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Redescription of *Notomastus hemipodus* Hartman, 1945 and *N. tenuis* Moore, 1909 (Polychaeta: Capitellidae)

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Abstract.—Redescriptions of *Notomastus hemipodus* and *N. tenuis* are provided based on the examination of type specimens and supplemental material. Details of important morphological characters such as epithelial texture, lateral organs, genital pores, shape of the hooded hooks, and methyl green stain pattern are provided for both species. The two species, widely reported along the east, west, and Gulf coasts of North America, the Caribbean, and even Nigeria, have been confused since the 1960s. *Notomastus americanus* is newly synonymized with *N. hemipodus* due to the similarity in the characters of epithelial texture, first uniramous chaetiger, presence of an anterior palpode, and hooded hooks as well as identical methyl green stain patterns.

Resumen.—Se describen las especies de *Notomastus hemipodus* y *Notomastus tenuis* basado en el material tipo y material adicional. Se detallan los caracteres morfológicos importantes como la textura del epitelio, los órganos laterales, poros genitales, la forma de los ganchos cubiertos, y el patrón de tinción con verde de metilo para ambas especies. Las dos especies, se han reportado ampliamente a lo largo del este, el oeste, y las costas del Golfo de Norte America, el Caribe e incluso Nigeria, teniendo confusión desde los años 1960's. *Notomastus americanus* es sinonimizado con *N. hemipodus*, debido a la similitud en los caracteres, textura del epitelial, primer setigero unirrámeo, presencia de palpo anterior, y los ganchos cubiertos, así como el patrón de tinción con verde de metilo.

Keywords: biogeography, capitellid literature, polychaete taxonomy, staining patterns

The taxonomy of capitellids appears simple because they are polychaetes with relatively few distinct morphological characters that can be used for classification. It is this simplicity that causes widespread confusion at the species level within genera and between genera. Such is the case of *Notomastus hemipodus* Hartman, 1945 and *Notomastus tenuis* Moore, 1909.

These species share similar morphological characters as well as a long history of mistaken identity dating back to the 1960s. Both species have been widely reported along the east and west coasts of North America, the Caribbean, and even Nigeria.

Moore (1909) described *Notomastus tenuis* from San Diego, California. It was later recorded from several areas including: British Columbia, Canada (Berkeley

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1929, Hobson & Banse 1981), from Washington to southern California (Hartman 1947 as *N. (Clistomastus) tenuis*; Blake 2000), western Mexico (Rioja 1962, Fauchald 1972, Salazar-Vallejo 1981, Calderón-Aguilera & Jorajuria-Corbo 1986, de León-González 1994), Gulf of California (Reish 1968, Kudenov 1980, Hernández-Alcántara & Solís-Weiss 1998, 1999, 2003), Gulf of Mexico (Ewing 1984 as *Notomastus ? tenuis*), Costa Rica (Dean 2001), Venezuela (Jiménez-Prieto et al. 2000), Cuba (Ibarzábal 2007), and Puerto Rico (Morales-Núñez 2005). Nigerian records are from George et al. (2009).

The first mention of *Notomastus (Clistomastus) hemipodus* was a brief diagnosis by Hartman (1945); only later did Hartman (1947) provide a detailed description of the species. The species was eventually recorded by Hartman from the Gulf of Mexico (1951) and California (1969). Additional reports of *N. hemipodus* include the following: North Carolina, Florida, and California (Day 1973); the northern Gulf of Mexico (Ewing 1984); the Mexican Pacific (Hernández-Alcántara & Solís-Weiss 1993, 1998, 1999, 2003); the Santa Maria Basin and Western Santa Barbara Channel in California (Blake 2000); Brazil (Rizzo & Amaral 2001); Pacific Panama (Lopez et al. 2002); Cuba (Ibarzábal 2007); Nigeria (Uwadiae 2009); and tentatively from Thailand (Green 2002).

In this paper, *Notomastus hemipodus* and *N. tenuis* are redescribed based on the examination of type and non-type materials previously recorded by other authors. *Notomastus americanus* (Day, 1973) is synonymized with *N. hemipodus* (Hartman, 1945) based on revision of the type material.

Materials and Methods

Type and non-type material belonging to the Natural History Museum of Los

Angeles County, Allan Hancock Foundation, (LACM-AHF), National Museum of Natural History, Smithsonian Institution (USNM), California Academy of Sciences, San Francisco (CAS), as well as the laboratory of Ecología y Biodiversidad de Invertebrados Marinos of the Instituto de Ciencias del Mar y Limnología-UNAM (ICMyL-UNAM) were examined. In addition, specimens from surveys carried out by the first and third authors in 2004, 2005, and 2006 in the Mexican Pacific were analyzed. These specimens are deposited in the Polychaete Collection of the Universidad Autónoma de Nuevo León (UANL). The methyl green staining pattern was used to determine specific patterns of glandular areas. Following the protocol of Warren et al. (1994), we submerged specimens for 1–2 min in a solution of methyl green in 70% alcohol and washed them in several alcohol changes to eliminate excess stain; several bands or dots of staining immediately appeared on the epithelium, and in most of the cases, revealed a specific pattern. Staining patterns are temporary and eventually disappear.

Systematics

Class Polychaeta Grube, 1850
Order Capitellida Fauchald, 1977
Family Capitellidae Grube, 1862
Genus *Notomastus* Sars, 1851

Notomastus hemipodus Hartman, 1945
Figs. 1A–D, 2A–D

Notomastus (Clistomastus) hemipodus Hartman, 1945:38; 1947:424, pl. 48, Figs. 1–5; 1951:103, pl. 24, Figs. 1–3; 1969:393, Figs. 1–5.

Notomastus hemipodus: Day, 1973:100.—Ewing, 1984:14.28, Figs. 14.23, 14.24a–d.—Blake, 2000:81, Fig. 4.13.

Notomastus (Clistomastus) tenuis Hartman 1947:420, pl. 47, Figs. 1–5 (par-tim).—Kudenov, 1975:220; 1980:115.

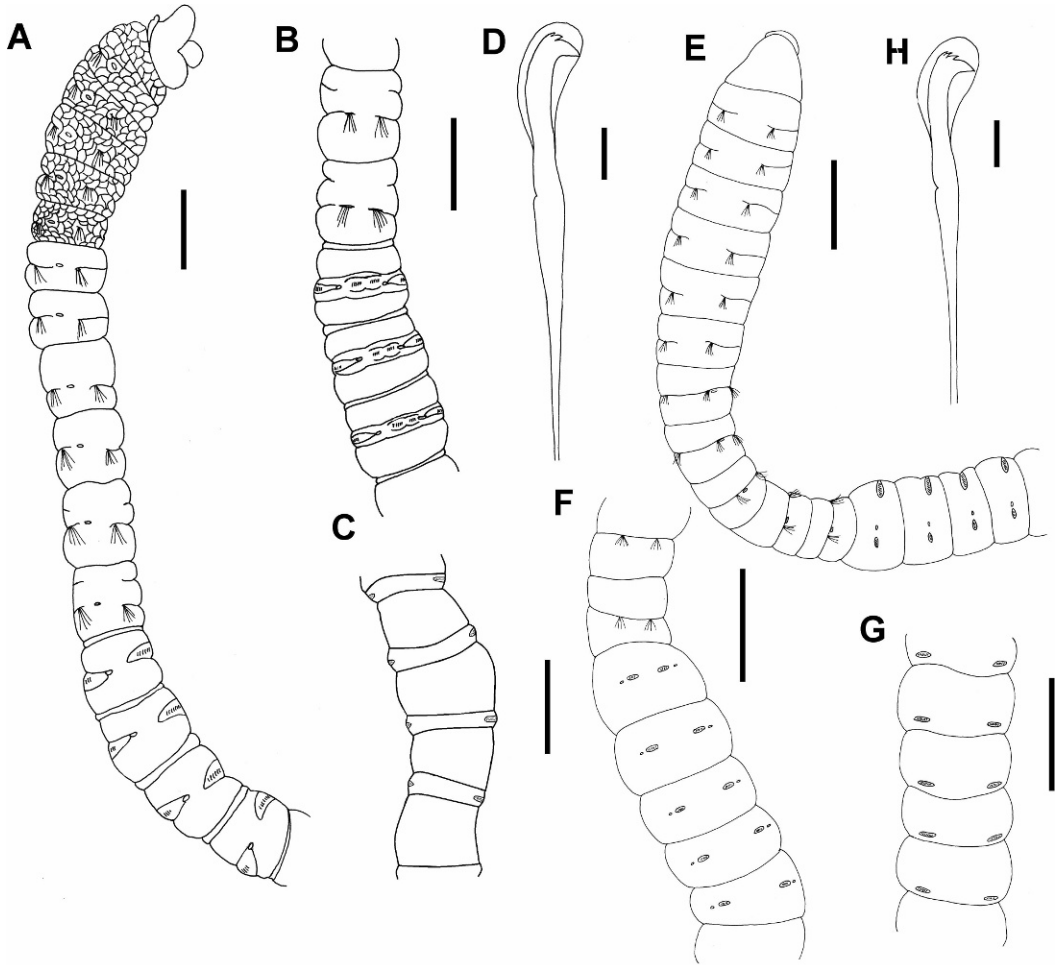


Fig. 1. A–D, *Notomastus hemipodus*, holotype; E–H, *Notomastus tenuis*, holotype. A, anterior end, lateral view; B, chaetigers 11–15, dorsal view; C, chaetigers 19–21, ventral view; D, neurohook from chaetiger 18, lateral view; E, anterior end, dorsal view; F, chaetigers 11–16, dorsal view; G, chaetigers 18–22, ventral view; H, neurohook from chaetiger 24, lateral view. Scale bars: A–C, E–G = 1 mm; D, H = 30 μ m.

Notomastus tenuis: Fauchald, 1972:248.—Hernández-Alcántara & Solís-Weiss, 1999:27; 2003:4 (not Moore, 1909).

Notomastus americanus Day, 1973:100, Figs. 13l–n.—Hernández-Alcántara & Solís-Weiss, 1993:1034; 1998:710–711; 1999:27; 2003:4. (new synonymy).

Type material.—Holotype: North Carolina, Bogue Sound, (LACM-AHF Poly 414), dredged in a few feet of water, 15 Jun 1940; Paratypes: North Carolina, Bogue Sound, (4), (LACM-AHF Poly 415), incomplete, Jun 1940; (1), (LACM-

AHF Poly 2667), muddy sand at low tide, Jun 1940; (2), (LACM-AHF Poly 2668), incomplete, muddy sand flats at low water, Jun 1940; (6), (LACM-AHF Poly 2669), incomplete, outer end of Bird Shoal, 18 Jun 1940, Coll. O. Hartman.

Additional type material.—*Notomastus americanus* Day, 1973, Holotype: North Carolina, Beaufort, (USNM 43118), 4 Jun 1965; Paratypes: North Carolina, Beaufort, (14), (USNM 43119), 4 Jun 1965.

Comparative material examined.—U.S.A.: Oregon, off Columbia River, (1), st. 668,

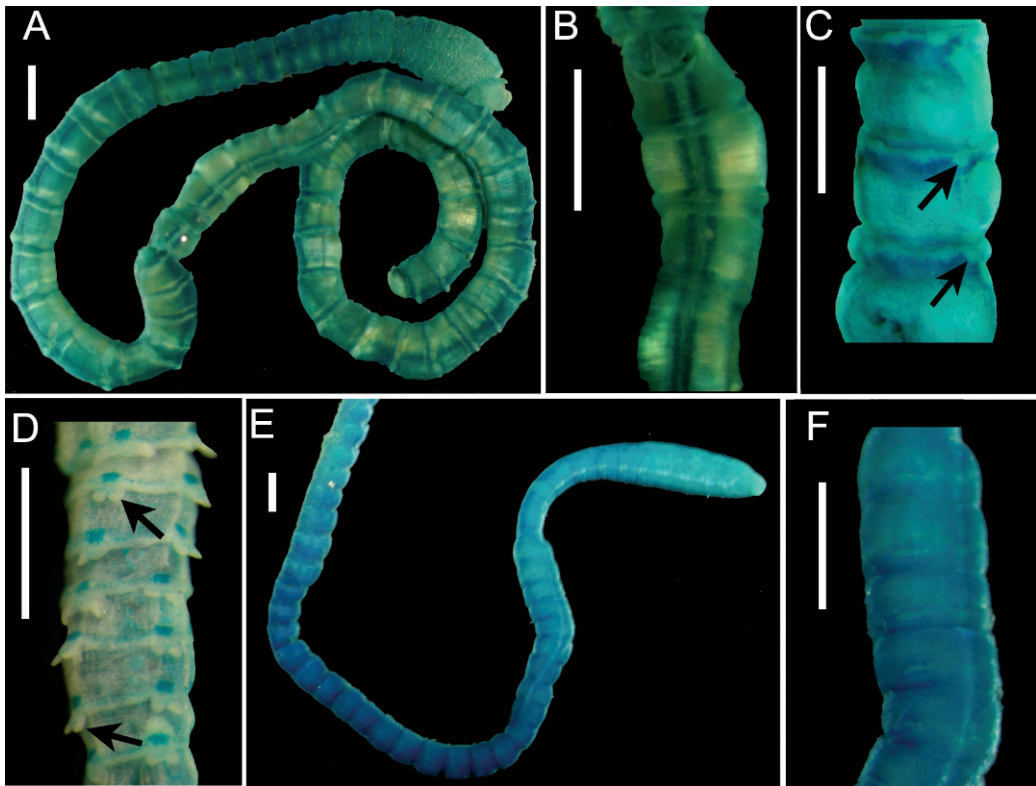


Fig. 2. Methyl green staining pattern. A–D, *Notomastus hemipodus*, holotype; E, F, *Notomastus tenuis*, holotype. A, anterior end, lateral view; B, chaetigers 24–28, ventral view; C, non-type chaetigers 23–27, dorsal view, arrows indicate intersegmental grooves; D, chaetigers 102–105, dorsal view, arrows indicate epithelial extensions; E, anterior end, lateral view; F, chaetigers 13–17, lateroventral view. Scale bars: A–F = 1 mm.

(LACM-AHF), 64 m depth, MCR Baseline Study, 24 Jan 1975, coll. A. G. Carey; (3), st. 89, (LACM-AHF), 86 m depth, MCR Baseline Study, 5 Dec 1974, coll. A. G. Carey. California, Anaheim Slough, (7), st. 903-38, (LACM-AHF), 5 Dec 1938; (5), st. 905-38, (LACM-AHF), 7 Dec 1938; Mission Bay, (2), *Velero III*, st. 1211-40, (LACM-AHF); Newport Bay, (1), st. 13, (LACM-AHF), Jan 1954, coll. D. J. Reish; (3), *Velero*, st. 2307-53, (LACM-AHF); Santa Maria Basin, off Point Arguello, (1), st. PJ-2 rep. 3, [34°55.32'N, 120°49.59'W], 142 m depth, (2), st. PJ-3 rep. 1, [34°56.26'N, 120°49.58'W], 138 m depth; (2), st. PJ-7 rep. 2, [34°55.79'N, 120°48.60'W], 123 m depth; (2), st. PJ-8 rep. 2, [34°56.87'N, 120°49.91'W], 142 m depth, coll. Battelle.

MEXICO: Baja California, Las Animas Island, (1), st. F3893-11831, (LACM-AHF) [28°41'30"N, 113°02'00"W], 207 m depth, 1 Dec 1967; North Consag Rock, (4), st. 38, (ICMyL-UNAM) [31°08.3'N, 114°13.3'W], 71.9 m depth, 16 Mar 1985; (12), st. 39, (ICMyL-UNAM) [30°59.4'N, 114°04.1'W], 106.4 m depth, 16 Mar 1985, coll. Pablo Hernández-Alcántara (PHA); Baja California Sur, Cabo Falso, (1), st. F4285-13774, [22°35'00"N, 109°35'00"W], 426.72 m depth, 22 Jan 1970, coll. *Velero IV*; Western coast, (1), st. 25 BIP II, (UANL 6486), 6 Oct 1998, coll. Eduardo Balart & Edgar Amador; Rancho Bueno, Santa Marina Bay, (2), (UANL 6485) [24°08'23.4"N, 110°21'05.8"W], 1 m depth, 21 Jan 1999, coll. Jesús Angel de León-González (JAL-G); Ensenada de La Paz,

La Paz Bay, (1), st. 10-A, (UANL 6484) [24°09'55.1"N, 110°25'39.6"W], 1 m depth, 27 Nov 2005, coll. Daniel Hernández-Villarreal (DH-V); (1), st.12, (UANL 6482) [24°07'37.3"N, 110°25'10.6"W], 0.15 m depth, 27 Nov 2005, coll. DHV; El Conchalito beach, (2), (UANL 6481) [24°08'23.4"N, 110°21'05.8"W], 1 m depth, 24 Jun 2005, coll. María Elena García-Garza (MEG-G); Concepción Bay, Los Cocos beach, (2), (UANL 6483) [26°44'39.1"N, 111°53'55.4"W], 1 m depth, 25 Jun 2005; Santispac Mangrove, (6) (UANL 6487) [26°45'43.2"N, 111°53'31.0"W], 1 m depth, 3 Aug 2006, coll. JAL-G & MEG-G; Sonora, Punta Arboleda, (13), st. 15, (ICMyL-UNAM) [26°51.1'N, 110°06.5'W], 49.8 m depth, 12 Mar 1985; Estero Tastiota, (5), st. 48, (ICMyL-UNAM) [28°16.4'N, 111°36.6'W], 60.2 m depth, 18 Mar 1985; Sinaloa, El Fuerte River, (5), st. 52, (ICMyL-UNAM) [25°39.9'N, 109°28.6'W], 28.6 m depth, 20 Mar 1985; Santa María Bay (1), st. 3, (ICMyL-UNAM) [25°02.4'N, 108°31.7'W], 32 m depth, 10 Mar 1985; (5), st. 05, (ICMyL-UNAM) [24°54.6'N, 108°45.3'W], 120 m depth, 10 Mar 1985; Santa Inés Bay, (5), st. 49C, (ICMyL-UNAM) [26°59.2'N, 111°58.3'W], 28.9 m depth, 19 Mar 1985, coll. PHA; Jalisco, Cabo Corrientes, (1), st. F4205-13756, (LACM-AHF) [19°51'30"N, 105°58'00"W], 426.72 m depth, 18 Jan 1970; Nayarit, Punta Piedras, San Juanito Island, (1), st. F4296-13768, (LACM-AHF) [21°53'00"N, 106°50'00"W], 256 m depth, 20 Jan 1970, coll. *Velero IV*; Campeche, Cd. Carmen, Playa Tortugueros, (1), st. 4, [18°42'10.6"N, 91°41'90"W], 0.50 m depth, 8 Jun 2011, coll. MEG-G, Julio Homero Landín Delgado, & Amilcar P. de la Rosa.

Diagnosis.—Prostomium conical, with anterior palpode, eyespots present. Peristomium and first five chaetigers with strongly tessellated epithelium. Thorax with 12 segments, 11 chaetigers with bilimbate capillary chaetae, first chaetiger uniramous. Thoracic and abdominal

chaetigers biannulate. Transition between thorax and abdomen marked by chaetal change and also by constriction. Abdominal chaetigers with hooded hooks on both rami, with notopodial lobes close together and neuropodial lobes lateral, expanded up to dorsal region. Notopodial and neuropodial abdominal hooded hooks of similar shape.

Redescription.—Holotype anterior fragment, 52 segments, 45 mm long by 1 mm wide in abdomen. Color in ethanol light brown. Prostomium conical, with anterior palpode. Pharynx everted, with soft papillae basally, smooth surface distally. Eyespots present, covered by peristomium. Peristomium and first five chaetigers with strongly tessellated epithelium, subsequent chaetigers smooth (Figs. 1A, 2A).

Thorax with 12 segments, including achaetous peristomium and 11 chaetigers with bilimbate capillary chaetae; first chaetigers uniramous with notopodium, subsequent chaetigers biramous. Notopodia lateral in first thoracic chaetiger, moved dorsally in subsequent chaetigers. Thoracic and abdominal chaetigers biannulate. Lateral organs present along body, situated between notopodia and neuropodia; thoracic lateral organs oval in shape, close to notopodia (Fig. 1A); anterior abdominal organs globular, exposed, and close to neuropodia. Genital pores on last thoracic chaetigers, appearing on intersegment areas of chaetigers 8/9, 9/10, 10/11, and 11/12.

Transition between thorax and abdomen marked by chaetal change and by constriction (Fig. 2A). Abdominal chaetigers with hooded hooks on both rami. Notopodial lobes close together on anterior abdominal region (Fig. 1B), chaetal fascicles with 12–15 hooded hooks. Neuropodial lobes lateral, expanded up to dorsal region, separated ventrally (Fig. 1C), chaetal fascicles with 18–20 hooded hooks. Notopodial and neuropodial abdominal hooded hooks of similar shape, with moderate anterior shaft, angulated node,

evident constriction, developed shoulder, moderate hood, and posterior shaft longer than anterior one. Two rows of subapical teeth above main fang, basal row with 7 teeth, and apical one also multidentate, smooth hood (Fig. 1D). Branchiae not observed in holotype. Pygidium unknown.

Additional information from paratype LACM-AHF Poly 2667.—Specimen nearly complete, 148 segments, 65 mm long by 2 mm wide, at about segment 60 notopodial tori begin to develop thin bilobed epithelial extensions that continue to end of specimen. Notopodial lobes nearly touching in anterior abdominal region, gradually moving apart in median and posterior chaetigers. Neuropodial lobes in median and posterior region small, inconspicuous.

Methyl green stain.—Dorsal part of peristomium with oval area stained light green. Chaetigers 1–6 with the same green intensity. Wide continuous longitudinal line on ventral side from peristomium to chaetiger 6; chaetigers 7–10 stained dark green mainly on dorsum (Fig. 2A). Abdominal chaetigers dorsally stained with moderate green. Ventral region with pair of longitudinal bands to end of body (Fig. 2B). Variations: when best developed in large, fresh specimens, prostomium, peristomium, chaetigers, segments 1 and 2 (first chaetiger) unstained; chaetigers 3–4 slightly darker, chaetigers 5–11 with dark speckled or solid bands encircling body, darkest on chaetigers 8 and 9; chaetiger 8 with darker half-oval on anterior part; chaetiger 12 lighter than previous or following chaetigers; from chaetiger 13 through most of body two thin parallel mid-ventral lines present (“racing stripes,” Fig. 2B), lines eventually become broken into short, comma-shaped spots in far posterior; dorsum dark for most of body, each chaetiger interrupted by unstained bands connecting podial tori and intersegmental grooves (Fig. 2C), dorsal stain gradually fades toward posterior, leaving thin encircling bands just above tori (Fig. 2D);

dark stain surrounds neuropodial tori. Half-oval on chaetiger 8 sometimes absent. Some individuals do not stain, especially older specimens, or only have parallel mid-ventral lines or only half-oval.

Remarks.—The holotype of *Notomastus hemipodus* is an incomplete specimen with only 52 segments; for this reason the branchial lobes were not observed. However, several paratypes, although incomplete, begin to develop epithelial extensions posterior to the notopodia starting around segment 60–70. Complete specimens from La Paz Bay, Baja California Sur, México also have these structures. These expansions first appear as subconical small simple lobes (Fig. 2C), from chaetigers 30 to 35, and from the 36th chaetiger, these structures appear larger and bilobed, extending until almost the end of the body (Fig. 2D). In another specimen collected in Rancho Bueno, Santa Maria Bay, branchial lobes are present from chaetigers 120 as simple lobes, and from chaetiger 135 these appear bilobed; however, other characteristics are similar to *N. hemipodus*, including the stain color pattern.

Hutchings & Rainer (1979) first noticed the epithelial extensions and referred to them as branchiae. Living animals do not appear to have blood vessels in the extensions. Capitellids frequently have rings of glandular tissue at the level of the tori that can be seen in preserved material with methyl green; these extensions are below the glandular ring and remain unstained despite long periods of immersion in stain. They also noted that the dental formula of the hooks on specimen LACM-AHF Poly 415 was MF: 4–6:6–8:6–8. There is a gradation in the amount of stain taken up even among the paratypes, ranging from almost no stain, except for faint midventral lines to the full pattern. Large specimens were more likely than small specimens to lack stain, as were individuals in poor condition.

Distribution.—Amphiameric: *Notomastus hemipodus* is known from the east coast of the United States, the Gulf of México, and western México northward to British Columbia; occurs in shallow bays, estuaries, mangroves, and shelf depths. Records for other parts of the world require confirmation. Depth range 0.50 m–426.72 m

Notomastus tenuis Moore, 1909

Figs. 1E–H, 2E, F

Notomastus tenuis Moore, 1909:277, pl. 9, fig. 55.—Berkeley & Berkeley, 1952:103.—Blake 2000:85, Fig. 4.15

Notomastus angulatus Chamberlin, 1919:16–17.—Berkeley, 1929:312.

Eisigella tenuis Berkeley & Berkeley, 1942:198.

Notomastus (Clistomastus) tenuis Hartman, 1947:420, pl. 47, Figs. 1–5 (partim); 1969:397, Figs. 1–5.—Reish, 1968:89.

Notomastus ? tenuis Ewing, 1984:14.26, Figs. 14–21, 14–22a–c.

Type material.—Holotype: California, San Diego, (CAS-019718), intertidal, 1902–1903, coll. E. C. Starks.

Comparative material examined.—Washington, Puget Sound, (2), st. N2251, (LACM-AHF), coll. O. Hartman; Friday Harbor, San Juan Island, (57), 60 m depth, soft sediments, Jan 2001, coll. Leslie H. Harris (LHH); California, Anaheim Slough, (7), *Velero IV*, st. 1457-42 (LACM-AHF); (5), *Velero IV*, st. 1495-43 (LACM-AHF); (1), *Velero IV*, st. 1472-42 (LACM-AHF); (10), *Velero IV*, st. 1505-42 (LACM-AHF); Point Richmond, San Francisco Bay, st. N2243, (LACM-AHF), 22 Feb 1937, Hartman Collection; Moss Beach, (4), st. N2247, Jul 1933; (8), st. N2246, Apr 1937, (LACM-AHF), Hartman Collection; off Oakland Airport, San Francisco Bay, (10), st. N2244, 28 Nov 1936, Hartman Collection; Drakes Estero, (5), st. N2245, May 1934, (LACM-AHF),

Hartman Collection; Princeton, (3), st. N2250, (LACM-AHF), Hartman Collection; Tomales Bay, in eel grass flats, (1), st. N3442, (LACM-AHF), Jul 1935, Hartman Collection; Duxbury trailhead, Point Reyes, (1), [37.903°N, 122.725°W], low intertidal, sandy, 4 Jun 2007, coll. Marine Pollution Studies Laboratory; south San Diego Bay, (13), 2–3 m depth, sandy silt, Jun 2003, coll. LHH.

Diagnosis.—Prostomium depressed, conical, without palpode, eyespots present. Epithelium smooth along body. Thoracic chaetigers biannulate. Thorax with 12 segments, 11 chaetigers with bilimbate capillary chaetae, first chaetiger uniramous. Transition between thorax and abdomen marked by abrupt enlargement of abdominal chaetigers and chaetal change. Abdominal chaetigers uniannulated, with hooded hooks on both rami, notopodia separated by wide gap from onset, neuropodia small, separated ventrally.

Redescription.—Holotype incomplete, 60 anterior segments, 13 mm long, 1 mm wide. Color in alcohol yellowish. Prostomium depressed, conical. Two pairs of brown eyespots patches inserted on anterolateral margin of prostomium. Pharynx exposed with soft basal papillae. Epithelium smooth along body. Thorax with 12 segments including achaetous peristomium and 11 chaetigers with bilimbate capillary chaetae; first chaetiger uniramous with notopodium, and following biramous; chaetigers 1–4 enlarged, 5–11 thinner than first ones, biannulated (Fig. 1E). Lateral organs from first chaetiger located between notopodia and neuropodia, closer to notopodia; in thoracic region, lateral organs oval shaped and in abdominal region appear as small protuberances, near notopodia, until end of body genital pores on thoracic intersegmental areas 5/6, 6/7, 7/8, 8/9, 9/10.

Transition between thorax and abdomen marked by abrupt enlargement of abdominal chaetigers and chaetal change.

Abdominal chaetigers with hooded hooks on both rami, uniannulated, notopodia separated by wide gap from onset (Fig. 1F), fascicles with 4–5 hooded hooks. Neuropodia small, separated ventrally (Fig. 1G) in fascicles with 6–10 hooded hooks on middle chaetigers, fascicles reduced to 4–5 hooks posteriorly. Notopodial and neuropodial abdominal hooded hooks of similar size and shape along whole body, with moderate anterior shaft, angulose node, evident constriction, wide shoulder, moderate hood, posterior shaft longer than anterior one (Fig. 1H). Four to five rows of multidentate subapical teeth above main fang. Branchiae not observed. Pygidium not observed.

Observations of additional specimens.—Presence and number of multiple eyespots is variable, usually seen only in freshly collected material. Texture of first half of thorax is variable from completely smooth to noticeably reticulated, appears to be related to degree of contraction. Abdominal chaetigers are often strongly moniliform in contrast to the cylindrical thoracic chaetigers. Median and posterior neuropodial tori are conspicuous large ovals. In median body the notopodial lobes expand into distinctive backwards-pointing nodes that continue to the end of the body. Pygidium a simple elongated cone as long as last 4–5 chaetigers, with small marginal papillae.

Methyl green stain.—Peristomium, thorax, and abdomen stain light green (Fig. 2E). Prechaetal area of some abdominal chaetigers has slightly darker green encircling band (Fig. 2F). Variation from non-type specimens: chaetigers 5 to 11 may stain slightly darker.

Remarks.—Moore (1909) did not describe the first chaetiger. When examining the type material, it was observed that the first chaetiger is uniramous. Moore did not observe the lateral organs or the genital pores. After staining the holotype with methyl green, lateral organs were

observed along the thorax and abdomen, as were genital pores in the intersegment areas between chaetigers 5–10. The three most distinctive characters of the species are the narrowing of the last thoracic chaetigers followed by the abrupt enlargement of the first abdominal chaetigers, the prominent notopodial lobes in the abdomen, and the presence of multiple eyespots, although this last character is the least reliable due to fading over time.

Distribution.—*Notomastus tenuis* is known from California through Washington, in sandy beaches, shallow bays and estuaries. Records from other parts of the world require confirmation.

Discussion.—After revision of the type material of *Notomastus hemipodus* and *N. tenuis*, we examined nearly all of the specimens labeled as such in the LACM-AHF as well as many specimens in LHH private collection. All of the *N. tenuis* cited in Hartman (1947) came from intertidal or shallow subtidal areas in sand, silt, and seagrass beds and are correctly identified; however, specimens of sampling stations 903-38, 905-38 and 1211-40 belong to *N. hemipodus*. Subsequently, researchers on the west coast of the U.S.A. have confused the two species, which resulted in *N. tenuis* being reported from shelf depths. This may be due to the fact that the specimen of *N. tenuis* illustrated in Hartman (1947: plate 47, Figs. 1–5) looks very similar to *N. hemipodus*. It shows minimal size difference between the last thoracic and first abdominal chaetigers and the first half of the thorax is tessellated. The fact that most collected specimens are anterior fragments lacking the characteristic enlarged posterior notopodia, and that eyespots rapidly fade in preservative also contributed to the confusion. Even Hartman failed to make the distinction in some of her later survey work. In her 1963 paper and the 1969 atlas, she reported *N. tenuis* down to a depth of 397 meters. The problem on the west coast worsened after

the First International Polychaete Conference in Sydney when an incorrect stain pattern for *N. hemipodus* was shown during one of the talks. Local workers erroneously believed that the pattern with mid-ventral lines belonged to *N. tenuis*. It was not until 1995 when the two species began to be properly distinguished based on staining patterns. In two newsletters of the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT vol. 18(1) and 19(11)), Leslie Harris (LACM-AHF) discussed the confusion between *N. tenuis* and *N. hemipodus* and the staining patterns of both species. SCAMIT proposed the provisional name *Notomastus* sp. A for the west coast specimens with mid-ventral lines retrieved from shelf depths due to the discontinuous distribution and difference in habitat from the type locality of *N. hemipodus* (intertidal and shallow subtidal in bays and estuaries). As we could not find any morphological character to distinguish west and Gulf coast specimens, we are treating both specimens as *N. hemipodus*. Genetic or life history studies would be required to confirm their synonymy.

Notomastus tenuis is largely restricted to intertidal and shallow subtidal habitats in west coast bays and estuaries. The Santa Maria Basin and Santa Barbara Channel records from 197 to 395 m (Blake 2000) probably represent another species whereas those reported from Tomales Bay are correctly identified. *Notomastus hemipodus* has a wider distribution on the east coast and in the Caribbean, whereas along the west coast it is primarily a shelf species.

Fauchald (1972) recorded *Notomastus tenuis* for the first time from northwestern Mexico. His material was re-examined and it is *N. hemipodus*. There are several misidentifications in the literature concerning *N. hemipodus*. For example, Kudenov (1975) recorded *N. tenuis* from La Cholla Bay, Peñasco Harbor. We found that these records correspond to

N. hemipodus. Moreover, Hernández-Alcántara & Solís-Weiss (1993, 1998, 1999, 2003) recorded *N. americanus*, *N. hemipodus*, and *N. tenuis* from the Gulf of California, but based on the revision of these materials, the specimens identified as *N. americanus* and *N. tenuis* belong to *N. hemipodus*.

Calderón-Aguilera & Jorajuria-Corbo (1986) recorded *Notomastus* (*Clistomastus*) *tenuis* from San Quintín Bay, Baja California. These specimens were not revised in the present work, but based on the description provided by the authors, we conclude that their record is erroneous because of the following characteristics: the first chaetiger is biramous, chaetiger 10 with a mixture of capillary chaetae and hooded hooks, and chaetiger 11 only with hooded hooks. These morphological characters do not correspond to *N. tenuis* or to *N. hemipodus*.

Hartman (1945) described *Notomastus hemipodus* from Beaufort, North Carolina. Later, Day (1973) described *N. americanus* from the same locality. The crucial difference between the two species is the presence of hooded hooks in the neuropodia of chaetiger 11 in *N. americanus*. Re-examination of type material of both species revealed similar morphological features and the same methyl green color. Day's specimens measure between 7–20 mm long and can be considered as juveniles. The variations in the chaetal formula during the ontogeny of the capitellids can generate confusion when identifying specimens in immature stages. Ewing (1984) found that small specimens of *N. americanus* occasionally present a mixture of capillary chaetae and hooded hooks in the neuropodia of chaetiger 10. Hernández-Alcántara & Solís-Weiss (1998) stated that in juvenile stages *N. americanus* have only hooded hooks or a mixture of capillary chaetae and hooded hooks on the neuropodia of chaetigers 9–11. We consider *N. americanus* to be a junior synonym of *N. hemipodus*.

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