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Deep-water polychaetes (Annelida) from the southeastern Gulf of California, Mexico

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Abstract: Polychaetes inhabiting deep-sea soft bottoms from the southeastern Gulf of California were collected during four oceanographic cruises during 2000 and 2001. Sampling of benthic organisms was performed with a benthic sledge to collect epifauna and a Karling dredge for epifauna and infauna, in a depth range from 732 to 2 250 m. A list of the polychaetes that were collected and their distribution are presented here. A total of 73 species (distributed among 33 families) were identified. Moreover, 11 species were identified only to genus level and 20 species only to family level. With the exception of *Ancistrosyllis hartmanae* and *Melinnampharete eoa*, all identified species have been previously reported in soft bottoms of the Gulf of California or in adjacent areas. Additional previously unreported information is provided herein regarding depth ranges, geographical distribution, morphology and tubes inhabited by the organisms. The morphology of the ampharetids *Amage* sp. and *Samytha* sp. does not coincide with that of other species in these genera reported for the Gulf of California, which suggests that they are probably undescribed species. Rev. Biol. Trop. 54 (3): 773-785. Epub 2006 Sept. 29.

Key words: Polychaeta, deep-sea, tubes of polychaetes, bathymetric distribution, southeastern Gulf of California, Mexico.

The southern Gulf of California meets the Pacific Ocean at depths greater than 3 000 m, while the northern part is relatively shallow (Parker 1964, Alvarez-Borrego and Schwartzlose 1979). Dissolved oxygen level is one of the major limiting factors affecting the presence of benthic and demersal species, as with most marine invertebrates which are affected by extremely low oxygen concentrations (Rosenberg *et al.* 1991, Diaz and Rosenberg 1995).

Numerous studies on the polychaetes inhabiting the continental shelf of southern California have been conducted (ie. Hartman 1938, 1939a,b, 1944a,b,c, 1951, 1955, 1961, 1966, 1968, 1969, Fauchald 1968, 1970, Kudenov 1975a,b, 1980, Williams 1987, among others). Polychaetes from the Gulf of California continental shelf have been studied

by Sarti-Martínez (1984), Lezcano-Bustamante (1989), Hernández-Alcántara (1992) and Hernández-Alcántara and Solís-Weiss (1999). Literature of other studies in the area is included in Salazar-Vallejo *et al.* (1989). Nevertheless, polychaetes from deep-sea waters in the Gulf of California and adjacent areas have been hardly investigated. The first studies of the polychaetes from deep basins off southern California were by Hartman (1960, 1963). Fauchald (1972) later identified 227 species (of which 66 were new) from material collected during the ALBATROSS expedition as reported by Chamberlin (1919a) and Treadwell (1923), and from material collected during two cruises with the VELERO IV in 1967 and 1970. The most recent studies in the hydrothermal vents from the Guaymas basin were reported by Blake (1985), Solís-Weiss and

Hilbig (1992) and Solís-Weiss and Hernández-Alcántara (1994). Other recent studies concerning deep-sea polychaetes in the northern Pacific were performed by Fauchald and Hancock (1981) in Central Oregon, and Blake and Hilbig (1990) in the Juan de Fuca and the Explorer Ridge systems in the northeast Pacific. Recently, Blake and other collaborators (1994-2000) compiled information related to polychaetes from the Point Conception region of southern California at depths from 50 to 1 000 m, which includes four volumes of a Taxonomic Atlas of the benthic fauna of the Santa Maria Basin and Western Santa Barbara Channel.

The TALUD project, organized by the Laboratory of Invertebrates of the Mazatlán Marine Station (Instituto de Ciencias del Mar y Limnología, UNAM), is a multidisciplinary project encompassing the study of crustaceans, mollusks, polychaetes, fish and meiofauna in the southern Gulf of California. Prospective cruises were conducted in 1989-1991 (TALUD 1 to 3) wherein no grabs were used and the polychaete fauna was not studied. Four additional cruises (TALUD 4 to 7) were organized in 2000 and 2001, which did include the collection of polychaetes.

During the last decade, few studies of polychaetes inhabiting deep-water have been performed in southern California or the Gulf of California. The purpose of this paper is to contribute to the knowledge of the polychaete fauna occurring offshore in soft sediments at a depth range from 732 to 2 250 m in the Southeastern Gulf of California.

MATERIALS AND METHODS

Benthic organisms associated with deep soft bottoms (732 to 2 250 m depth) were collected aboard the R/V "El Puma" (Universidad Nacional Autónoma de México) during four oceanographic cruises: TALUD 4 in August 2000 (11 stations), TALUD 5 during December 2000 (ten stations), TALUD 6 in March 2001 (12 stations), and TALUD 7 in June 2001 (13

stations). Two types of gear were used at most stations: a) a 2.35 m wide by 0.95 m high modified benthic sledge equipped with a collecting net of ca. 5.5 cm (2 1/4") stretch mesh lined with ca. 2 cm (3/4") mesh net in the mouth area, and b) a 110x40x14 cm Karling dredge used to collect sediments to a depth of 7 cm, with a capacity of 85 l.

Polychaetes retained in the benthic sledge were directly collected with forceps and fixed with 10 % formaldehyde solution. The sediment collected with the Karling dredge was washed through a 0.5 mm sieve and the polychaetes were sorted and fixed on board. Specimens found inside thick muddy tubes were fixed by adding 10 % formaldehyde solution through one of the tube openings using a syringe.

In the laboratory, polychaetes were washed and preserved in 70 % ethanol and identified to the specific level, as possible, following the keys of Chamberlin (1919b), Hartman (1944a, 1957, 1960, 1968, 1969), Pettibone (1966), Fauchald (1968, 1970, 1972, 1977), Fauchald and Hancock (1981), Paxton (1986), Hernández-Alcántara (1992) and Petersen (2000).

RESULTS

The position and depth range of stations in which polychaetes were collected are included in Table 1.

A total of 73 species, representing 33 families, were identified. Additional specimens belonging to the genera *Polydora*, *Cirratulus*, *Tharyx*, *Notomastus*, *Eumida*, *Sthenolepis*, *Sigambra*, *Pareurythoe* (?), *Amage*, *Samytha* and *Thelepus* were not identified to species due to their poor condition. Important taxonomic structures from several specimens from the families Spionidae, Maldanidae, Opheliidae, Phyllodocidae, Nereididae, Glyceridae, Lumbrineridae, Ampharetidae, Sabellidae and Serpulidae were absent, making further identification impossible. They were catalogued as "indeterminable" (Table 2).

The families best represented in the study area are Ampharetidae (13 taxa), Maldanidae

TABLE 1
Position and sampling depth range of the stations where polychaetes were collected

Station	Latitude	Longitude	Depth range (m)			
			TALUD 4	TALUD 5	TALUD 6	TALUD 7
3	22 00.2	106 28.1	-	732	770-780	740-750
4	22 04.6	106 34.7	-	-	1 190-1 250	1 200-1 230
5	22 00.7	106 39.9	-	1 515-1 620	1 470-1 530	-
6	22 00.0	106 48.1	-	1 950-2 010	-	-
11	23 15.0	106 59.0	-	850-870	825-855	780-790
12	23 18.6	107 26.9	-	1 160-1 170	-	1 040-1 120
13b	23 30.3	107 44.0	-	-	-	1 400-1450
14	23 16.3	107 40.7	2 220-2 250	2 080-2 140	-	-
18	24 15.0	108 17.1	908-944	940-990	890-950	950-1 010
19	24 16.4	108 24.3	1 196-1 200	1 180-1 200	1 160-1 200	1 160-1 180
20	24 14.8	108 35.2	1 500-2 000	-	1 250-1 440	-
25	24 51.7	108 57.9	778-800	800-860	830-850	780-850
26	24 56.3	109 11.8	1 200-1 274	1 280-1 310	1 190-1 270	1 180-1 220
27	25 01.2	109 11.1	-	-	1 580-1 600	1 580-1 600
28	24 52.6	109 37.7	2 024-2 040	-	-	-
32b	26 03.0	109 55.4	-	-	-	850-880
33	25 45.8	109 48.7	1 060-1 090	-	-	-
33b	26 06.5	110 06.7	-	-	-	1 260-1 300
34	25 43.8	109 54.0	1 244	-	1 240-1 270	-
34b	26 05.5	110 10.5	-	-	-	1 500-1 520
35	25 57.8	110 11.4	2 000-2 100	-	-	-

(11 taxa), and Cirratulidae and Phyllodocidae (eight taxa each). Based on their occurrence for different stations and cruises, the most representative species for the study area are: *Melinna exilia*, *Melinnampharete eoa*, *Thelepus hamatus*, *Mexamage corrugata*, *Terebellides stroemi*, *Fauveliopsis rugosa*, *Nothria iridiscens*, *Califia calida*, *Neoheteromastus lineus* and *Maldane cristata*. Except for *Ancistrosyllis hartmanae* and *M. eoa*, all identified species have been previously reported for the Gulf of California or adjacent areas in soft bottoms.

Comparing the two sampling methods, higher numbers of taxa were collected with the Karling dredge during the four cruises: TALUD

4, 44 taxa (Karling) vs. 25 taxa (benthic sledge); TALUD 5, 28 taxa vs. 17; TALUD 6, 42 taxa vs. 20; TALUD 7, 50 taxa vs. 19.

Only species for which new information was obtained were treated individually. New data related to depth range, distribution, morphology or tube description (or other protective structures in which the animals were found) are provided here.

Family Chaetopteridae

Phyllochaetopterus limicolus. This species lives in a slender, smooth, cylindrical, unbranched tube measuring 20 cm long by 0.5-0.6 cm wide

TABLE 2
List of polychaete species collected during the four cruises

SPECIES	TALUD 4		TALUD 5		TALUD 6		TALUD 7	
	KD	BS	KD	BS	KD	BS	KD	BS
Orbiniidae								
<i>Califia calida</i> Hartman, 1957	18, 20, 25		5, 25		5, 20, 25	25	27, 33b, 34b	18
<i>Haploscoloplos elongatus</i> (Johnson, 1901)							27, 33b, 34b	
<i>Phylo nudus</i> (Moore, 1911)	28							
Paraonidae								
<i>Aedicira alisetosa</i> Fauchald, 1972	35						27	
<i>Aedicira longicirrata</i> Fauchald, 1972							13b	
<i>Paraonis pycnobranchiata</i> Fauchald, 1972							34b	
Spionidae								
<i>Polydora</i> sp.							27	
<i>Prionospio</i> (<i>A.</i>) <i>vermillionensis</i> Fauchald, 1972					26			
<i>Spiophanes fimbriata</i> Moore, 1923	26		19		34		13b, 27	
Spionidae indeterminable		33						
Poecilochaetidae								
<i>Poecilochaetus johnsoni</i> Hartman, 1939					19			
Heterospionidae								
<i>Heterospio catalinensis</i> (Hartman, 1944)					27			
Chaetopteridae								
<i>Phyllochaetopterus limicolus</i> Hartman, 1960	26				4, 5, 19, 20, 25, 26, 27	25	4, 19, 33b, 34b	18
Cirratulidae								
<i>Aphelochaeta montilaris</i> Hartman, 1960					20, 26		27	
<i>Chaetozone corona</i> Berkeley & Berkeley, 1941							33b	
<i>Chaetozone setosa</i> Malmgren, 1867			19		3, 5, 20, 27		27	
<i>Cirratulus sinicolens</i> Chamberlin, 1919								3, 11, 32b
<i>Cirratulus</i> cf. <i>sinicolens</i> Chamberlin, 1919		25		3, 11				
<i>Cirratulus</i> sp.			26					
<i>Tharyx multifilis</i> Moore, 1909					27	3		
<i>Tharyx tessellata</i> Hartman, 1960							27, 33b, 34b	
<i>Tharyx</i> sp.	20, 26		18				4, 13b, 27, 33b	
Capitellidae								
<i>Neoheteromastus lineus</i> Hartman, 1960	26	20	5, 26		20, 34		4, 27, 33b, 34b	

TABLE 2 (...continued)
List of polychaete species collected during the four cruises

SPECIES	TALUD 4		TALUD 5		TALUD 6		TALUD 7	
	KD	BS	KD	BS	KD	BS	KD	BS
<i>Notomastus</i> sp.	28							
Maldanidae								
<i>Asychis ramosus</i> Levenstein, 1961	20						13b	
<i>Maldane cristata</i> Treadwell, 1923	18	33	14	18	18, 25	25	18	18
Maldanidae sp. 1	34	34	26					
Maldanidae sp. 2	28						13b	
Maldanidae sp. 3	35		6		27		4, 34b	
Maldanidae sp. 4	19	20						
Maldanidae sp. 5	20, 33		19		5,27	34		
Maldanidae sp. 6							4	
Maldanidae sp. 7							4, 13b, 19	
Maldanidae sp. 8							18	18
Maldanidae indeterminable			5, 18, 25	25	5, 19, 20	25	13b, 26, 27, 33b, 34b	
Opheliidae								
<i>Ammotrypane pallida</i> Hartman, 1960			14		19			
<i>Travisia brevis</i> Moore, 1923	33				34			
Opheliidae indeterminable					26			
Scalibregmidae								
<i>Scalibregma inflatum</i> Rathke, 1843	18, 25				18, 25		19, 25	
Phyllodocidae								
<i>Eteone cf dilatae</i> Hartman, 1936					27			
<i>Eulalia anoculata</i> Fauchald, 1972							27	
<i>Eulalia strigata</i> Hartman, 1968	19							
<i>Eumida sanguinea</i> (Oersted, 1843)		35						
<i>Eumida</i> sp.		34						
<i>Paranaitis polynoides</i> (Moore, 1909)						34	33b	
<i>Steggoa gracilior</i> Chamberlin, 1919		34						
Phyllodocidae indeterminable						25		
Aphroditidae								
<i>Aphrodita parva</i> Moore, 1905		25		11, 18, 25		18		32b
<i>Laetmonice pellucida</i> Moore, 1903								13b
Polynoidae								
<i>Halosydna johnsoni</i> (Darboux, 1899)							4, 19	

TABLE 2 (...continued)
List of polychaete species collected during the four cruises

SPECIES	TALUD 4		TALUD 5		TALUD 6		TALUD 7	
	KD	BS	KD	BS	KD	BS	KD	BS
Polynoidae sp. 1		25						
Polynoidae sp. 2	19							
Polynoidae sp. 3		35						
Sigalionidae								
<i>Leanira alba</i> Moore, 1910					34		33b	
<i>Sthenolepis</i> sp.			12					
Pilargidae								
<i>Ancistrosyllis hartmanae</i> Pettibone, 1966	20, 28							
<i>Sigambra</i> sp.							3	
Syllidae								
<i>Exogone lourei</i> Berkeley & Berkeley, 1938					19, 26, 27			
Nereididae								
<i>Ceratocephale loveni pacifica</i> Hartman, 1960							11	
<i>Ceratonereis vermillionensis</i> Fauchald, 1972	26, 33							
<i>Nereis anoculopsis</i> Fauchald, 1972	33	33						
Nereididae indeterminate			19				12	
Glyceridae								
Glyceridae indeterminate	25							
Goniadidae								
<i>Goniada brunnea</i> Treadwell, 1906	20						13b, 27, 33b	
Nephtyidae								
<i>Nephtys paradoxa</i> Malm, 1874	28		6					
Amphinomidae								
<i>Pareurythoe</i> (?) sp.	33	25						
<i>Pseudeurythoe ambigua</i> (Monro, 1933)			14		18			18
Onuphidae								
<i>Anchinothria fissurata</i> Fauchald, 1972		14						
<i>Nothria abyssalis</i> Fauchald, 1968		35				25		
<i>Nothria iridescens</i> (Johnson, 1901)	19, 26		12		20, 34		4, 12, 13b, 19, 26, 33b	
<i>Onuphis profundus</i> Fauchald, 1968	20		5, 6, 12		5			
Eunicidae								
<i>Eunice megabranhia</i> Fauchald, 1970	25	25		18	25			11, 18

TABLE 2 (...continued)
List of polychaete species collected during the four cruises

SPECIES	TALUD 4		TALUD 5		TALUD 6		TALUD 7	
	KD	BS	KD	BS	KD	BS	KD	BS
Lumbrineridae								
<i>Lumbrineris bicirrata</i> Treadwell, 1929							19, 27, 33b	
<i>Lumbrineris cedroensis</i> Fauchal, 1970					20			
<i>Ninoe foliosa</i> Fauchald, 1972							32b, 33b	
<i>Ninoe fuscooides</i> Fauchald, 1972		25		3	3			
<i>Ninoe longibranchia</i> Fauchald, 1972							33b	
Lumbrineridae indeterminate		35	26		5, 34	25	13b, 33b, 34b	
Arabellidae								
<i>Drilonereis falcata</i> Moore, 1911						34	4	
Sternaspidae								
<i>Sternaspis fossor</i> Stimpson, 1854	19, 26		25	18	20, 34		19, 33b	
Flabelligeridae								
<i>Brada pluribranchiata</i> (Moore, 1923)	18, 25, 33		3	3		25		25, 3, 18
<i>Ilyphagus ilyvestis</i> Hartman 1960					27			
<i>Pherusa abyssalis</i> Fauchald, 1972					18		33b	
Fauveliopsidae								
<i>Fauveliopsis rugosa</i> Fauchald, 1972	33	25	25	11	25	34	12, 25	
Ampharetidae								
<i>Amage</i> sp.						25		
<i>Ampharete acutifrons</i> (Grube, 1860)		25						
<i>Ampharete arctica</i> Malmgren, 1866	35	35	26	3	26, 27		34b	
<i>Amphicteis scaphobranchiata</i> Moore, 1906								25
<i>Egamella quadribanchiata</i> Fauchald, 1972		35						
<i>Melinna exilia</i> Fauchald, 1972	18, 19, 26, 35		5, 6, 19, 26	25	20, 25, 27, 34	25, 34	4, 13b, 33b	18
<i>Melinnampharete eoa</i> Annenkova, 1937	25	25		11	5, 11,	25	25, 26, 33b	18, 25
<i>Mexamage corrugata</i> Fauchald, 1972	18, 25, 33		5		4		13b, 34b	
<i>Paramage scutata</i> Moore, 1923						34		
<i>Samytha</i> sp.				11				
<i>Samythella pala</i> Fauchald, 1972	28				5, 20		4	
<i>Schistocomus hiltoni</i> Chamberlin, 1919	33			18			18	18
Ampharetidae indeterminate	18, 25, 28				18		26, 27, 33b	
Terebellidae								
<i>Thelepus hamatus</i> Moore, 1905	33		6	18	18, 34	25	13b, 18, 19, 26, 33b	25

TABLE 2 (...continued)
List of polychaete species collected during the four cruises

SPECIES	TALUD 4		TALUD 5		TALUD 6		TALUD 7	
	KD	BS	KD	BS	KD	BS	KD	BS
<i>Thelepus setosus</i> (Quatrefages, 1865)	19, 25			11				11
<i>Thelepus</i> sp.								11
<i>Streblosoma crassibranchia</i> Treadwell, 1914			12		20		4	25
Trichobranchidae								
<i>Terebellides stroemi</i> Sars, 1835	20, 25, 26		14		5, 20		4, 13b, 26	
Sabellidae								
<i>Chone gracilis</i> Moore, 1906	33				34			18
<i>Pseudopotamilla intermedia</i> Moore, 1905						34		
Sabellidae indeterminate				11	18, 19, 34			
Serpulidae								
Serpulidae indeterminate		34						

The numbers in columns correspond to the collection stations (KD= Karling dredge; BS= Benthic sledge).

(Hartman 1969). One specimen from station 4 (TALUD 6) was found inside a 1.8 cm long tube with a mucoid base, externally covered by mud. It is probable that the worm abandoned its own tube (a typical chaetopterid tube was found in the same sample) and invaded this empty tube, which may have been produced by another polychaete.

Family Maldanidae

Maldane cristata. The tubes are thick and mucoid, covered with compact mud (0.5 cm external diameter).

Maldanidae sp. 1 to sp. 8. Several maldanids lacked the posterior end which made species identification impossible. According to the characteristics of the prostomium, eight different species were tentatively distinguished.

Family Phyllodocidae

Eteone cf. *dilatata*. One specimen fits the description of *E. dilatata* but appears to be a juvenile because the tentacular and dorsal cirri are not well developed. The eyes are absent, while *E. dilatata* has two small eyes. Although this species has been reported from the intertidal zone to 177 m (Hartman 1936, 1963, 1968, Reish 1968), our sample was collected at a depth range of 1 580 to 1 600 m.

Eumida sanguinea. Was found at depths between 2 000 and 2 100 m. This species has previously been considered cosmopolitan in shelf depths on rocky or mixed sediments (Hartman 1968), from the intertidal zone to 177 m (Rioja 1947, 1962, Hartman 1963, Hernández-Alcántara 1992, Bastida-Zavala

1993) and had not been previously reported in depths greater than 175 m (Eibye-Jacobsen, pers.comm.).

Steggoa gracilior. This species has been reported for the Gulf of California by Chamberlin (1919b) and Hartman (1968), but depth of occurrence was not provided. The unique specimen found during this study was collected at 1 244 m depth.

Family Polynoidae

Halosydna johnsoni. It has been reported from the intertidal zone to 531 m, in sand, mud or reefs (Hartman 1939a, 1968, Berkeley and Berkeley 1939, 1941, Rioja 1941, 1962) and amongst basalt boulders (Kudenov 1975a). In this study, this species was found between 1 160 and 1 230 m depth.

Polynoidae sp. 1, sp. 2, sp. 3. Three different species of polynoids were recognised but they were too incomplete to make identification possible.

Family Pilargidae

Ancistrocyllis hartmanae. Two specimens were collected in depths ranging from 1 500 to 2 040 m, while this species had been reported in the Chesapeake Bay at 12.8 m by Pettibone (1966) and by Fiege and Bogemann (1999).

Family Amphinomidae

Pareurythoe (?) sp. Three specimens were found: two from 778-800 m and one from 1 060-1 090 m. Placement of these specimens in this genus is dubious since they have slender notoseate, suggesting that all of them are epitokous forms. All specimens have bifid neurosetae, yellow aciculae, three smooth antennae and smooth dorsal cirri, which fits with *P. californica*, described from the Gulf of California (Hartman 1968). Nevertheless, the presence of dendritic branchiae from setiger three to the end of the body, and the absence of eyes suggests that they could be a different species.

Pseudeurythoe (= *Linopherus*; Salazar-Vallejo 1987) *ambigua*. It was collected at several stations: one specimen from station 14 at 2 080-2 140 m (TALUD 5), two specimens from station 18 at 890-950 m (TALUD 6) and one individual from station 18 at 950-1 010 m (TALUD 7). The species is reported from southern California from 1 645 to 1 900 m by Hartman (1968). This author indicates that two different branchial arrangements can be found in this species: a) branchiae present at setiger four and continuing for seven segments, and b) branchiae present at setiger three and continuing for 43 segments. The specimens collected at station 18 (both cruises) correspond to the first branchial arrangement, while those from station 14 correspond to the second branchial arrangement, perhaps due to clinal variation.

Family Onuphidae

Anchinothria fissurata. The tube had not been previously described. In cross section, it consists of a series of transparent hyaline layers with a very hard consistency. It measures about 12 cm long and 0.5 cm external diameter. Sometimes, they have attached anemones or serpulid tubes.

Family Euniciidae

Eunice megabranhia. The specimens were found inside the oscula of sponges and a tube with the specimen was found inside a sponge attached to a tube of the ampharetid *Shistocomus hiltoni*.

Family Fauveliopsidae

Fauveliopsis rugosa. Members of the genus *Fauveliopsis* have been found inside shells of mollusks and tubular tests of foraminifera (Petersen 2000). In the present study, *F. rugosa* was found inside shells of the scaphopods *Fissidentalium megathyris* and *Rhabdus dalli*, surrounded by mud.

Family Ampharetidae

Paramage scutata. The tube consists of an inner hyaline layer covered with mud, conically shaped, with incrustations of large foraminifera. The animal occupies 1/3 to 1/2 the length of the tube.

Ampharete acutifrons. The tube is a hard mucoid inner layer externally covered with compact mud. It is thick (about 1.5 cm external diameter) and tapers proximally. The animal occupies about 1/7 of the tube length.

Ampharete arctica. The tube was described by Hartman (1969) as long, tapering proximally, externally covered with fragments of algae, small sticks and debris. Most of the tubes found in the present study are covered with mud, and are similar to those described by Hartman (1969), but specimens were also found in tubes constructed with sand with bands of algae or debris, similar to typical onuphid tubes.

Amphicteis scaphobranchiata. This species builds tubes which are up to 25 cm long and about 1 cm external diameter, with a thick mucoid inner layer covered with ring-like compact mud of different colour. The tubes taper proximally and the animal occupies about 1/3 its length.

Egamella quadribranchiata. The tube is thin, made on a mucoid layer covered with bands of mud and fine sand and foraminifera attached to the outer surface. Animals occupy about 1/6 of the tube.

Melinna exilia. The tubes are made of mud, with an external diameter of about 0.3 cm.

Melinnampharete eoa. This species builds tubes that are up to 30 cm long and about 0.2 cm external diameter made of fine sand and mud. Animals occupy 1/5 to 1/10 of tube length. *M. eoa* has been reported in deep-water of the Northwest Pacific (Hartman 1960), thus this is the first record of this species in the Gulf of California.

Mexamage corrugata. This species has a tube about 1 cm external diameter with a mucoid layer covered with compact mud.

Schistocomus hiltoni. Chamberlin (1919b) described the tube of this species as 3.3 cm long,

with the wall thickened by the adhesion of fine particles of sand, shell fragments, etc. Hartman (1969) described the tube as having a mucoid inner layer, externally covered with sticks set crosswise. The tubes found in the present study are about 15 cm long and about 1 cm external diameter, and the animal occupies about 1/10 the length. Some tubes have attached fragments of sponges and foraminifera.

Two species of the ampharetid genera *Amage* and *Samytha* have not been reported from the Gulf of California, and their detailed description will be reported elsewhere. Five ovigerous females of *Amage* sp. were collected at depths between 830-850 m. They differ from the six species previously reported by Hartman (1969) and Fauchald (1972) from the Gulf of California and northeast Pacific. The specimens have 14 thoracic segments, and setigers one to three are asetigerous (as *A. anops*, but different from the other species). They have eleven thoracic segments with notosetae and neuropodial uncini, two pairs of short branchiae (different from *A. longibranchiata*, which has long branchiae), ten abdominal setigers (as *A. scutata* and *A. sculpta* and different from *A. delus* (=perfecta), *A. arieticornuta* and *A. anops*), notopodia with notopodial lobes (as *A. arieticornuta* and *A. anops*), and prostomium trilobed (as *A. arieticornuta* and *A. anops* and different from *A. delus* and *A. longibranchiata*, which is bifid). The tubes are thick and mud-walled (as *A. anops* and different from *A. arieticornuta*).

Fourteen individuals of *Samytha* sp. were collected at depths of 850-870 m. They have three pairs of smooth branchiae; 17 thoracic setigers of which 14 are uncinigerous and seven to eight abdominal setigers. The prostomium is trilobed and paleae are absent. The specimens differ from the two species reported from California (Hartman 1969) in the number of abdominal setigers (*S. californiensis* with 20 and *S. sexcirrata* with 13). The tubes (about 55 cm long) are covered with mud and have attached anemones and foraminifera. The animal occupies about 1/7 part of the tube.

DISCUSSION

Few studies about deep-water polychaetes from the Gulf of California or adjacent areas have been performed, thus results found here are a contribution to their knowledge. This study comprises a list of polychaete taxa collected between 732 and 2 250 m depth, most of them previously collected and described by other authors. Nevertheless, new distribution and depth information is provided. All the species determined at the specific level found in this study have been previously reported for the Gulf of California or adjacent areas except for the pilargid *A. hartmanae* and the ampharetid *M. eoa*, which constitute new distribution records. New depth records are provided for *E. cf. dilatata*, *E. sanguinea*, *S. gracilior*, *H. johnsoni*, *A. hartmanae*, and *P. ambigua*.

In order to facilitate further taxonomic studies, the descriptions of the tubes or other protective structures, which had not been previously mentioned in the literature are provided for *M. cristata*, *A. fissurata*, *E. megabranchia*, *P. scutata*, *A. acutifrons*, *A. scaphobranchiata*, *E. quadribranchiata*, *M. exilia*, *M. eoa*, and *M. corrugata*. This study also includes new descriptions of the tubes of *P. limicolus*, *F. rugosa*, *A. arctica*, and *S. hiltoni*, which differ from previous descriptions.

The descriptions of ampharetids belonging to the genera *Amage* and *Samytha* and comparisons with species reported from adjacent areas suggest that they are probably undescribed species.

Based on the number of taxa found during this study, the Karling dredge was more effective than the benthic sledge for collecting polychaetes inhabiting soft bottom, since it is able to collect species representing both, infauna and epifauna, while the benthic sledge only collects mostly large specimens from the epifauna. Moreover, the smaller mesh used for sieving sediments collected with the Karling dredge allowed the capture of smaller animals.

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RESUMEN

Se recolectaron anélidos poliquetos de fondos profundos del SE del golfo de California durante cuatro campañas oceanográficas entre 2000 y 2001. El muestreo de organismos bentónicos se llevó a cabo mediante una draga de arrastre bentónica para recolectar epifauna y una draga tipo Karling para epifauna y endofauna, en un intervalo de profundidad de 732 a 2 250 m. Se presenta un listado de poliquetos con su distribución dentro del área de estudio. En total se identificaron 73 especies (distribuidas en 33 familias). Además, 11 especies fueron identificadas a nivel genérico y 20 a nivel de familia. Con excepción de *Ancistrosyllis hartmanae* y *Melinnampharete eoa*, todas las especies habían sido registradas en fondos blandos del golfo de California o zonas adyacentes. Se proporciona nueva información sobre los intervalos de profundidad, la distribución geográfica, la morfología y la descripción de tubos donde los organismos fueron encontrados. Las características morfológicas de *Amage* sp. y *Samytha* sp. no coinciden con las especies de estos géneros registradas en el golfo de California, lo que sugiere que podría tratarse de especies no descritas.

Palabras clave: poliquetos, océano profundo, tubos de poliquetos, distribución batimétrica, sureste del Golfo de California, México.

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