Biodiversidad de poliquetos capitélidos (annelida:polychaeta) de las costas mexicanas

Biodiversity of capitélidos polychaetes (Annelida: Polychaeta) from the Mexican coast

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Resumen

Los poliquetos pertenecen al Phylum Annelida, se encuentran entre los organismos marinos más frecuentes y abundantes en todos los ambientes marinos, desde la zona de entre mareas hasta las profundidades abisales. Los capitélidos generalmente viven enterrados en la arena o lodo, con hábitos similares a los de las lombrices de tierra. Se alimentan de materia orgánica adherida al sedimento, y son a menudo componentes dominantes de la infauna, especialmente en aquellos sedimentos enriquecidos orgánicamente. Debido a esto, son considerados los mejores indicadores del grado de contaminación orgánica, por tener la capacidad de reproducirse y establecerse en condiciones muy adversas. El objetivo principal de este estudio fue analizar la biodiversidad y el estatus taxonómico de los capitélidos en las costas del Pacífico mexicano y el Golfo de México, realizando una revisión taxonómica de las especies descritas para estas zonas, examinando material tipo y no tipo de diversas colecciones nacionales e internacionales. El material biológico examinado, proviene de 3 fuentes, material tipo, material no tipo, y material de las campañas de muestreo. Se examinó material tipo y no tipo perteneciente a 22 géneros y 62 especies, 11 de estas potencialmente nuevas para la ciencia, del género *Notomastus* 5 especies, *Notodasus* con 3 especies, *Dasybranchethus* y *Leiochrides* con una nueva especie respectivamente y *Capitella* con un complejo de 7 morfotipos. Los especímenes analizados fueron corroborados con material tipo de diferentes museos. Antes de iniciar el presente

estudio se reportaban 19 géneros y 43 especies. Con esta nueva investigación se amplía el conocimiento de nuevas especies, además de evidenciar que algunas especies previamente registradas para nuestro país no lo son en realidad y están bajo otro nombre. El nombrar especies de otras latitudes es quizá una de las prácticas más frecuentes en la taxonomía. Esto debido a que gran cantidad de literatura clásica fue dedicada para fauna de otros continentes, aunado a descripciones escuetas, con ilustraciones poco detalladas.

Palabras claves: Taxonomía, Polychaeta, Capitellidae, México.

Abstract

Polychaetes belonging to Phylum Annelida, are among the most frequent and abundant marine organisms in all marine environments, from the intertidal zone to the abyssal depths. The capitélidos usually live buried in sand or mud, similar to earthworms habits. They feed on organic matter adhering to the sediment, and are often key components of the infauna, especially in organically enriched sediments. Because of this, they are considered the best indicators of the degree of organic pollution, have the ability to reproduce and settle in very adverse conditions. The main objective of this study was to analyze the biodiversity and taxonomic status of capitélidos on Mexico's Pacific coast and the Gulf of Mexico, making a taxonomic revision of the species described for these areas, examining type material rather different type of collections national and international.

Key words: Taxonomy, Polychaeta, Capitellidae, Mexico.

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Introduction

Polychaetes belong to the Phylum Annelida, they are among the most frequent and abundant marine organisms in all marine environments, from the intertidal zone to the abyssal depths; this group of organisms can be dominant in various environments such as hydrothermal vents. Most polychaetes are part of the cryptic fauna inhabiting sedimentary or coral rock, or in galleries formed in the sediment. Due to this diversity of habitat, it is not surprising that polychaetes exhibit great variation in both shape and size.

Some adult specimens can reach lengths of fractions of a millimeter, others up to around 6 meters (Rouse and Pleijel, 2001). The importance of these organisms lies mainly in the food web of these environments, since they are part of the feeding of bentophagous fish, as well as macroinvertebrates and other polychaetes; also, its importance stands out since they are the benthic organisms that show the fastest response to any disturbance, whether natural or anthropogenic, for which some species have been taken as bioindicators.

The capitellids are included in the group Sedentaria, and groups of genera of capitellids at the subfamily level are not currently recognized. The recognition of the genera of capitelids has been based on the setal formula; that is, the number of segments with capillary setae, the mixed segments, and the setation of the abdominal segments. Although there is some ontogenetic variation, the setal formula is useful for identifying adults.

The capitals are typical inhabitants of soft bottoms and can be very numerous, due to their abundance they are important in the energetics of these environments. Their morphology is very simple, they have the shape of an earthworm. They generally live buried in sand or mud, and feed by assimilating organic matter attached to the sediment. Their distribution range is from the intertidal zone to the deep sea and they are often dominant components of the infaunal community, especially in organically enriched sediments. Given their importance as bioindicators, capitellids have been the subject of numerous ecological studies. However, the lack of taxonomic research, in which its variations are analyzed, has caused a number of errors when naming species that are now considered to have a dubious distribution.

Objetive

Cclarify the taxonomic status of the capitelid polychaete fauna of the Northwest Mexico.

Particular objectives

1.- Carry out taxonomic revisions of the Capitellidae species on the coasts of the Northwest Mexico, based on redescriptions of the type material.

2.- Review the non-type material from various national collections registered for the

study area, to clarify the possible morphological variations.
3.- Provide diagnoses and standardized illustrations for each species.
4.- Point out the geographical distribution of the species of capitals of Northwest Mexico

Material and methods

The study area ranges from the eastern Pacific coast of the Baja California Peninsula to the coasts of the states of Sonora, Sinaloa, Nayarit, Jalisco and Colima, including the Gulf of California with a length of 7,232.09 km.

The biological material examined comes from 3 sources: type material, from the collections of international museums, Los Angeles County Museum of Natural History, Allan Hancock Foundation (LACM-AHF), Natural History Museum of London (BMNH) in London, Zoologisches Institut and Zoologisches Museum, Universität Hamburg (ZMH), California Academy of Sciences, Philadephia (CAS), and the Muséum National d'Histoire Naturelle (MNHN) in Paris.

Non-type material, from the national collections of the Institute of Marine Sciences and Limnology – UNAM, from El Colegio de la Frontera Sur, Chetumal Unit, the Universidad del Mar campus Puerto Ángel, Oaxaca, the Institute of Marine Sciences and Limnology Mazatlán Unit , the Center for Scientific Research and Higher Studies of Ensenada, the Autonomous University of Baja California Sur and the Polychaeological Collection of the Autonomous University of Nuevo León (UANL).
In addition to 3 sampling campaigns carried out in 2004, 2005 and 2006 in the area entre tides of the coasts of Baja California, Baja California Sur, Sinaloa, Sonora, Nayarit, Jalisco and Colima, this in order to increase the biological material and have better representation of the study area.

carried out locating in the study areas the different habitats in which the species of capitellids could be found. The samples were obtained manually, sifting sand, with 0.5 and 1.0 mm mesh sieves, in the intertidal zone at a depth of 0.50 m to 3.0 m. The organisms were relaxed by lowering the temperature of the container in which they were found, and fixed in 10% formaldehyde in seawater. Once in the laboratory, the material was washed with running tap water and separated, the organisms were preserved in 80% ethyl alcohol, later they were identified at a specific level, based on the literature

available to date. The most important taxonomic characters were examined: shape of the prostomium, distribution of hair setae on the thorax, presence or absence of hair setae on the first notopodium, number of transitional segments between the thorax and abdomen, shape and number of hooks, nuchal organs , presence or absence of gills, lateral organs, nephridial pores and shape of the pygidium.

As alternatives to differentiate and observe morphological structures of the species, methyl green was used, which shows characteristic staining patterns in each species. (Fig.1), Hoyer's liquid to make the integument transparent, facilitating morphological observation under the microscope (Fig.2), and photography with microscopy scanning electronics (Fig.3).

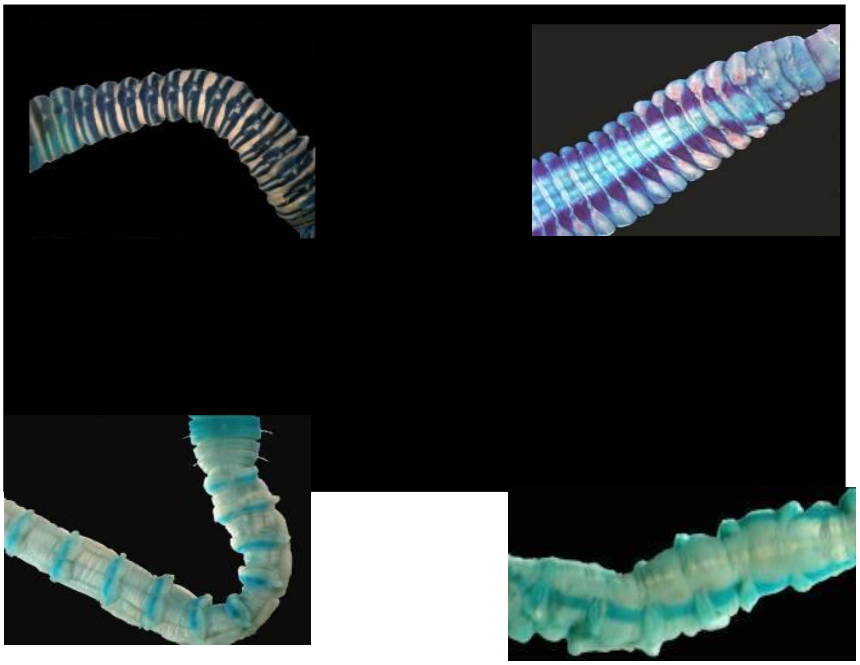

Figura 1. Methyl green staining patterns A) *Dasybranchus parplatyceps,* B) *Notodasus* sp 1, C) *Notomastus* n sp 2, D) *Notomastus polyodon*.

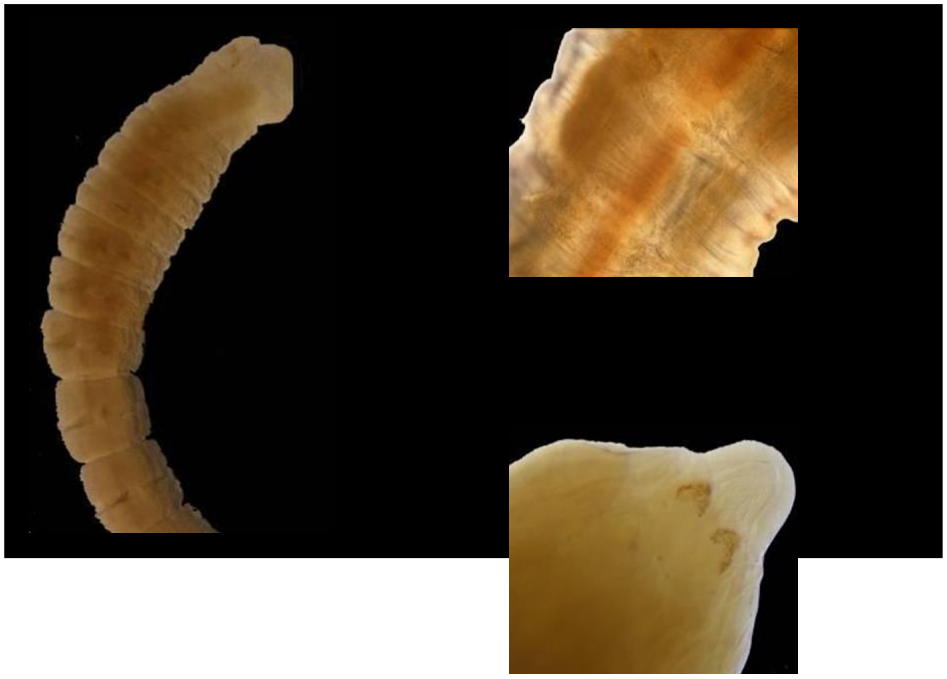

Figura 2. Transparency with L. de Hoyer A) front, side view, B) Abdominal segments, showing notopodial lobes and covered hooks notopodiales, back view, C) Peristomium with eyespots.

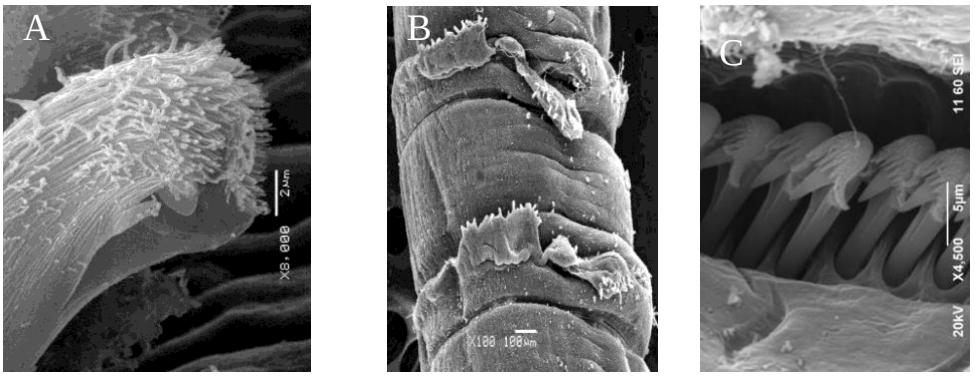

Figura 3. Photographs with Scanning Electron Microscopy (SEM) A) Neuropodial hook Rasghua lobatus, lateral view; B) Abdominal segments Notomastus sp1 dorsal view; C) Notopodial hooks segment 22, Leiochrides sp.

Results

22 genera and 62 species were examined, of which 11 are considered potentially new to science. The species Amastigos acutus, Neopseudocapitella brasiliensis, Notomastus polydon and Dasybranchethus sp, are reported as new records for Mexico. The biological material was corroborated with the holotypes, examining a total of
25 types. The taxonomic classification for genera was based on the scheme proposed by Fauchald (1977).

The species of the Capitellidae family are listed, including synonyms, type material and material examined.

Amastigos acutus Piltz 1977

Type material: Holotype (LACM-AHF POLY 1239), Hope Ranch near Carpinteria, California, USA.

Material examined: (3 specimens). BCS, Bay of La Paz, (UANL 6457) est. eleven); (UANL 6459), est. 7(1); (UANL 6456), est. 11, (1), Col. Daniel Hernández Valdez (DHV).

Distribution: USA, southern California; Baja California Sur, Bay of La Paz; Warrior Bahía de Peta calco.

Anotomastus gordiodes (Moore 1909)

Material examined: (51 specimens) BCS, Bahía Todos Santos, CAP-1, est. IV -2, (1), Col. Sergio Salazar Vallejo (SSV); Bahía de Los Angeles municipal beach, (UANL 6463), (26), Col. JALG and MEGG; BCS, Bahía Magdalena, (UANL 6245) est. E-9, (1); (UANL 6246) est. E-5, (2); its T. E-7, (1), Col. JALG; Sonora, Puerto Peñasco, La Choya Bay, (UANL 6462) (16), (UANL 6464) (4), Col. JALG and MEGG.

Distribution: Mission Bay and Newport, Anaheim Cove and San Diego, California; Baja California Sur and Gulf of California, Mexico

Capitella sp.

material type: Holotipo *Capitella capitata* var. *antartida* NHMAN021930.10.8.2075-2077.

Holotipo *Capitella capitata tripartite* LACM AHF POLY 0447.

Holotipo *Capitella capitata oculata* LACM AHF POLY 0445.

Material examined: (679 specimens) BC, Bahía San Quintín est. 43R(1); BCS, Bahía La Paz, San Gabriel, (1), Col. JALG; Bahía Magdalena (139), Col. JALG; Ensenada La Paz, est. eleven); its T. 3, (1); est.4 (16); est.5, (1); est.11, (1); its T. 12, (1); its T. 1 (1), est. 5(2); its T. 11 (33); its T. eleven); its T. twenty-one); its T. 8(2); est.10, (1) ;est. 11, (2), Col. DHV; Mangrove Zacatecas (4), Col. JALG, MEGG; San Carlos, est 2-B, (43), Sonora, Bahía de Guaymas, (UANL 5238) est-2, (18); (UANL 5239) est. 2, (1), (UANL 5240) (1); (UANL 5241) (1); its T.

6, (4); UANL 5242; est. 3, (2), (UANL5243); est. 3, (1), (UANL 5244); est. 1, (1); River

Hidden, (17); Sinaloa, Mazatlan, (12), 1979 Col. Agnes Rutgers; UANL-0031; Estero el Yugo, (378).

Distribution: Baja California, Baja California Sur, Sonora, Sinaloa, we can infer that this genus is widely distributed in all the Mexican Pacific coasts

Dasybranchethus sp.

Material tipo: Holotipo NHM-AN 02 1931.7.1.58 *Dasybranchetus fauveli*. Monro 1931. examined materia: (2 especímenes) BCS, Bahía Concepción, Playa El Quemadito, (UANL 6336), (1); Manglar Santispac, (UANL 6337), (1), Col. MEGG y JALG.

Distribución: Baja California Sur, Bahía Concepción, México

Dasybranchus parplatyceps Kudenov, 1975

Material Type: Holotype (LACM-AHF POLY 1111); Paratipo (LACM-AHF POLY 1112), Playa

Estación Puerto Peñasco, Sonora.

examined material it: (120 especímenes). BCS, Bahía de La Paz, playa Caimancito est. 1 (1), Col. Héctor Salaices-Polanco; est. C-37 (2); est. C-37, (20); est. 1 (5); Manglar Enfermería, est. E-19, (2); playa Enfermería, (2); playa El Saladito (2); Playa El Presidente, (2), Col. JALG, SSV; Bahía Concepción, Playa El Requesón (UANL 6430) (1), (9), (UANL 6438), Col. JALG; playa El Quemadito, (UANL 6433), (1); Playa Los Cocos, (UANL 6437) (3); Cabo Pulmo-Los Frailes Est. CP-988-2, (5), Col. JRBZ; Bahía de Los Ángeles, playa Moradas, (3), Col. SSV; Playa La Gringa, (UANL 6431), (2), (UANL 6429) (2), Col. JALG, MEGG; Bahía Magdalena, Estero Rancho Nuevo, Bahía Santa Marina, (UANL 6428), (6); Costa Oeste de Baja California Sur, Bahía San Juaníco, (UANL 6439), (2), Col. JALG, Sonora, Guaymas, Playa Varadero (UANL 6427), (11), Col. JALG, MEGG; Nayarit, Islas Marías, (UANL 6463), (1), Col. SSV.

Distribution: Bahía de Guaymas, Bahía de Los Ángeles, Golfo de California; Bahía Santa Marina costa occidental de la Península de Baja California

Dasybranchus platyceps Hartman, 1947

Material tipo: Sintipos (LACM-AHF POLY 0431), Sonora, Golfo de California.

Material examined: (3) Syntypes (LACM-AHF POLY 0431), Sonora, Golfo de

California. Distribution: Gulf of California.

Heteromastus filiformis (Claparède, 1864)

examined material: (19 especímenes), Mazatlán Sinaloa, Estero de Urías, (19) enero 1979, (EMU-418).

Distribution: Widely distributed in the Atlantic and Pacific; Australia, Victoria a Queensland; Mar Mediterraneo.

***Leiocapitella glabra* Hartman**
1947

Distribution: Gulf of California, Cedros Island.

Leiochrides hemipodus Hartman 1960

Material Type: Holotype

Distribution: USA, California centro y sur; Baja California Sur y Jalisco.

Leiochrides sp.

examined material: (3 especímenes). BCS, Bahía La Paz, Playa El Caimancito, (1), Col. SSV; Los Frailes, est. CP-989, (1), Col. José Rolando Bastida Zavala (JRBZ); Playa El Portugués, (UANL 6335), (1), Col. JALG.

Distribution: Baja California Sur, Bahía La Paz, Golfo de California

Mediomastus ambiseta (Hartman, 1947)

material type: Holotipo (LACM-AHF POLY 1451-42, Poly 0449), Bahía de Newport Harbour, Corona del Mar, California, USA,

Examined material: (41 especímenes) BC, Bahía Todos Santos est. V-1, 116° (5), (3); Bahía San Quintín est-13, (8); Sinaloa, Bahía de Ohuira est. B-2, (25).

Distribution: east and west coasts of North America, Baja California, Sinaloa,

Mediomastus californiensis Hartman, 1944

Material tipo: Holotipo (LACM-AHF POLY 63 n 747 Poly 0428), California, Bahía Tomales, USA 28° 25'N 123° W, 8 junio 1941, zona de entre mareas.

examined material: (408 especímenes). BCS, Bahía La Paz, Ensenada de La Paz, est. 1, (10); est.3, (1) ; est.4, (20); est.8, (8); est.10, (42); est. 11, (7); est. 12 , (4); est. 1 (6), est. 2, (23); est. 3 (16); est. 6, (2); est. 8 (13); est. 11 (6); est. 1(17); est. 2 (59); est. 3 (51); est. 4 (2); est. 7, (1); est. 8 (6); est.9, (3); est.10 (9); est. 11 (1); est. 12 (1), est.1 (5), est.2 (17); est. 3 (3), est. 4 (4), est. 5, (1); est. 8 (7), est. 9 (4), est. 10 (15), est. 11 (4), est. 12 (1), Col. DHV; Manglar Zacatecas (UANL 6425), (2); (UANL 6422), (15); Playa Enfermería (UANL 6424), (2); playa El Conchalito (UANL 6423), (20), Col. JALG, MEGG.

Distribution: This species is widely dispersed in North America, Alaska west of Mexico in the Pacific, New England to the Gulf of Mexico, and in the Atlantic. In Mexico it is known for Baja California, Baja California Sur, Sonora, Sinaloa, Jalisco and Veracruz

Neoheteromastus lineus Hartman, 1960

material type: Holotipo (LACM-AHF POLY 0421), San Nicolas, California, USA, prof. 1609m

.

Examined material: (3 specimens) sur-este del Golfo de California Talud IV T-3, (1); Talud IV T-4, (1), Col. Nuria Méndez Ubach; BCS, Cabo Pulmo-Los Frailes (1), est. CP-589-1, Col. JRBZ.

Distribution: Central California USA; Gulf de California; Nayarit, Isla San Juanico.

Neomediomastus glabrus Hartman 1960

Material Type: Holotype (LACM-AHF POLY 0426) est. 2850. sur de California, Ensenada de Santa Catalina, USA.

Distribution: California, USA; oeste de México

Neonotomastus glabrus Fauchald, 1972

Material Type: Holotype (LACM AHF POLY 1027). Baja California Sur Punta colored Isla San José st. 11792, 25°20'00"N, 109°58'30"W, 24 noviembre 1967, prof. 405m.

Distribution:Center del Golfo de California; Nayarit, Cabo Corrientes

Neopseudocapitella brasiliensis

Rullier y Amoureux, 1979

material type: 2 Sintipos (MNHN POLY TYPE 1301). est. 49 bis, Campañas del CALYPSO en América del Sur, Brasil

examined material: (1espécimen) Sonora, Puerto Peñasco, Bahía La Choya, (UANL 6519), (1), Col. MEGG.

Distribución: Brasil, Baja California Sur

Notodasus magnus Fauchald, 1972

examined material: (1espécimen) Holotipo (LACM-AHF POLY 1031), Isla Carmen, Punta Arena Golfo de California.

Distribution: Only known from one locality in Baja California Sur, Isla Carmen, off Loreto Bay.

Notodasus sp. 1

Examined material: (67 espécimens). Sinaloa, Mazatlán, Estero de Urías, ICMyL EMU-420), (1), Col. Agnes Rutgers; Baja California Sur, Playa El Mogote, (UANL 6441), est. 89, (4), Col. Alejandra Chávez; Ensenada de La Paz, est. 2 (UANL 6506), (1); est. 5 (UANL 6507), (2), Col. DVH; Playa El Requesón, (UANL 6508), (1); playa El Quemadito (UANL 6445), (1), Cols. JALG y MEGG; Playa El Tesoro, (UANL 6440), (3); Playa Balandra (UANL 6511), (35), Col. JALG y MEGG; BC, Bahía Los Angeles, playa Municipal (UANL 6512), (1), Cols. JALG y MEGG. Sonora, Puerto Peñasco, Bahía La Choya, (UANL 6443), (18), Cols. JALG y MEGG.

Distribution:Golfo de California

Notodasus sp. 2

examined material: (27 especímenes) Sonora, Guaymas, Playa Varadero, , (UANL 6461), (25), Col. MEG-G y JAL-G; BC, Bahía Los Angeles, Playa Municipal ECOSUR, (2), Col. P. Sánchez y E. M. Espinosa; Estero Rancho Nuevo, Bahía Santa Marina, , (UANL
6460), (1), Col. JAL-G.

Distribution: Golfo de California, costa occidental de la Península de Baja California.

Notomastus abyssalis Fauchald, 1972

Material Type: Holotype (LACM-AHF POLY 1012- AHF 11788), BCS, Punta colored,Isla San José, est. 11788.

examined material: (10 especímenes) BCS, Cabo Falso, est. 13774, (1); est. 13775, (1); Punta Colorado, Isla San José, est. 11788, (1); est. 11792, (1); est. 11793, (2); Sinaloa, Mazatlán, Isla Creston, est. 11761, (2); Jalisco, Cabo Corrientes est. 13752, (1); Nayarit, Isla San Juanito, Isla Tres Marías est. 13765, (1).

Distribution: Baja California Sur, centro y sur del Golfo de California; Nayarit, Isla Tres María
s

Notomastus angelicae

Hernádez Alcántara y Solís-Weiss, 1998

Type material: Paratype (LACM-AHF-POLY-1902), Sinaloa, oeste de Río Fuerte.

examined material: (104 especímenes). BCS costa oeste, est. E-14, (2), Col. JALG; Bahía Santa María, est. 4, (4); Punta San Marcial est 10, (4); Punta Arboleada, est. 14, (1); Bahía Santa María, est. 5, (2); Cabo San Miguel, est. 21, (2); BC, Punta Willard, est. 30, (1); Cabo Tepoca, est. 44, (9); Bahía Santa Ines, est. 49, (3); est. 49B (4); Río Fuerte, est. 50, (9); est. 51, (11); Islas Marías est. 62C, (56). Col. PHA

Distribution: Baja California Sur, Sinaloa

Notomastus cinctus Fauchald, 1972

Examined material: Holotype (LACM AHF POLY 1026), Baja California Sur, Cabo Falso.

Distribution: Baja California Sur, Cabo Falso; Guerrero, Bahía Zihuatanejo; Nayarit, Islas Tres Marías.

Notomastus hemipodus Hartman, 1947

material type: Holotipo (LACM-AHF POLY 0414), Paratipos (1), (LACM-AHF POLY 1697), (1) (LACM-AHF POLY 0415), 15 junio 1940; (2), (LACM-AHF POLY 1701); (5), (LACM-AHF POLY 1709), 18 junio 1940. Carolina del Norte, Beaufort.

examined material: (57 especímenes). BCS, costa oeste, (UANL 64865), est. 25 BIP II (1), Cols. Eduardo Balart y Edgar Amador (EB,EA); Bahía de La Paz, Ensenada de La Paz, (UANL 6484), est.12, (1, Col. DVH; Playa El Conchalito, (UANL 6481), (2); Bahía Concepción, Playa Los Cocos, (UANL 6483), (2); Manglar Santispac, (UANL 6487), (6), Cols. JALG, MEGG; Sinaloa, Bahía Santa María, (UANL 6485), est. 3, (1), est. 05, (5); Punta Arboleda est. 15, (13); Norte Rocas Consag, est. 38, (4); est. 39, (12); Estero Tastiota est. (5); Bahía Santa Inés, est. 49C, (5); Río Fuerte, est. 52, (5). Col. Pablo Hernández Alcántara.

Distribution: USA, Carolina del Norte; Golfo de México, Golfo de California

Notomastus magnus Hartman, 1947

Type material: Paratype (LACM-POLY 0413); Paratipo (LACM-POLY 2217). Bahía Tomales, California, USA.

examined material: (6 especímenes). BCS, Bahía Magdalena, (1), Col. Victoria Díaz Castañeda; Puerto Peñasco Sonora, Bahía La Choya, (5), Col. JALG, MEGG.

Distribution: USA, California, México, Baja California Sur, Sonora.

Notomastus polyodon Gallardo, 1968

Material Type: Holotype (LACM-AHF POLY 0301), Vietnam del Sur, Nha Trang, est. 26411

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examined material: (78 especimenes). BCS costa oeste, Crucero El Puma , (UANL 6520), EP 8710, (2), Col. JALG; Bahía La Paz, Playa Caleritas, (1), Col. JALG; est. Ca-29 N° 8, Col. JRB-Z; Ensenada de La Paz, (UANL 6521), est.1, (1); (UANL 6522), est. 4, (2); (UANL 6523), est. 6, (1); (UANL 6524), est. 7, (1); (UANL 6525), est. 8, (3); (UANL 6526), est. 9, (3); (UANL 6527), est. 10, (7); (UANL 6528), est. 11, (2), Col. DHV; Playa Balandra,

(UANL 6529), (3); Bahía Concepción, Playa Santispac, (UANL 6530), (1), Col. MEGG-JALG; El Quemadito, (UANL 6531), (14), Col. MEG-JALG; Puerto Peñasco Sonora, Bahía La Choya, (UANL 6532), (2); Mazatlán Sinaloa, Playa Punta Cerritos, (UANL 6533), (21), Col. JALG, MEGG; Estero de Urías, (UANL 6534), (13), Col. Agnes Rutgers, SISV; (UANL 6535), SIMPSUM VII est. 10 A (1), Col. Eduardo Balart y Edgar Amador.

Distribution:sur de Vietnam, Nha Trang; México, Baja California, Sonora, Sinaloa

Notomastus precocis Hartman, 1960

Material Type: Holotype (LACM-AHF POLY 0416), Golfo de Santa Catalina, USA, prof. 1400-2000 m.

examined material: (6 especímenes) Baja California Sur, Isla Natividad est. 7358, (3); Jalisco, Cabo Corrientes, est.13754, (2); Nayarit, Punta Piedras, est. 13767, (1).

Distribution: USA, California, Bahía Santa Catalina; México, Baja California: Isla Cedros, Jalisco; Cabo Corrientes, Nayarit: Islas Tres Marías

Notomastus sonorae Kudenov, 1975

Material Type: Holotype (LACM-AHF POLY 1113), Bahía La Choya, Puerto Peñasco, Sonora, 28 marzo 1971, entre mareas.

examined material: (11 especímenes). Sonora, Puerto Peñasco, Bahía La Choya, (UANL 6536), Col. JALG, MEGG.

Distribution: Sonora, Puerto Peñasco.

Notomastus sp. 1

examined material: (10 especímenes). BCS, Bahía de La Paz, (UANL 6537), est. 12, (1); (UANL 6538), est.12, (7); (UANL 6539), est.12 (2), Col. DHV.

Distribution: Baja California Sur, Bahía de La Paz, Ensenada de La Paz

Notomastus sp. 2

examined material: (278 especímenes). BC, Bahía Los Angeles, playa Municipal,

(UANL 6540), (1); playa La Gringa, (UANL 6541), (18); (45), Cols. JALGy MEGG; BCS, Bahía La Paz, Ensenada de La Paz (UANL 6542), est.1, (2); (UANL 6543), est. 4, (1); est. 12, (2), Col. DHV; playa El Tesoro, (UANL 6544), (17); Bahía Concepción: playa el Requesón, (UANL 6545), (8); (2); playa Los Cocos, (UANL 6546), (95); playa Santispac, (UANL 6547), (32); (13); playa Armenta, (UANL 6548), (30); Sonora, Puerto Peñasco, Bahía La Choya, (UANL 6549), (10); playa DICTUS, (UANL 6550), (1); Guaymas, playa Varadero, (UANL 6551), (1), Cols. JALG y MEGG.

Notomastus sp. 3

examined material: (3 especímenes). BCS, costa oeste, (UANL 6552), est. BIP II, 25, 6 octubre 1998, Cols. Eduardo Balart y Edgar Amador.

Distribution: Golfo de California

Notomastus sp. 4

examined material: (1 espécimen). sur-este del Golfo de California, Talud IV T-4 (1), Col. Nuria Méndez Ubach.

Distribution: Golfo de California

Notomastus sp. 5

examined material: (1 espécimen). Sonora, Puerto Peñasco, Bahía La Choya, (UANL 6553), Col. MEG-G.

Distribution: México, Sonora.

Rasghua lobatus (Hartman 1947)

Material Type: Holotype (LACM-AHF POLY 1107-40); Paratipo (LACM-AHF POLY 0411); Paratipo (LACM-AHF POLY 1069-40). Golfo de California, Isla Espíritu Santo.

examined material: (173 especímenes). BCS, Bahía de La Paz, Playa Caimancito, est. C-37, (8); Ensenada de la Paz, (UANL 6554), est. 3, (12); (UANL 6555), est. 2, (52); (UANL 6556), est. 2, (106), Col. DHV; Guaymas Sonora, Playa Varadero, (UANL 6557), (3), Col. JALG, MEGG.

Distribution: Baja California Sur, Sonora

Scyphoproctus oculatus Reish, 1959

Material Type: Holotype (LACM-AHF POLY11108 poly 0481) Bahía NewPort, California.

Material examinado: (14 especimenes) BC, Bahía San Quintín, (UANL 6558), est 13, (1); Baja California Sur, Bahía La Paz, San Gabriel, (UANL 6559), (2); El Portugués, (UANL 6560), (8); Bahía Concepción Playa Santispac, (UANL 6561), (3), Cols. JALG, MEGG.

Distribution: California Bahía de Newport; Baja California, Baja California Sur

discussions

Before starting this study, 19 genera and 43 species were known., some of these not correctly determined, for example, Fauchald (1972) recorded Notomastus tenuis for Baja California, Baja California Sur, Nayarit and Jalisco. When examining the specimens registered by Fauchald, it was observed that the organisms correspond to N. hemipodus Hartman (1947) described for North Carolina. This was confirmed by reviewing holotypes of N. tenuis and N. hemipodus.

So also Calderón-Aguilera and Jorajuria-Corbo A. in 1986, Bastida-Zavala in 1993 and

1995, De León-González in 1994, Hernández-Alcántara and Solís-Weiss in 1993 and 1998 recorded species from other latitudes; However, when examining said material and corroborating it with the type material, it was observed that the morphological characteristics did not correspond to the previously recorded species.

Naming species from other latitudes is perhaps one of the most frequent practices in

taxonomy. This is due to the fact that a large amount of classical literature was dedicated to the fauna of other continents, coupled with brief descriptions, with little detailed illustrations. This, without a doubt, has made it possible to enlist species from other latitudes to our continent. However, we cannot rule out the fact of finding species, described in other latitudes, in our territory. Since anthropogenic activities, such as navigation (ballast water), have been the main vector of dispersion of marine species. (Luppi and Bas 2002). Although many organisms die along the way, some persist

and manage to establish themselves on the coast; once they have been established, oceanographic transport mechanisms (circulation induced by wind, tides, density difference) would be the main route of larval dispersal along the coasts (Jamieson et al., 2002). Depending on the larval ecology of each particular species, marine invertebrate larvae can be carried from a few meters to hundreds of kilometers during a breeding season (Makarov, 1966).

The Mexican coasts are vulnerable for the establishment of marine organisms, since along the margin there are numerous ports that constitute the route or destinations of large ships that transport various materials from around the world. The main maritime destinations are the ports of Ensenada, Mazatlán, Manzanillo, Lázaro Cárdenas, Acapulco, Salina Cruz, Tampico, Veracruz, Coatzacoalcos and Progreso; in addition to the tourist destinations of the Caribbean, Cozumel and Majahual. For this reason, we do not rule out that some species that we are recording in this study have established themselves in this way, on the Mexican coast.

In this research, 11 potentially new species for science are proposed, being the genus Notomastus the one with the greatest diversity, with five species, Notodasus with two, Dasybranchethus and Leiochrides with one, respectively; and of the genus Capitella seven morphotypes corresponding to seven different populations.

On the other hand, when examining the type material described for the study area, and the descriptions made by their respective authors, we find some omissions and errors in some of them, which will justify the redescription of the type species..

Conclusions

With the contribution of this research, it is increased to 22 genera and 62 species, of which 11 are potentially new to science, included in the genera Notomastus, Notodasus, Leiochrides, Dasybranchethus and Capitella.

We can infer that having found the species Amastigos acutus, Neopseudocapitella brasiliensis, Notomastus polydon and organisms of the genus Dasybranchethus, which were recorded for the first time in other latitudes far from the study area; it could be due to the discharge of ballast water from interoceanic ships on the one hand, and the introduction of aquaculture products.

Within the genus Capitella we find 7 morphotypes which present morphological characteristics with little variability, however the methyl green staining pattern clearly shows that there are very distinctive patterns in each population, to resolve this complex of specimens another tool is required such as molecular biology, to be able to establish similarities or differences between the organisms of the different populations.

27 type species, included in 15 genera, from international museum collections were examined: LACM-AHF, BMNH, ZMH, CAS and the MNHN. In order to corroborate the registered specimens of the study area. Finding that some species previously registered for our country are not actually registered and are under another name. As well as some original descriptions do not show important morphological structures that the type specimens present. Adding to this, another factor that generates confusion in the determinations of the organisms.

As an alternative to highlight structures and reveal staining patterns, we use methyl green, describing the staining pattern that each species evidences. In addition to this, we found that the transparency of the organisms with Hoyer's liquid represents another alternative to observe the morphology that is not appreciated under the optics of the compound microscope and the photography with scanning electron microscopy SEM, was very useful, to describe covered hooks, distinctive character of the species.

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