

A BIOLOGICAL SURVEY OF BAHIA DE LOS ANGELES,
GULF OF CALIFORNIA, MEXICO. II.
BENTHIC POLYCHAETOUS ANNELIDS.

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ABSTRACT. The benthic polychaetous annelids of Bahía de los Angeles were studied quantitatively in April 1962 and October 1963. Distribution and sediment preferences of the principal species are summarized. Of the 112 species encountered, ninety were previously unreported from the Gulf of California. Six new species are described: *Microphthalmus riojai*, sp. n., *Aricidea (Aricidea) rosea* sp. n., *Prionospio longibranchiata* sp. n., *Pectinaria (Pectinaria) hartmanae* sp. n., *Euchone barnardi* sp. n., and *Euchone cortezi* sp. n. In April 1962, 39,470 specimens were collected; in October 1963, 7,100. The cause of this reduction is unknown, but high summer water temperatures may be involved. Previous reports of polychaetes from the Gulf of California are summarized.

RESUMEN. Los Anélidos Poliquetos bentónicos de la Bahía de los Angeles fueron estudiados cuantitativamente durante Abril de 1962 y Octubre de 1963. Se detalla la distribución de las especies principales, y las preferencias que presentan respecto a los distintos sedimentos. De las 112 especies registradas, solamente 22 han sido observadas previamente en el Golfo de California. Se incluye la descripción de seis especies nuevas: *Microphthalmus riojai* sp. n., *Aricidea (Aricidea) rosea* sp. n., *Prionospio longibranchiata* sp. n., *Pectinaria (Pectinaria) hartmanae* sp. n., *Euchone barnardi* sp. n., y *Euchone cortezi* sp. n. En Abril de 1962 se obtuvieron 39,470 ejemplares, y solamente 7,100 en Octubre de 1963. Se desconocen los factores causantes de esta enorme diferencia numérica; sin embargo, se considera que las temperaturas elevadas registradas durante el verano, pudieron ejercer una definida influencia en ese fenómeno. También se incluyen las observaciones previas correspondientes a los Poliquetos del Golfo de California.

Early accounts of polychaetes from the Gulf of California have been summarized by Rioja (1941). Subsequent information has been added by Rioja (1943; 1947a, b), Hartman (1944a, 1950), Treadwell (1942), Fauvel (1943), Woodwick (1961), and Parker (1963). However, no quantitative studies have been made. Previous quantitative studies of eastern Pacific polychaetes by Reish (see references) have dealt with nearly all the principal bays from Morro Bay, in central California, south to Bahía de San Quintín, Baja California. This paper, which summarizes the quantitative data on the distribution of polychaetes in Bahía de los Angeles, a small bay on the west side of the Gulf of California, and compares the fauna ecologically and zoogeographically with that of similar areas in southern California, extends the area of quantitative studies into a geographically disjunct area.

The specimens on which this report is based were collected by the Beaudette Foundation in April 1962 and October 1963 (see Barnard and Grady, 1968). Quantitative samples were taken at 79 stations in April 1962 and 82 stations in October 1963 (Fig. 1) using a modified size-one Hayward orange-peel bucket which samples an area of 0.06m². Three dredge hauls were made in April 1962. Samples were brought back to the base camp, washed through a 0.5mm screen and preserved in formaldehyde for later sorting. I wish to thank Dr. J. Laurens Barnard for making the collections available to me. My research was supported in part by a grant from the National Science Foundation (NSFG- 20909).

Chemical and Physical Data. — Salinity was measured throughout the bay in April 1962, April 1963, and October 1963 at water depths of 0, 5, 10, 20, 30, 40, and 50 meters. All values ranged from about 35.0 to 35.5 ‰, which coincide with the salinity values given for the upper Gulf of California by Parker (1963).

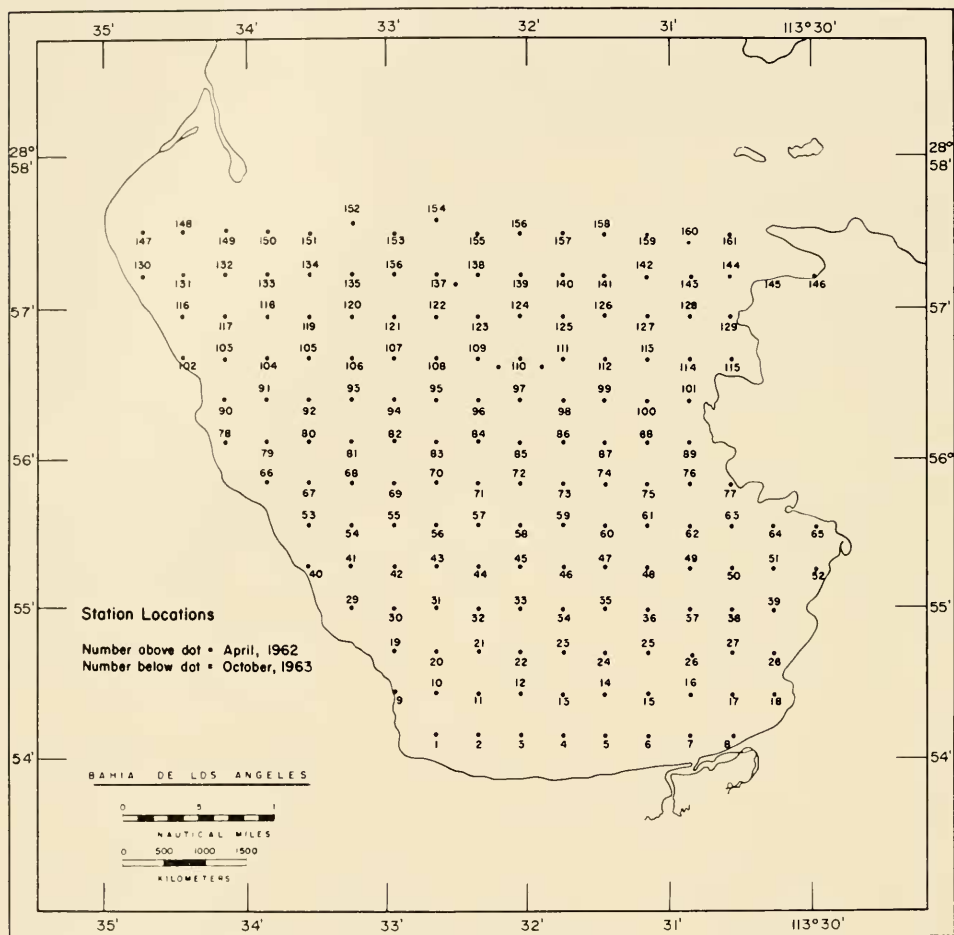


Figure 1. — Map of Bahía de los Angeles showing station locations.

Dissolved oxygen was measured at the same stations. Generally the dissolved oxygen values exceeded 3.0 ml/l with higher readings in April than in October. Bottom waters at depths of 75 to 98 meters reached lows of 1.66 ml/l.

Surface water temperatures were taken at the majority of the stations. They varied from 16.9 to 21.6 with a median of 18.2C. In general, warmer waters were found inshore in shallow waters and colder waters were encountered near the entrance of the bay. The warm temperatures occurred after the high summer air temperatures, and the colder temperatures followed the winter months. The warm water temperatures are believed to have influenced the marked reduction in the number of specimens collected in October 1963 as compared to the April 1962 survey.

Four kinds of sediments occur on the bottom of Bahía de los Angeles: sand, silty sand, sandy silt, and silt. Sand bottoms (40 stations) are present primarily along the shores of the bay. These are replaced by silty sand, (46 stations) and sandy silt bottoms (30 stations) in deeper waters. Silts (45 stations) are limited to the outer part of the bay (Barnard and Grady, 1968).

DISCUSSION

Zoogeography.—A total of 112 species were encountered in this study. Specific identification was not possible for one species of *Arenicola* that was represented by a single incomplete specimen. Only 22 of these species, had previously been reported from the Gulf of California. Of the 90 species previously unknown from the Gulf of California, 72 have been taken from southern California waters, two from northern California, one from British Columbia, and one from Alaska (also Acapulco). Northern distributional extensions include four from the Pacific side of southern Mexico (including the one also known from Alaska), one from Panama, one from Peru, and two from the Central Pacific Ocean.

Table 1 (see Appendix) summarizes the distributional data on the polychaetes of the Gulf of California. Species previously unknown from the area are indicated by an asterisk; literature citations and locality data are included. Only included in Table 1 are those reports in which specific identification was made by earlier workers; excluded are reports to only family or genus. No attempt was made to determine or evaluate the identification of others, since their material was not at hand. However, evaluations or opinions of subsequent workers are included. Presently, 300 species of polychaetes are known from the Gulf of California. The quantitative survey at Bahía de los Angeles therefore increased the number known from 210. Probably this total will be increased by other quantitative studies.

Relationship of polychaetes to sediments. — As noted, four kinds of sediments were encountered on the benthos of Bahía de los Angeles. The relationships of the percentage occurrence and the average number of specimens per station of the principal polychaetes (based on the presence at 35 or more stations) to the general sediment type are given in Table 2. Since the number of stations characterized by a particular sediment varied, the occurrence of a species on a particular substrate is given in percentage units rather than according to the number of times it was found. In addition, the average number of specimens per station is a further indication of substrate preference or tendency. On the basis of this analysis, the most abundant species of polychaetes may be grouped as follows:

Preference for sand: *Parculepis fimbriata*, *Ophiodromus pugettensis*, *Pilargis hamatus*, *Langerbansia heterochaeta*, *Ceratonereis mirabilis*, *Nereis procera*, *Glycera tessellata*, *Lumbrineris minima*, *Cbaetozone corona*, *Armandia bioculata*, *Cbone mollis*.

Preference for silty sand: *Eteone dilatata*, *Ancistrosyllis bassi*, *Tharyx parvus*, *Megalomma pigmentum*.

Preference for sand and silty sand: *Prionospio pinnata*, *Magelona californica*, *Telepsaurus costarum*.

Preference for sand, silty sand, sandy silt: *Haploscoloplos elongatus*, *Praxillella affinis pacifica*.

Preference for sandy silt: *Prionospio pygmaeus*.

Preference for silty sand and sandy silt: *Capitata ambiseta*.

Preference for sandy silt and silt: *Onuphis zebra*, *Prionospio cirrifera*.

Preference for silt: *Aricidea rosea*, *Cossura candida*.

No apparent preference for specific sediments: *Aglaophamus dicirrus*, *Glycinde armigera*, *Polydora socialis plena*, *Heteroclymene glabra*, *Amacana occidentalis*, *Euchone barnardi*.

These data indicate that the commonest species of polychaetes occur near sandy sediments. Furthermore, the finer the sediments the fewer the number of species encountered, both with respect to percent occurrence and the average number of specimens encountered per station.

Substrate domination by polychaetes. — Dominant species were defined as those represented by the largest number of specimens. These were compared for substrate

preferences. Five species constituted the dominant bay species during the April 1962 survey and nine species in October 1963. Only two species, *Prionospio cirrifera* and *Tharyx parvus*, were dominant in both surveys.

April 1962. — Sandy substrates: *Capitata ambiseta*, *Chaetozone corona*, *Praxillella affinis pacifica*, *Haploscoloplos elongatus*, *Spiophanes bombyx*. Silty sands: *C. ambiseta*, *H. elongatus*, *Aricidea rosea*, and *Tharyx parvus*. Sandy silts and silts: *A. rosea*, *C. ambiseta*. Silts: *Prionospio cirrifera*, *A. rosea*, and *C. ambiseta*.

October 1963. — Sandy substrate: *Prionospio pinnata*, *Armandia bioculata*, *Glycera tessellata*. Silty sands: *P. pinnata*, *Magelona californica*, *Prionospio cirrifera*, *Tharyx parvus*. Sandy silts: *Aglaophamus dicirris*, *Onuphis zebra*, *P. cirrifera*. Silts: *O. zebra*, *Cossura candida*.

Seasonal Differences. — Of 46,570 polychaetes taken during this study, 39,470 were collected in April 1962 and 7,100 in October 1963. The cause of this 89 per cent reduction in numbers of specimens is unknown, but some explanations can be offered. Summer water temperatures may be too high for this primarily temperate fauna. Median surface-water temperatures were 18.2C in April 1962 and 25.9C in October 1963. Greater extremes have been measured (Barnard, personal communication). Minima of 15C (possibly 12C) were measured in February and 29.8C in August during the years 1962 and 1963. A second possibility is that red tides might lower the dissolved oxygen below minimal values for survival of benthic animals. Such a phenomenon has occurred in Alamitos Bay, California (Reish 1963b). Collections of benthic animals in Alamitos Bay were made before and after an extensive bloom of the dinoflagellate, *Gonyaulax polyhedra* Stein. Approximately 50 per cent of the animals, the majority of which were polychaetes, were eliminated; of the remaining species nearly two-thirds decreased in abundance. Dense red tides were observed in Bahía de los Angeles by Dr. J. L. Barnard in March 1961, April 1962, and April 1963, but whether they contributed to the summer decrease in the fauna is unknown. The causative organism of these red tides in Bahía de los Angeles is unknown.

The number of specimens per station was plotted for both surveys (Figs. 2, 3). In both surveys the largest populations occurred in the inner middle part of the bay and along the north shore. A marked decrease in polychaete numbers was evident in the October survey. In April 1962, samples ranged from 66 to 1722 individuals (median 500), but in October 1963 only 14 to 425 (median 46) were collected. The decrease in the number of species collected, from 98 to 90, was not as noticeable. Considering only the 75 species in which ten or more individuals were collected, the inter-sample variation can be classified as follows.

Species presently only in April 1963 (6). — *Eumida sanguinea*, *Syllidia liniata*, *Pionosyllis gigantia*, *Platynereis bicanaliculata*, *Orbinia johnsoni*, *Polycirris perplexus*.

Species which decreased from April 1962 to October 1963 (41). — *Eteone dilatata*, *Paranaitis polynoides*, *Microphthbalmus riojai*, *Ancistrosyllis bassi*, *Langerbansia heterochaeta*, *Ceratonereis mirabilis*, *Nereis procera*, *Pilargis hamatus*, *Aglaophamus dicirris*, *Nephtys panamensis*, *Glycera americana*, *Lumbrineris minima*, *Haploscoloplos elongatus*, *Aricidea rosea*, *Paraonis gracilis oculata*, *Nerinides acuta*, *Polydora socialis plena*, *Prionospio cirrifera*, *P. pygmaeus*, *Spiophanes bombyx*, *S. missionensis*, *Telepsavus costarum*, *Caulleriella alata*, *Chaetozone corona*, *Tharyx parvus*, *T. tessellata*, *Polyophthbalmus pictus*, *Travisia gigas*, *Anotomastus gordiodes*, *Capitata ambiseta*, *Notomastus (Clistomastus) tennis*, *Heteroclymene glabra*, *Maldane sarsi*, *Praxillella affinis pacifica*, *Amphisamytha bioculata*, *Amphibictes scaphobranchiata*, *Amaeana occidentalis*, *Terebellides stroemi*, *Chone mollis*, *Euchone barnardi*, *Megalomma pigmentum*.

Species present only in October 1963 (3). — *Nereis riisei*, *Laonice cirrata*, *Fabricia limnicola*.

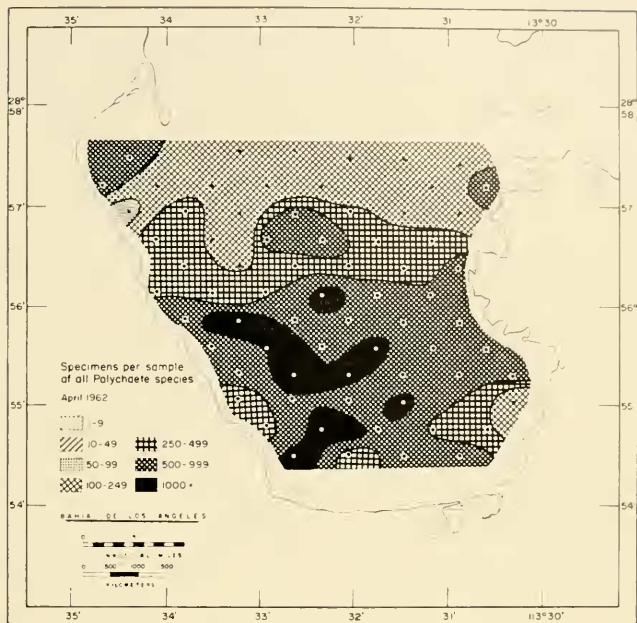


Figure 2.—Map of Bahia de los Angeles showing the number of specimens of polychaetes collected per station in April 1962.

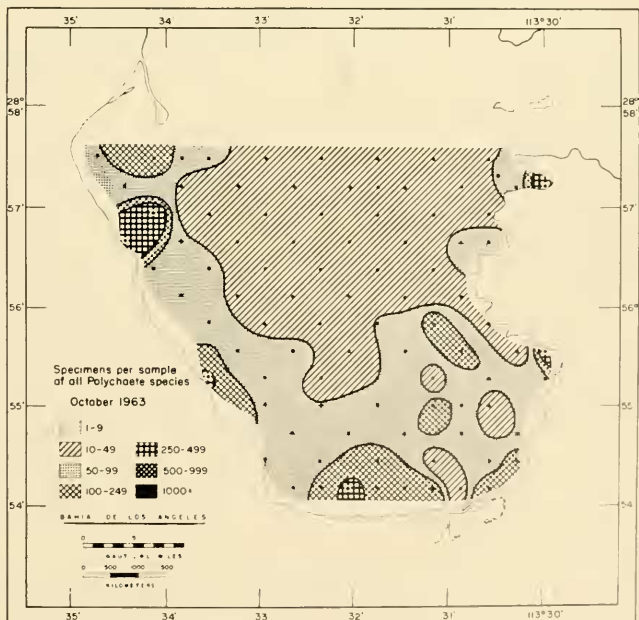


Figure 3.—Map of Bahia de los Angeles showing the number of specimens of polychaetes collected per station in October 1963.

Species which increased from April 1962 to October 1963 (16).—*Pareulepis fimbriata*, *Chloecia viridis*, *Parerythrocalifornia*, *Ophiodromus pugettensis*, *Exogone lourei*, *Eunice vittata*, *Protodorvillea gracilis*, *Prionospio malmgreni*, *P. pinnata*, *Magelona californica*, *Cirriformia spirabranca*, *Armandia bioculata*, *Owenia fusiformis collaris*, *Pista cristata*.

Species in approximate equal numbers in both surveys (9).—*Glycinde armigera*, *Onuphis zebra*, *Phylo felix*, *P. nudus*, *Scoloplos acmeceps*, *Aricidea uschakoui*, *Pocillochaetus johnsoni*, *Cossura candida*, *Pberusa neopapillata*.

Therefore, more species were reduced or eliminated from April 1962 to October 1963 than the reverse. If this reduction is an annual phenomenon, then repopulation—presumably from the deeper waters of the gulf—must be rapid, judged by the large samples obtained during the April survey. Bahía de los Angeles specimens are smaller than those of the same species from southern California. Possibly many are immature, but some with ova developing within the coelom were observed. A study of the causes of the reduction and subsequent increase in the fauna should be undertaken.

In the following list, the number of stations in at which each species was collected, and the number of specimens collected (in parentheses) is given for each survey. The detailed station listing of species and numbers of specimens has been filed with the American Documentation Institute, Auxillary Publication Service, Library of Congress, Washington, D.C. Holotypes and paratypes, and additional specimens of the new species have been deposited in The United States National Museum; the remaining material studied is in the author's collection.

SYSTEMATIC LIST

Family Polynoidae

Lepidonotus purpureus Potts

Lepidonotus purpureus, Potts, 1910: 334; Hartman, 1951: 91, *Lepidonotus bedleyi* Benham, Hartman, 1939a: 40.

Material.—April 1962: 3 (4).

Ecology.—Two specimens from sandy substrates, two from silt-sand mixture.

Distribution.—Indian Ocean, Australia, South Pacific, Gulf of California.

Pantbalis pacifica Treadwell

Pantbalis pacifica, Treadwell, 1914: 184; Hartman, 1939a: 87-88.

Material.—April 1962: 2 (2).

Ecology.—Both specimens from silty substrates.

Distribution.—Southern California to Baja California, questionably Panama (Hartman, 1939a).

Polyodontes frons Hartman

Polyodontes frons, Hartman, 1939a: 84-86.

Material.—April 1962: 1 (1). October 1963: 1 (1).

Distribution.—Previously known only from type collected from Pinas Bay, Panama.

Family Sigalionidae

Stelanellella uniformis Moore

Stelanellella uniformis, Moore, 1910: 391-395; Hartman, 1939a: 69-70.

Material.—October 1963: 3 (9).

Ecology.—Eight specimens from sandy substrates, one from silty sand.

Distribution.—Southern California to Ecuador. This is the first report from the Gulf of California.

Stenolepis fimbriarum (Hartman)

Stenolepis fimbriarum, Hartman, 1939a: 70-72. *Stenolepis fimbriarum*, Hartman, 1965b: 15.

Material.—April 1962: 5 (8).

Ecology.—Three stations sandy, two silty.

Distribution.—Southern California to Ecuador; Gulf of California.

Tbalenessa lewisii (Berkeley and Berkeley)

Sigalion lewisii, Berkeley and Berkeley, 1939: 226-228. *Eusigalion bancocki*, Hartman, 1939a: 59-60.

Tbalenessa lewisii, Hartman, 1959: 122.

Material.—April 1962: 2 (8); October 1963: 1 (1).

Ecology.—Eight specimens taken from sandy substrates, and one from silty sand.

Distribution.—Gulf of California south to Ecuador and Galapagos Islands.

Family Pareulepidae

Pareulepis fimbriata (Treadwell)

Eulepis fimbriata. Treadwell, 1901: 190. *Pareulepis fimbriata*. Hartman, 1939a: 79-80; 1961: 54-55.

Material.—April 1963: 13 (29); October 1963: 21 (37).

Ecology.—Shows a slight preference for sandy sediments (Table 2).

Distribution.—Southern California to Ecuador; West Indies; New Caledonia; Madagascar.

Family Chrysopetalidae

Palcanotus bellis (Johnson)

Heteropale bellis. Johnson, 1897: 163. *Palcanotus bellis*. Hartman, 1961: 57-58.

Material.—April 1962: 1 (1); October 1963: 1 (1).

Ecology.—Silty sands.

Distribution.—British Columbia to western Mexico. This is the first report from the Gulf of California.

Family Amphinomidae

Cbloxia viridis Schmarda

Cbloxia viridis. Schmarda, 1861: 144. Hartman, 1940: 205.

Material.—April 1962: 5 (8); October 1963: 5 (18).

Ecology.—Occurs in all types of substrates.

Distribution.—West Indies, Gulf of California, south to Panama, Galapagos Islands, and Cocos Islands.

Pareurythoe californica (Johnson)

Eurythoe californica Johnson, 1897: 159. *Pareurythoe californica*. Hartman, 1940: 203-204; 1961: 11.

Material.—April 1962: 3 (4); October 1963: 4 (13).

Ecology.—Preferred silty sand substrates.

Distribution.—Central and southern California; the distribution is extended into the Gulf of California.

Family Phyllococidae

Anaitides mucosa (Oersted)

Phyllococe mucosa. Oersted, 1843: 31. *Anaitides mucosa*. Hartman, 1961: 12.

Material.—April 1962: 4 (4).

Ecology.—Taken from various substrates.

Distribution.—Cosmopolitan. This is the first report from the Gulf of California.

Anaitides williamsi Hartman

Anaitides williamsi. Hartman, 1936: 126; Reish, 1963: 408.

Material.—April 1962: 3 (5).

Ecology.—Sandy sediments.

Distribution.—Oregon to Pacific Baja California. This is the first report from the Gulf of California.

Eteone dilatata Hartman

Eteone dilatata. Hartman, 1936: 130-131; Reish, 1963a: 408.

Material.—April 1962: 35 (85); October 1963: 7 (14).

Ecology.—Preference for silty sands (Table 2), which agrees with the finding of Hartman (1961) and Reish (1963a).

Distribution.—California and San Quintin Bay. This is the first report from the Gulf of California.

Enumida sanguinea (Oersted)

Eulalia sanguinea. Oersted, 1843: 28. *Enumida sanguinea*. Hartman, 1961: 13.

Material.—April 1962: 17 (30).

Ecology.—This species was taken from a variety of substrates.

Distribution.—Cosmopolitan. Rioja (1947a) reported this species from La Paz.

Paranaitis polynoides (Moore)

Anaitis polynoides. Moore, 1909b: 339. *Paranaitis polynoides*. Hartman, 1961: 13.

Material.—April 1962: 16 (18); October 1963: 1 (1).

Ecology.—Specimens collected from a variety of substrates.

Distribution.—British Columbia to southern California. The distribution is extended into the Gulf of California.

Family Typhlocolecidae

Typhlocolex mulleri Busch

Typhlocolex mulleri. Busch, 1851: 115; Tebble, 1960: 231-236.

Material.—October 1963: 1 (1).

Remarks.—*Typhlocolex mulleri* is a pelagic cosmopolitan species. Presumably, this specimen was collected while the orange-peel bucket was being brought to the surface.

Family Hesionidae

Genus *Microphthalmus* Mecznirow, 1865, emended.

Type: *Microphthalmus sczelkowi* Mecznirow, 1865.

Remarks.—All known species of the genus possess three antennae and a pygidial plate (posterior end unknown in *M. aciculata* Hartman-Schröder, (1962a). Since the pygidial plate is distinctive to this genus of hesionids, the generic diagnosis of *Microphthalmus* is emended to include species with two antennae as well as three antennae

Diagnosis.—Prostomium with two or three frontal antennae, a pair of small ventral palpi; eyes present or absent; segments 1 to 3 each with a pair of dorsal and ventral tentacular cirri, no setae; parapodia unequally a single simple notoseta; dorsal and ventral cirri short and digitiform; neurosetae compound; pygidium with an expanded plate and two dorsal anal cirri.

Microphthalmus riojai, new species

Figure 4, a-f

Material.—Stations, April 1962: 5 (12); October 1963: 3 (5).

Description.—Length up to 3 mm; width including setae up to 0.2 mm; setigerous segments up to 30; prostomium and dorsal surface with reddish brown pigment; prostomium (Fig. 4a) trapezoidal in shape, widest posteriorly; two eyes at the posterior-lateral margin; a pair of antennae at the anterior margin of the prostomium; a pair of simple ventral palpi, nature of proboscis unknown; no jaws seen; segments 1 to 3 ascigerous, with 6 pairs of long tentacular cirri; parapodial lobes unequally biramous (Fig. 4c), neuropodial lobe conical in shape; one simple, curved lyrate notoseta (Fig. 4d) per lobe, each provided with 8 teeth; 4 to 6 compound neuroseta per lobe (Fig. 4e, f), each terminate in a delicate bidentate tip; pre-anal segment ascigerous, provided with a pair of dorsal and ventral knob-shaped cirri; pygidial plate (Fig. 4b) broadly concave with no indication of a bilobed condition; anal cirri extend beyond the margin of the anal plate.

Remarks.—Ten species are previously known to belong to this genus, three of which were recently described from the Pacific side of South America by Hartmann-Schröder (1962a, b). *Microphthalmus riojai* differs from the other species by the absence of the median unpaired antennae. It belongs to that group of species characterized by the presence of lyrate setae in the notopodium. Other species known to possess this type of notosetae include *M. sczelkowi* Mecznirow, (1865), *M. s. murmanica* Zachs (in Uschakov, 1955), and *M. urofimbriata* Alikunhi (1943.)

Ecology.—Associated with the coarser sediments; eleven specimens were taken from a sandy substrate and six from silty sand.

Type material.—The holotype and 7 paratypes have been deposited in the U. S. National Museum.

Type locality.—Bahía de los Angeles, Gulf of California, Baja California. This species is named in honor of Dr. Enrique Rioja, in recognition of his contribution to the knowledge of Mexican polychaetes.

Ophiodromus pugettensis (Johnson)

Podarke pugettensis, Johnson, 1901: 395; Rioja, 1947a: 202. *Ophiodromus pugettensis*, Hartman, 1961: 67-68; Reish, 1963a: 423.

Material.—April 1962: 29 (46); October 1963: 19 (101).

Ecology.—Found on sandy or silty substrates (Table 2).

Distribution.—Japan and from British Columbia to Peru.

Oxydromus arenicolus glabrus Hartman

Oxydromus arenicolus glabrus, Hartman, 1961: 68-69.

Material.—April 1962: 4 (9).

Ecology.—Specimens from silty sands or sandy silts.

Distribution.—Previously known from California. The distribution is extended into the Gulf of California.

Oxydromus brunnea Hartman

Oxydromus brunnea, Hartman, 1961: 69-70.

Material.—April 1962: 2 (2).

Ecology.—Sand and silty sand.

Distribution.—Southern California; the distribution is extended into the Gulf of California.

Syllidia liniata Hartmann-Schröder

Syllidia liniata, Hartmann-Schröder, 1962a: 115-116.

Material.—April 1962: 8 (55); October 1963: 3 (6).

Ecology.—Silty sands at most stations; however, 30 specimens were taken at a station consisting of sands.

Distribution.—Peru; the distribution is extended into the Gulf of California.

Family Pilargidae

Aucistrostylis bassi Hartman

Aucistrostylis bassi, Hartman, 1947b: 501-504.

Material.—April 1962: 4 (7); October 1963: 35 (52).

Ecology.—*A. bassi* showed a slight preference for silty sand sediments (Table 2).

Distribution.—Known from California and Florida; the distribution is extended into the Gulf of California.

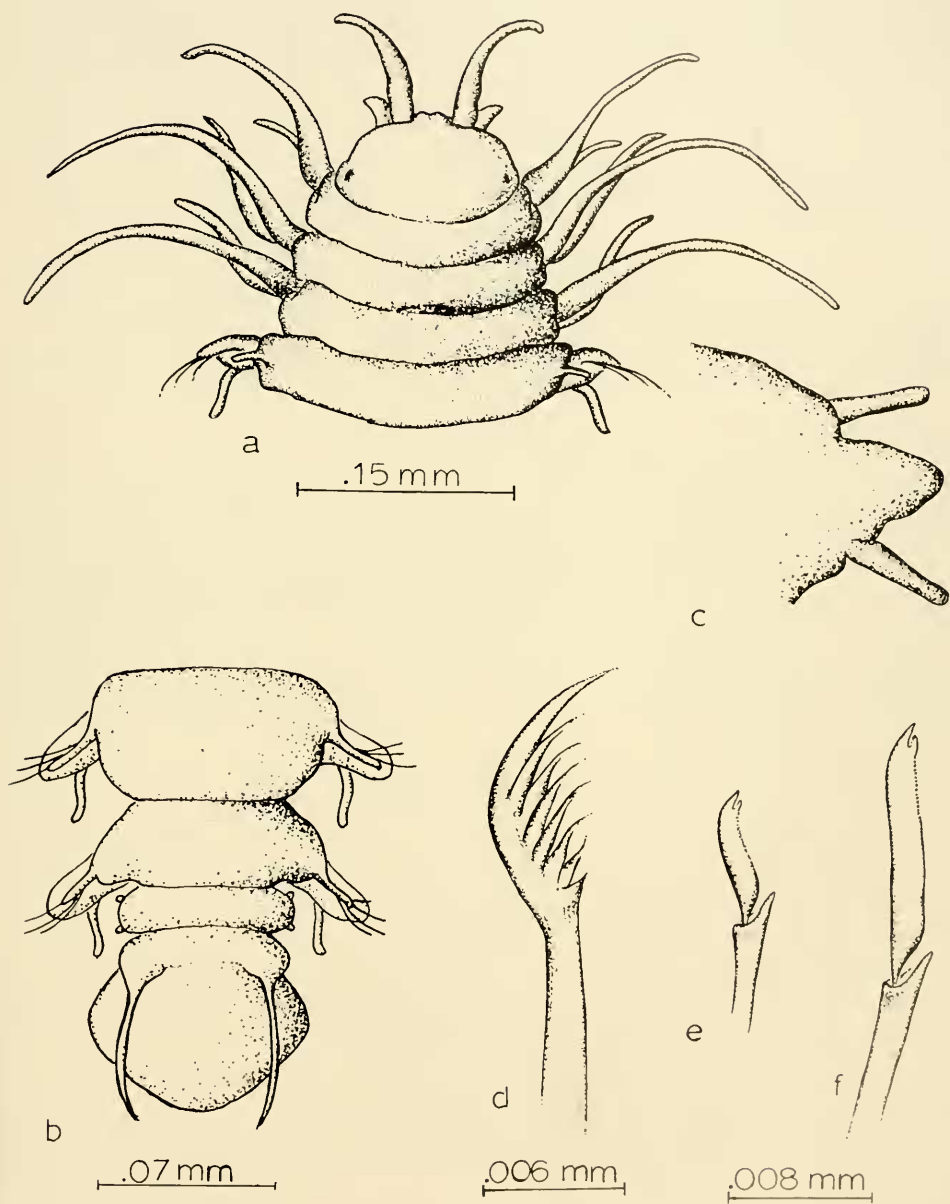


Figure 4. — *Microphthalmus riojai*, n. sp.: a, anterior end, dorsal view; b, posterior end, dorsal view; c, parapodium from mid-region, magnification as figure b; d, lyre seta from notopodium; e-f, compound neurosetae from neuropodium.

Loandalia fauveli Berkeley and Berkeley

Loandalia fauveli. Berkeley and Berkeley, 1941: 30-31, pl. 5, figs. 4-6.

Material.—April 1962: 4 (4); October 1963: 5 (5).

Ecology.—Taken from all substrate types.

Distribution.—Previously known only from southern California; the distribution is extended into the Gulf of California.

Pilargis bamatus Hartman

Pilargis bamatus. Hartman, 1960: 88-89.

Material.—April 1962: 26 (63); October 1963: 9 (16).

Ecology.—*Pilargis bamatus* showed a preference for either sands or silty sands (Table 2).

Distribution.—Southern California; the distribution is extended into the Gulf of California.

Family Syllidae

Brania limbata (Claparède)

Grubea limbata. Claparède, 1868: 52. *Brania limbata*. Reish, 1959a: 79; Hartmann-Schröder, 1962b: 103.

Material.—April 1962: 2 (3).

Ecology.—Sandy sediments.

Distribution.—Known from Europe, southern California, and Chile. This is the first report from the Gulf of California.

Exogone lourei Berkeley and Berkeley

Exogone lourei. Berkeley, 1938: 44-47; Reish, 1959a: 80.

Material.—April 1962: 5 (13); October 1963: 11 (231).

Ecology.—This species showed a preference for either sandy or silty sand sediments; 161 specimens were taken from a station composed of silty sands.

Distribution.—This species is known from British Columbia to southern California and Acapulco, Mexico. The distribution is extended into the Gulf of California.

Langerbansia heterochaeta (Moore)

Syllis (Eblersia) heterochaeta. Moore, 1909b: 322-325. *Langerbansia heterochaeta*. Hartman, 1959: 210, 1961: 16.

Material.—April 1962: 21 (70); October 1963: 16 (40).

Ecology.—This species showed preference for either a sandy or silty sand substrates (Table 2).

Distribution.—Known from British Columbia to southern California. This report extends its distribution into the Gulf of California.

Odontosyllis phosphorea Moore

Odontosyllis phosphorea. Moore, 1909b: 327-329; Hartman, 1961: 76-77.

Material.—October 1963: 1 (1).

Ecology.—Sandy sediments.

Distribution.—British Columbia to southern California; this is the first report of the species from the Gulf of California.

Pionosyllis gigantea Moore

Pionosyllis gigantea. Moore, 1908: 325-328; Hartman, 1961: 16.

Material.—April 1962: 8 (27).

Ecology.—All but 3 specimens from stations possessing sandy sediments.

Distribution.—Known from British Columbia to California; the distribution is extended into the Gulf of California.

Sphaerosyllis erinaceus Claparède

Sphaerosyllis erinaceus. Claparède, 1863: 45; Rioja, 1943: 211-214; Day, 1954: 13-14; Pettibone, 1963: 135-136.

Material.—April 1962: 1 (1); October 1963: 1 (6).

Ecology.—Substrate sand or silty sands.

Distribution.—Northern Hemisphere and Tristan de Cunha; Rioja (1943) reported it from Acapulco; this is the first record from the Gulf of California.

Family Nereidae

Ceratonereis mirabilis Kinberg

Ceratonereis mirabilis. Kinberg, 1866: 170; Hartman, 1948: 71-72. *Nereis (Ceratonereis) mirabilis*. Fauvel, 1953: 200-201. *Ceratonereis singularis*. Treadwell, 1929: 1-3.

Material.—April 1962: 33 (68); October 1963: 9 (29).

Ecology.—Marked preference for sandy sediments (Table 2).

Distribution.—Cosmopolitan in warmer seas. Hartman (1948) referred *C. singularis* Treadwell from Carmen Island, Baja California to this species.

Nereis procera Ehlers

Nereis procera, Ehlers, 1868: 557; Reish, 1959a: 81-82.

Material. — April 1962: 27 (65); October 1963: 6 (16).

Ecology. — *Nereis procera* showed a slight preference for sandy substrates (Table 2).

Distribution. — British Columbia to southern California; the distribution is extended into the Gulf of California.

Nereis riisei Grube

Nereis riisei, Grube, 1857: 162; Hartman, 1940: 221-222; 1951: 46; Rioja, 1959: 225.

Material. — October 1963: 6 (11).

Ecology. — Nine specimens from sandy substrates; two from silty sands.

Distribution. — Known from the Gulf of California to Ecuador and Gulf of Mexico; the distribution within the Gulf of California is extended northward.

Platynereis bicanaliculata (Baird)

Nereis bicanaliculata, Baird, 1863: 109; *Platynereis bicanaliculata*, Hartman, 1954: 36-39.

Material. — April 1962: 4 (32).

Ecology. — The substrate was sandy at Station 130 where 29 specimens were collected. The other stations were composed of silty sands and sandy silts.

Distribution. — Western Canada to Baja California, Gulf of California, Hawaii, Australia, and possibly Peru (Hartmann-Schröder, 1962a).

Family Nephtyidae

Aglaophamus dicirris Hartman

Aglaophamus dicirris, Hartman, 1950: 122-124.

Material. — April 1962: 67 (822); October 1963: 84 (509).

Ecology. — Collected at 93 per cent of the stations sampled. Equally common on silty sand or sandy silt substrates (Table 2). As widespread but less abundant in October 1963 than in April 1962; the average number of specimens per station was only 6 (maximum 19) as compared to 12 (maximum 76). The population, especially reduced in the inner reaches of the bay.

Distribution. — Southern California to Panama; Gulf of California; North Carolina.

Nephtys panamensis Monro

Nephtys panamensis, Monro, 1928: 81-82; Hartman, 1940: 239-240; 1950: 101.

Material. — April 1962: 24 (147); October 1963: 3 (4).

Ecology. — Commonest on sandy substrates.

Distribution. — Gulf of California to Panama.

Family Glyceridae

Glycera americana Leidy

Glycera americana Leidy, 1855: 147-148; Hartman, 1950: 73-75.

Material. — April 1962: 21 (40); October 1963: 6 (18).

Ecology. — Taken most frequently from the sandy and silty sand bottoms.

Distribution. — Western Hemisphere, New Zealand, Australia.

Glycera robusta Ehlers

Glycera robusta Ehlers, 1868: 656-658; Hartman, 1950: 69-70.

Material. — April 1962: 2 (7).

Ecology. — Sandy sediments.

Distribution. — British Columbia to southern California and possibly Florida (Hartman, 1950). The distribution is extended into the Gulf of California.

Glycera tessellata Grube

Glycera tessellata Grube, 1863: 41-42; Hartman, 1950: 77-78; Imajima and Hartman, 1964: 165.

Material. — April 1962: 21 (69); Oct. 1963: 35 (658).

Ecology. — *Glycera tessellata* preferred sandy substrates (Table 2). Most specimens were collected in October 1963 and these were small and presumably immature worms.

Distribution. — British Columbia south to tropical Pacific, Japan, Indo-Pacific, Caribbean Sea, and Mediterranean Sea.

Family Goniadidae

Glycinde armingi Moore

Glycinde armingi Moore, 1911: 307-311; Hartman, 1950: 49-51.

Material. — April 1962: 57 (290); October 1963: 56 (342).

Ecology. — Widespread, in all substrates in both survey; most specimens from sandy benthos (Table 2). The increase in October 1963 reflects the extreme abundance of the species (225 individuals) at station 65. The largest sample in April 1962 was 18.

Distribution. — British Columbia south to Galapagos Islands. The distribution is extended into the Gulf of California.

Goniada littorea Hartman

Goniada littorea Hartman, 1950: 23-26; Reish, 1963a: 425.

Material.—October 1963: 1 (1).

Ecology.—Silty sand.

Distribution.—Southern California to San Quintin Bay; the distribution is extended into the Gulf of California.

Family Onuphidae

Onuphis nebulosa Moore

Onuphis nebulosa Moore, 1911: 269-273; Hartman, 1944a: 75-78.

Material.—April 1962: 9 (23); Oct. 1963: 8 (44).

Ecology.—This species preferred coarser sediments.

Distribution.—Central California to Panama; this is the first report from the Gulf of California.

Family Onuphidae

Onuphis zebra Berkeley and Berkeley

Onuphis zebra Berkeley and Berkeley, 1939; 337-338; Hartman, 1944a: 71-72.

Material.—April 1962: 60 (746); Oct. 1963: 76 (566).

Ecology.—This was one of the commonest worms in the bay. It was present in all types of substrates, but it showed a preference for finer sediments. This species constructs a tube of silt. *Onuphis zebra* was widespread throughout the bay during both surveys; a slight drop in the population was noted in the October 1963 survey. The maximum April sample was 115; October, 23.

Distribution.—Punta Gorda, Baja California and Guatemala; the distribution is extended northward in the Gulf of California from near the vicinity of La Paz to Bahía de los Angeles.

Family Eunicidae

Eunice vittata (delle Chiaje)

Nereis vittata delle Chiaje, 1828: 195. *Eunice vittata*. Hartman, 1944a: 118.

Material.—April 1962: 1 (1); Oct. 1963: 3 (4).

Ecology.—Sands or silty sands.

Distribution.—Warmer waters of the Western Hemisphere from Bermuda to West Indies and Trinidad, from southern California to Panama, and many localities in the Gulf of California.

Nematoneis unicornis (Grube)

Lumbriconereis unicornis Grube, 1840: 80. *Nematoneis unicornis*. Fauvel, 1953: 249-250.

Material.—April 1962: 1 (5).

Ecology.—Sand.

Distribution.—Cosmopolitan in warmer seas; previously unknown from the Gulf of California.

Family Lumbrineridae

Lumbrineris erecta (Moore)

Lumbriconereis erecta. Moore, 1904: 490-492. *Lumbrineris erecta*. Hartman, 1944a: 149-150.

Material.—October 1963: 1 (1).

Ecology.—Sand.

Distribution.—Southern California to Panama, and Gulf of California.

Lumbrineris minima Hartman

Lumbrineris minima. Hartman, 1944a: 155-156; Reish, 1963a: 425-426.

Material.—April 1962: 57 (378). October 1963: 20 (53).

Ecology.—Commonest on coarser sediments (Table 2). This is similar to the ecology off southern California (Hartman, 1944a; Reish, 1959a), but unlike that at San Quintin Bay (Reish, 1963a).

Distribution.—Southern California and San Quintin Bay; the distribution is extended into the Gulf of California.

Family Arabellidae

Drilonereis nuda Moore

Drilonereis nuda. Moore, 1909a: 254-256; Hartman, 1944a: 178-179.

Material.—April 1962: 2 (2); October 1963: 3 (3).

Ecology.—Sands or sands and silts.

Distribution.—Central California to Panama, Fauvel (1943) reported it from the Gulf of California (locality unspecified).

Family Dorvilleidae

Protodorvillea gracilis (Hartman)

Stauronereis gracilis. Hartman, 1938: 100-101. *Dorvillea gracilis*. Hartman, 1944a: 189. *Protodorvillea gracilis*. Hartman, 1965b: 48.

Material.—April 1962: 7 (20). October 1963: 7 (132).

Ecology.—Of 152 specimens, 141 were taken from eight stations characterized by sandy sediments.

Distribution.—California; the distribution is extended into the Gulf of California.

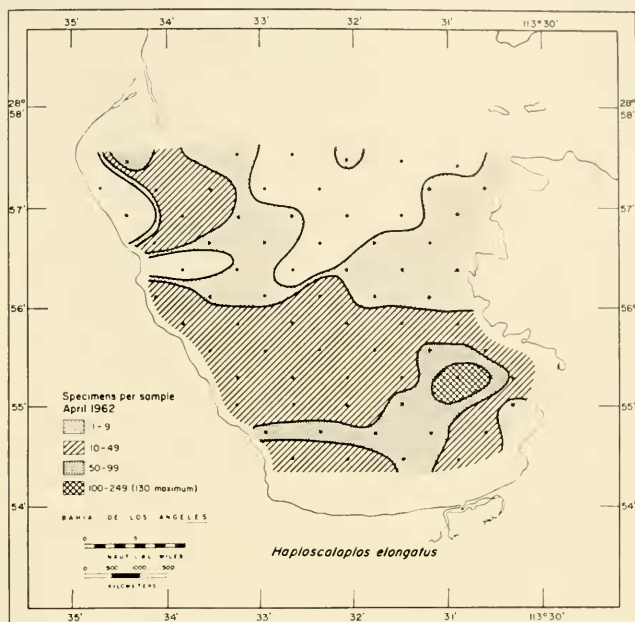


Figure 5. — Benthic distribution of *Haploscoloplos elongatus* in April 1962.

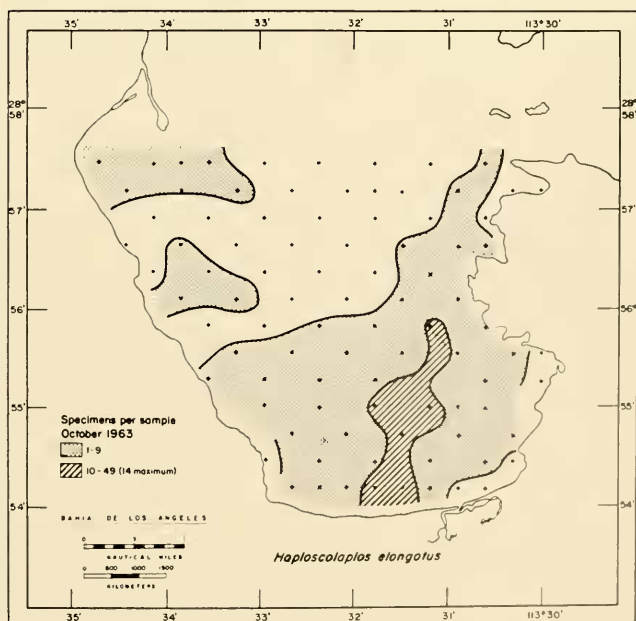


Figure 6. — Benthic distribution of *Haploscoloplos elongatus* in October 1963.

Family Orbiniidae

Haploscoloplos elongatus (Johnson)

Scoloplos elongatus. Johnson, 1901: 412-413. *Haploscoloplos elongatus*. Hartman, 1957: 273-275; Reish, 1963a: 426; 1965: 140; Imajima and Hartman, 1964: 274.

Material. — April 1962: 58 (1470). October 1963: 54 (252).

Ecology. — Widespread, commonest on silty sandy (Table 2). Much reduced in October 1963, especially in inner part of bay (Figs. 5, 6).

Distribution. — Japan, Beaufort Sea to San Quintin Bay; the distribution is extended into the Gulf of California.

Orbinia johnsoni (Moore)

Aricia johnsoni. Moore, 1909a: 260-262; *Orbinia johnsoni*. Hartman, 1957: 257-260.

Material. — April 1962: 2 (4).

Ecology. — Sandy silts.

Distribution. — Central California to Costa Rica; previously unknown from the Gulf of California.

Phylo felix Kinberg

Phylo felix. Kinberg, 1866: 251-252; Hartman, 1957: 262-265.

Material. — April 1962: 10 (15); October 1963: 19 (17).

Ecology. — Taken from all substrate types.

Distribution. — California, Gulf of California, Brazil, Patagonia, East Falkland Island, and Antarctic Ocean.

Phylo nudus (Moore)

Aricia nuda. Moore, 1911: 311-315. *Phylo nudus*. Hartman, 1957: 268.

Material. — April 1962: 4 (7); October 1963: 6 (8).

Ecology. — Sands or a mixture of sands and silts.

Distribution. — Southern California and Burma; the distribution is extended into the Gulf of California.

Scoloplos acmeceps Chamberlin

Scoloplos acmeceps. Chamberlin, 1919b: 15-16; Hartman, 1957: 282-283.

Material. — April 1962: 3 (7); October 1963: 2 (6).

Ecology. — Sands or sands and silts.

Distribution. — Alaska to Mazatlan; this is the first report from the Gulf of California.

Family Paraonidae

Aricidea uscbakowi Zachs

Aricidea uscbakowi. Zachs, 1925: 1-3; Hartman, 1957: 321.

Material. — April 1962: 8 (176); October 1963: 24 (160).

Ecology. — Commonest on sand bottoms.

Distribution. — Russian Pacific Ocean to southern California; the distribution is extended into the Gulf of California.

Aricidea rosea, new species

Figures 7a-c, 8

Material. — April 1962: 53 (5534); October 1963: 12 (19).

Diagnosis. — Length to 7-8 mm; width 0.25 mm; to at least 70 setigerous segments; prostomium (Fig. 7a) triangular in shape and rounded anteriorly, without eyespots, the median antenna extends into the second setigerous segment; branchiae number 11 to 12 pairs, begin at setigerous segment 4 and extend to segment 15 or 16, third to ninth pair largest and may overlap with opposite member mid-dorsally; notopodia with cirriform notopodial post-setal lobe which is well developed throughout the length of the worm; neuropodium poorly developed; setae of notopodium of capillary type and distally pointed (Fig. 7b); capillary setae present in all neuropodial lobes; beginning at about segments 20-25 and to the posterior end four to six modified setae appear in the neuropodium (Fig. 7c); they are of the curved acicular type with a secondary tooth and a pointed hood.

Type material. — The holotype and paratypes have been deposited in the U. S. National Museum. The type locality is Bahía de los Angeles, Baja California, Mexico.

Remarks. — Hartman (1959b) listed nine species within the genus *Aricidea* (*Aricidea*) plus two additional species which were referred with question. Three additional species have since been described *A. (A.) lopezi ruba* Hartman (1963), *A. abrauchiata* Hartman (1965a), and *A. neosuecica* Hartman (1965a). The different species of the genus may be conveniently separated from one another on the basis of the number of pairs of branchiae and the nature of the modified neuroseta. *Aricidea (A.) rosea* can be distinguished from the majority of the known species by the number of pairs of branchiae. There are 11 to 12 pairs in *A. (A.) rosea* and 9 to 11 in *A. (A.) lopezi ruba*; they differ, however, in the nature of their modified neuroseta.

Ecology. — This is one of the commonest polychaetes in Bahía de los Angeles; 22 of the 5352 specimens were collected in April 1962 (Fig. 15). The greatest concentration of *A. rosea* occurred in fine sediments in the middle part of the bay.

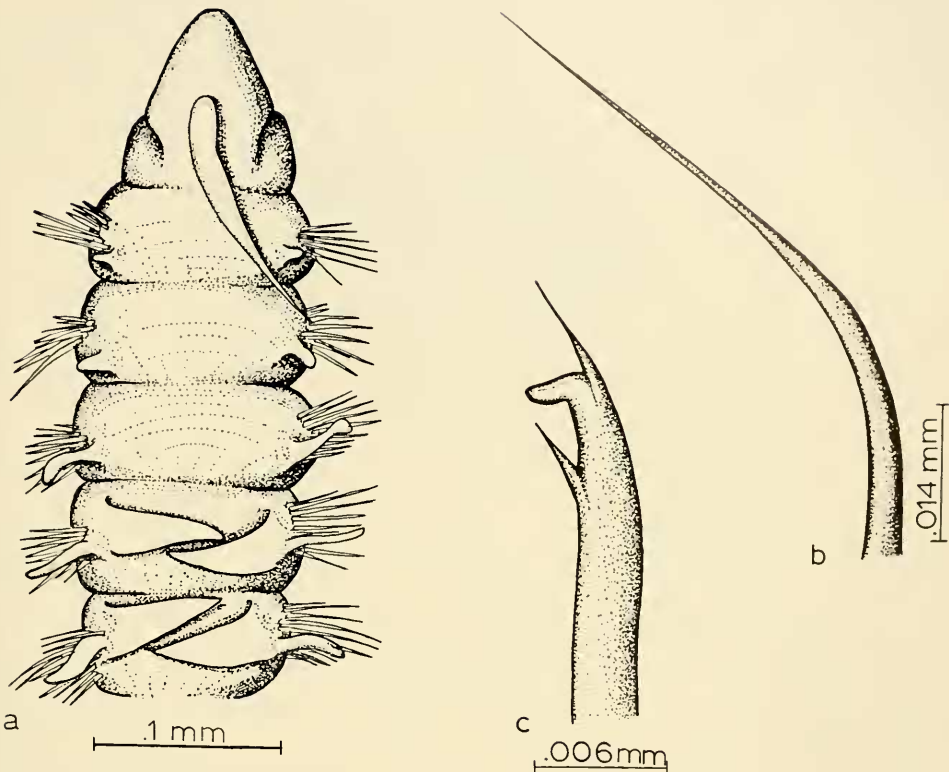


Figure 7 — *Aricidea (Aricidea) rosea*, n. sp.: a, anterior end, dorsal view; b, capillary setae from notopodium; c, modified seta from neuropodium.

Paradoneis lyra Southern

Paraonis (Paraonides) lyra. Southern, 1914: 94-95; Hartman, 1957: 334-335.

Paradoneis lyra. Hartman, 1965: 52.

Material. — October 1963: 1 (3).

Ecology. — Sand.

Distribution. — European waters and southern California; the distribution is extended into the Gulf of California.

Paraonis gracilis oculata Hartman

Paraonis gracilis oculata. Hartman, 1957: 331-332.

Material. — April 1962: 13 (80); October 1963: 10 (17).

Ecology. — Commonest in sands and silty sands.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Family Spionidae

Laonice cirrata (Sars)

Nerine cirrata. Sars, 1851: 207; *Laonice cirrata*. Berkeley and Berkeley, 1952: 26; Imajima and Hartman, 1964: 281-282.

Material. — October 1963: 3 (10).

Ecology. — Silty sands.

Distribution. — Cosmopolitan; this is the first report from the Gulf of California.

Nerinides acuta (Treadwell)

Spio acuta. Treadwell, 1914: 199-201. *Nerinides acuta*. Hartman, 1941: 294-296; Reish 1959a: 86.

Material. — April 1962: 5 (7); October 1963: 2 (2).

Ecology. — Sands and from sand and silts.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

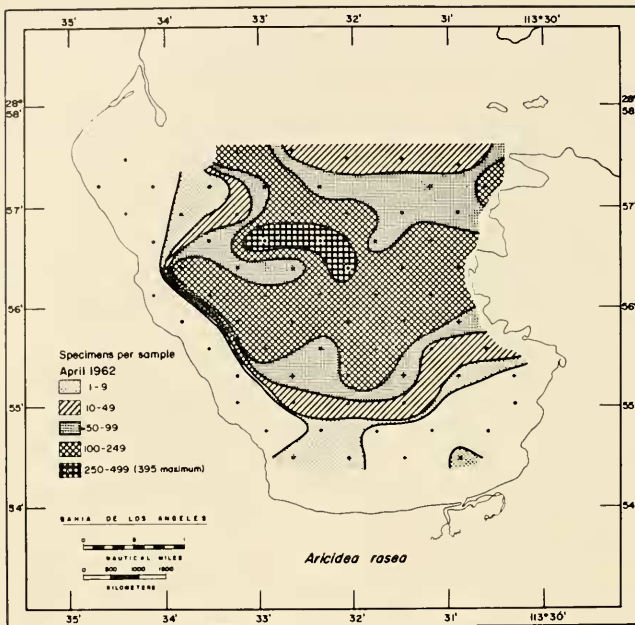


Figure 8 — Benthic distribution of *Aricidea rosea* in April 1962.

Nerinides maculata Hartman

Nerinides maculata. Hartman, 1961: 91-92; Reish, 1963a: 427.

Material. — October 1963: 1 (1).

Ecology. — Sand.

Distribution. — Southern California, San Quintin Bay, and the northern Gulf of California at San Felipe.

Nerinides pigmentata (Reish)

Spiophanes pigmentata. Reish, 1959c: 11-13. *Nerinides pigmentata*. Hartman, 1961: 92-93.

Material. — October 1963: 1 (2).

Ecology. — Silty sand.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Polydora heterochaeta Rioja

Polydora heterochaeta. Rioja, 1939: 308-309.

Material. — October 1963: 3 (3).

Ecology. — Sand or silty sands.

Remarks. — Identified by Keith H. Woodwick.

Distribution. — Acapulco; the distribution is extended into the Gulf of California.

Polydora socialis plena Berkeley and Berkeley

Polydora socialis plena. Berkeley and Berkeley, 1936: 468-469; 1952: 22.

Material. — April 1962: 27 (81); October 1963: 22 (36).

Ecology. — Occurs on all substrate; commonest on sandy silts.

Remarks. — Identified by Keith H. Woodwick.

Distribution. — Alaska and British Columbia; the distribution is extended in the Gulf of California.

Prionospio cirrifera Wiren

Prionospio cirrifera. Wiren, 1883: 409; Fauvel, 1927: 62-63; Reish, 1959a: 87.

Material. — April 1962: 46 (623); October 1963: 62 (471).

Ecology. — This species was found at more stations, but not in greater numbers, in areas of finer sediments (Table 2). This relationship is similar to that found in Newport Bay, California (Reish, 1959a). Maximum count April, 1962, 48; October 1963, 34.

Distribution. — Europe, North Sea, Arctic Ocean, Bering Sea to southern California; the distribution is extended into the Gulf of California.

Prionospio longibranchiata, new species

Fig. 9 a-e

Material. — April 1962: 2 (2); October 1963: 5 (6).

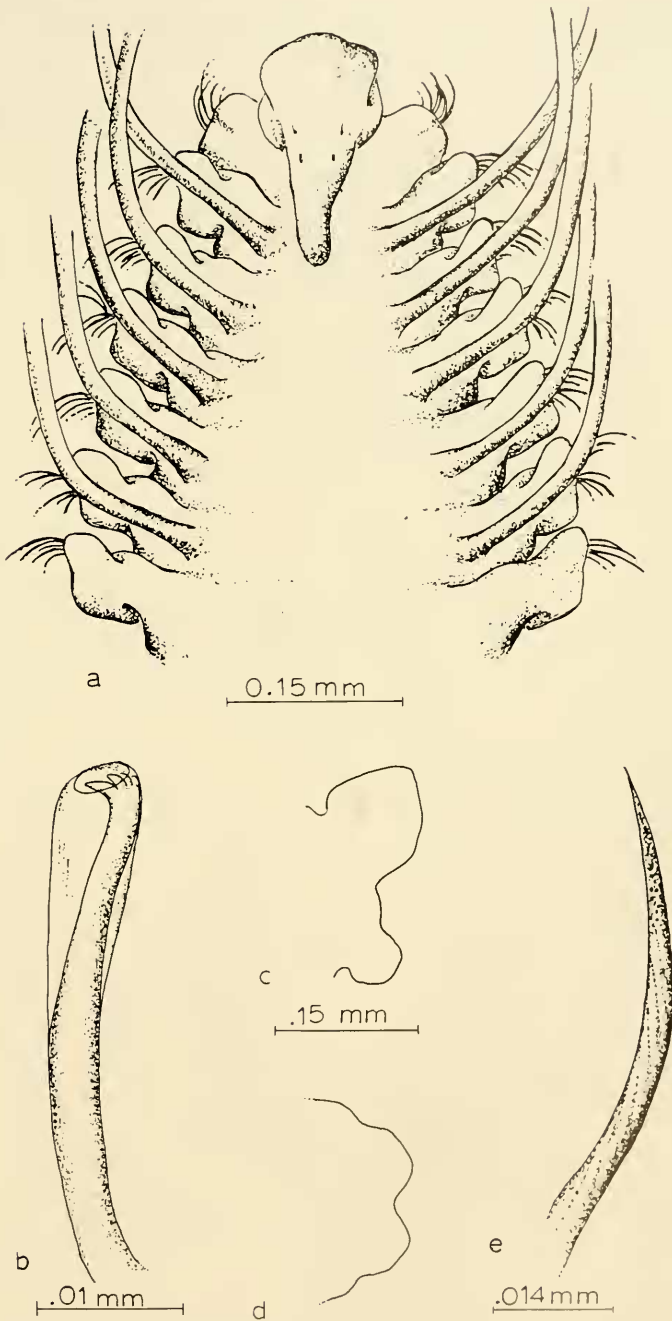


Figure 9. — *Prionospio longibranchiata*, n. sp.: a, anterior end, dorsal view; b, hooded hook from neuropodium; c, anterior parapodium; d, posterior parapodium, magnification as figure c; e, capillary seta from posterior inferior neuropodium.

Diagnosis.—Length of holotype 5 mm; width 0.2 mm; 37 setigerous segments; incomplete specimens as long as 12 mm, width 0.4 mm, 55 setigerous segments; prostomium (Fig. 9a) longer than broad, slightly rounded and expanded anteriorly, tapers posteriorly to second setigerous segment; peristomium prolonged anteriorly as lateral lobes to prostomium; palps broken off; 4 eyes equal in size with anterior pair farther apart; 5 pairs of long, cirriform branchiae, some partially broken with the longest extending to segment 20; all setigerous segments biramous; anterior segments with only capillary setae; hooded hooks from setigerous segment 17 in neuropodium, 21 in notopodium; hooded hooks (Fig. 9b) consist of one large tooth at right angles to shaft and 3 smaller teeth, hood as indicated in Fig. b; details of anterior and mid-body parapodial lobes shown in Fig. 9 c, d; pygidium with an unpaired longer cirrus and two shorter ones.

Remarks.—Thirty species are known previously from the genus *Prionospio* Malmgren (Hartman, 1959b; Hartmann-Schröder, 1962a, b; Laubier, 1962). *Prionospio longibranchiata* belongs to the group possessing only cirriform branchiae, but can be distinguished by the number and nature of the branchiae. *Prionospio cirrifera* Wiren (1883), cosmopolitan in distribution, has from 6 to 12 pairs of short branchiae. *Prionospio polybranchiata* Fauvel (1953), known from India, has 5 pairs of long branchiae, which resemble those of *P. longibranchiata*, and at least 35 pairs of shorter branchiae. *Prionospio heterobranchia* Moore (1907), from Massachusetts, *P. b. texana* Hartman (1951a) from Texas, and *P. b. newportensis*, Reish (1959c), from California, all have 5 pairs of branchiae, but the first, fourth, and fifth pairs are pinnate in all three species.

Type material.—The holotype and paratypes have been deposited in the U. S. National Museum. Type locality Bahía de los Angeles Baja California, Mexico.

Prionospio malmgreni Claparède

Prionospio malmgreni. Claparède, 1868: 333; Pettibone, 1954: 282-284.

Material.—April 1962: 7 (19); October 1963: 15 (59).

Ecology.—Sands or sandy silts. In San Quintin Bay, *P. malmgreni* was more abundant in finer sediments (Reish, 1963a).

Distribution.—Northern Hemisphere and South Africa; this is the first report from the Gulf of California.

Prionospio pinnata Ehlers

Prionospio pinnata. Ehlers, 1901; 163-164; Hartman, 1960: 114-115.

Material.—April 1962: 36 (252); October 1963: 61 (755).

Ecology.—Commonest on sand and silty sands.

Distribution.—Cosmopolitan; this is the first report from the Gulf of California.

Prionospio pygmaeus Hartman

Prionospio pygmaeus. Hartman, 1961: 93-95; Reish, 1963a: 427.

Material.—April 1962: 51 (876); October 1963: 4 (9).

Ecology.—All substrates (Table 2).

Distribution.—Southern California, San Quintin Bay; the distribution is extended into the Gulf of California.

Pseudopolydora reishi Woodwick

Pseudopolydora reishi. Woodwick, 1964: 152.

Material.—October 1963: 2 (4).

Ecology.—Silt and silty sands.

Remarks.—Specimens identified by Keith H. Woodwick.

Distribution.—This species was recently described from Eniwetok Atoll, Marshall Islands; the distribution is extended into the Gulf of California.

Spiophanes bombyx (Claparède)

Spio bombyx. Claparède, 1870: 485. *Spiophanes bombyx*. Berkeley and Berkeley, 1952: 22-24.

Material.—April 1962: 20 (427); October 1963: 3 (8).

Ecology.—Occurred almost exclusively in sandy sediments.

Distribution.—Cosmopolitan; this is the first report of the species from the Gulf of California.

Spiophanes missionensis Hartman

Spiophanes missionensis. Hartman, 1941: 296-298; Reish, 1963a: 427.

Material.—April 1962: 9 (12); October 1963: 1 (1).

Ecology.—Taken from all substrates.

Distribution.—Southern California, San Quintin Bay; the distribution is extended into the Gulf of California.

Family Magelonidae

Magelona californica Hartman

Magelona californica. Hartman, 1944c: 320-321; Reish, 1963a: 427.

Material.—April 1962: 14 (119); October 1963: 30 (537).

Ecology.—All specimens but one from sand or silty sands. Present at 73 per cent of the sandy stations but only 30 per cent of the silty sand stations (Table 2).

Distribution.—Southern California, San Quintin Bay; the distribution is extended into the Gulf of California.

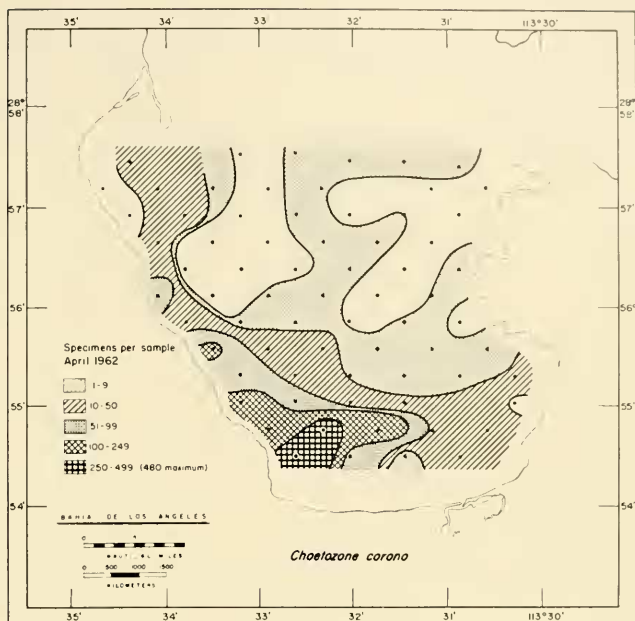


Figure 10.—Benthic distribution of *Chaetozone corona* in April 1962.

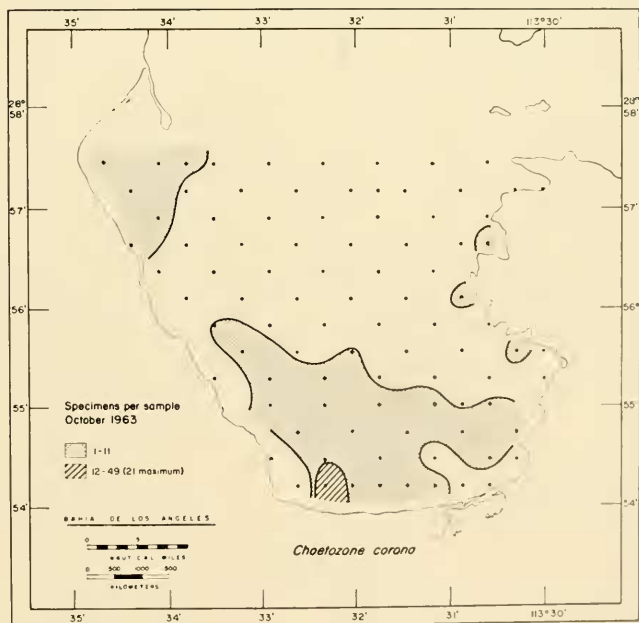


Figure 11.—Benthic distribution of *Chaetozone corona* in October 1963.

Family Disomidae

Pocillochaetus johnsoni Hartman

Pocillochaetus johnsoni. Hartman, 1939b: 164-166.

Material. — April 1962: 5 (6); October 1963: 3 (5).

Ecology. — Primarily sandy stations.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Family Chaetopteridae

Telepsavus costarum Claparède

Telepsavus costarum. Claparède, 1868: 340; Berkeley and Berkeley, 1952: 63; Hartman, 1961: 31.

Material. — April 1962: 43 (433); October 1963: 24 (47).

Ecology. — Commonest on coarser sediments, but present at a few stations with sandy silt and silts.

Distribution. — Cosmopolitan; this is the first report from the Gulf of California.

Family Cirratulidae

Acrocirrus crassifilis Moore

Acrocirrus crassifilis. Moore, 1923: 188-190; Hartman, 1961: 31.

Material. — October 1963: 2 (5).

Ecology. — Sand or silty sands.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Caulleliella alata (Southern)

Chaetozone alata. Southern, 1914: 112-113; *Caulleliella alata*. Hartman, 1961: 108.

Material. — April 1962: 10 (232); October 1963: 9 (21).

Ecology. — Preference for sand and silty sands.

Distribution. — Ireland and from British Columbia to southern California; the distribution is extended into the Gulf of California.

Chaetozone corona Berkeley and Berkeley

Chaetozone spinosa. Moore, var. *corona* Berkeley and Berkeley, 1941: 45-46; *Chaetozone corona*. Reish, 1959a: 89; Hartman, 1961: 109-110.

Material. — April 1962: 49 (2112); October 1963: 32 (133).

Ecology. — This species was eliminated from the outer part of the bay and was reduced in the inner reaches of the bay in October 1963 (Figs. 10, 11).

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Cirriformia spirabrancha (Moore)

Cirratulus spirabranchus. Moore 1904: 492-493; *Cirriformia spirabrancha*. Hartman, 1944b: 263.

Material. — April 1962: 2 (2); October 1963: 4 (20).

Ecology. — Sands or sand and silt mixture.

Distribution. — California; the distribution is extended into the Gulf of California.

Cossura candida Hartman

Cossura candida. Hartman, 1955: 44-45; Reish, 1963a: 428.

Material. — April 1962: 40 (341); October 1963: 42 (333).

Ecology. — *C. candida* was found at a larger number of stations and in greater abundance with increasing fineness of the sediment (Table 1). A similar ecology has been reported at San Quintin Bay (Reish 1963a). About equal numbers were taken in both surveys.

Distribution. — Southern and Lower California; the distribution is extended into the Gulf of California.

Tbaryx parvus Berkeley

Tbaryx multifilis parvus. Berkeley, 1929: 307, *Tbaryx parvus*. Hartman, 1961: 113.

Material. — April 1962: 58 (1262); October 1963: 47 (520).

Ecology. — *T. parvus* showed a preference for the silty sands. About twice as many specimens were taken in April 1962 than October 1963; the reduction in the population occurred largely in the outer reaches of the bay (Figs. 12, 13).

Distribution. — British Columbia to southern California; the distribution is extended into the Gulf of California.

Tbaryx tesselata Hartman

Tbaryx tesselata. Hartman, 1960: 126-127; 1961: 113.

Material. — April 1962: 14 (62); October 1963: 3 (3).

Ecology. — Sands, silty sands and sandy silts.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Family Flabelligeridae

Pberusa neopapillata Hartman

Pberusa neopapillata. Hartman, 1961: 121-122.

Material. — April 1962: 10 (12); October 1963: 6 (10).

Ecology. — All sediment types.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

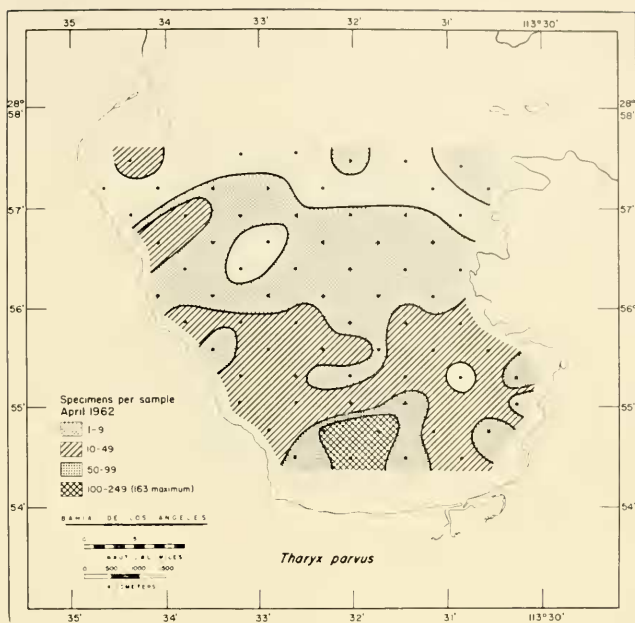


Figure 12. — Benthic distribution of *Tharyx parvus* in April 1962.

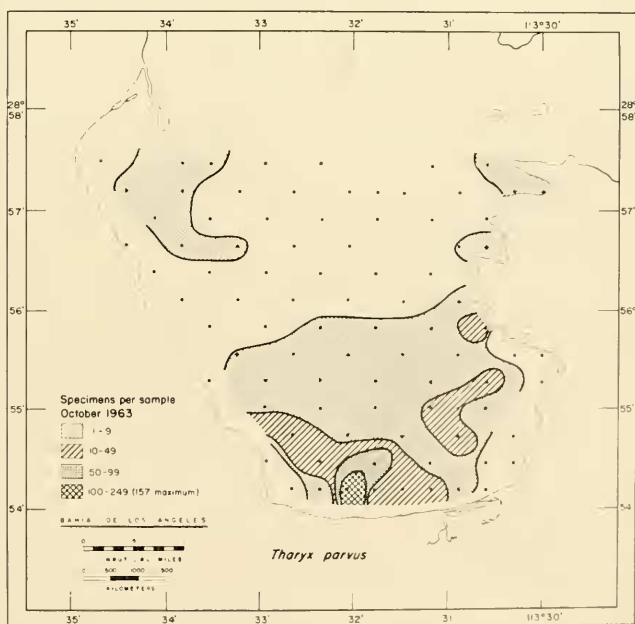


Figure 13. — Benthic distribution of *Tharyx parvus* in October 1963.

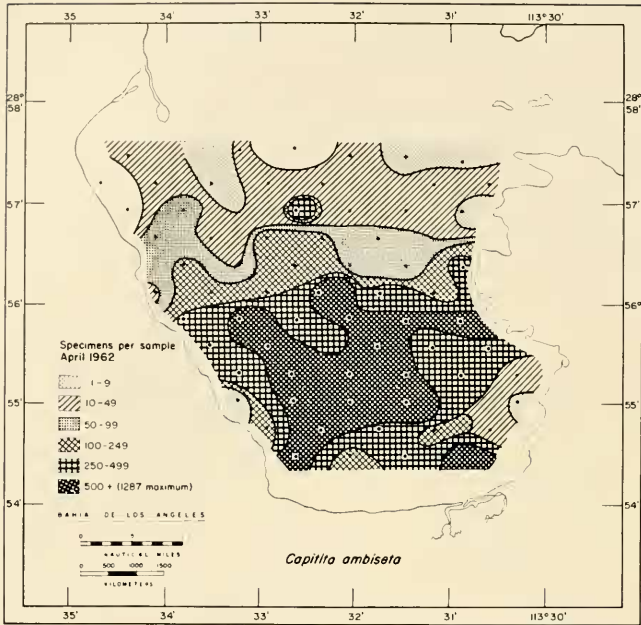


Figure 14. — Benthic distribution of *Capitita ambiseta* in April 1962.

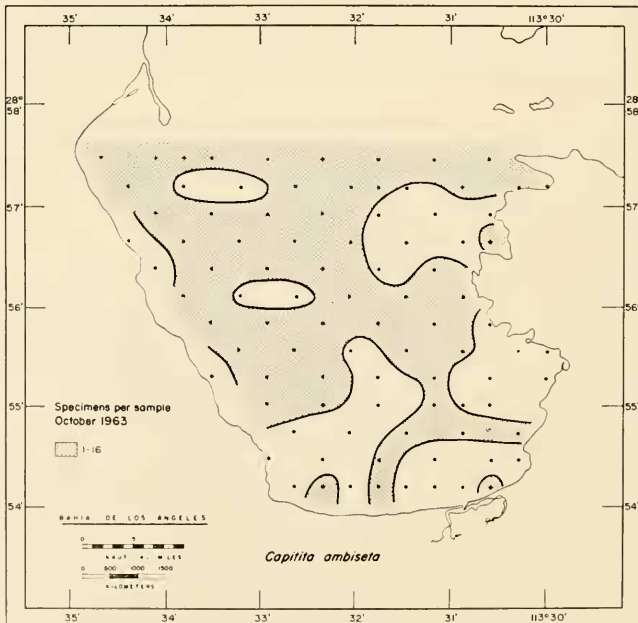


Figure 15. — Benthic distribution of *Capitita ambiseta* in October 1963.

Piromis gracilis Hartman

Piromis gracilis. Hartman, 1961: 123-124.

Material. — April 1962: 3 (3).

Ecology. — Sand and sandy silts.

Distribution. — Oaxaca, Mexico, Guatemala, and Ecuador; the distribution is extended into the Gulf of California.

Family Opheliidae

Armandia bioculata Hartman

Armandia bioculata. Hartman, 1938: 105; Reish, 1963a: 428.

Material. — April 1962: 31 (65); October 1963: 15 (264).

Ecology. — Preference for sandy substrates (Table 2).

Distribution. — California and San Quintin Bay; the distribution is extended into the Gulf of California.

Polyophtthalmus pictus (Dujardin)

Nais picta. Dujardin, 1839: 293; *Polyophtthalmus pictus*. Imajima and Hartman, 1964: 309.

Material. — April 1962: 1 (81); October 1963: 2 (2).

Ecology. — Found on sands or silty sands.

Distribution. — Cosmopolitan; Rioja (1947) reported it from the lower part of Gulf of California.

Travisia gigas Hartman

Travisia gigas. Hartman, 1938: 103-105; 1961: 34.

Material. — April 1962: 4 (14); October 1963: 1 (3).

Ecology. — Sandy at all stations.

Distribution. — Central and southern California and Cabo San Lucas; the distribution within the Gulf of California is extended northward.

Family Capitellidae

Anotomastus gordiodes (Moore)

Anotomastus gordiodes. Moore, 1909a: 278-279; *Anotomastus gordiodes*. Hartman, 1947a: 442-444.

Material. — April 1962: 9 (34); October 1963: 3 (3).

Ecology. — Sand or a sand and silt mixture.

Distribution. — California; the distribution is extended into the Gulf of California.

Family Capitellidae

Capitella capitata (Fabricius)

Lumbricus capitatus. Fabricius, 1780: 279; *Capitella capitata*. Fauvel, 1927: 154-155; Reish, 1963a: 428.

Material. — October 1963: 1 (2).

Ecology. — Silty sands.

Distribution. — Cosmopolitan; this is the first report from the Gulf of California.

Capitita ambiseta Hartman

Capitita ambiseta. Hartman, 1947a: 409-410; Reish, 1963: 429.

Material. — April 1962: 67 (18377); October 1963: 54 (215).

Ecology. — *C. ambiseta* was the most abundant species collected; 18,552 specimens were taken. The population was nearly eliminated following the warmer months with only 215 specimens collected from 54 stations in October 1962 (Figs. 14, 15). This species was taken more frequently, but in fewer number, from stations composed of silty sediments. An average of 147, 255, and 182 specimens per station were taken from sandy, silty sand, and sandy silt sediments respectively. The population of *C. ambiseta* in April 1962 was more extensive than that encountered at San Quintin Bay (Reish, 1963a).

Distribution. — Central California south to San Quintin Bay, Baja California; this is the first report from the Gulf of California.

Notomastus (Clistomastus) tenuis Moore

Notomastus tenuis. Moore 1909a: 277-278; *Notomastus (Clistomastus) tenuis*. Hartman, 1947a: 420-422; Reish, 1959a, p. 92.

Material. — April 1962: 8 (16); October 1963: 6 (8).

Ecology. — Sands or silty sands.

Distribution. — British Columbia to southern California; this is the first report from the Gulf of California.

Family Arenicolidae

Arenicola sp.

Material. — April 1962: 1 (1).

Remarks. — One specimen lacking the posterior end was taken; it was impossible to make a specific identification. The substrate was sandy at this station.

Family Maldanidae

Asychis disparidentata (Moore)

Maldane disparidentata. Moore, 1904: 494-496; *Asychis disparidentata*. Berkeley and Berkeley, 1952: 46-47.

Material. — April 1962: 1 (1).

Ecology. — Silt.

Distribution. — Known previously from British Columbia, California, and India; this is the first report of the species from the Gulf of California.

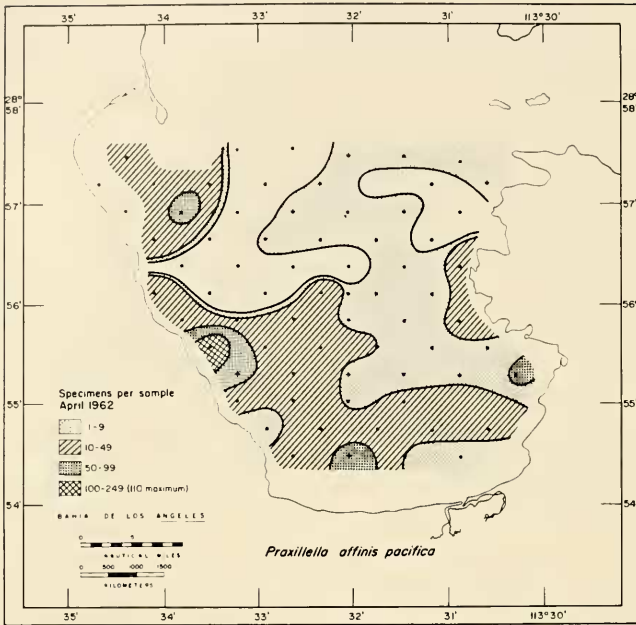


Figure 16. — Benthic distribution of *Praxillella affinis pacifica* in April 1962.

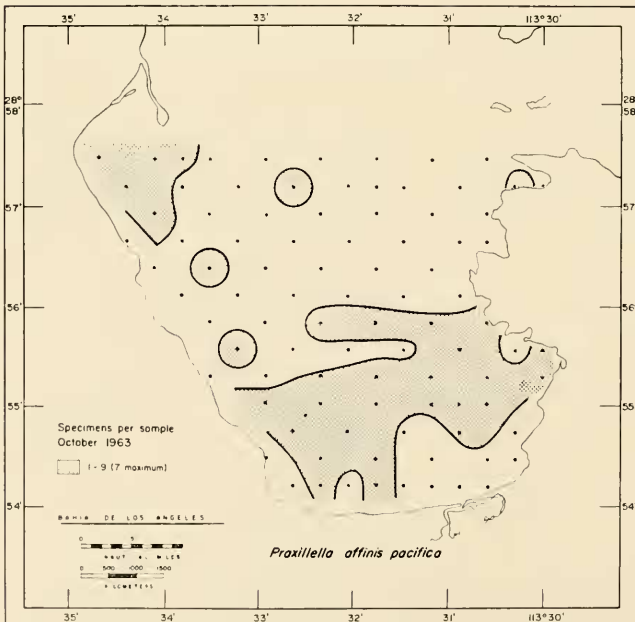


Figure 17. — Benthic distribution of *Praxillella affinis pacifica* in October 1963.

Axiobella rubrocincta (Johnson)

Clymenella rubrocincta. Johnson, 1901: 418-419; *Axiobella rubrocincta*. Berkeley and Berkeley, 1952: 51; Reish, 1963a: 429.

Material. — October 1963: 1 (4).

Ecology. — Silty sands.

Distribution. — British Columbia to San Quintin Bay; the distribution is extended into the Gulf of California.

Heteroclymene glabra Moore

Heteroclymene glabra. Moore, 1923: 229-230; Hartman, 1961: 37.

Material. — April 1962: 37 (382); October 1963: 1 (1).

Ecology. — Equally widespread on all types of sediments, but commonest on sandy substrates (Table 2).

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Maldane sarsi Malmgren

Maldane sarsi. Malmgren, 1865: 188; Fauvel, 1927: 197-199; Hartman, 1961: 37.

Material. — April 1962: 6 (28); October 1963: 5 (7).

Ecology. — Most specimens from sandy silt or a silty benthos.

Distribution. — Cosmopolitan; this is the first report from the Gulf of California.

Praxillella affinis pacifica Berkeley

Praxillella affinis (Sars) var. *pacifica*. Berkeley, 1929: 313-314; Berkeley and Berkeley, 1952: 49-50;

Praxillella affinis pacifica. Hartman, 1961: 37; Reish, 1959a: 93.

Material. — April 1962: 54 (1040); October 1963: 32 (56).

Ecology. — Occurred mainly on sand and silty sand bottoms. In October the population was nearly eliminated in the outer part of the bay and was much reduced in the inner bay area. (Figs. 16, 17).

Distribution. — British Columbia to southern California; the distribution is extended into the Gulf of California.

Family Oweniidae

Owenia fusiformis collaris Hartman

Owenia fusiformis collaris. Hartman, 1955: 46; Reish, 1959a: 94.

Material. — April 1962: 2 (3); October 1963: 6 (8).

Ecology. — Sands.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Family Pectinariidae

Pectinaria (*Pectinaria*) *hartmanae*, new species

Figure 18 a-c

Material. — April 1962: 6 (6).

Diagnosis. — Length 15-20 mm, width at anterior end 3-4 mm; cephalic spines brassy, number from 8 to 10 pairs, long, flattened, recurved, attenuated tips (Fig. 18a); antennular membrane with about 30 filiform fringes; about 30 varying sized oral tentacles; two pairs pectinate branchiae the anterior longer than the posterior; setigerous segments 1 to 3 with only notopodial fascicle; the next 12 segments with both components; notosetae of two types, both tapered to a point, one nearly smooth (Fig. 18b), the other limbate, denticulated and incised (Fig. 18c); uncini in neuropodium with 7 major teeth in two rows and many smaller teeth medially (Fig. 18d); scaphal hooks (Fig. 18e) number from 8 to 10, blunt, brassy in color; anal tongue with median papillae and crenulated margin; tube, straight, length 25 mm; consists of coarse silicious grains.

Remarks. — The subgenus *Pectinaria* was previously known from 18 species (Hartman, 1959b). These species can be grouped conveniently according to the number of segments with notosetae. Further groupings may be made on the number of segments with uncini. *P. hartmanae* and *P. nana* Wesenberg-Lund (1949), from the Gulf of Oman, are the only two species known with 15 pairs of notosetae. Both species have 12 uncinigerous segments. These two species are separated from one another on the basis of 8-10 pairs of cephalic spines in *P. hartmanae* and 11 pairs in *P. nana*, 8-10 pairs of scaphal hooks in the former and 3 pairs in the latter, and antennular membrane with 30 fringes in the former and 8 in the latter.

Ecology. — The substrate consisted of silty sand at three of the stations and sand and sandy silt at the other three.

Type material. — The holotype and three additional specimens have been deposited in the U. S. National Museum.

Type locality. — Bahia de los Angeles, Gulf of California, Baja California. This species is named in honor of Dr. Olga Hartman in recognition of her contributions to the knowledge of polychaetes.

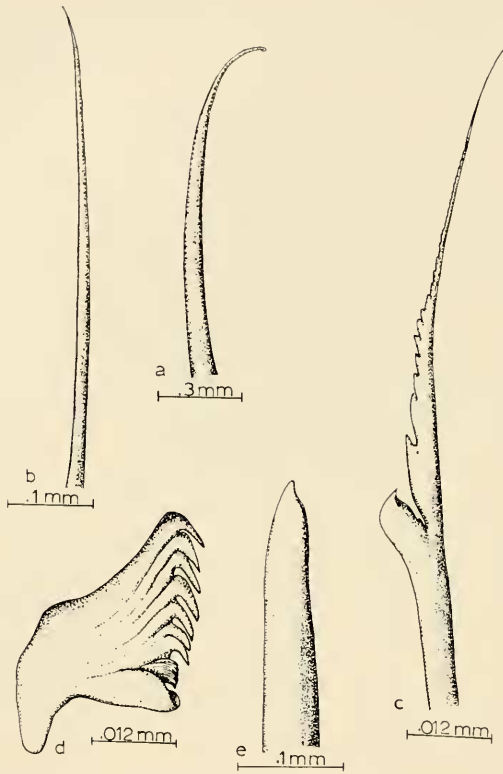


Figure 18. — *Pectinaria (Pectinaria) hartmanae*, n. sp.: a, cephalic spine; b, capillary seta from notopodium; c, limbate seta with incised margin from notopodium; d, uncinus from neuropodium; e, scaphal hook.

Family Ampharetidae

Amphisamytha bioculata (Moore)

Samytha bioculata. Moore, 1906: 253-255; *Amphisamytha bioculata*. Berkeley and Berkeley, 1952: 73.

Material. — April 1962: 6 (38); October 1963: 1 (1).

Ecology. — Preferred silty sands.

Distribution. — British Columbia, southern California, India; this is the first report from the Gulf of California.

Amphicteis scaphobranchiata Moore

Amphicteis scaphobranchiata. Moore, 1906: 255-257; Berkeley and Berkeley, 1952: 68-69.

Material. — April 1962: 7 (23); October 1963: 7 (8).

Ecology. — Preferred silty sands.

Distribution. — British Columbia to southern California; the distribution is extended into the Gulf of California.

Asabellides lineata (Berkeley and Berkeley)

Pseudosabellides lineata. Berkeley and Berkeley, 1943: 131-132; 1952: 71-72; 1956: 241: *Asabellides lineata*.

Hartman, 1961: 39.

Material. — April 1962: 1 (1).

Ecology. — Sandy silts.

Distribution. — British Columbia, Alaska, Canadian Arctic, Hudson Bay (Berkeley and Berkeley, 1956) and questionably southern California (Hartman, 1961). The distribution is extended into the Gulf of California.

Family Terebellidae

Amacana occidentalis (Hartman)

Amacana occidentalis. Hartman, 1944b: 277-278; *Amacana occidentalis*. Hartman 1959: 495.

Material. — April, 1962: 34 (273); October 1963: 11 (15).

Ecology. — Most frequent on sandy silts but commonest on sands in April 1962.

Distribution. — Central and southern California; the distribution is extended into the Gulf of California.

Pista cristata (Müller)

Amphitrite cristata. Müller, 1776: 40; *Pista cristata*. Fauvel, 1927: 266; Berkeley and Berkeley, 1952: 78-79.

Material. — April 1962: 3 (4); October 1963: 3 (9).

Ecology. — Sand or silty sands.

Distribution. — Cosmopolitan; this is the first report from the Gulf of California.

Polycirris perplexus Moore

Polycirris perplexus. Moore, 1923: 198-199; Hartman, 1961: 41.

Material. — April 1962: 31 (212).

Ecology. — Most specimens from sandy silt or silty substrates.

Distribution. — Southern California; the distribution is extended into the Gulf of California.

Family Trichobranchidae

Terebellides stroemi Sars

Terebellides stroemi. Sars, 1835: 48, Berkeley and Berkeley, 1939: 343; Reish, 1959b: 39; Imajima and Hartman, 1964: 352-353.

Material. — April 1962: 7 (19); October 1963: 3 (3).

Ecology. — All substrates.

Distribution. — Cosmopolitan; Berkeley and Berkeley (1939) reported it from Puerto San Carlos (near Guaymas).

Family Sabellidae

Cbone mollis (Bush)

Metacbone mollis. Bush, 1904: 216; *Cbone mollis*, Hartman, 1944b: 279-280; Reish, 1963a: 430.

Material. — April 1962: 55 (553); October 1963: 14 (34).

Ecology. — Prefers coarser sediments (Table 2).

Distribution. — California and San Quintin Bay; the distribution is extended into the Gulf of California.

Euclide barnardi, new species

Figure 19 a-d

Material. — April 1962: 35 (663); October 1963: 2 (2).

Diagnosis. — Maximum length of 2.0mm including branchial length of 0.5mm; 8 thoracic and 9 abdominal setigerous segments, the last 3 comprise the anal depression; branchiae with 3 radioles per side, with numerous filaments which extend within 0.1mm of the tip, united for one-half of their length; collar little developed dorsally but produced into 2 lobes ventrally; thoracic notopodium with 2-3 superior double-winged capillary setae (Fig. 19a) and 3-4 inferior subspatulate setae (Fig. 19b); 3-4 long handled uncini in thoracic neuropodium, each with a large tooth and 4-5 smaller teeth (Fig. 19c); abdominal notopodium with 5-6 avicular hooks, each with larger tooth and 15-20 teeth (Fig. 19d); abdominal neuropodium including and depression with 4-5 simple capillary setae.

Remarks. — Hartman (1959b) lists 13 and possibly 14 species in the genus *Euclide* Malmgren. Additional species described include *E. limnicola* Reish (1960), *E. incolor* Hartman (1965a), and *E. trisegmentata* Reish (1965). *Euclide barnardi* comes closest to *E. trisegmentata*, *E. rosea* Langerhans, and *E. incolor*. All are small and the three former have only 17 setigerous segments; *E. incolor* possesses from 16-19 setigerous segments. The anal depression consists of 4 segments in *E. rosea*; it consists of 3 segments in *E. barnardi*, *E. trisegmentata* and *E. incolor*. The margins of the anal depression are flared in *E. incolor* but not in *E. barnardi* or *E. trisegmentata*. *Euclide barnardi* and *E. trisegmentata* have 3 pairs of radioles; *E. incolor* has 3 to 4 pairs of radioles. These species all have similar setae but differ in details: superior thoracic notopodial setae double-winged in *E. barnardi* and *E. incolor*, single in *E. trisegmentata*; thoracic neuropodia long-handled hooks with 5-6 teeth in *E. barnardi*, 4-5 in *E. incolor*, and 7 in *E. trisegmentata*, abdominal avicular hooks with 6 rows of teeth in *E. barnardi*, 7 in *E. incolor*, and 10 in *E. trisegmentata*.

Ecology. — All but three of specimens were taken in the April 1962 survey. This species did not exhibit any preference for a particular substrate type.

Type material. — The holotype and paratypes have been deposited in the U. S. National Museum.

Type locality. — Bahia de los Angeles, Gulf of California, Baja California.

This species is named in honor of Dr. J. Laurens Barnard, in appreciation for making these collections available for study.

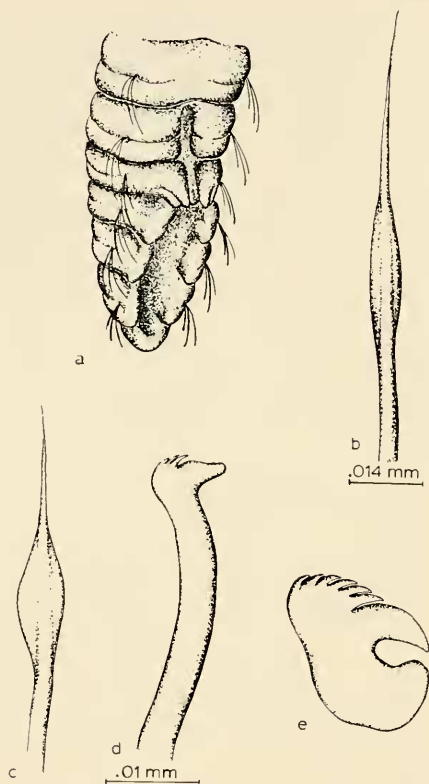


Figure 19. — *Euchone barnardi*, n. sp.: a, double winged capillary seta from superior thoracic notopodium; b, subspatulate seta from inferior thoracic notopodium; c, long handle uncinus from thoracic neuropodium, magnification as figure b; d, avicular hook from abdominal notopodium.

Euchone cortezi, new species

Figure 20 a-e

Material. — April 1962; 2 (2). Both stations located near Isla Ventana in Bahía de los Angeles.

Diagnosis. — Length 2 to 6mm including the branchial length of 0.5 to 1.5mm; 8 thoracic and 12 to 13 abdominal setigerous segments, the last 5 in two and last 6 in one specimen comprise the anal depression (Fig. 20a); branchiae with 7 radioles per side, united with a membrane for one-half of their length, and the filaments extending to near the tip of the radiole; collar well developed and divided into two lobes with incised margins along the mid-dorsal and mid-ventral line; thoracic notopodium with superior double-winged capillary setae (Fig. 20b) and inferior spatulate setae (Fig. 20c); thoracic neuropodium with long handled uncini (Fig. 20d) each with a large tooth and 3 smaller teeth; abdominal notopodium (Fig. 20e), provided with avicular hooks each with a large tooth and 25 to 30 smaller teeth in 6 rows; abdominal neuropodium including the anal depression with simple capillary setae.

Remarks. — Of the 16 to 17 known species in the genus *Euchone* (see under *E. barnardi* above), *E. cortezi* comes closest to *E. papillosa* (Sars) (Malmgren, 1865) on the basis of the number of segments in the anal depression. *Euchone cortezi* has 5 to 6 segments in the region and *E. papillosa* has approximately 6; however, the two species can be readily separated on the basis of the number of segments; there are 20 to 21 in the former and 33 to 34 in the latter. The inferior spatulate setae also differ.

The specific name refers to the Sea of Cortez, a name used for the Gulf of California in the past.

Type material. — The holotype and one paratype have been deposited in the U. S. National Museum.

Type locality. — Near Isla Ventana in Bahía de los Angeles, Gulf of California.

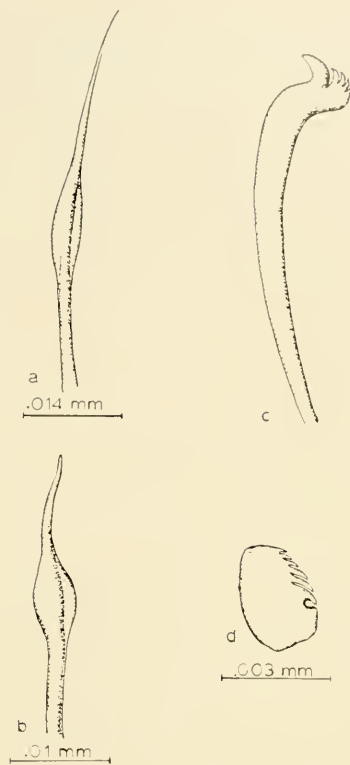


Figure 20. — *Euchone cortezi*, n. sp.: a, posterior end showing anal depression; b, double winged capillary seta from superior thoracic notopodium; c, subspatulate seta from inferior thoracic notopodium, magnification as figure b; d, long handle uncinus from thoracic neuropodium; e, avicular hook from abdominal notopodium, magnification as figure d.

Fabricia limnicola Hartman

Fabricia limnicola. Hartman, 1951b: 384-385; Reish, 1963a: 430.

Material. — October 1963: 2 (44).

Ecology. — Silty sands and sands.

Distribution. — Southern California and San Quintin Bay; the distribution is extended into the Gulf of California.

Megalomma pigmentum Reish

Megalomma pigmentum. Reish, 1963a: 430-433.

Material. — April 1962: 22 (68); October 1963: 13 (23).

Ecology. — This species showed a preference for sands and silty sands (Table 2); at San Quintin Bay *M. pigmentum* was more commonly taken from finer sediments (Reish, 1963a).

Distribution. — Southern California and San Quintin Bay; the distribution is extended into the Gulf of California.

Family Serpulidae

Hydroides recurvispina Rioja

Hydroides recurvispina. Rioja, 1941: 169-172.

Material. — April 1962: 3 (5); October 1963: 1 (1).

Ecology. — Majority from sands.

Distribution. — Mazatlan and Acapulco; the distribution is extended northward into the Gulf of California.

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APPENDIX

TABLE 1

Polychaetes reported from the Gulf of California. An asterisk denotes new distributional records for the area. The names listed are those accepted by the author cited.

Aphroditidae

- Aphrodita japonica* Marenzeller. Hartman, 1939a. Isla Partida; Isla Espiritu Santo.
A. parva Moore. Hartman, 1939a. Bahía de San Ignacio; Sinaloa.
Pontogonia lacincta Hartman, 1939a. Isla Angel de la Guarda.

Polynoidae

- Arctonoe vittata* (Grube). Treadwell, 1923. La Paz.
Chactocanthus magnificus (Grube). Treadwell, 1937; Berkeley and Berkeley, 1939; Hartman, 1959. Isla Espiritu Santo; Banco Arena.
Halosydna brevicauda Kinberg. Fauvel, 1943. Gulf.
H. fuscomarmorata (Grube). Fauvel, 1943. Gulf.
H. glabra Hartman, 1939a; Fauvel, 1943; Steinbeck and Ricketts, 1941. Bahía de la Concepcion, Cabo Pulmo, Gulf.
H. johnsoni (Darboux). Berkeley and Berkeley, 1939. Georges Is.; Punta Penasco, Sonora; San Felipe.
H. latior Chamberlin. Rioja, 1947a. Topolobampo; Bahía de Navachiste.
Harmothoe hirsuta Johnson. Rioja, 1947a. Topolobampo.
Hololepida velorumis Hartman, 1939a. Bahía de San Francisquito; Isla Angel de la Guarda.
Ipbione muricata (Savigny). Fauvel, 1943. Gulf.
I. ovata Kinberg. Hartman, 1939a; Steinbeck and Ricketts, 1941, west side of Gulf between 24° and 26° W. Latitude.
Lepidamctria gigas (Johnson). Berkeley and Berkeley, 1939. San Felipe.
Lepidastheneia dignetti Gravier, 1905; Fauvel, 1943. La Paz and Gulf.
L. ornata Chamberlin. Treadwell, 1937. Banco Arena.
Lepidonotus caelorus Moore. Treadwell, 1937; Rioja, 1947a. Banco Arena and La Paz.
L. clava (Montagu). Fauvel, 1943. La Paz.
L. bufferi Augener. Hartman, 1939a; Steinbeck and Ricketts, 1941; Rioja, 1947a. Estero de Agiabampo; Bahía de la Concepcion; La Paz.
L. purpureus Potts. Berkeley and Berkeley, 1939; Hartman, 1959. Isla Angel de la Guarda.
L. versicolor Ehlers. Hartman, 1939a; Rioja, 1947a. Bahía de San Francisquito; Isla San Esteban; Topolobampo.
Tbormora johnsoni (Kinberg). Hartman, 1939a; Steinbeck and Ricketts, 1941; Rioja, 1947a. Baja Calif. side of Gulf between 24° and 29° W. Latitude.

Polyodontidae

- Pantbalis adumbrata* Hoagland. Treadwell, 1937. Bahía de Santa Inez.
 **P. pacifica* Treadwell.
 **Polyodontes frous* Hartman.
P. oculca (Treadwell). Hartman, 1939a; Steinbeck and Ricketts, 1941. Pichilique Harbor, Estero de Agiabampo.

Sigalionidae

- Eupholoe philippinensis* McIntosh. Berkeley and Berkeley, 1939. Isla Espiritu Santo.
 **Stenolepis fimbriarum* Hartman; 1939a. Isla del Carmen, near Isla Espiritu Santo.
Psammolyce myops Hartman, 1939a. Near Isla Espiritu Santo.
Stenelais maculata Hartman, 1939a. Isla Espiritu Santo.
S. neoleanirae Hartman, 1939a. Isla del Carmen.
 **Stenelanelia uniformis* Moore.
Thalenessa lewisii (Berkeley and Berkeley), 1939; Hartman, 1939a; Steinbeck and Ricketts, 1941; Fauvel 1943. Cabo San Lucas, Isla Espiritu Santo, Bahía de los Angeles.

Pareulepididae

- **Pareulepis fimbriata* (Treadwell).

Chrysopetalidae

- Bhawania riveti* (Gravier). Steinbeck and Ricketts, 1941. La Paz.
 **Palcanotus bellis* (Johnson). Bahía de los Angeles.
P. chrysoplepis Schmarda. Rioja, 1947a. La Paz.
P. purpurea Rioja, 1947b. La Paz.

Amphionomidae

- Chloia conspicua* Horst. Rioja, 1943. Gulf.
C. entypa Chamberlin. Treadwell, 1937; Rioja, 1947a. Cabo San Lucas, La Paz, Bahía de Santa Inez, Topolobampo.

C. flava (Pallas). Treadwell, 1923. Bahia de San Francisquito.

C. pinnata Moore. Berkeley and Berkeley, 1939. Isla Espiritu Santo.

(?) *C. rosea* Potts [sic]. Fauvel, 1943. Gulf.

C. viridis Schmarda. Hartman, 1939; Berkeley and Berkeley, 1939; Steinbeck and Ricketts, 1941. Common in Gulf.

Eurythoe complanata (Pallas). Hartman, 1939a; Berkeley and Berkeley, 1939; Steinbeck and Ricketts, 1941; Fauvel, 1943; Rioja, 1947a. Common in Gulf.

(?) *E. dubia* Horst [sic]. Fauvel, 1943. Gulf.

Notopygos bispida Potts. Fauvel, 1943. Gulf.

N. ornata Grube. Hartman, 1939a; Berkeley and Berkeley, 1939; Steinbeck and Ricketts, 1941; Rioja, 1947a. Common in Gulf.

**Pareurythoe californica* (Johnson).

Euphrosinidae

Euphrosine aurantiaca Johnson. Rioja, 1947a. La Paz.

E. bicirrata Moore. Hartman, 1939a. Isla Partida.

Phyllodoceidae

Anatides lamellifera (Pallas). Fauvel, 1943. Gulf.

A. madeirensis (Langerhans). Treadwell, 1937; Steinbeck and Ricketts, 1941; Fauvel, 1943. Common in Gulf.

**A. mucosa* (Oersted).

**A. panamensis* (Treadwell). Fauvel, 1943. La Paz.

**A. williamsi* Hartman.

**Eteone dilatata* Hartman.

Eulalia myriacylum (Schmarda). Steinbeck and Ricketts, 1941. Puerto Refugio.

Eumida sanguinea (Oersted). Rioja, 1947a. La Paz.

**Paranaitis polynoides* (Moore).

Phyllodoce digneti Fauvel, 1943. Gulf.

Typhloscolecidae

**Typhloscolex mulleri* Busch.

Hesionidae

Hesion genetta Grube. Fauvel, 1943. Gulf.

H. intertexta Grube. Berkeley and Berkeley, 1939; Hartman, 1940; Rioja, 1947a. Common in Gulf.

H. pantherina Risso. Fauvel, 1943. Isla San Jose.

Leocrates chinensis Kinberg. Hartman, 1940. Isla Espiritu Santo.

**Microphthalmus riojai* n. sp.

Opbiodromus pugettensis (Johnson). Steinbeck and Ricketts, 1941; Rioja, 1947a. Cabo Pulmo, Topolobampo.

**Oxydromus brunnea* Hartman.

**O. arenicolus glabrus* Hartman.

**Syllidia limata* Hartmann-Schröder.

Pilargidae

**Ancistrotyllis bassi* Hartman.

**Loandalia fauveli* Berkeley and Berkeley.

**Pilargis bamatus* Hartman.

Syllidae

Antolytus varius Treadwell. Rioja, 1947a. La Paz, Bahia de Navachiste.

**Brania limbata* (Claparède).

**Exogone lourei* Berkeley and Berkeley.

**Langerhansia heterochaeta* (Moore).

Odontosyllis phosphorea Moore. Rioja, 1947a. La Paz.

**Pionosyllis gigantea* Moore.

**Sphaerosyllis erinaceus* Claparède.

Syllis elongata (Johnson). Rioja, 1947a. La Paz, Topolobampo.

Typosyllis hyalina (Grube). Rioja, 1947a. La Paz.

Nereidae

Ceratonereis mirabilis Kinberg. Treadwell, 1929; Hartman, 1940; Steinbeck and Ricketts, 1941; Fauvel, 1943; Rioja, 1947a. Common in Gulf.

C. paucidentata (Moore). Fauvel, 1943. Gulf, La Paz.

Neantbes succinea (Frey and Leuckart). Rioja, 1947a. Estero de Agiabampo; Topolobampo.

Nereis grubei (Kinberg). Fauvel, 1943. Gulf.

**N. procera* Ehlers.

N. rara Ehlers. Berkeley and Berkeley, 1939. Isla Espiritu Santo.

N. riisei Grube. Hartman, 1940; Fauvel, 1943. Gulf.

N. zonata Malmgren. Hartman, 1940. Isla San Esteban.

Nicon mexicana (Treadwell). Treadwell, 1942. Topolobampo, Isla San Jose.

N. moniloceras (Hartman). Hartman, 1940. Isla San Esteban.

Platyncercis bicanaliculata (Baird). Treadwell, 1914; Hartman, 1940; Steinbeck and Ricketts, 1941.

Common in Gulf.

P. polyscalma Chamberlin. Hartman, 1940; Steinbeck and Ricketts, 1941. Between 23° and 27° W. Latitude.

Pseudonercis gallapagensis Kinberg. Fauvel, 1943. Gulf.

Nephtyidae

Aglaophamus dicirris Hartman. Hartman, 1940. Common in Gulf.

A. dibrancheis (Grube). Treadwell, 1937; Hartman, 1940. Bahia de San Francisquito, Isla del Carmen. Cabo San Lucas.

A. incermis Ehlers. Hartman, 1940. Isla Espiritu Santo.

Nephtys caccoides Hartman. Hartman, 1940. Isla Partida.

N. magellanica Augener. Hartman, 1940. Common in Gulf.

N. panamensis Monro. Hartman, 1940. Between 24° and 29° W. Latitude.

N. singularis Hartman, 1940. Cabeza Ballona.

N. squamosa Ehlers. Hartman, 1940, 1950. Common in Gulf.

Glyceridae

Glycera americana Leidy. Hartman, 1940. Common in Gulf.

G. capitata Oersted. Hartman, 1950. Arroyo de San Luis.

G. capitata branchiopoda Moore. Chamberlin 1919a. 26° 48' W. Latitude, 110° 45' 20" N. Longitude.

G. dibranchiata Ehlers. Steinbeck and Ricketts 1941; Fauvel 1943. Gulf.

G. mexicana (Chamberlin). Chamberlin, 1919a. 27° 39' 40" W. Latitude, 111° 0' 30" N. Longitude.

**G. robusta* Ehlers.

G. rugosa Johnson. Treadwell, 1937. Bahia de Santa Ynez.

G. tessellata Grube. Hartman, 1940; Rioja, 1947a. Common in Gulf.

Goniadidae

**Glycinde armigera* Moore.

Goniada acicula Hartman, 1940. Between 24° 22' W. Latitude and 29° 33' N. Longitude.

**G. littorea* Hartman.

Onuphiidae

Diopatra chiliensis Quatrefages. Fauvel, 1943. Gulf.

D. neapolitana delle Chiaje. Fauvel, 1943. Gulf.

D. neotridens Hartman, 1944a. Isla Angel de la Guarda.

D. obliqua Hartman, 1944a. Between 27° 57' W. and 31° 19' W. Latitude.

D. ornata Moore. Berkeley and Berkeley, 1939. Bahia de las Animas.

D. splendidissima Kinberg. Rioja, 1947a. La Paz, Topolobampo.

D. tridentata Hartman, 1944a; Rioja 1947b, Gulf.

Hyalinoccia juvenalis Moore. Treadwell, 1937; Hartman, 1944a; Rioja, 1947b. Common in Gulf.

Nothria stigmatis cirrata Hartman, 1944a. Bahía Tepoca.

Onuphis eremita Audouin and Milne Edwards, Rioja, 1947b. Topolobampo.

O. nannognathus Chamberlin, 1919a. 25° 59' W. Latitude and 108° 40' N. Longitude.

**O. nebulosa* Moore.

O. vexillaria Moore, 1911. Estado de Sonora.

O. zebra Berkeley and Berkeley, 1939; Rioja, 1947a. La Paz.

Eunicidae

Eunice afra Peters. Steinbeck and Ricketts, 1941; Hartman, 1944a. Isla Espiritu Santo.

E. a. pauper Grube. Fauvel, 1943. Gulf.

E. antennata (Savigny). Berkeley and Berkeley, 1939; Steinbeck and Ricketts, 1941; Fauvel, 1943; Hartman, 1944a. Common in Gulf.

E. aphroditois (Pallas). Steinbeck and Ricketts, 1941; Fauvel, 1943; Hartman, 1944a. Common in Gulf.

E. australis Quatrefages. Fauvel, 1943. La Paz.

(?) *E. coccinea* Grube. [sic]. Fauvel, 1943. Gulf.

E. filamentosa Grube. Steinbeck and Ricketts, 1941; Fauvel, 1943; Hartman, 1944a. Gulf.

E. indica Kinberg. Fauvel, 1943. Isla San Jose.

E. longicirrata Webster. Berkeley and Berkeley, 1939; Hartman, 1944a. Common in Gulf.

E. multiplectinata Moore. Fauvel, 1943. Gulf.

E. schemacephala Schmarda. Steinbeck and Ricketts, 1941. Isla Espiritu Santo.

E. tentaculata Quatrefages. Fauvel, 1943. Gulf. [perhaps *E. aphroditois*, *vide* Hartman, 1959b].

E. vittata (delle Chiaje). Hartman, 1944a; Rioja, 1947a. La Paz to Bahía de los Angeles.

Marphysa aenea (Blanchard). Steinbeck and Ricketts, 1941; Hartman, 1944a. Isla Espiritu Santo, El Mogote.

M. mortenseni Monroe. Berkeley and Berkeley, 1939. Isla Espiritu Santo.

M. sanguinea (Montagu). Hartman, 1944a; Rioja, 1947b. Isla de Jorge. Isla Angel de la Guarda, La Paz.

M. stylobranchiata Moore. Rioja, 1947a. La Paz. Bahía de Navachiste.

**Nematoneis unicornis* (Grube).

Nicidion cariboca (Grube). Hartman, 1944a. Isla Espiritu Santo.

Palola paloloides (Moore). Rioja, 1947a. La Paz, Topolobampo.

P. sicilensis (Grube). Hartman, 1940; Steinbeck and Ricketts, 1941; Fauvel, 1943. Common in Gulf.

Lumbrineridae

Lumbrineris biflavis (Ehlers). Hartman, 1944a; Rioja, 1947a. La Paz, Los Frailes.

L. brachiata Fauvel, 1943. [Homonym, *vide* Hartman, 1959b, p. 333.]

L. brevicirra (Schmarda). Fauvel, 1943. La Paz, Isla San Jose.

L. crecta (Moore). Hartman, 1944a. Between 24° 25' and 29° 54' W. Latitude.

L. inflata Moore. Fauvel, 1943; Hartman, 1944a. Isla Partida.

L. lafreilli Audouin and Milne Edwards. Hartman, 1944a. Between 25° 49' and 31° 01' W. Latitude.

L. l. japonica Marenzeller. Hartman, 1944a. Bahía de San Francisquito.

**L. minima* Hartman.

L. simplicis Hartman, 1944a, 1959. Isla Angel de la Guarda, Bahía San Luis Gonzaga.

L. tetraura (Schmarda). Hartman, 1944a. Isla Tuburon, Isla Espiritu Santo, Bahía Tepoca.

Arabellidae

Arabella iricolor (Montagu). Hartman, 1944a; Rioja, 1947a. Common in Gulf.

A. mutans (Chamberlin). Fauvel, 1943; Hartman, 1944a. Isla Angel de la Guarda, Bahía Agua Verde.

A. semimaculata (Moore). Hartman, 1944a; Rioja, 1947b. Between 24° and 30° W. Latitude.

Drilonereis filum (Claparède). Fauvel, 1943. Gulf.

D. facata Moore. Hartman, 1944a. Isla Espiritu Santo.

D. nuda Moore. Fauvel, 1943. Gulf.

Lysaretidae

Aglanirides fulgida (Savigny). Steinbeck and Ricketts, 1941; Fauvel, 1943; Hartman, 1944a. Common in Gulf.

Dovilleidae

Dorvillea articulata (Hartman). Rioja 1947a. La Paz.

D. crasina (Ehlers). Steinbeck and Ricketts, 1941; Hartman, 1944a. Between 24° and 29° W. Latitude.

**Protodorvillea gracilis* (Hartman).

Orbiniidae

**Haploscoloplos elongatus* (Johnson).

Nainericis laevigata (Grube). Rioja, 1947b. Topolobampo.

**Orbinia johnsoni* (Moore).

**Phylo felix* Kinberg.

**P. nudus* (Moore).

**Scoloplos acmeceps* Chamberlin.

Paraonidae

**Aricidea rosca*, n. sp.

**A. uscbakowi* Zachs.

**Paradoneis lyra* (Southern)

**Paraonis gracilis oculata* Hartman.

Spionidae

Aoniles californiensis Rioja, 1947a. La Paz.

**Laonice cirrata* (Sars).

**Nerinidis acuta* (Treadwell).

**N. maculata* Hartman.

**N. pigmentata* (Reish).

Polydora ciliata (Johnston). Rioja, 1943. Guaymas.

P. cirrosa Rioja, 1943. Guaymas.

**P. beterochaeta* Rioja.

P. ligui Webster. Rioja, 1943, 1947a. Guaymas, Topolobampo.

P. rickettsi Woodwick, 1961. Cabo San Lucus.

P. socialis (Schmarda). Rioja, 1947a. La Paz.

**P. s. plena* Berkeley and Berkeley.

**Prionospio cirrifera* W'ren. Bahía de los Angeles.

**P. longibranchiata*, n. sp.

**P. malmgreni* Claparède.

**P. pinnata* Ehlers.

**P. pygmaeus* Hartman.

**Pseudopolydora reishi* Woodwick.

**Spiophanes bombyx* (Claparède).

**S. missionensis* Hartman.

Magelonidae

**M. californica* Hartman.

Disomidae

**Poecilobactus jobsoni* Hartman.

Chaetopteridae

Chaetopterus varipedatus (Renier). Fauvel, 1943; Rioja 1947b. La Paz.

**Telepsarus costarum* Claparède.

Cirratulidae

**Acrocirrus crassifilis* Moore.

**Cauleriella alata* (Southern).

**Chatozone corona* Berkeley and Berkeley.

Cirratulus exuberans Chamberlin. Treadwell, 1937. Gulf.

C. sinicolens Chamberlin. 26° 48' W. Latitude and 110° 45' 20" N. Longitude.

Cirriformia luxuriosa (Moore). Rioja, 1947a. Bahía de Navachiste.

C. spirabrancha (Moore). Steinbeck and Ricketts 1941. Bahía de los Angeles, Coronados.

**Cossura candida* Hartman.

Dolecaceria pacifica (Fewkes). Rioja, 1944. Guaymas.

**Tharyx partus* Berkeley.

**T. tessellata* Hartman.

Flabelligeridae

Pherusa capulata (Moore). Steinbeck and Ricketts, 1941. Isla Angel de la Guarda.

P. eruca Claparède. Rioja, 1947b. La Paz.

**P. neopapillata* Hartman.

P. papillata (Johnson) Steinbeck and Ricketts, 1941; Rioja 1947a. La Paz.

P. plumosa (Müller). Rioja, 1947b. La Paz.

**Piromis gracilis* Hartman.

Opheliidae

Ammotrypane aulogaster Rathke. Rioja, 1947a. La Paz.

**Armandia bioculata* Hartman. Bahía de los Angeles.

Polyophthalmus pictus (Dujardin) Rioja, 1947a. La Paz, Topolobampo, Bahía de los Angeles.

Travisia gigas Hartman. Steinbeck and Ricketts, 1941. Cabo San Lucas, Bahía de los Angeles.

T. olens Ehlers. Fauvel, 1943. Gulf. [Perhaps *T. chinensis* Grube or *T. japonica* Fujiwara, *vide* Hartman, 1959b, p. 436].

Sternaspidae

Sternaspis major Chamberlin, 1919a. Between 27° 39' 40" W. Latitude and 100° 0' 30" N. Longitude.

Capitellidae

**Anotomastus gordioides* (Moore).

**Capitella capitata* (Fabricius).

**Capitita ambiseta* Hartman.

Dasybranchus calvus (Grube). Steinbeck and Ricketts, 1941; Fauvel, 1943; Rioja, 1947b. La Paz, Isla San Jose, El Mogote.

D. glabrus Moore. Hartman, 1947a. Guaymas.

D. lumbricoides Grube. Hartman, 1947a. Isla Tiburon.

D. platyceps Hartman, 1947a. Estado de Sonora.

Notomastus lobatus Hartman, 1947a. Consag Rock.

**N. (Clistomastus) tenuis* Moore.

Arenicolidae

Arenicola glasselli Berkeley and Berkeley, 1939. San Felipe.

Arenicola sp.

Maldanidae

**Asychis disparidentata* (Moore).

**Axiobella rubrocineta* (Johnson).

Euclymene papillata Berkeley and Berkeley, 1939; Rioja, 1947a. Punta Penasco.

**Heteroclymene glabra* Moore.

**Maldane sarsi* Malmgren.

**Praxillella affinis pacifica* Berkeley.

Oweniidae

Owenia fusiformis delle Chiaje. Steinbeck and Ricketts, 1941. El Mogote.

**O. f. collaris* Hartman.

Sabellaridae

Idanthyrsus pennatus (Peters). Steinbeck and Ricketts, 1941. Cabo Pulmo.

Pectinariidae

Ampibictene auricoma (Müller). Rioja, 1947b. La Paz.

**Pectinaria bartmanae* n. sp.

Ampharetidae

Ampbarete bona Chamberlin, 1919a. 26° 40' W. Latitude and 110° 45' 20" N. Longitude.

**Ampbicteis scaphobranchiata* Moore.

**Ampbisamytha bioculata* (Moore).

**Asabellides lineata* (Berkeley and Berkeley).

Sabellides delus Chamberlin, 1919a. 26° 40' W. Latitude and 110° 45' 20" N. Longitude.

Terebellidae

**Amacana occidentalis* (Hartman).

Artacana conifera Moore. Hartman, 1955. Los Frailes.

Axionice mirabilis McIntosh. Fauvel, 1943. Gulf.

Eupolymnia heterobranchia (Johnson). Rioja, 1947a. La Paz.

Loimia medusa (Savigny). Fauvel, 1943. Gulf.

L. montagni (Grube). Rioja, 1947a. La Paz.

Ncoampbitrite robusta (Johnson). Fauvel, 1943; Rioja, 1947a. La Paz.

Neoleprea spiralis (Johnson). Rioja, 1947a. Topolobampo.

Nicola latens. Chamberlin, 1919a. 26° 48' W. Latitude and 110° 45' 20" N. Longitude.

Pista elongata Moore. Steinbeck and Ricketts, 1941. El Mogote.

**P. cristata* (Müller).

Polycirrus mexicanus (Rioja), 1947a. La Paz.

**P. perplexus* Moore.

Spinospaera oculata Hartman. Rioja, 1947b. La Paz.

Terbella californica Moore. Fauvel, 1943. Gulf.

Tbelerps comatus (Grube). Fauvel, 1943. Gulf.

T. crispus Johnson. Treadwell, 1937. Cabo San Lucas.

T. setosus (Quatrefages). Berkeley and Berkeley, 1939; Steinbeck and Ricketts, 1941. San Felipe, Bahia de los Angeles, Punta San Marcial.

Trichobranchidae

Terbellides stroemi Sars. Berkeley and Berkeley, 1939. Puerto San Carlos.

Sabellidae

Chone infundibuliformis fauveli McIntosh. Berkeley and Berkeley, 1939. Puerto San Carlos, Bahia de los Angeles.

C. minuta Hartman. Rioja, 1947a. La Paz.

**C. mollis* (Bush).

**Euchone barnardi*, n. sp.

**E. cortezi*, n. sp.

**Fabricia limnicola* Hartman.

Hypsicomus pbacotaenia (Schmarda). Fauvel, 1943; Rioja, 1947a. La Paz.

Megalomma musbaensis (Gravier). Steinbeck and Ricketts, 1941; Fauvel, 1943; Rioja, 1947a. La Paz, Isla Espiritu Santo, Coronados.

**M. pigmentum* Reish.

Oriopsis armandia (Claparède). Rioja, 1947a. La Paz.

Pseudopotamilla ocellata Moore. Rioja, 1947b. La Paz.

Sabella melanostigma Schmarda. Fauvel, 1943. Gulf.

Serpulidae

Apomatus similis Marion and Bobretzky. Treadwell, 1937. Cabo San Lucas.

Eupomatus humilis Bush, 1904. Guaymas.

Hydroides crucigera Morch. Rioja, 1947a. La Paz. Topolobampo.

**H. recurispina* Rioja, 1941. Rio Mayo.

Pomatoceros minutus Rioja, 1941, 1947a. Rio Mayo, Bahia de Navachiste.

Pomatoleios kraussi (Baird). Rioja, 1947a, Bahia de Navachiste, Topolobampo.

Pomatostegus stellatus (Abildgaard). Fauvel, 1943. Cabo Pulmo.

Profula superba Moore. Parker, 1963. Off mainland coast and southern limits of Gulf of California.

Profunda tubularia (Montagu). Steinbeck and Ricketts, 1941. Puerto Refugio.

Salmacina dysteri (Huxley). Steinbeck and Ricketts, 1941; Fauvel, 1943, Bahia de los Angeles, Bahia de San Francisquito.

Spirobranchus giganteus (Pallas), Fauvel, 1943. La Paz, Cabo Pulmo.

S. pseudoincrassatus Bush, 1904; Steinbeck and Ricketts, 1941; Rioja, 1947a. Cabo San Lucas, Topolobampo.

Spirorbis marioni Caullery and Mesnil. Bush, 1904. Guaymas, La Paz.

Vermiliopsis cornuta Rioja, 1947b. La Paz.

TABLE 2

The relationship of the principle polychaetes to sediment type in Bahia de los Angeles, Baja California. Numerals in parentheses indicate the number of stations at which the species were collected in April 1962 and October 1963, respectively.

Species	Sand, 40 stations		Silty Sand, 46 stations		Sandy Silt, 30 stations		Silt, 45 stations	
	Per- centage occur- rence	Mean no. specimens per station	Per- centage occur- rence	Mean no. specimens per station	Per- centage occur- rence	Mean no. specimens per station	Per- centage occur- rence	Mean no. specimens per station
<i>Parvulepis fimbriata</i> (13-21)	30	2	27	2	17	2	—	—
<i>Eteone dilatata</i> (35-7)	33	2	40	2	20	3	9	1
<i>Ophiodromus pugettensis</i> (29-20)	40	3	39	3	27	2	17	1
<i>Ancistrosyllis bassi</i> (4-39)	25	2	35	2	20	2	17	1
<i>Pilargis hamatus</i> (26-9)	30	3	26	2	23	1	9	1
<i>Langerbansia heterochaeta</i> (21-16)	42	4	33	2	13	3	2	1
<i>Ceratonereis mirabilis</i> (32-9)	35	14	28	2	23	1	17	1
<i>Nereis procerca</i> (27-6)	30	3	22	3	20	3	11	1
<i>Aglaophamus dicirrus</i> (66-84)	90	12	98	9	93	10	91	6
<i>Glycera tessellata</i> (20-35)	48	30	37	5	20	1	29	1
<i>Glycinde armigea</i> (57-56)	63	11	76	4	80	4	65	4
<i>Onuphis zebra</i> (60-76)	63	9	85	6	97	13	96	10
<i>Lumbrineris minima</i> (57-20)	60	9	52	5	50	3	29	2
<i>Haploscoloplos elongatus</i> (58-54)	75	18	83	22	83	11	42	4
<i>Aricidea rosea</i>	15	17	35	76	63	87	53	100
<i>Polydora socialis plena</i> (27-22)	35	3	33	1	37	4	20	1
<i>Prionospio cirrifera</i> (46-62)	40	5	57	12	83	12	91	12
<i>P. pinnata</i> (36-60)	83	11	80	16	53	7	22	1
<i>P. pygmaeus</i> (51-4)	20	9	26	18	60	18	38	16
<i>Magelona californica</i> (14-30)	73	10	30	24	3	1	—	—
<i>Telepsaurus costarum</i> (43-23)	55	4	56	3	4	5	18	1
<i>Cbaetozone corona</i> (49-32)	70	40	72	11	33	6	22	3
<i>Cossura candida</i> (40-42)	5	1	39	2	67	6	94	12
<i>Tharyx parvus</i> (58-47)	65	21	85	28	67	9	44	2
<i>Armandia bioculata</i> (31-15)	42	13	26	3	27	7	40	2
<i>Capitita ambiseta</i> (67-54)	62	147	72	255	83	182	84	52
<i>Heteroclymene glabra</i> (37-1)	27	19	22	9	27	6	20	5
<i>Praxillella affinis pacifica</i> (54-32)	68	20	67	11	47	14	31	2
<i>Amacana occidentalis</i> (33-11)	25	15	22	6	53	4	18	1
<i>Chone mollis</i> (54-14)	50	11	43	9	43	9	33	3
<i>Euchone barnardi</i> (35-3)	15	27	19	10	40	15	24	23
<i>Megalomma pigmentum</i> (22-13)	30	2	39	3	10	1	2	1