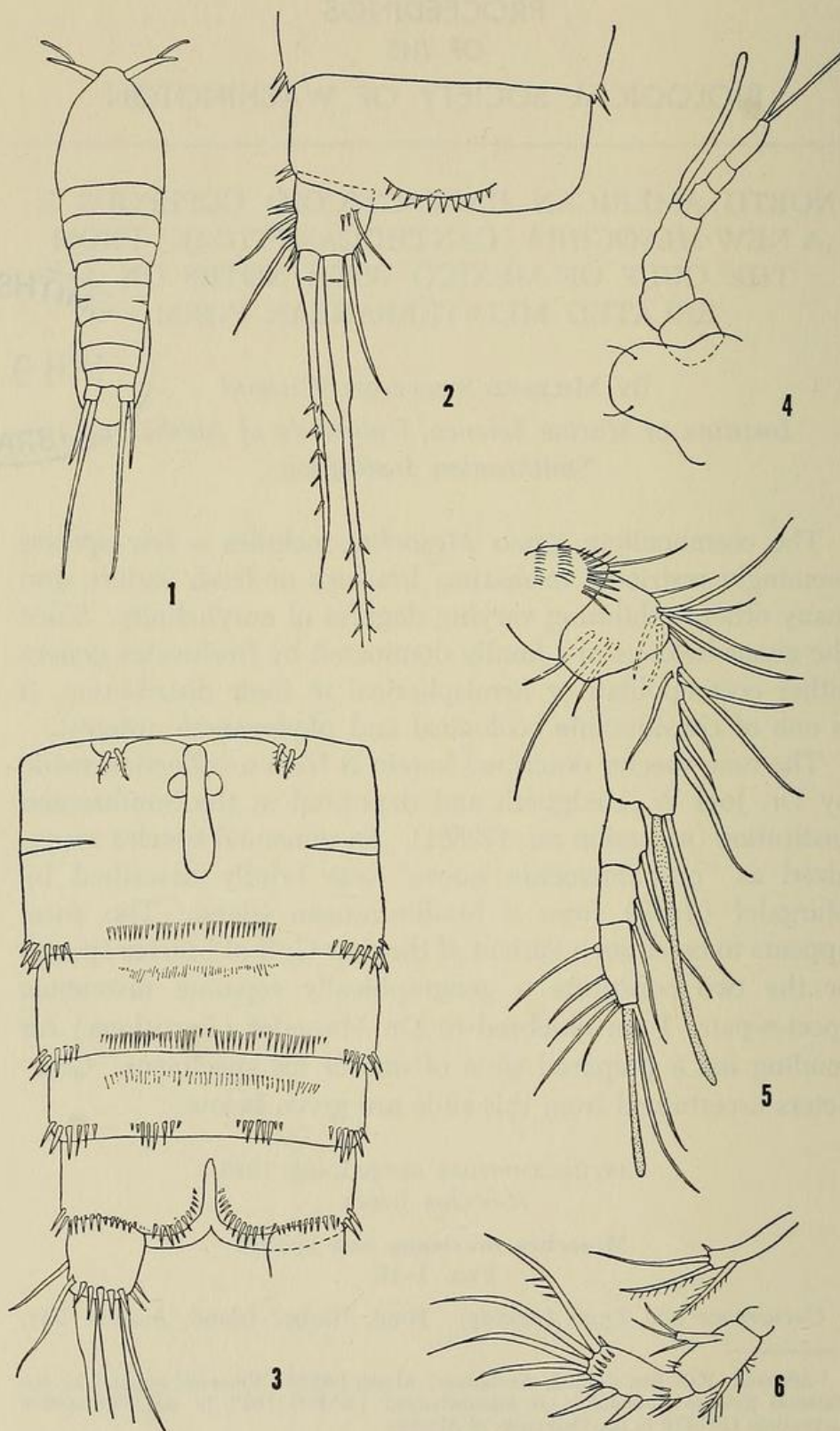
Mesochra Boeck

Mesochra mexicana new species

Figs. 1-15

Occurrence and Type Locality: Pond, Harbor Island, Aransas Bay,

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Aransas Co., Texas, U.S.A., about 28°N, 97°W; 24 March 1948; J. W. Hedgpeth, collector. Occurring with *Nitocra lacustris* (Schmankewitsch) and *Halicyclops fosteri* M. S. Wilson.

Specimens: 3 ♀, ovigerous. Holotype (whole, alcoholic), USNM 127666. Two paratypes dissected, USNM 127667.

Definition (♀): With characters of Group I of Lang (1948): Legs 2-4, exopod segment 3 with 3 spines; leg 1, endopod 3-segmented. Specific characters: Antennule 6-segmented, aesthete on third segment; leg 1, exopod segment 2 with inner seta, endopod segment 1 reduced, its actual length less than that of exopod segments 1 + 2; legs 2-4, endopod segment 2 with total of 5,6,5 setae of which 2,3,2 are on the inner margin; leg 5, exopod with 5 and basal expansion with 6 setae. Male unknown.

Description (♀): Total body length, dorsal midline (base of rostrum to apex of caudal rami): 0.45-0.495 mm.

Body (Fig. 1) robust, gradually tapered posteriorly; cuticle dark brown and thick obscuring any cuticular discs (defined areas of thin cuticle). Genital segment with transverse lateral sclerotizations at midpoint of length; external genital area, including leg 6, as shown in Figure 3; ovisac with 14-15 large ova.

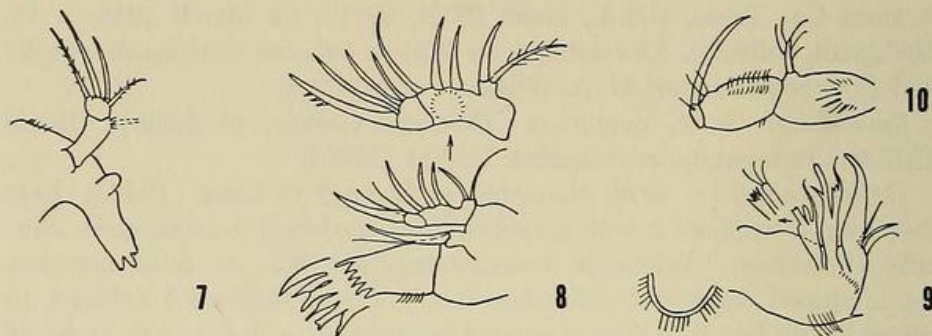
Ornamentation of urosome (genital and succeeding posterior segments, the latter referred to here as segments 2-4): Dorsally and ventrally, distal membrane of segments finely serrate and lateral edges with stout spinules. Ventrally (Fig. 3), a row of spinulose hairs in proximal center portions of segments 2 and 3; fine spinules of varying sizes at distal centers of genital and segments 2-3, those of segment 3 placed in two groups with gap at center of segment; groups of stout spinules of varied lengths continued from lateral groups over bases of caudal rami and along medial incision of last segment. Anal operculum (Fig. 2) with 10 stout spinules.

Caudal ramus (Figs. 2-3) a little longer than broad and a little shorter than outer margin of last body segment; tapered but not constricted distally; dorsal seta accompanied by a few spinules; stout spinules along outer margin, at distal inner margin and overlying caudal setae ventrally. Caudal setae well-developed, relative lengths (outer to inner): 3.2:7.4:1.0; both outer and middle setae swollen and jointed at bases and armed with stout spinules.

Rostrum (Fig. 4) broad throughout, produced forwards from base and prominent in dorsal view, the apex rounded. Antennule (Figs. 4-5) 6-

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FIGS. 1-6. *Mesochra mexicana* n. sp., female, all appendages (figs. 4-15), except fig. 5, drawn to same scale: 1, Habitus, outline of dorsum and ovisac; 2, anal segment with operculum and left caudal ramus with setae; 3, urosome, ventral, with legs 6, external genital area and detail spination of segments and caudal rami; 4, outline rostrum and antennule; 5, antennule with seta, enlarged; 6, antenna with detail exopod.



FIGS. 7-10. *Mesochra mexicana* n. sp., female: 7, Mandible (seta of segment 1 of palp shown by dashed lines); 8, maxillule, with enlarged detail apices gnathal lobe and second lacinia; 9, maxilla and sternal plate; 10, maxilliped.

segmented; the third segment (representing fused segments 3 and 4 of the normal canthocamptid antennule) the longest, subequal in length to segments 1 + 2; aesthete on third segment, reaching beyond apex of antennule by about one-third of its own length; segment 1 ornamented with groups of hairs and spinules, its single seta non-plumose; lateral setae of apical segment on basal joints, apical aesthete shorter than that of segment 3. Number of setae on segments of antennule:

1	2	3	4	5	6
1	10 (or 11)	7 (or 8)	1	2 (or 3)	7 (or 8)

(The variation in the number of setae was found on one side of a pair of appendages of one of the two dissected specimens. Because of the thickness of the cuticle and extraneous threadlike debris, it was not easy to make out the exact number of setae and the summary and illustration are presented as tentative.) Antenna (Fig. 6) with 2 setae on allobasis, the proximal spinelike, the distal the longer, plumose; palp (exopod) unsegmented, with 3 setae.

Oral appendages as characteristic for the genus, conforming to the canthocamptid type. Mandible (Fig. 7): Blade with the usual apical teeth and lateral seta; palp 2-segmented, seta of segment 1 probably present but broken in dissected specimens, segment 2 with 4 setae. Maxillule (Fig. 8): Gnathal lobe with 6 apical teeth modified as shown in illustration; first lacinia a simple lobe with 2 setae of unequal thickness; second lacinia elongate and 2-segmented, its first segment having near the base a lobe bearing 2 setae and 3 spinelike setae inserted singly along margin of segment, its second segment with 4 setae of which the apical is the stoutest and spiniform. Maxilla (Fig. 9) with 3 endites, the apices of the first two modified as illustrated, the third clawlike with 3 lateral setae. Maxilliped (Fig. 10) well-developed, basal segment and base of claw each bearing a seta. Sternal plate present between bases of maxilla and maxilliped (Fig. 9).

Leg 1 (Fig. 11): Exopod segment 2 with inner seta. Endopod segments 1 and 2 with inner setae, that of 1 stout basally, placed just below middle of segment; apex of segment 3 with stout outer spine, elongate seta that exceeds length of longest seta of exopod, and a shorter, plumose seta placed subapically. Endopod segment 1 broadened in midregion, reaching to near end of exopod segment 2, its actual length less than combined lengths of exopod segments 1 + 2 (about 1:1.4) and of endopod segments 2 + 3 (about 1:1.6); endopod segments 2 and 3 subequal in length to one another (along inner margin), each much narrower than segment 1.

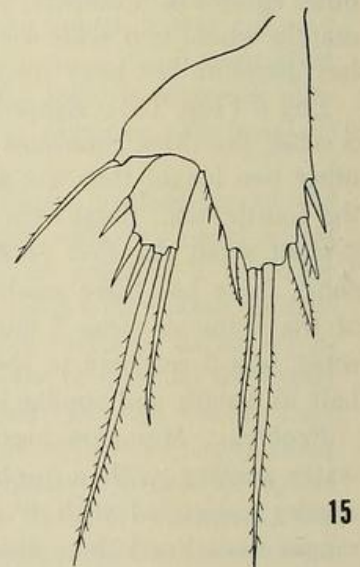
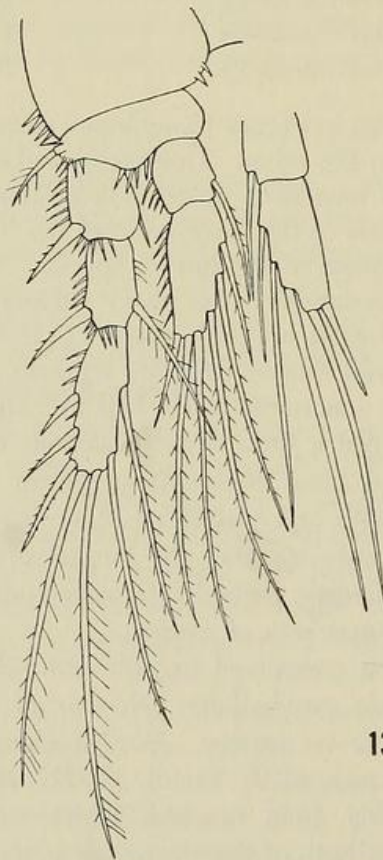
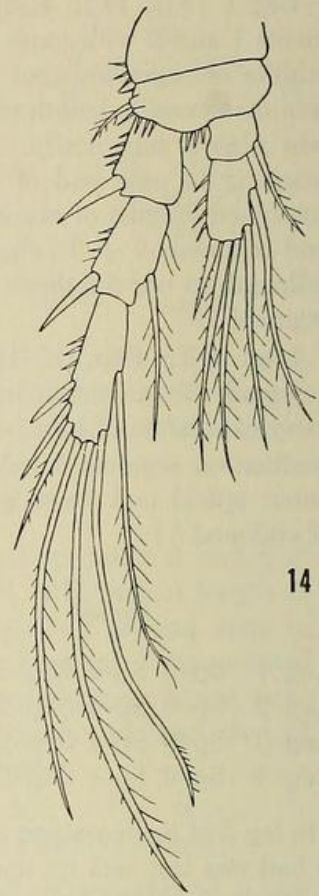
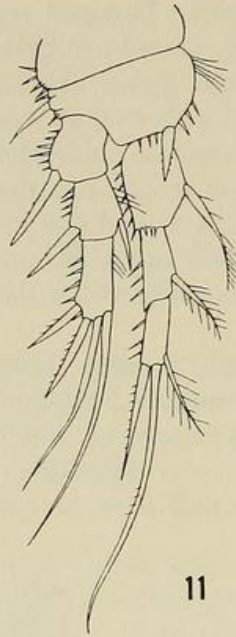
Legs 2-4 (Figs. 12-14): Exopod segment 3 with 3 outer spines; endopods 2-segmented, length decreasing regularly from legs 2-4. Summary of setation of legs 1-4, outer to inner margin (Sp = spine; s = seta; position on segment 3 indicated by the marks - or , : - = separation of outer, apical and inner margins; the , divides spine and setae of apex of endopod 3):

	Exopod			Total	Endopod			Total
	1	2	3	Exo. 3	1	2	3	Apical Seg.
Leg 1	Sp-0	Sp-s	2Sp-2s-0	4	0-s	0-s	0-Sp,s-s	3
Leg 2	Sp-0	Sp-s	3Sp-2s-1s	6	0-s	Sp-2s-2s		5
Leg 3	Sp-0	Sp-s	3Sp-2s-2s	7	0-s	Sp-2s-3s		6
Leg 4	Sp-0	Sp-s	3Sp-2s-2s	7	0-s	Sp-2s-2s		5

(In leg 3 of one paratype specimen, shown in Figure 13, endopod segment 2 had one less seta on one side than on the other. This seems to be an anomaly since the loss was that of the innermost apical seta present in other species of *Mesochra*, rather than one of the three setae of the inner margin where two setae are present in most of the known species. This has therefore not been recorded as a variation in the above summary.)

Leg 5 (Fig. 15): Exopod segment, length to width about 1.5:1; with 5 setae, the three outermost spiniform and shorter than the segment, the other two longer than the segment, the innermost about half as long as the fourth seta. Basal expansion produced a little beyond exopod; with 6 stout setae, the first (outermost) and three innermost spiniform and short, these last three graduated in length and placed on inner margin of the segment; setae 2 and 3 (from outer margin) the longest of the setae, seta 3 reaching to about end of longest exopod seta, seta 2 about half its length and similar to the innermost seta of exopod.

Ecology: *Mesochra mexicana* can be considered as only a brackish water species, with a probable variable euryhalinity. Neither of the species associated with it are known to be marine. *Nitocra lacustris* ranges from brackish to fresh water (Lang, 1948; Noodt, 1957). *Hali-cyclops fosteri* is known otherwise only from brackish water, as is common for the genus. The specimens of both of these associated species from the Harbor Island pond have been previously described or illus-



trated in literature (Wilson, 1958b; Wilson and Yeatman, 1959, fig. 29.168). All specimens of the three species in the sample were dark brown in color and had thickened cuticle, a condition probably due to environmental factors.

Mesochra sp. or *M. mexicana* variant

Mesochra sp., Margalef, 1953: 102, fig. 6V-W (descriptive notes; figs. of legs 1, 5 ♀).

Mesochra cf. *heldti* Monard: Margalef, 1953, in legends for fig. 6 and table 12.

Mesochra sp. conf. *heldti* Monard, Margalef, 1953: Bodin, 1967, p. 41 (catalog list).

Material examined: 1 undissected ♀, mounted in ventral view; slide from Margalef collection, deposited Smithsonian Institution.

Descriptive notes: Margalef compared a few characters with specimens of *M. heldti* from Menorca. His notes (translated) state: "Female 0.425-0.45 mm, with 9 eggs in sac. Operculum with 5 spines; first segment of endopod of the first leg somewhat shorter than segments 1 and 2 combined and without inner seta (?)."

Since the single mounted specimen is undissected it was possible to discern only some characters. The following observations confirm or add to Margalef's notes and illustrations: Caudal ramus similar to that of *M. mexicana* but apical caudal setae not enlarged. Urosome ventral armature similar so far as could be observed; operculum with 5 very stout spinules. Antennule not in good position but appearing to be 6-segmented. Leg 1 mostly discernible, shape and size as in Margalef's Figure 6V but setae of exopod longer, similar to those of *M. mexicana*; inner seta of endopod segment 1 present; Margalef shows no inner seta on exopod segment 2 but one may be present since there is a characteristic indentation of the segment where it should originate. The exopods of legs 2-4 can be seen in the mount and have armature like those of *M. mexicana* but the more important characters of the endopods cannot be distinguished. Leg 5 agrees with Margalef's 6W, closely resembling that of *M. mexicana*.

Before the status of this form, either as a separate but closely related species or subspecies, can be determined, it will be necessary to know the setation of the endopods of legs 2-4. If it agrees with that of *M. mexicana*, the two may be variants of the same species or subspecies. It may also be necessary to know the characters of the males of both before final determination can be made.

Ecology and Occurrence: This form was collected on 5 June 1950 from a pool ("charco junto" in Spanish) near a salt-mine south of a

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FIGS. 11-15. *Mesochra mexicana* n. sp., female: 11, Leg 1; 12, leg 2; 13, leg 3, with outline anomalous endopod (see text); 14, leg 4; 15, leg 5.

large lake formed by the sea, near Alcudia, Mallorca, one of the Balearic Islands off the Mediterranean coast of Spain, about 39°51' N, 3°8' E. Margalef has discussed the characteristics of the habitats studied on the island and given long lists of organisms from them. One other species of *Mesochra* (*M. lilljeborgi*) was found. All harpacticoid copepods listed are those found in coastal bodies of brackish water of comparatively low salinity.

TAXONOMY

There is no question that the geographically separated *M. mexicana* and the Mediterranean form are properly placed in *Mesochra* as now defined. All of the appendages, the rostrum, and the genital region are highly characteristic of the genus. The two forms are closely allied through a character rare in the genus—the short, broad first segment of the endopod of leg 1. Otherwise, *M. mexicana* seems to be allied to *M. armoricana* Monard (1935). Both are similar in the form of leg 5, the enlarged caudal setae, and the ventral spinal ornamentation of the urosome. Also, both have a character not widely known in *Mesochra*—the presence of three setae on the inner margin of endopod 2 of leg 3.

Bodin's (1967) list of species of *Mesochra* described since Lang (1948) includes all but two of those known to me. These are:

- M. suifunensis* Borutskii (1952) ♀, ♂, Suifun River, Asian U.S.S.R.;
M. alaskana M. S. Wilson (1958a; illustrated in M. S. Wilson and Yeatman, 1959) ♀, ♂, Alaska, U.S.A.

The nomenclatural status of two names in Bodin's list will have to be considered in future revisions. *M. pygmaea* var. *meridionalis* Steuer, 1943, if raised to a subspecies or species, would become a primary homonym of *M. meridionalis* Sars, 1905. *M. parva* Thomson, 1946, is a secondary homonym of *Mesochra parva* (T. and A. Scott, 1896), originally described as *Canthocamptus parvus* and long recognized as a synonym of *M. pygmaea* (Claus) (Lang, 1948). From Thomson's description, it appears that his species is closely allied to *M. meridionalis* Sars from the Chatham Islands, and the conspecificity of the two should be carefully considered before a replacement name (nomen novum) is proposed.

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Addendum: Another species to be added to Bodin's 1967 list is: *M. quadrispinosa* Shen and Tai, 1965, ♀, ♂, China (Acta Zootaxonomica Sinica 2(2):126-140).