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**THREE NEW SPECIAL OF *Melita* (CRUSTACEA: AMPHIPODA),
WITH NOTES ON THE AMPHIPOD FAUNA OF THE
APALACHICOLA ESTUARY OF NORTHWEST FLORIDA**

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ABSTRACT: Three undescribed species of *Melita* have been collected in the Apalachicola estuary of northwest Florida. These new species, *Melita elongata*, *M. longisetosa*, and *M. intermedia*, are similar to and co-occur with *M. nitida* Smith, 1873, along the U.S. Gulf Coast. The new species of the *nitida* complex are yet unknown on the Atlantic coast north of Florida, although *M. nitida* occurs north to the Gulf of St. Lawrence. A key to the males of the species in the *M. nitida* complex is given.

Nineteen other amphipod species have been collected in the Apalachicola estuary, six of which are at present undescribed. The life history, abundance patterns and ecological attributes are given for each species to the limit of available information.

The amphipod fauna of the Gulf of Mexico is not well known. Excepting limited investigations (reviewed by McKinney, 1977), examinations of U.S. Gulf Coast amphipod communities are restricted to those of Pearse (1913), Shoemaker (1933), Farrell (1970), Thomas (1976), and McKinney (1977). The latter three authors recorded numerous undescribed amphipod species, indicating the state of knowledge of this region.

Investigations of community structure and function in the Apalachicola Bay estuary of northwest Florida included studies of benthic and litter-associated organisms (Livingston *et al.*, 1977). These studies revealed nine species of amphipods new to science as well as limited ecological and life history information on the amphipod fauna of the estuary, at present totalling 22 species. Three of the undescribed species, closely related to *Melita nitida* Smith, 1873, are figured herein. Figures and a description of *M. nitida*, collected in Apalachicola Bay, are included for comparative purposes. Barnard (1962) discussed the 38 members of the genus *Melita* known at that time, separating

them into groups based upon pleonal tooth formulae (Group A, the "*nitida* complex", bearing no dorsal pleonal teeth; Group B, dorsal pleonal teeth only on urosome; Group C, dorsal pleonal teeth on both metasome and urosome). Barnard further subdivided the "*nitida* complex" based upon the presence or absence of dorsal spines on urosome segment 2. Those species lacking dorsal spines now include *M. lagunae* Oliveira, 1953 and *M. mangrovi* Oliveira, 1953 (both from Argentina), *M. parvimana* Holmes, 1905 (New England), *M. pelucida* G.O. Sars, 1895 (Europe), and *M. planaterga* Kunkel, 1910 (Bermuda). Those species with two groups of dorsal spines on urosome 2 now include *M. coronitii* Heller, 1866 (Europe), *M. koreana* Stephensen, 1944 and *M. laevidorsum* Stephensen, 1944 (Korea), *M. pahuwaii* Bernard, 1970 (Hawaii), *M. zeylanica* Stebbing, 1904 (Ceylon/Sri Lanka), and *M. nitida* (Gulf of St. Lawrence to Yucatan). Bousfield (1977) diagnoses the characteristics of the superfamily Melitoidea and the family Melitidae. Descriptions of the three new species of *Melita* and their relationships to the "*nitida* complex" follow. Type

specimens are deposited with the U.S. National Museum of Natural History, Smithsonian Institution (USNM) and the National Museums of Canada (NMC).

***Melitta nitida* Smith, 1873. Figures 1-3.**

Description. Male, 6 mm. Antenna 1, peduncle segment 3 medium (50% of segment 2); flagellum of 16-21 articles, with whorls of short setae; accessory flagellum of 2 short articles. Antenna 2, peduncle segment 5 shorter than 4; flagellum shorter than peduncle and of 9-10 articles; peduncle segment 5 and flagellum with heavy "bottle brush" of medium setae.

Mandible, incisor with 4 teeth, lacinia mobilis with 2 teeth; spine row of 6 spines. Maxilla 1, inner plate with 6 inner marginal setae. Maxilla 2, inner plate with 6 marginal setae; inner and outer plates with dense apical setae.

Maxilliped, dactyl long, clawlike, with row of fine, short setae along inner margin.

Gnathopod 1, coxa subquadrate, distal margin with short setae; article 4 with spinose posterior margin. Gnathopod 2, coxa subquadrate, distal margin with mostly short setae; article 5, posterodistal lobe with 3 groups of moderate setae; article 6, dactyl tip longer than palm, closing on densely setose depression on medial face of hand.

Pleon, epimera 1-3 subquadrate, each with small posterodistal tooth and no other serrations, 2 and 3 each with two distal marginal spines. Urosome 2 with 2 pairs of short posterodorsal spines. Uropod 3, inner ramus very short (1/6 of outer ramus), with single apical spine; outer ramus medium broad, one-segmented, blunt-tipped, margins with medium length spines and few setae. Telson, lobes fused along 1/3 of basal length, each with several apical spines, occasionally with inner marginal spines.

Female. Oviparous, 4 mm. Similar to male except in the following characters. Antenna 2, peduncle segment 5 equal to 4, segment 5 and flagellum without "bottle brush" setation. Gnathopod 1, article 3 with small posterior spine group. Gnathopod 2, dactyl congruent with palm, no setose medial depression on hand. Coxa 6 bearing anterodistal cusp lacking surface ridges and with 2 small posterior lobes. Epimeral margins more rounded, posterodistal tooth more prominent; epimeron 3, margin with single spine. Uropod 3, outer ramus broader than male. Simple linear brood plates on pereopods 2-5, with 11-13 simple, linear, marginal setae.

Ecology. Abundant, particularly in higher salinity (20-33 ppt) grass beds and marsh areas of Apalachicola Bay, late spring through early winter. Gravid

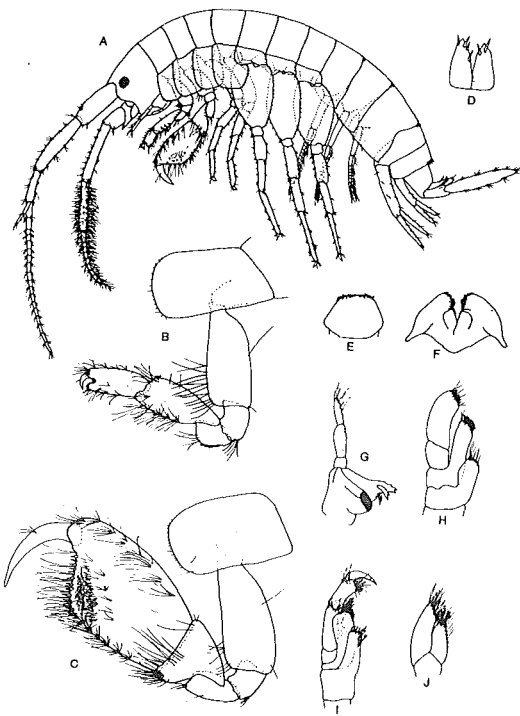


Figure 1. *Melitta nitida* Smith, 1873. Male, 6mm. A, lateral view; B, gnathopod 1; C, gnathopod 2; D, telson; E, upper lip; F, lower lip; G, mandible; H, maxilla 1; I, maxilliped; J, maxilla 2.

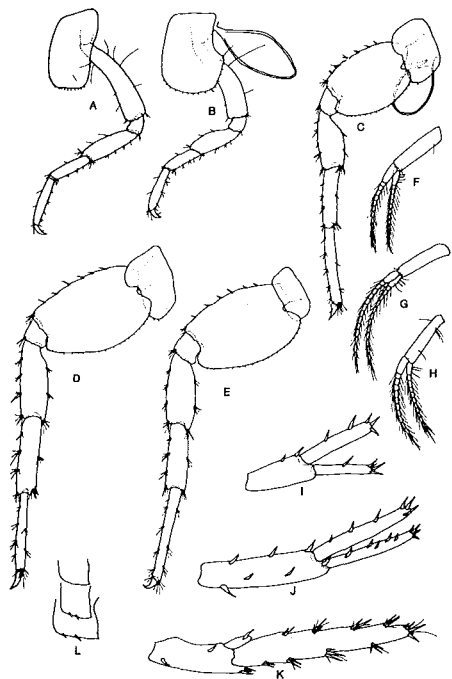


Figure 2. *Melita nitida* Smith, 1873. Male, 6mm, A-E, pereopods 3-7; F-H, pleopods 1-3; I, uropod 2; J, uropod 1; K, uropod 3; L, epimera 1-3 (top to bottom).

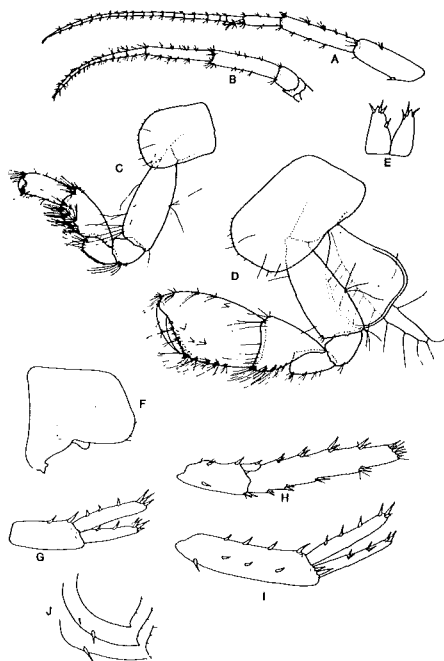


Figure 3. *Melita nitida* Smith, 1873. Female, 4mm, A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, telson; F, coxa 6; G, uropod 3; H, uropod 1; I, uropod 2; J, epimera 1-3 (top to bottom).

females noted July through September. Salinity: 7-33 ppt; temperature: 21-32°C.

Present Distribution. Gulf of St. Lawrence to Northern Florida on Atlantic Coast. Vicinity of Cape Romain, Florida, to Yucatan, Mexico, on the Gulf of Mexico. Mazatlan, Mexico to Ecuador on the Pacific Coast.

***Melita elongata* n. sp. Figures 4-6.**

Description. Male, holotype, 5 mm. Antenna 1, peduncle segment 3 long (60% or more of segment 2); segments 2,3 and flagellum with whorls of long marginal setae; flagellum of 15-18 articles; accessory flagellum of 1-2 short articles. Antenna 2, peduncle segment 5 slender, 135% or more of segment 4; flagellum of 7-9 articles; segments 4, 5 and flagellum with whorls of long setae. Mandible, incisor with 5 teeth, lacinia mobilis with 2 teeth; spine row of 4 spines. Maxilla 1, inner plate with 10-12 inner marginal setae. Maxilla 2, inner plate with 8-10 stout marginal setae, inner and outer plates with dense apical setae. Maxilliped, dactyl long, clawlike, with row of fine short setae along inner margin.

Gnathopod 1, coxa subquadrate, distal margin and outer surface with sparse long and short setae; articles 3 and 4 with dense posterior spine groups; article 5, spine group on anterodistal corner. Gnathopod 2, coxa subquadrate, distal margin and outer surface with sparse long and short setae; article 5, posterodistal lobe with 5 groups of heavy setae; article 6, dactyl tip longer than palm, closing on setose area defined by toothed ridge on medial face of hand.

Pleon, epimera 1-3 subquadrate, each with small posterodistal tooth and no other serrations, distal margins with 1,2,3 spines, respectively. Urosome 2 with 2 pairs of short posterodistal spines. Uropod 3, inner ramus very

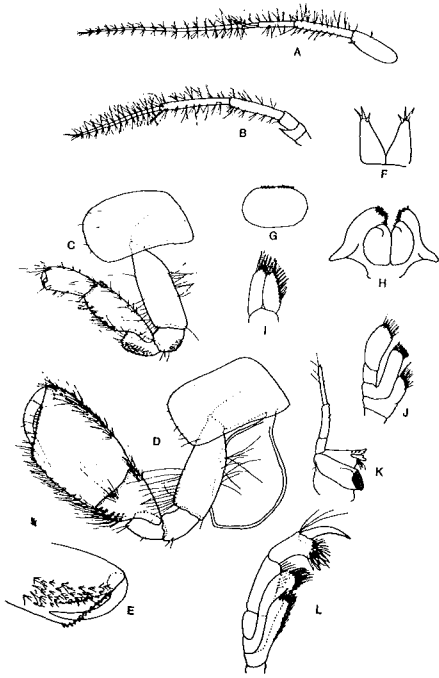


Figure 4. *Melita elongata* n. sp. Male, 5 mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, gnathopod 2, inner face; F, telson; G, upper lip; H, lower lip; I, maxilla 2; J, maxilla 1; K, mandible; L, maxilliped.

short, with single apical spine; outer ramus slender, one-segmented, tip acute, margins with medium length spine pairs and no setae. Telson, lobes fused along 1/5 of basal length, each with several apical spines but no marginal spines.

Female. Oviparous allotype, 3mm. Similar to male except in the following characters. Antenna 1, peduncle segment 3 slightly more than 50% of segment 2. Antenna 2, peduncle segment 5 only slightly longer than 4. Gnathopod 2, no setose medial depression on hand. Coxa 6 bearing anterodistal cusp with single surficial ridge and 2 small posterior lobes. Epimera 1-3 with 0,1,2 marginal spines, respectively. Uropod 3, outer ramus more slender than male, tip subacute, a few setae among spine pairs. Simple linear brood plates on pereopods 2-5, with 9-10 simple, linear, marginal setae.

Etymology. This species is named for the uniquely elongate peduncle 5 of antenna 2.

Ecology. Commonly found spring through fall in outer Apalachicola Bay and along St. George Island, being most numerous over seagrass beds and in marsh embayments. Peak abundance noted in the spring. Gravid females found in April, August, and October. Salinity: 20-32 ppt; temperature: 20-32°C.

Present Distribution: Banana River — Indian River systems on Atlantic Coast of Florida, and from Tampa Bay, Florida, to St. Andrew Bay, Florida, on the Gulf of Mexico.

Material. Numerous individuals from litter basket and core samples from the following sites in Apalachicola Bay, Franklin Co., Florida (see Livingston *et al.*, 1977, for station locations). Station 1, Green Point light, NMC 14183, August, 1974, 1 male, 1 female; NMC 14184,

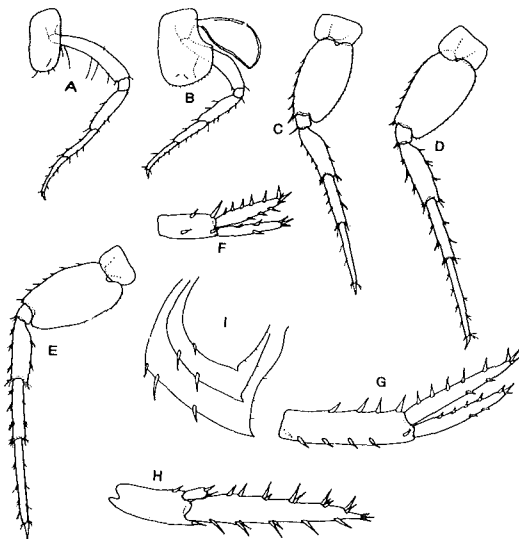


Figure 5. *Melita elongata* n. sp. Male, 5mm. A-E, pereopods 3-7; F, uropod 2; G, uropod 1; H, uropod 3; I, epimera 1-3 (top to bottom).

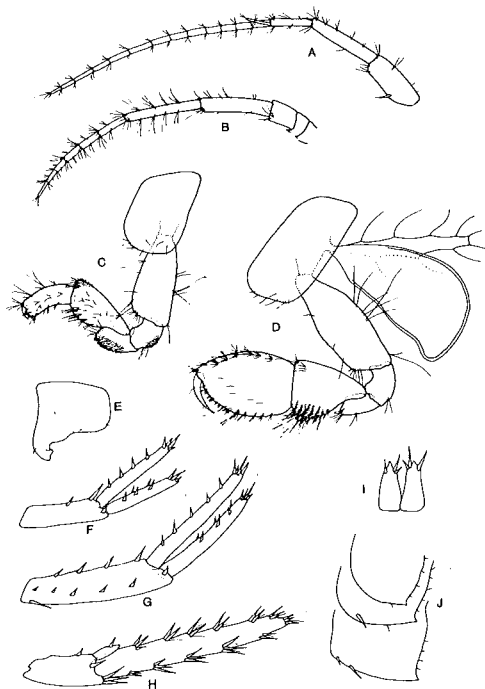


Figure 6. *Melita elongata* n. sp. Female, 3 mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, coxa 6; F, uropod 2; G, uropod 1; H, uropod 3; I, telson; J, epimera 1-3 (top to bottom).

October, 1974, 2 females. Station 1X, 2km east of Bob Sykes Cut, NMC 14186, June, 1974, 18 males; August, 1974, 4 males, 6 gravid females; NMC 14185, October, 1974, 9 gravid females; March, 1975, 7 males, 1 female; April, 1975, 30 males, 24 females (2 gravid); October, 1975, 3 males, 7 females; December, 1975, 2 males; January, 1976, 1 female.

Other stations are: St. Andrew Bay, Bay Col, Florida, 9 July 1974, 3 males, 13 females (3 gravid); 31 July 1974, 5 males, 6 females (C. Saloman, coll.). Tampa Bay, Hillsborough Co., Florida, 1 February 1978, 5 males, 8 females (K. Thoenke, coll.). Banana River, Brevard Co., Florida, 17 May 1971, 12 males, 27 females (R. Fox, coll.). Indian River, Florida; Brevard Co., 3 March 1970, 3 males, 2 females (R. Fox, coll.); St. Lucie Co., 8 December 1975, 52 males, 25 females (23 gravid), 16 February 1976, 15 males, 10 females

(7 gravid), 19 April 1976, 30 males, 14 females (11 gravid), 14 June 1976, 10 males, 14 females (7 gravid), 16 August 1976, 3 males, 1 female, 21 October 1976, 10 males, 5 gravid females; Martin Co., 13 April 1976, 12 males, 3 females (2 gravid), 20 August 1976, 17 males, 9 females (4 gravid) (K. Cairns, coll.).

The holotype (USNM 170998), allotype (USNM 170999), and a paratypic series (USNM 171000) are deposited in the U.S. National Museum of Natural History, Smithsonian Institution. A paratypic series is deposited in the National Museums of Canada, Museum of Natural Sciences, Ottawa, Canada.

***Melita longisetosa* n. sp. Figures 7-9.**

Description. Male, holotype, 6 mm. Antenna 1, peduncle segment 3 short (35% of segment 2); segments 2,3, and flagellum with short marginal setae; flagellum of 19-22 articles; accessory flagellum of 2-4 short articles. Antenna 2, peduncle segment 5 slightly longer than 4; flagellum shorter than peduncle and of 9-10 articles; segments 4,5, and flagellum with whorls of short setae.

Mandible, incisor with 4 teeth; lacinia mobilis with 2 teeth; spine row of four spines. Maxilla 1, inner plate with 8-10 inner marginal setae. Maxilla 2, inner plate with 6 stout marginal setae, inner and outer plates with dense apical setae. Maxilliped, dactyl clawlike, lacking fine setae on inner margin.

Gnathopod 1, coxa subquadrate, distal margin with numerous long and short setae; article 4 with spinose posterior margin. Gnathopod 2, coxa subquadrate, distal margin with long and short setae; article 5, posterodistal lobe heavily setose, setae in 5 groups; article 6, dactyl with fine short setae on inner margin, closing on setose depression on medial face of article 6. Pereopod 7, article 6 with 3 whorls of long setae

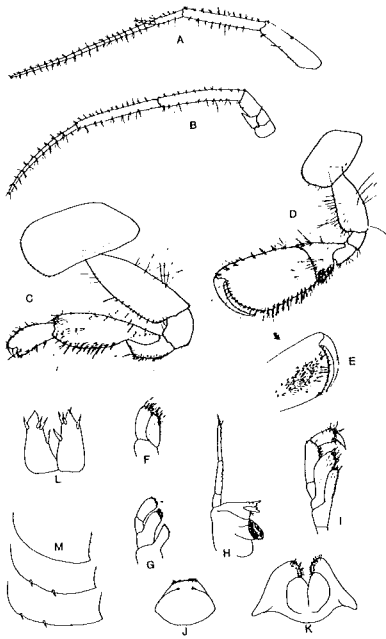


Figure 7. *Melita longisetosa* n. sp. Male, 6mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, gnathopod 2, inner face; F, maxilla 2; G, maxilla 1; H, mandible; I, maxilliped; J, upper lip; K, lower lip; L, telson; M, epimera 1-3 (top to bottom).

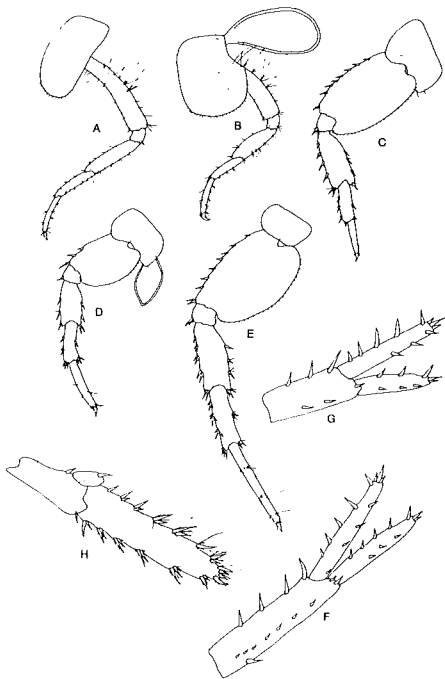


Figure 8. *Melita longisetosa* n. sp. Male, 6mm. A-E, pereopods 3-7; F-H, uropods 1-3.

evenly spaced along its length.

Pleon, epimera 1-3 subquadrate, each with small posterodistal tooth and no other serrations; distal margins with 0,2,2 spines, respectively. Urosome 2 with 2 pairs of short posterodorsal spines. Uropod 3, inner ramus very short (1/5 of outer ramus), with single apical spine; outer ramus broad, one-segmented, blunt-tipped, with numerous long setae among spine pairs. Telson, lobes fused basally for 1/4 of length, each with apical and inner marginal spines.

Female. Ovigerous allotype, 5 mm. Similar to male except in the following characters. Antenna 2, peduncle segment 5 equal to 4. Gnathopod 1, article 5 only 30% longer than 6. Gnathopod 2, palm oblique, spinose, no setose medial depression on hand. Coxa 6 bearing anterodistal cusp with smooth surface and irregular posterior margin of 3-4 lobes. Epimera 1-3, distal margins with 0,1,2 posterior marginal spines, respectively. Uropod 3, inner ramus with 2 apical spines; outer ramus broader and blunter than male. Telson with relatively long apical spines. Simple linear brood plates on pereopods 2-5, with 10-11 simple, linear, marginal setae.

Material. Numerous individuals from litter basket and core samples taken from the following sites in Apalachicola Bay, Franklin Co., Florida (see Livingston *et al.*, 1977, for station locations). Station 5A, White Beach, NMC 14174, October, 1974, 1 male. Station 1, Green Point light, NMC 14175, August, 1974, 11 males, 3 females; October, 1974, 2 males, 1 gravid female. Station 1X, 2km east of Bob Sykes Cut, NMC 14176, June, 1974, 5 males; NMC 14177, August, 1974, 1 gravid female; NMC 14178, October, 1974, 1 male, 1 female; May, 1976, 31 males, 9 females; July, 1976, 5 males, 2 females; September, 1976, 16 males, 12 females.

Other stations are: Panacea, Franklin Co., Florida, 2 June 1972, 2 males, 1 gravid female, in aquaria (J. Rudloe, coll.). Pensacola Bay, Escambia Co., Florida, "Summer", 1973, 3 males 1 female (F. Bisterfeld, coll.). Mobile Bay, Mobile Co., Alabama, near Dauphin Island bridge, 27 June 1977, 22 males, 15 females (13 gravid), 8 immatures (C. Lee, coll.). Bay Lanoux, Plaquemines Parish, Louisiana, 15 January 1978, 19 males, 3 females (D. Dugas, coll.). Bay of St. Louis, Hancock Co., Mississippi, 18 January 1978, 1 gravid female, 2 immatures (K. Stuck, coll.).

The holotype (USNM 171001), allotype (USNM 171002), and a paratypic series (USNM 171003) are deposited with the U.S. National Museum of Natural History, Smithsonian Institution. A paratypic series is deposited with the National Museums of Canada, Museum

of Natural Sciences, Ottawa, Canada.

Etymology. This species is named for the long setae on the outer ramus of uropod 3 which readily distinguish it from other closely related species.

Ecology. Uncommon except along St. George Island's marsh embayments and seagrass beds where it is abundant spring through fall. Peak numbers found in April and May. Gravid females found in August and October. Salinity: 11-33 ppt; temperature: 20-32°C.

Present Distribution. Panacea, Florida to Bay Lanoux, Louisiana, on the Gulf of Mexico.

***Melita intermedia* n. sp. Figures 10-12.**

Description. Male, holotype, 5 mm. Antenna 1, peduncle segment 3 50% of 2; flagellum of 17-19 articles; accessory flagellum of 2 short articles; peduncle and flagellum with sparse short marginal setae. Antenna 2, peduncle segments 2 and 3 each with short dorsal spine; segment 5 equal to 4; flagellum shorter than peduncle and of 8-9 articles with "bottle brush" of medium setae.

Mandible, molar lacking accessory spine; incisor with 4 teeth, lacinia mobilis with 4 teeth; spine row of 5 spines. Maxilla 1, inner plate with 5-6 inner marginal setae. Maxilla 2, inner plate with 6-7 marginal setae and dense apical setae; outer plate with dense apical setae. Maxilliped, dactyl clawlike, inner margin with fine short setae.

Gnathopod 1, coxa subquadrate, distal margin with mostly short setae; article 4 spinose posteriorly. Gnathopod 2, coxa subquadrate, distal margin with mostly short setae; article 5 with 3 groups of heavy setae; article 6, dactyl longer than palm, closing on setose depression on medial face of hand delimited by low, tooth-bearing ridge.

Pleon, epimera 1-3 subquadrate, each with small posterodistal tooth, 3 with

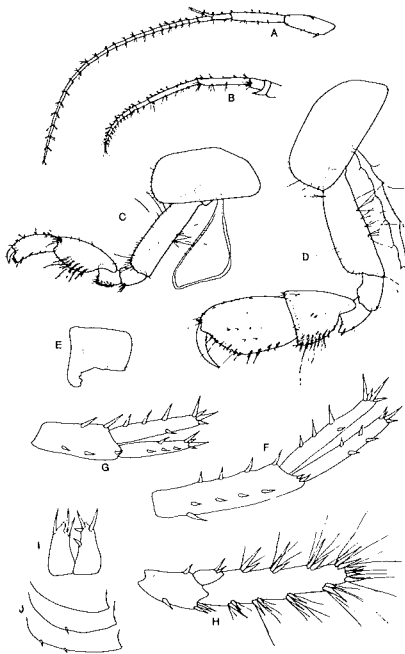


Figure 9. *Melita longisetosa* n. sp. Female, 5mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, coxa 6; F-H, uropods 1-3; I, telson; J, epimera 1-3 (top to bottom).

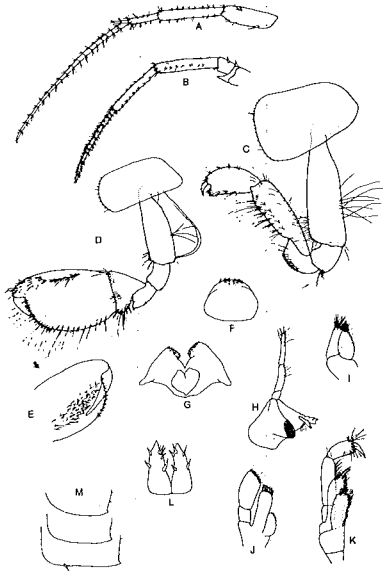


Figure 10. *Melita intermedia* n. sp. Male, 5mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, gnathopod 2, inner face; F, upper lip; G, lower lip; H, mandible; I, maxilla 1; J, maxilla 2; K, maxilliped; L, telson; M, epimera 1-3 (top to bottom).

single distal marginal spine. Urosome 2 with 2 pairs of short posterodorsal spines. Uropod 3, inner ramus short (1/5 of outer ramus), with 3 apical and sub-apical spines; outer ramus slender, one-segmented, tip subacute, spinose with few short setae interspersed. Telson, lobes fused basally for 1/4 of length, each with spines on inner and outer margins and apex.

Female. Ovigerous allotype, 4 mm. Similar to male except in the following characters. Antenna 1, less setose than male; peduncle segment 3 70% of 2. Antenna 2, flagellum less setose than male. Gnathopod 2, dactyl congruent with palm, no setose depression on medial face of hand. Coxa 6 bearing anterodistal cusp with 2-3 posterior surficial ridges. Epimeron 2 with single distal marginal spine. Uropod 3, inner ramus with 1 apical spine. Telson, lobes lacking outer marginal spines. Simple linear brood plates on pereopods 2-5,

with 7-8 simple, linear, marginal setae.

Material. Numerous specimens from litter basket and core samples from the following sites in Apalachicola Bay, Franklin Co., Florida (see Livingston *et al.*, 1977, for station locations). Station 5A, White Beach, NMC 14179, May, 1974, 6 males, 8 gravid females; NMC 14180, August, 1974, 10 males, 8 females; NMC 14181, October, 1974, 14 males, 4 females. Station 3, 2km east of the town of Apalachicola along Gorrie Bridge, June, 1974, 20 males, 25 females; August, 1974, 14 males, 14 females; NMC 14182, October, 1974, 6 males, 8 gravid females; March, 1975, 5 males, 4 females; April, 1975, 7 males, 9 females; June, 1975, 1 male. Station 6, Alligator Bayou, Lower Atchafalaya Basin, St. Mary Parish, Louisiana, 14 September 1975, 3 males, 2 females (D. Dugas, coll.). Davis Bayou, Jackson Co., Mississippi, various dates in 1975-1976,

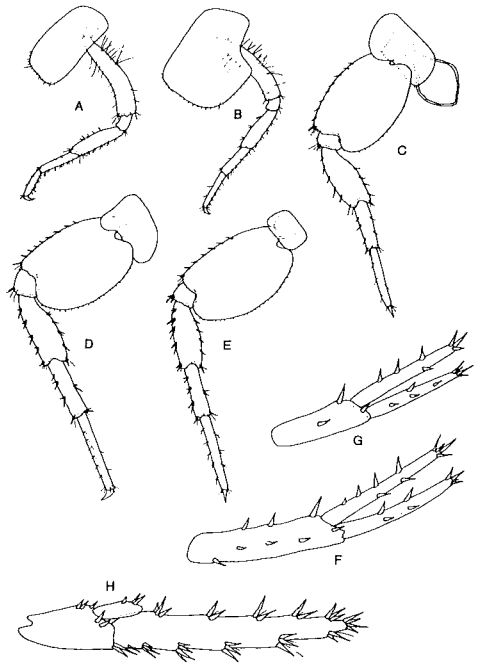


Figure 11. *Melita intermedia* n. sp. Male, 5mm. A-E, pereopods 3-7; F-H, uropods 1-3.

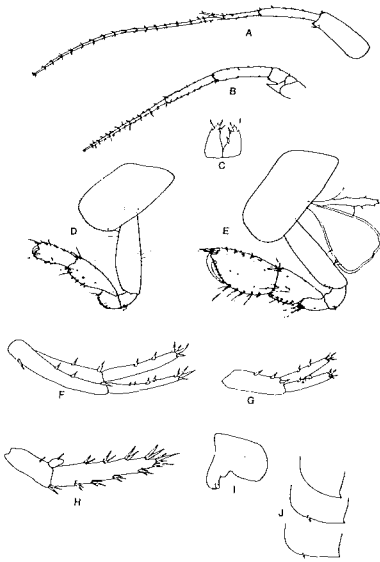


Figure 12. *Melita intermedia* n. sp. Female, 4mm. A, antenna 1; B, antenna 2; C, telson; D, gnathopod 1; E, gnathopod 2; F-H, uropods 1-3; I, coxa 6; J, epimera 1-3 (top to bottom).

23 males, 7 gravid females (J. Steen, Jr., coll.). Simmons Bayou, Jackson Co., Mississippi, 22 February 1977, 2 males, 6 immatures (J. McBee, coll.).

The holotype (USNM 171004), allotype (USNM 171005), and a paratypic series (USNM 171006) are deposited with the U.S. National Museum of Natural History, Smithsonian Institution. A paratypic series is deposited with the National Museums of Canada, Museum of Natural Sciences, Ottawa, Canada.

Etymology. This species is so named because many of its characteristics are intermediate between other closely related species.

Ecology. Common to abundant all year, particularly in low salinity (0-5 ppt) areas of the estuary. Peak abundance noted April through June. Gravid females found in May and October. Salinity: 0-17 ppt; temp: 10-32°C.

Present Distribution. Apalachicola Bay, Florida, to Lower Atchafalaya Basin, Louisiana, on the Gulf of Mexico.

Relationships:

Melita elongata, *M. longisetosa*, and *M. intermedia* have pleon and urosome segments lacking dorsal carinations and have quadrate hind corners on epimere 3, thus allying these species with *M. nitida* (Bousfield, 1973). *Melita elongata* is the only species in the "nitida complex" having long setae on antennae 1 and 2 and having article 5 of antenna 2 much longer than article 4. It appears most closely related to *M. nitida* and *M. zeylanica* in having a non-aberrant gnathopod 1 and a "palmata type" gnathopod 2 in the males. However, the inner medial face of article 6, gnathopod 2, in *M. nitida* has an ill-defined setose patch, while in *M. elongata* and *M. zeylanica* there is a defining spinose ridge bordering the setose area. Also, the outer ramus of uropod 3 is slender and acutely tipped and the telson has only apical spines in *M. elongata*, whereas both *M. nitida* and *M. zeylanica* have a medium, blunt-tipped outer ramus on uropod 3 and apical plus inner marginal spines on the telson. *Melita zeylanica* has shorter and stouter pereopods (especially segments 4 and 5) than either *M. elongata* or *M. nitida*.

Melita intermedia and *M. longisetosa* are the only members of the "nitida complex" having the combination of a non-aberrant gnathopod 1, a "non-palmata type" gnathopod 2, and two groups of spines on urosome 2. *Melita pellucida*, *M. parvimana*, *M. lagunae* and *M. mangrovi* all have the same gnathopod characteristics but lack dorsal spines on urosome 2. *Melita intermedia* resembles *M. nitida* since males of both species exhibit a "bottle-brush" setation of the flagellum of antenna 2. *Melita longisetosa* differs from all other members of the "nitida complex" in having a heavily setose outer ramus of uropod 3.

Shoemaker's (1935) record of *M. nitida* on the west coast of Mexico should be related to the specimens collected in the Gulf of Mexico. In comparing *M. nitida* from the two areas, several similarities and contrasts are noted. Similar characters include: 1) a non-aberrant gnathopod 1, 2) few setae on a medium width, blunt-tipped outer ramus of uropod 3, and 3) telson with apical and inner marginal spines only. In contrast, Mexican specimens 1) have long setae on antenna 1 (similar to *M. elongata*), 2) do not have a "bottle-brush" setation of antenna 2, and 3) have a "non-palmata type" of gnathopod 2 with a spinose ridge on the inner medial face of the hand. Shoemaker's specimens are thus allied with both *M. nitida* and *M. elongata*.

Key to the Males of the Species in the *Melita nitida* Complex (after Barnard, 1962);

- 1. Urosome 2 with 2 pairs of dorsal spines 2
- Urosome 2 lacking dorsal spines . 7
- 2. Gnathopod 1, finger short, stout, not reaching end of palm .. *M. koreana*
- Gnathopod 1, finger with distal accessory process *M. laevidorsum*
- Gnathopod 1, finger attached to lower distal end of article 6
..... *M. coroninti*, *M. pahuwatt*
- Gnathopod 1, finger attached to upper distal end of article 6 3
- 3. Antenna 2, flagellum with heavy "bottle-brush" setation 4
- Antenna 2, flagellum lacking "bottle brush" setation 5
- 4. Antenna 2, peduncular segment 5 with "bottle brush" setation; medial face of hand lacking toothed ridge *M. nitida*
- Antenna 2, peduncular segment 5

- without "bottle brush" setation; medial face of hand bearing toothed ridge *M. intermedia*
- 5. Antenna 2, peduncular segment 5 greatly exceeding segment 4 in length *M. elongata*
- Antenna 2, peduncular segment 5 subequal to segment 4 in length. 6
- 6. Uropod 3, outer ramus, and pereopod 7, article 6 bearing numerous long setae *M. longisetosa*
- Uropod 3, outer ramus, and pereopod 7, article 6 lacking setae
..... *M. zeylanica*
- 7. Gnathopod 1, finger curved, fitting palm, attached normally 8
- Gnathopod 1, finger aberrant 9
- 8. Gnathopod 1, article 6 expanded, as large as gnathopod 2
..... *M. parvimana*
- Gnathopod 1, article 6 small, linear *M. pellucida*, *M. planaterga*
- 9. Gnathopod 1, finger articulated, stout, conical *M. lagunae*
- Gnathopod 1, finger indistinctly articulated, blunt *M. mangrovi*

Other Amphipods Collected in Apalachicola Bay:

The organization of higher taxonomic categories follows recent systematic revisions of Bousfield (1977, 1978), designed to reflect current theories on amphipod evolution.

Superfamily Talitroidea

Family Hyalellidae

Hyalella azteca Saussure, 1857. Rare, collected only once in oligohaline areas, March, 1975. Salinity: 0 ppt; temperature: 15°C.

Family Talitridae

Orchestia uhlert Shoemaker, 1930. One specimen collected in oligohaline areas in January, 1976. Salinity: 0 ppt; temperature: 11°C.

Superfamily Eusiroidea

Family Bateidae

Batea catharinensis Muller, 1865. Rare, only one specimen (a gravid female) collected in October, 1974. Salinity: 24 ppt; temperature: 22°C. *Cartnobatea* sp. Rare, only one specimen collected from the stomach of an anchovy (*Anchoa mitchilli*).

Superfamily Leucothoidea

Family Amphilochidae

Gitanopsis sp. (Near *G. tortugae* Shoemaker, 1933). Specimens collected from spring through fall in open waters, maximum abundance in late summer. Gravid females found in summer. Salinity: 13-33 ppt; temperature: 22-32°C. No specimens have been found which refer to *G. laguna* McKinney, 1978.

Family Stenothoidae

Parametopella cypris (Holmes), 1905. Rare, only collected in October, 1974; gravid females noted. Salinity: 20-24 ppt; temperature: 20-22°C.

Superfamily Gammaroidea

Family Gammaridae

Mucrogammarus mucronatus Say, 1818. Very abundant in high salinity areas, particularly along St. George Island. Found all months, reaching peak abundance in spring. Gravid females noted all year, maxima in spring and fall. Salinity: 13-33 ppt; temperature: 15-32°C.

Mucrogammarus sp. Common to abundant in oligohaline areas, late fall through spring, peaking in early spring. Gravid females found during all months collected. Salinity: 0-17 ppt; temperature: 10-32°C. Farrell (1970) recorded this undescribed species from northern Florida to Mississippi. It is characterized by more dorsally projected mucronations than *M. mucronatus* and is

presently being described by M. Mulino of Tulane University.

Gammarus sp. (near *G. tigrinus* Sexton, 1939). Uncommon, found mainly in low salinity areas near the mouth of the Apalachicola River.

Superfamily Ampeliscoidea

Family Ampeliscidae

Ampelisca vadorum Mills, 1963. Very abundant in seagrass beds along St. George Island, where it builds weak tubes attached to the seagrass blades or sediment. Most numerous in spring. Gravid females collected all year but most abundantly in February. Salinity: 6-27 ppt; temperature: 11-32°C. No specimens have been found which definitely refer to *A. abdita* Mills, 1963. *Ampelisca* sp. (near *A. verrilli* Mills, 1967). Only found in western Apalachicola Bay, July, 1975. Common at that time. Salinity: 11-26 ppt; temperature: 27-29°C.

Superfamily Melitoidea

Family Melitidae

Melita appendiculata (Say), 1818. Rare, migrating into the estuary with high salinity water from adjacent St. George Sound, a grassbed area to the east of the Apalachicola estuary.

Superfamily Corophioidea

Family Photidae

Microtopopus sp. (near *M. raneyi* Wigley, 1966). Uncommon, found only in open waters in late summer, gravid females noted at that time.

Family Ischyroceridae

Cerapus sp. Common in oligohaline areas, forming colonies of long brown tubes. Found spring through fall, with peak abundance in late spring and summer. Gravid females noted May-July. Occasionally collected in plankton samples. Salinity: 0-10 ppt; temperature: 10-30°C. This

species is distinct from *C. tubularis* Say, 1818.

Family Ampithoidae

Cymadusa compta (Smith), 1873. Common late summer through spring, particularly in October - November along high salinity St. George Island. Gravid females noted in all months of collection, particularly in October. Salinity: 15-33 ppt; temperature: 12-32°C.

Family Aoridae

Grandidierella bonnieroides Stephensen, 1948. One of the most abundant amphipods in the Apalachicola estuary, particularly in low salinity areas. Most numerous in March and August. Gravid females found November through April. Salinity: 0-27 ppt; temperature: 6-33°C.

Family Corophiidae

Corophium louisianum Shoemaker, 1934. Common in low salinity areas from spring through fall, reaching peak abundance in late summer-early fall. Gravid females noted in spring. Salinity: 0-24 ppt; temperature: 20-32°C.

Superfamily Caprellioidea

Family Caprellidae

Paracaprella tenuis Mayer, 1903. Common in mesohaline fouling communities, spring through fall. Salinity: 11-24 ppt; temperature: 20-32°C.

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LITERATURE CITED

- Barnard, J. L. 1962. Benthic marine amphipods of Southern California: families Tironidae to Gammaridae. *Pacific Natur.* 3:74-115.
- _____. 1970. Sublittoral Gammaridae (Amphipoda) of the Hawaiian Islands. *Smithsonian Contrib. Zool.* 34:1-286.
- Bousfield, E. L. 1973. Shallow-water Gammaridean Amphipods of New England. *Cornell Univ. Press.* 312p.
- _____. 1977. A new look at the systematics of gammaroidean amphipods of the world. *Crustaceana, Suppl.* 4:282-316.
- _____. 1978. A revised classification and phylogeny of amphipod crustaceans. *Trans. Roy. Soc. Can., Ser. IV, Vol. 16:*343-390.
- Farrell, D. H. 1970. Ecology and seasonal abundance of littoral amphipods from Mississippi. M. S. Thesis, Miss. State Univ.
- Heller, C. 1866. Beiträge zur Näheren Kenntniss der Amphipoden des Adriatischen Meeres. *Denkschriften der Kaiserlichen Akad. Wissenschaften, Mathematisch-Naturwissenschaftlichen Classe, Wien,* 26:1-62.
- Holmes, S. J. 1905. The Amphipoda of southern New England. *Bull. U. S. Bur.*

- Fish. 24:457-529.
- Kunkel, B. W. 1910. The Amphipoda of Bermuda. Trans. Conn. Acad. Arts Sci. 16:1-116.
- Livingston, R. J., P. F. Sheridan, B. G. McLane, F. G. Lewis, III, and G. J. Kobylinski. 1977. The biota of the Apalachicola Bay system: functional relationships. *in* R. J. Livingston and E. A. Joyce, Jr. (eds.), Proceedings of the Conference on the Apalachicola Drainage System. Fla. Dept. Nat. Res., Mar. Res. Lab. Publ. 26. pp. 75-100.
- Mayer, P. 1903. Die Caprellidae der Siboga-Expedition. Siboga-Expedite, Uitkomsten op Zoologisch, Botanisch, Oceanographisch en Geologisch Gebied, Nederlandisch Oost-Indie, 1889-1900, 34:1-160.
- McKinney, L. D. 1977. The origin and distribution of shallow water gammaridean Amphipoda in the Gulf of Mexico and Caribbean Sea with notes on their ecology. Ph. D. Dissertation, Texas A and M Univ.
- _____ 1978. Amphilochidae (Crustacea: Amphipoda) from the western Gulf of Mexico and Caribbean Sea. Gulf Res. Repts. 6:137-143.
- Mills, E. L. 1963. A new species of *Ampelisca* (Crustacea: Amphipoda) from eastern North America, with notes on other species of the genus. Can. J. Zool. 41:971-989.
- _____ 1967. A reexamination of some species of *Ampelisca* from the east coast of North America. Can. J. Zool. 45:635-652.
- Muller, F. 1865. Description of a new genus of amphipod Crustacea. Ann. Mag. Nat. Hist., Ser. 3, Vol. 15, pp. 276-277.
- Oliviera, L. H. P. de. 1953. Crustacea Amphipoda do Rio de Janeiro. Mem. do Inst. Oswaldo Cruz 51:289-376.
- Pearse, A. S. 1913. Notes on certain amphipods from the Gulf of Mexico, with descriptions of new genera and new species. Proc. U. S. Nat. Mus. 43(1936): 369-379.
- Sars, G. O. 1895. An account of the Crustacea of Norway: Amphipoda. 1:viii + 1-711. 11b. Cammermeyers, Christiana and Copenhagen.
- Saussure, H. F. de. 1858. Mémoire sur divers crustacés nouveaux des Antilles et du Mexique. Mém. Soc. Physique Hist. Nat. Genève, Vol. 14, Part 2, pp. 417-496.
- Say, T. 1818. An account of the Crustacea of the United States. J. Acad. Nat. Sci. Phila. 1:37-401.
- Sexton, E. W. 1939. On a new species of *Gammarus* (*tigrinus*) from Droitwich district. J. Mar. Biol. Assn. U. K. 23: 543-551.
- Shoemaker, C. R. 1930. The Amphipoda of the Cheticamp Expedition of 1917. Contrib. Can. Biol. Fish. 5:211-359.
- _____ 1933. Amphipoda from Florida and the West Indies. Amer. Mus. Novit. 598:1-24.
- _____ 1934. The amphipod genus *Corophium* on the east coast of America. Proc. Biol. Soc. Wash. 47: 23-32.
- _____ 1935. A new species of amphipod of the genus *Grandidierella* and a new record of *Melita nitida* from Sinaloa, Mexico. J. Wash. Acad. Sci. 25:65-71.
- Smith, S. I. 1873. Report on the invertebrate animals of Vineyard Sound and adjacent waters, with an account of the physical features of the region (Crustacea: Amphipoda), *in* Verrill, A. E., pp. 1545-1558.
- Stebbing, T. R. R. 1904. Gregarious Crustacea from Ceylon. Spolia Zeylanica 2:1-26.
- Stephensen, K. 1944. Some Japanese amphipods. Videnskabelige Meddel-

eser fra Dansk Naturhistorisk Forening, Kobenhavn, Vol. 108: 25-88.

_____ 1948. Amphipods from Curaçao, Bonaire, Aruba, and the Venezuelan Islands. Natuwuetschappeleijke Studierkronng vaon Swirameende Nederlands Antillen Utgaven 5:12-17.

Thomas, J. D. 1976. A survey of gamma-rid amphipods of the Barataria Bay, Louisiana, region. Contrib. Mar. Sci. 20:87-100.

Wigley, R. L. 1966. Two new marine amphipods from Massachusetts, U. S. A. Crustaceana 10: 259-270.