

## Mediterranean Marine Science

---

Τόμ. 11, Αρ. 1 (2010)

---



### First record of *Paraprionospio coora* Wilson, 1990 (Polychaeta: Spionidae) from the Mediterranean Sea)

H. YOKOYAMA, E. DAGLI, M.E. CINAR

doi: [10.12681/mms.96](https://doi.org/10.12681/mms.96)

---

#### Βιβλιογραφική αναφορά:

YOKOYAMA, H., DAGLI, E., & CINAR, M. (2010). First record of *Paraprionospio coora* Wilson, 1990 (Polychaeta: Spionidae) from the Mediterranean Sea). *Mediterranean Marine Science*, 11(1), 133–142.  
<https://doi.org/10.12681/mms.96>

## First record of *Paraprionospio coora* Wilson, 1990 (Polychaeta: Spionidae) from the Mediterranean Sea

H. YOKOYAMA<sup>1</sup>, E. DAĞLI<sup>2</sup> and M. E. ÇINAR<sup>2</sup>

<sup>1</sup> National Research Institute of Aquaculture, Fisheries Research Agency, Minami-ise, Mie 516-0193, Japan

<sup>2</sup> Ege University, Faculty of Fisheries, Department of Hydrobiology, 35100 Bornova, Izmir, Turkey

Corresponding author: [hyoko@fra.affrc.go.jp](mailto:hyoko@fra.affrc.go.jp)

Received: 28 October 2009; Accepted: 16 March 2010 Published on line: 21 April 2010

---

### Abstract

The spionid polychaete *Paraprionospio pinnata* (Ehlers, 1901) has been widely reported from the Mediterranean Sea. We examined some specimens belonging to the genus *Paraprionospio* that had been collected from the Aegean Sea, the Sea of Marmara and the Spanish Mediterranean coast, and identified them as *Paraprionospio coora* Wilson, 1990, which is new to the Mediterranean fauna. This finding indicates that *P. coora* has a widespread geographical distribution in Australia, the Far East and the Mediterranean, and suggests that the previous records of *P. pinnata* from the Mediterranean are questionable.

**Keywords:** *Paraprionospio coora*; Taxonomy; Aegean Sea; Sea of Marmara; Turkey; Spain.

---

### Introduction

The spionid polychaete *Paraprionospio pinnata* (Ehlers, 1901) has been reported not only from the Mediterranean (BELLAN, 1964; DIAPOULIS & BOGDANOS, 1983; ERGEN, 1992; REDONDO & SAN MARTÍN, 1997; SIMBOURA & NICOLAIDOU, 2001; ERGEN *et al.*, 2002, 2006; ÇINAR, 2005; DOĞAN *et al.*, 2005) but also from various temperate and tropical waters in the world (e.g., FAUVEL, 1932; WESENBERG-LUND, 1949; HARTMAN, 1960; DAY, 1961; IMAJIMA

& HARTMAN, 1964; HARTMANN-SCHRÖDER, 1965), resulting in it gaining recognition as a cosmopolitan species (LIGHT, 1978; MACIOLEK, 1985). FOSTER (1971) demonstrated that *P. pinnata* is a monotypic species which belongs to the genus *Paraprionospio* Caullery, 1914. YOKOYAMA & TAMAI (1981), however, found that the Japanese specimens of *Paraprionospio pinnata* comprised four distinct forms of morphological variations based on a series of 11 characters including papillae on posterior margins of the peristomial wings, pigment patches on the peris-

tomium, accessory processes on the first pair of branchiae, shapes of branchial lamellae, filaments on the third chaetiger, a ventral ridge on the eighth chaetiger, transverse dorsal crests, a semi-transparent dorsal cuticle, interneuropodial pouches, lateral anal cirri and the first appearance of nonlimbate capillaries in neuropodia. They suggested that the observed variations might be sufficient to allow the forms to be distinguished at the specific level, but they did not determine species names. Later, YOKOYAMA (2007) published a revision of the genus *Paraprionospio*, in which 9 valid species including 4 Japanese species that are *P. coora* Wilson, 1990, and 3 undescribed species (*P. cordifolia* Yokoyama, 2007, *P. oceanensis* Yokoyama, 2007 and *P. patiens* Yokoyama, 2007) were validated. ZHOU *et al.* (2008) also examined the Chinese specimens, which were previously identified as *P. pinnata*, and found that they belonged to the three species, *P. coora*, *P. inaequibranchia* (Caullery, 1914) and an undescribed species (*P. cristata* Zhou, Yokoyama & Li, 2008). The above-mentioned studies suggested a possibility of misidentification of the specimens, which were previously reported as *P. pinnata*. Hence, we examined some specimens of *Paraprionospio* collected from the Aegean Sea, the Sea of Marmara and the Spanish Mediterranean coast to identify species.

## Material and Methods

Specimens of *Paraprionospio* were collected at 21 stations in the Aegean Sea and the Sea of Marmara between the years 1999 and 2008 (Fig. 1). Samples were taken by an anchor dredge and a Van Veen Grab at depths ranging from 17 to 135 m. All benthic samples were sieved through a 0.5 mm mesh and then the retained material was fixed with a 4% formaldehyde-sea water so-

lution. In the laboratory, the samples were sorted according to taxonomic groups under a stereomicroscope and preserved in 70% ethanol. Afterwards, specimens were identified and counted under stereo- and compound microscopes. The body length and width of the 5th chaetiger (excluding parapodia) of the worms were measured using an ocular micrometer. The specimens examined were deposited at ESFM [Ege Universitesi Su Urünleri Müzesi (Museum of Faculty of Fisheries, Ege University)].

A specimen which was collected from the Spanish Mediterranean coast and described as *Paraprionospio pinnata* in REDONDO & SAN MARTÍN (1997) was also examined. The specimen was deposited at MNCN (Museo Nacional de Ciencias Naturales).

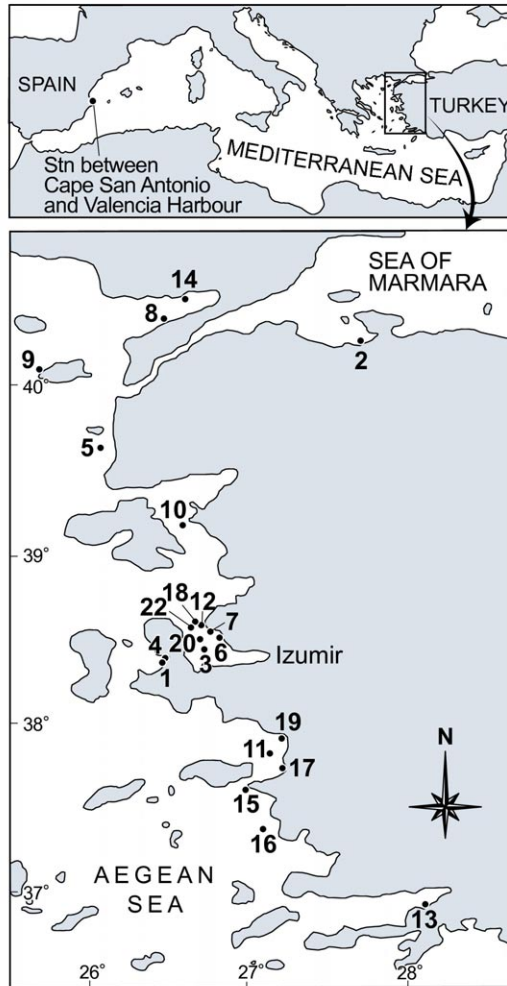
## Taxonomic Account

### *Paraprionospio coora* Wilson, 1990

*Paraprionospio* sp. Form CI Yokoyama & Tamai, 1981: 311, Fig. 5.

*Paraprionospio coora* Wilson, 1990: 266-268, Figs 75-83; Yokoyama, 2007: 264, Fig. 8; Zhou *et al.*, 2008: 309-311, Fig. 1.

**Material examined: The Aegean Sea:** ESFM-POL/08-22, 1 specimen, 21 May 2008, Gerence Bay, Station 1, 38°26'32"N, 26°29'07"E, 45 m, mud with shell fragments, coll. E. Dağlı; ESFM-POL/07-37, 9 specimens, 17 October 2007, Izmir Bay, Station 3, 38°28'50"N, 26°46'27"E, 40 m, mud, coll. E. Dağlı; ESFM-POL/08-23, 8 specimens, 4 May 2008, Gerence Bay, Station 4, 38°27'17"N, 26°27'14"E, 52 m, sandy mud, coll. E. Dağlı; ESFM-POL/00-192, 1 specimen, 29 July 2000, Izmir Bay, Station 5, 39°44'22"N, 26°01'59"E, 60 m, sandy mud, coll. E. Dağlı; ESFM-POL/99-19, 1 specimen, 27 May 1999, Izmir Bay, Station 6, 36°35'25"N, 26°47'03"E, 22 m, mud, coll.



**Fig. 1:** Map showing sampling stations of *Paraprionospio coora*.

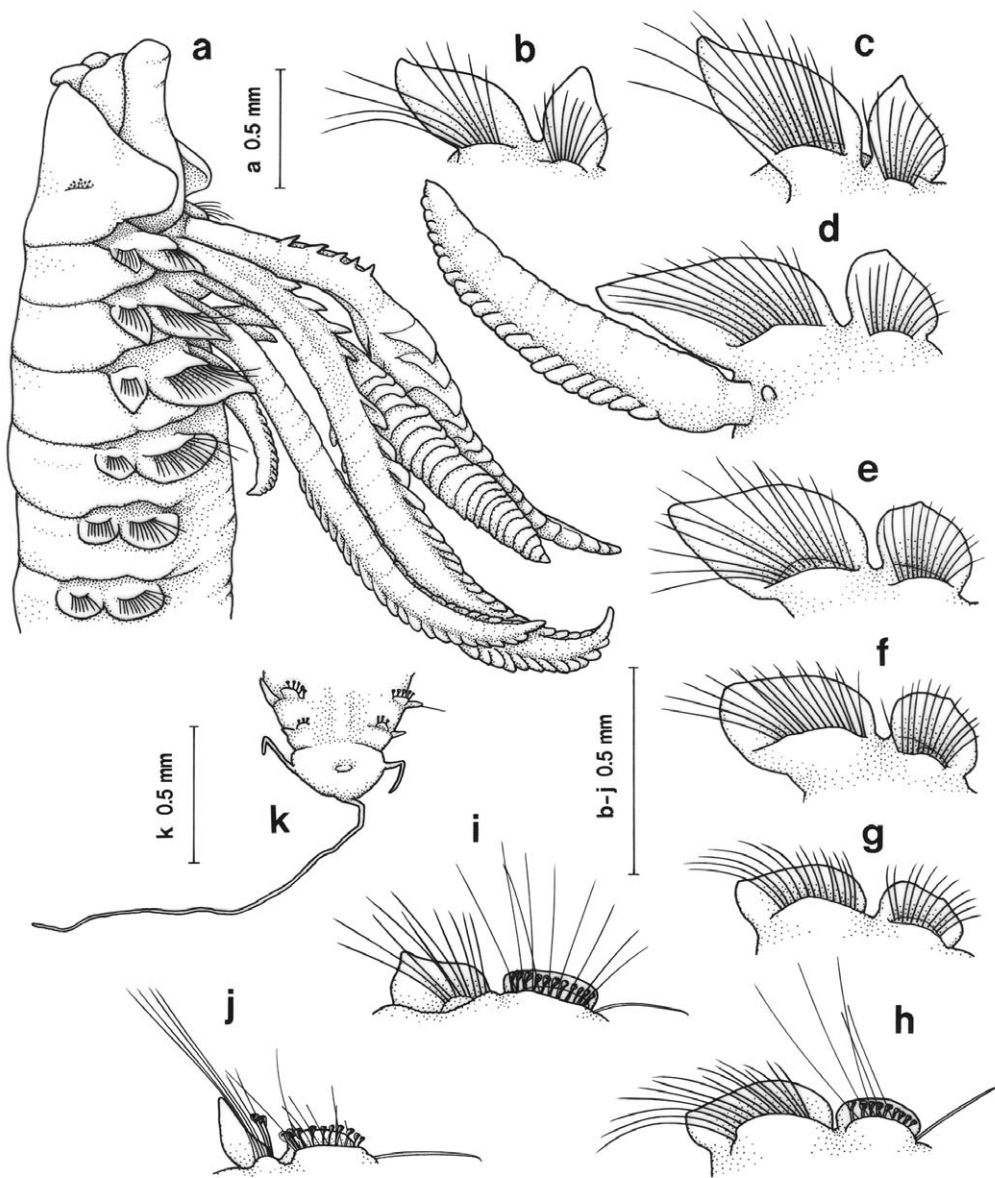
M. E. Çinar; ESFM-POL/00-201, 2 specimens, 14 July 2000, Izmir Bay, Station 7, 38°35'10"N, 26°45'35"E, 33 m, mud, coll. E. Dağlı; ESFM-POL/00-189, 1 specimen, 3 August 2000, Saroz Bay, Station 8, 40°27'40"N, 26°29'57"E, 135 m, mud, coll. E. Dağlı; ESFM-POL/00-191, 2 specimens, 13 August 2000, Gokceada Island, Station 9, 40°10'40"N, 25°40'50"E, 104 m, mud, coll. E. Dağlı; ESFM-POL/00-193, 1 specimen, 28 July 2000, Aegean Sea, Station 10,

39°15'00"N, 26°32'05"E, 53 m, sandy mud, coll. E. Dağlı; ESFM-POL/00-208, 4 specimens, 14 September 2000, Kusadasi Bay, Station 11, 37°55'18"N, 27°07'41"E, 78 m, mud, coll. E. Dağlı; ESFM-POL/00-196, 4 specimens, 14 July 2000, Izmir Bay, Station 12, 38°40'36"N, 26°41'50"E, 62 m, mud, coll. E. Dağlı; ESFM-POL/00-213, 1 specimen, 19 September 2000, Gökova Bay, Station 13, 36°54'40"N, 28°09'57"E, 19 m, sandy mud, coll. E. Dağlı; ESFM-POL/00-

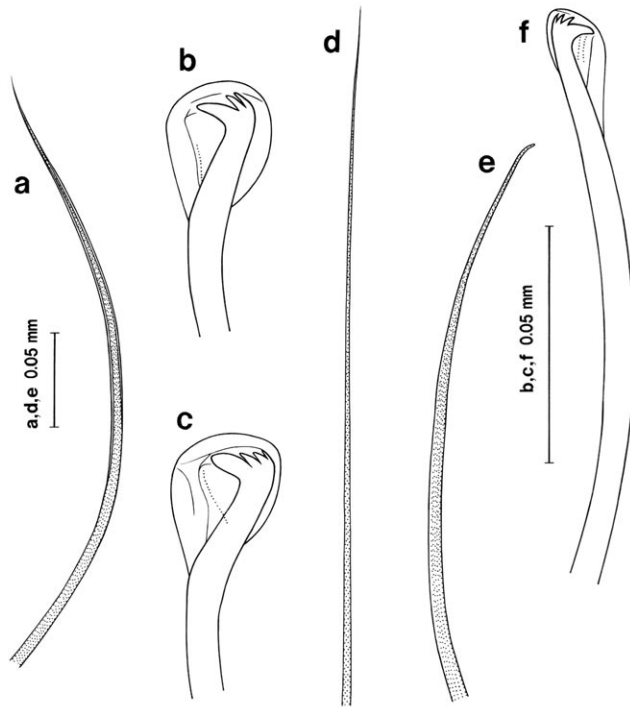
187, 1 specimen, 4 August 2000, Saroz Bay, Station 14, 40°36'08"N, 26°33'53"E, 66 m, mud, coll. E. Dağlı; ESFM-POL/00-210, 3 specimens, 29 September 2000, south western of Dilek Peninsula, Station 15, 37°38'50"N, 27°01'17"E, 35 m, mud, coll. E. Dağlı; ESFM-POL/00-211, 4 specimens, 15 September 2000, east of Agathonisi Island, Station 16, 37°23'55"N, 27°06'52"E, 71 m, mud, coll. E. Dağlı; ESFM-POL/00-209, 1 specimen, 29 September 2000, Kusadasi Bay, Station 17, 37°48'00"N, 27°16'00"E, 31 m, mud, coll. E. Dağlı; ESFM-POL/00-194, 2 specimens, 14 July 2000, Izmir Bay, Station 18, 38°40'36"N, 26°37'05"E, 73 m, mud, coll. E. Dağlı; ESFM-POL/00-207, 3 specimens, 30 September 2000, Kusadasi Bay, Station 19, 37°59'00"N, 27°11'15"E, 32 m, mud, coll. E. Dağlı; ESFM-POL/00-200, 1 specimen, 14 July 2000, Izmir Bay, Station 20, 38°35'10"N, 26°43'05"E, 61 m, mud, coll. E. Dağlı; ESFM-POL/00-622, 1 specimen, 19 January 2000, Izmir Bay, Station 22, 38°39'19"N, 26°37'04"E, 69 m, mud, coll. E. Dağlı; **Sea of Marmara:** ESFM-POL/08-24, 1 specimen, 9 August 2008, Erdak Bay, Station 2, 40°18'42"N, 27°46'18"E, 17 m, sandy mud, coll. E. Dağlı; **Spanish Mediterranean coast:** MNCN 16.01/2646, 1 specimen, Station between Cape San Antonio and Valencia Harbour, coll. CIS (Centro de Investigaciones Submarinas).

**Description:** Largest complete specimen, 42 mm long, 1.3 mm wide with 95 chaetigers. Prostomium fusiform with round or bluntly pointed anterior end (Fig. 2a), extending posteriorly as a faintly raised ridge to first chaetiger. Two pairs of black, small eyes in trapezoidal arrangement. Brown pigment patch usually present on lateral side of peristomium (Fig. 2a). Faint groove just posterior to pigmented area on peristomium. Small papilla on posterior margin of

peristomium (Fig. 2a). Notopodial postchaetal lamellae on chaetigers 1–3 long, foliaceous, distally pointed (Fig. 2b-d); posterior to chaetiger 4, becoming rounded and reducing in size (Fig. 1e-h); posterior to chaetiger 10, elevated increasingly, showing triangular to lanceolate (Fig. 2i,j). Neuropodial postchaetal lamellae of chaetiger 1–3 lanceolate (Fig. 2b-d); posterior to chaetiger 4, lamellae becoming rounded and reducing to low postchaetal ridges by about chaetiger 9 (Fig. 2e-h). Three pairs of branchiae on chaetigers 1–3. First branchiae longest extending posteriorly to about chaetiger 10 (Fig. 2a), second branchiae extending posteriorly to about chaetiger 9, third pair shortest extending to about chaetiger 6. In basal region of first branchial shaft, 2–5 conic processes placed along anterior face. All branchiae bearing lamellar plates; in proximal region of branchial shaft, lamella consisting of single triangular plate; succeeding lamellae consisting of two plates; in middle and distal regions, two plates united completely, showing flabellate-shape. A small protuberance usually present on dorsum near base of third branchiae (Fig. 2d), instead of the slender filament in some of the other *Paraprionospio* species. Anterior chaetae all limbate capillaries bearing granules (Fig. 3a). Posterior to about chaetiger 16, notopodial limbate capillaries replaced by slender, nonlimbate capillaries. Neuropodial hooded hooks with 2–3 pairs of apical teeth above main fang and striate secondary internal hood from chaetiger 9 (Fig. 3b,c), accompanied by alternating nonlimbate slender capillaries (Fig. 3d) and one to two granulated sabre chaetae (Fig. 3e). Notopodial hooded hooks with 3 pairs of apical teeth above main fang and striate secondary internal hood appearing from about chaetiger 33 (Fig. 3f). No ventral bilobed flap on chaetiger 8. No interneuropodial pouches



**Fig. 2:** *Paraprionospio coora* collected from the Aegean Sea (a, ESFM-POL/99-19; b-k, ESFM-POL/08-23). a, Anterior end in dorso-lateral view; b, 1st parapodium, in anterior view; c, 2nd parapodium, in anterior view; d, 3rd parapodium, 3rd branchia and a protuberance near the base of the 3rd branchia, in anterior view; e, 4th parapodium, in anterior view; f, 5th parapodium, in anterior view; g, 8th parapodium, in anterior view; h, 9th parapodium, in anterior view; i, 15th parapodium, in anterior view; j, 48th parapodium, in anterior view; k, posterior end, in ventral view.



**Fig. 3:** *Paraprionospio coora* collected from the Aegean Sea (ESFM-POL/08-23). a, Notopodial limbate capillary from chaetiger 4; b, neuropodial hooded hood from chaetiger 9, bearing 2 pairs of apical teeth; c, neuropodial hooded hood from chaetiger 9, bearing 3 pairs of apical teeth; d, neuropodial non-limbate capillary from chaetiger 9; e, sabre chaeta from chaetiger 39; f, notopodial hooded hook from chaetiger 48.

from all specimens. Dorsum of chaetigers 4–11 faintly biannulated. Dorsum of chaetigers 12–17 transverse series of lighter colored slightly raised ridges, 3 ridges per chaetiger. Membranous dorsal crests and semi-transparent dorsal cuticle absent. Pygidium with a long median anal cirrus and two short, lateral cirri (Fig. 2k). Muscular gizzard present between chaetigers 6–8.

**Distribution:** Western Japan, more southern than 37°N; Yellow Sea, East China Sea, New South Wales to Tasmania in Australia, Mediterranean.

**Remarks:** The Mediterranean specimens of *Paraprionospio coora* closely agree with the original description of the species

from Australia by WILSON (1990), but have 2–3 pairs of apical teeth in neuropodial hooded hooks rather than only 2 pairs of apical teeth. A variable number of apical teeth was noted within the Mediterranean specimens, suggesting that this is not a stable characteristic to be used in distinguishing species. Interneuropodial pouches were found in most specimens collected from Australia (WILSON, 1990) and in some specimens from Japan (YOKOYAMA, 2007) and China (ZHOU *et al.*, 2008), whereas all Mediterranean specimens examined in this study lack this characteristic. However, it seems this is not a stable characteristic which can be dependably used in distinguishing species,

because the number of interneuropodial pouches varies from zero to about 30 even in a local population in Australia, China and Japan. The Mediterranean specimens have a small protuberance on the dorsum near the base of third branchiae (Fig. 2d) instead of the slender filament in some of the other *Paraprionospio* species (see Figs 1,10,11,13,14 in YOKOYAMA, 2007). WILSON (1990), YOKOYAMA (2007) and ZHOU *et al.* (2008) did not mention this characteristic however, we found the same structure in the Japanese specimens of *P. coora*. Hence, we identified the Mediterranean specimens as *P. coora*. It is the first time this species has been recorded from the Mediterranean Sea; the present study has revealed the widespread geographical occurrence of *P. coora* from Australia, the Far East and the Mediterranean.

The closely similar species *Paraprionospio pinnata* was first recorded from the western Mediterranean by BELLAN (1964) and from the eastern Mediterranean by ERGEN (1992). Later, this species was reported especially from the eastern Mediterranean (DIAPOULIS & BOGDANOS, 1983; SIMBOURA & NICOLAIDOU, 2001; ERGEN *et al.*, 2002, 2006; DOĞAN *et al.*, 2005; ÇINAR, 2005) and the Red Sea (FAUVEL, 1933). The examination of the older benthic material, which was collected in the Aegean Sea and identified as *P. pinnata*, in fact belongs to *P. coora*. This finding suggests that the occurrence of *P. pinnata* in the Mediterranean should be reexamined.

*Paraprionospio coora* is closely related to *P. pinnata* in morphological and chaetal appearances. However, *P. coora* easily distinguishes from *P. pinnata* in the following characteristics 1) *P. coora* has a small papilla on posterior margin of the peristomium (no papilla in *P. pinnata*); 2) The first branchiae of *P. coora* are usually the

longest or the first and second branchiae are approximately equal in length, the third pair is the shortest (branchiae are almost equal in size in *P. pinnata*); 3) *P. coora* has conic processes in the basal region of the first branchial shaft (no processes in *P. pinnata*); 4) *P. coora* has a small protuberance on the dorsum near the base of the third branchiae (no protuberance in *P. pinnata*); 5) *P. coora* lacks a semi-transparent dorsal cuticle (*P. pinnata* has a semi-transparent dorsal cuticle); and 6) Interparapodial pouches are present in some specimens of *P. coora* (absent in *P. pinnata*).

*Paraprionospio coora* has been reported from distant regions (i.e. Australia, Japan and China) before (WILSON, 1990; YOKOYAMA, 2007; ZHOU *et al.*, 2008). The occurrence of *P. coora* in the Mediterranean Sea indicates that this species has a wider distributional pattern than we know now. Spionid polychaetes are known to invade different zoogeographic regions as a result of their introduction via the ballast waters of ships (BASTROP *et al.*, 1997; ÇINAR *et al.*, 2005, 2006, 2008; DAĞLI & ÇINAR, 2009) or the introduction of molluscs into coastal waters for further commercial cultivation (MORENO *et al.*, 2006; RADASHEVSKY *et al.*, 2006). *P. coora* may be included in alien species however, at present their alien status cannot be demonstrated based on scientific data except for their extensive geographical distribution. The discovery of this species in other parts of the world and genetic studies on its distant populations would shed more light on its alien status.

## Acknowledgements

We thank Guillermo San Martín for informing us that his material was deposited in MNCN and to Javier Sánchez Almazán for arranging the loan of the material.



## References

- BASTROP, R., RÖHNER, M., STURMBAUER, C. & JÜRSS, K., 1997. Where did *Marenzelleria* spp. (Polychaeta: Spionidae) in Europe come from? *Aquatic Ecology*, 31 (2): 119-136.
- BELLAN, G., 1964. Contribution à l'étude systématique, bionomique et écologique des Annélides Polychètes de la Méditerranée. *Recueil des Travaux de la Station Marine d'Endoume*, 49 (33): 1-371.
- ÇINAR, M.E., 2005. Polychaetes from the coast of northern Cyprus (eastern Mediterranean Sea), with two new records for the Mediterranean Sea. *Cahiers de Biologie Marine*, 46 (2): 143-161.
- ÇINAR, M.E., ERGEN, Z., DAĞLI, E. & PETERSEN, M.E., 2005. Alien species of spionid polychaetes (*Streblospio gynobranchiata* and *Polydora cornuta*) in Izmir Bay, eastern Mediterranean. *Journal of the Marine Biological Associations of the United Kingdom*, 85 (4): 821-827.
- ÇINAR, M.E., KATAGAN, T., ÖZTÜRK, B., EGEMEN, Ö., ERGEN, Z., KOCATAS, A., ÖNEN, M., KIRKIM, F., BAKIR, K., KURT, G., DAĞLI, E., KAYMAKÇI, A., AÇIK, S., DOĞAN, A. & ÖZCAN, T., 2006. Temporal changes of soft bottom zoobenthic communities in and around Alsancak Harbor (Izmir Bay, Aegean Sea), with special attention to the autoecology of exotic species. *Marine Ecology*, 27 (3): 229-246.
- ÇINAR, M.E., KATAGAN, T., KOÇAK, F., ÖZTÜRK, B., ERGEN, Z., KOCATAS, A., ÖNEN, M., KIRKIM, F., BAKIR, K., KURT, G., DAĞLI, E., AÇIK, S., DOĞAN, A. & ÖZCAN, T., 2008. Faunal assemblages of the mussel *Mytilus galloprovincialis* in and around Alsancak Harbour (Izmir Bay, eastern Mediterranean) with special emphasis on alien species. *Journal of Marine Systems*, 71 (1-2): 1-17.
- DAĞLI, E. & ÇINAR, M.E., 2009. Species of the subgenera *Aquilaspio* and *Prionospio* (Polychaeta: Spionidae: *Prionospio*) from the southern coast of Turkey (Levantine Sea, eastern Mediterranean), with description of a new species and two new reports for the Mediterranean fauna. *Zootaxa*, 2275: 1-20.
- DAY, J. H., 1961. The polychaete fauna of South Africa, Part 6, Sedentary species dredged off Cape coasts with a few new records from the shore. *Journal of the Linnean Society of London*, 44 (299): 463-560.
- DIAPOULIS, A. & BOGDANOS, C., 1983. Preliminary study of soft substrate macrozoobenthos and marine flora in the Bay of Geras (Lesvos Island, Greece). *Thalassographica*, 6: 127-139.
- DOĞAN, A., ÇINAR, M.E., ÖNEN, M., ERGEN, Z. & KATAĞAN, T., 2005. Seasonal dynamics of soft-bottom zoobenthic communities in polluted and unpolluted areas of Izmir Bay (Aegean Sea). *Senckenbergiana Maritima*, 35: 133-145.
- ERGEN, Z., 1992. The Latest Status of Polychaeta in the Soft Substrate of Izmir Bay. *Rapport de la Commission Internationale Exploration de la Mer Méditerranée*, 33, p.36.
- ERGEN, Z., DORA, Ç. & ÇINAR, M. E., 2002. Seasonal Analysis of Polychaetes from the Gediz River Delta (Izmir Bay, Aegean Sea). *Acta Adriatica*, 43 (2): 29-42.
- ERGEN, Z., ÇINAR, M.E., DAĞLI, E. & KURT, G., 2006. Seasonal dynamics of soft-bottom polychaetes in Izmir Bay (Aegean Sea, eastern Mediterranean). *Scientia Marina*, 70S3: 97-207.
- FAUVEL, P., 1932. Annelida Polychaeta of the Indian Museum, Calcutta. *Memoirs*

- of the *Indian Museum*, 12 (1): 1-262.
- FAUVEL, P., 1933. Mission Robert Ph. Dolfus en Egypte. Annélides polychètes. *Mémoires de l'Institut d'Egypte*, 12: 31-83.
- FOSTER, N. M., 1971. Spionidae (Polychaeta) of the Gulf of Mexico and the Caribbean Sea. *Studies on the Fauna of Curaçao and other Caribbean Islands*, 36: 1-183.
- HARTMAN, O., 1960. Systematic account of some marine invertebrate animals from the deep basins off southern California. *Allan Hancock Pacific Expeditions*, 22: 69-215.
- HARTMANN-SCHRÖDER, G., 1965. Zur Kenntnis des Sublitorals der chilenischen Küste unter besonderer Berücksichtigung der Polychaeten und Ostracoden. Tl. II. Die Polychaeten des Sublitorals. *Mitteilungen des Hamburgischen Zoologischen Museum und Institut*, 62 (Suppl.): 59-305.
- IMAJIMA, M. & HARTMAN, O., 1964. The polychaetous annelids of Japan, Part II. *Allan Hancock Foundation Publications, Occasional Paper*, 26: 239-452.
- LIGHT, W.J., 1978. *Invertebrates of the San Francisco Bay Estuary System, Family Spionidae (Annelida, Polychaeta)*. The Boxwood Press, Pacific Grove, California, 211 pp.
- MACIOLEK, N.J., 1985. A revision of the genus *Prionospio* Malmgren, with special emphasis on species from the Atlantic Ocean, and new records of species belonging to the genera *Apoprionospio* Foster and *Paraprionospio* Caullery (Polychaeta, Annelida, Spionidae). *Zoological Journal of the Linnean Society* 84: 325-383.
- MORENO, R.A., NEILL, P.E. & ROZBACZYLO, N., 2006. Native and non-indigenous boring polychaetes in Chile: a threat to native and commercial mollusc species. *Revista Chilena de Historia Natural*, 79 (2): 263-278.
- RADASHEVSKY, V.I., LANA, P.C. & NALESSO, R.C., 2006. Morphology and biology of *Polydora* species (Polychaeta: Spionidae) boring into oyster shells in south America, with the description of a new species. *Zootaxa*, 1353: 1-37.
- REDONDO, M.S. & SAN MARTÍN, G., 1997. Anélidos poliquetos de la costa comprendida entre el cabo de San Antonio y el puerto de Valencia (Mediterráneo occidental). *Publicaciones Especiales. Instituto Español de Oceanografía*, 23: 225-233.
- SIMBOURA, N. & NICOLAIDOU, A., 2001. The Polychaetes (Annelida, Polychaeta) of Greece: Checklist, distribution and ecological characteristics. *Monographs on Marine Sciences*, Series no 4., NCMR, 115 pp.
- WESENBERG-LUND, E., 1949. Polychaetes of the Iranian Gulf. *Danish Scientific Investigations in Iran*, 4 (4): 247-400.
- WILSON, R.S., 1990. *Prionospio* and *Paraprionospio* (Polychaeta: Spionidae) from southern Australia. *Memoirs of the Museum of Victoria*, 50: 243-274.
- YOKOYAMA, H., 2007. A revision of the genus *Paraprionospio* (Polychaeta: Spionidae). *Zoological Journal of the Linnean Society*, 151 (2): 253-284.
- YOKOYAMA, H. & TAMAI, K., 1981. Four forms of the genus *Paraprionospio* (Polychaeta: Spionidae) from Japan. *Publications of the Seto Marine Biological Laboratory*, 26: 303-317.
- ZHOU, J., YOKOYAMA, H. & LI, X., 2008. New records of *Paraprionospio* (Annelida: Spionidae) from Chinese waters, with the description of a new species. *Proceedings of the Biological Society of Washington*, 121 (3): 308-320.

