ePublishing

EKT ΕΘΝΙΚΟ ΚΕΝΤΡΟ ΤΕΚΜΗΡΙΩΣΗΣ NATIONAL DOCUMENTATION CENTRE

Mediterranean Marine Science

Vol 9, No 2 (2008)

First occurrence of the invasive alien species Polydora cornuta Bosc, 1802 (Polychaeta: Spionidae) on the coast of Greece (Elefsis Bay; Aegean Sea)

N. SIMBOURA, K. SIGALA, E. VOUTSINAS, E. KALKAN

doi: 10.12681/mms.138

To cite this article:

SIMBOURA, N., SIGALA, K., VOUTSINAS, E., & KALKAN, E. (2008). First occurrence of the invasive alien species Polydora cornuta Bosc, 1802 (Polychaeta: Spionidae) on the coast of Greece (Elefsis Bay; Aegean Sea). *Mediterranean Marine Science*, *9*(2), 119-124. https://doi.org/10.12681/mms.138

https://epublishing.ekt.gr | **e-Publisher:** EKT | **Downloaded at:** 19/01/2025 10:18:30

Mediterranean Marine Science
Volume 9/2, 2008, 119-124

First occurrence of the invasive alien species *Polydora cornuta* Bosc, 1802 (Polychaeta: Spionidae) on the coast of Greece (Elefsis Bay; Aegean Sea)

N. SIMBOURA[1], K. SIGALA[2], E. VOUTSINAS[1] and E. KALKAN[3]

[1]Hellenic Centre for Marine Research, Institute of Oceanography,
P.O. Box 712, 19013, Anavissos, Attica, Hellas
[2] University of Crete, Department of Biology, P.O. Box 2208, 71409,
Heraklion, Crete, Hellas
[3] Department of Environmental Science, Institute of Environmental Sciences,
Bogaziçi University, Hisar Campus, TR-34342 Bebek, Istanbul, Turkey

e-mail: msim@ath.hcmr.gr

Abstract

The present study reports on the occurrence of two specimens of the alien species Polydora cornuta Bosc, 1802, in Elefsis Bay, the Saronikos Gulf (Aegean Sea, eastern Mediterranean). This is the first record of this invasive alien species on the coast of Greece and the second report in the eastern Mediterranean Sea after its first finding in Izmir Bay (on the Turkish Aegean coast). This finding enhances its distributional pattern within the Mediterranean

Keywords: *Polydora cornuta;* Spionidae; Alien Species; Mediterranean Sea.

Introduction

Polydora cornuta belongs to the polychaete family Spionidae that is represented by at least 115 species and nine genera. The genera *Polydora* has 52 valid species worldwide (ITIS: http://www.itis.gov/) and 10 valid species in Europe (ERMS: http://www.marbef.org/data/erms.php). The genera includes widespread 'cosmopolitan' species which have been later proved to actually include multiple cryptic species (RICE *et al.,* 2007). Taxonomic confusion in the genus *Polydora* is a long-standing problem. *Polydora cornuta* mainly differs from its con-generic species in having a slender, subdistal longitudinal flange on falcate spines of chaetiger 5 (RADASHEVSKY, 2005).

This species is widely distributed from the Atlantic (U.S.A., Mexico, Argentina and Europe) to the Pacific (Australia, China, Taiwan and Korea) (RADASHEVSKY & HSIEH, 2000). According to a recently updated annotated list of alien marine species in the Mediterranean Sea

(STREFTARIS & ZENETOS, 2006), the spionid *Polydora cornuta* Bosc, 1802 is considered to be one of the worst invasive alien species (IAS) on soft bottom substrates. *Polydora cornuta* was encountered for the first time in the Mediterranean in organically polluted sediments in the Valencia Harbour (Spain) (TENA *et al.,* 1991). Fourteen years later, this species was reported in the Alsancak Harbor in Izmir Bay (Aegean Sea, Turkey) (CINAR *et al.,* 2005). *Polydora cornuta* is known from the Romanian coast of the Black Sea (SURUGIU, 2005) and the Crimea (BOLTACHOVA & LISITSKAYA 2007). DAGLI & ERGEN, 2008 reported the first record of this species in the Sea of Marmara (Izmir Bay) which increased its distributional pattern within the Mediterranean and Black Seas and provided a link between its Aegean and Black Sea populations. Recently, KARHAN *et al.* (2008) reported the occurrence of *P. cornuta* in the Bosphorus Strait. The present work reports the first occurrence of *P. cornuta* in Greek waters further increasing the species' distributional range within the Mediterranean.

Methods

Two *Polydora cornuta* specimens were found in Elefsis Bay in benthic samples collected with a Ponar grab of 0,045m^2 sampling surface from two sites (Fig.1),

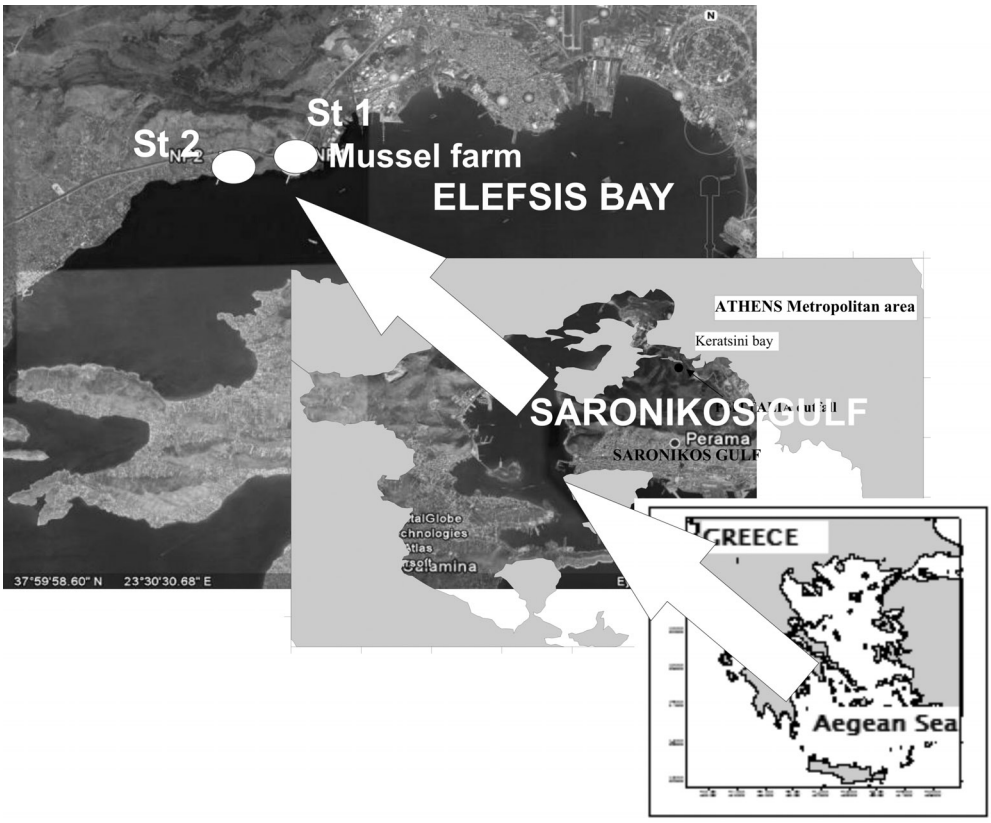

Fig. 1: Location of the stations where specimens of *Polydora cornuta* were found.

the one located (st 1) in a mussel culture area and the other at a 1500m distance from the mussel farm (st 2). Pictures of the specimens were taken using a SONY color digital video-camera attached to the stereo microscopes. Measurements of the specimens were carried out using a micro-scale embedded into the microscope lense. Width of setigers does not include chaetae.

Results

Polydora cornuta Bosc, 1802

Polydora cornuta; Blake & Maciolec, 1987; Radashevsky & Hsieh, 2000

Synonyms: *Polydora ligni* Webster, 1879.

Material examined: Elefsis Bay (Loutropyrgos, Nea Peramos), March 2008, 25 m, on mussel bed, 2 specimens.

Remarks: Two individuals complete, up to 45.9 mm long, 1,4 mm wide, with 129 chaetigers. Body stouter in anterior part (Fig.1a, b), prostomium expanded; with triangular median antenna; two pairs of small eyes in a trapezoid arrangement; low narrow caruncule. Chaetiger 1 without notochaetae. Neuropodia, with short capillary chaetae from chaetiger 1 to chaetiger 6. After chaetiger 6 neuropodia with bidentate hooded hooks only numbering 5 in anterior, 7 in middle and 9 in posterior parapodia. Chaetiger 5 with six amber-coloured falcate spines (Fig.2b); anterior

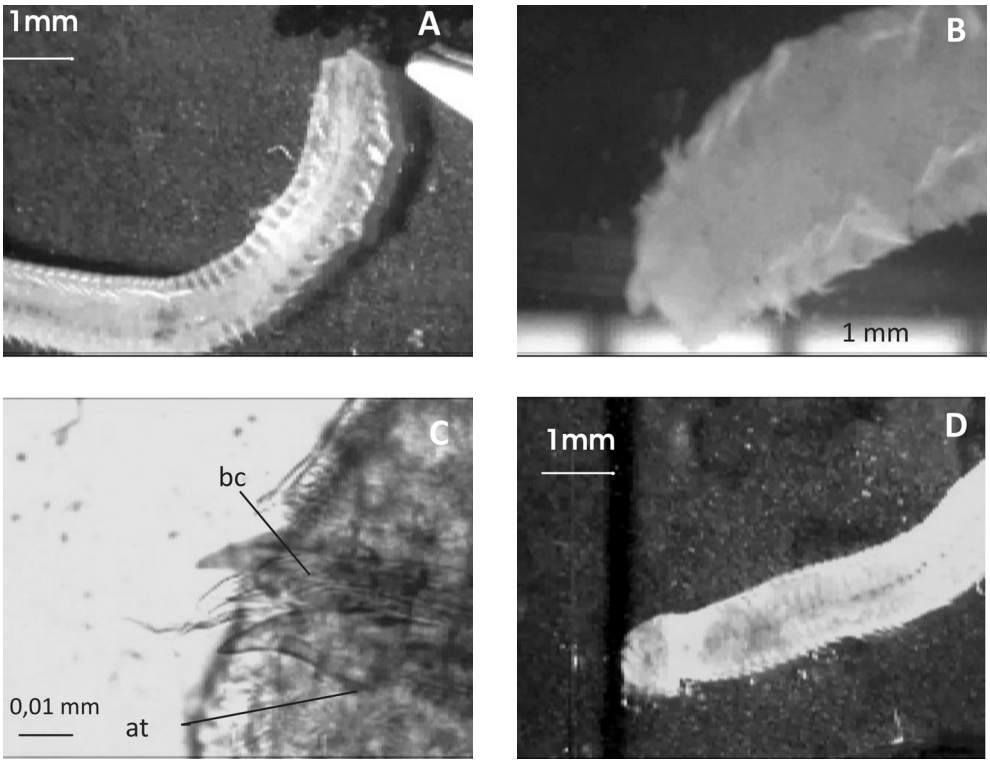

Fig. 2: *Polydora cornuta* A. Dorsal view of anterior and middle part, B. Dorsal view of anterior part, C. Major falcate spines with accessory tooth (at) and posterior broom-like companion chaetae (bc), D. Disclike pygidium.

spines extending well beyond body wall, while the posterior are embedded. Spines with an accessory tooth hardly discernible on posterior spines (Fig.2c). Spines accompanied by thin broom-like companion chaetae. Newly developed posterior companion chaetae often with compact, broom like distal tip covering major spine as a cup or hood (Fig.2c). Branchiae ciliated, from chaetiger 7 almost to end of the body. Pygidium disclike (Fig.2d).

Discussion

Polydora cornuta mainly differs from the other species of *Polydora* in having a slender, subdistal longitudinal flange on falcate spines of chaetiger 5 and is unique in the morphology of companion chaetae on chaetiger 5, adhering closely to the convex side of the spines.

The size of Greek specimens was significantly greater than the maximum size of the Izmir Bay specimens, which were maximally 11.63 mm long, 0.80 mm wide and had 58 chaetigers (CINAR *et al.,* 2005). Our specimens are also bigger than the maximum size of the specimens from the Spanish coast, measuring 14 mm long and 1,5 mm wide, and counting 46 setigers, (TENA *et al.,* 1991). It is also noteworthy that the Greek specimens were bigger than the specimens collected from the Bosphorus strait (E. Kalkan personal observation).

The discovery of *Polydora cornuta* on the coast of Greece could be considered as an accidental finding as only two specimens were encountered. The origin of the Black Sea populations of this species has been linked to the introduction of the species from the Sea of Marmara through the Dardanelles Strait, or it could be an independent introduction from outside or inside the Mediterranean (KARHAN *et al.,* 2008). Besides, as the populations of *P. cornuta* comprise a species complex composed of at least three separate species in the North America (RICE *et al.,* 2007), the Mediterranean populations could similarly include several sibling species.

Poydora cornuta has probably been introduced into the Mediterranean by shipping, as it was previously found in and around large commercial harbours which host many inter-oceanic cargo ships (CINAR *et al.,* 2005). In the present study, the specimens of *P. cornuta* were found in Elefsis Bay, which is one of the busiest waterways within the Hellenic Seas. However, aquaculture cannot be excluded as a possible vector for the introduction of this alien species as the specimens were found in a mussel farm area. In all these cases, the areas where *P. cornuta* was found were polluted. *Polydora cornuta* is known to be an opportunistic species and has been widely found in organically enriched and polluted environments (PEARSON & ROSENBERG, 1978).

In the Greek Seas multi-annual trend analysis has revealed an important increase in the number of marine alien species (PANCUCCI-PAPADOPOULOU *et al.,* 2006), reaching 110 in Greek waters (ZENETOS *et al.,* 2007). According to a recently updated annotated list of marine alien species in the Mediterranean Sea (ZENETOS *et al.,* 2008), there are 42 polychaete species established or naturalized into the Mediterranean, another 33 referred to as casual records, and another 20 with questionable or doubtful status.

Acknowledgements

Thanks are due to the anonymous reviewers for their constructive comments

and suggestions. The study was effectuated in the framework of an HCMR assessment study of the environmental quality of a mussel farm unit in Loutropyrgos-Nea Peramos area (researcher responsible: V.A. Catsiki).

References

BLAKE, J.A. & MACIOLEC, N.J. 1987. A redescription of *Polydora cornuta* Bosc (Polychaeta: Spionidae) and designation of a neotype. *Bulletin of the Biological Society of Washington,* 7: 11-15.

BOLTACHOVA, N.A. & LISITSKAYA, E.V., 2007. About species of *Polydora* (Polychaeta: Spionidae) from the Balaklava bay (the Black Sea). *Morskoi ekologichnii Zhurnal* 6: 33-35.

CINAR, M.E., ERGEN, Z., DAGLI, 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 Association of the United Kingdom,* 85: 821-827.

DAGLI, E. & ERGEN, Z., 2008. First record of *Polydora cornuta* Bosc, 1802 (Polychaeta: Spionidae) from the Sea of Marmara, Turkey. *Aquatic Invasions,* 3: 231-233.

KARHAN, S.Ü., KALKAN E., SIMBOURA, N., MUTLU, E. & BEKBÖLET, M., 2008. On the occurrence and established populations of the alien polychaete *Polydora cornuta* Bosc, 1802 (Polychaeta: Spionidae) in the Sea of Marmara and the Bosphorus Strait (Turkey). *Mediterranean Marine Science,* .9: 5-19.

PANCUCCI-PAPADOPOULOU, M.A., ZENETOS, A., CORSINI-FOKA, M. & C.-Y. POLITOU, 2006. Update of marine alien species in Hellenic waters. *Mediterranean Marine Science,* 6 (2): 147-158 [2005].

PEARSON, T.H. & ROSENBERG, R., 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. *Oceanography and Marine Biology Annual Review,* 16: 229-311.

RADASHEVSKY, V.I., 2005. On adult and larval morphology of *Polydora cornuta* Bosc, 1802 (Annelida: Spionidae). *Zootaxa,* 1064: 1-24.

RADASHEVSKY, V.I. & HSIEH, H-L., 2000. *Polydora* (Polychaeta: Spionidae) species from Taiwan. *Zoological Studies,* 39: 203-217.

RICE, S.A., KARL, S. & RICE, K.A., 2007. The *Polydora cornuta* complex (Annelida: Polychaeta) contains populations that are reproductively isolated and genetically distinct. *Invertebrate Biology,* 127: 45-64..

STREFTARIS, N & ZENETOS, A., 2006. Alien marine species in the Mediterranean - the 100 'Worst Invasives' and their impact. *Mediterranean Marine Science,* 7: 87-118.

SURUGIU, V., 2005. Inventory of inshore polychaetes from the Romanian coast (Black Sea). *Mediterranean Marine Science,* 6: 45-64.

TENA, J., CAPACCIONI-AZZATI, R., PORRAS, R. & TORRES-GAVILA, F.J., 1991. Cuatro especies de poliquetos nuevas para las costas Mediterraneas en los sedimentos del antepuerto da Valencia. *Miscellania Zoologica,* 15: 29-41.

ZENETOS, A., MERIC, E. VERLAQUE, M., GALLI, P., BOUDOURESQUE, C.-F., GIANGRANDE, A., CINAR, M.E. & BILECENOGLU, M., 2008. Additions to the annotated list of

marine alien biota in the Mediterranean with special emphasis on Foraminifera and Parasites. *Mediterranean Marine Science,* 9: 119-165.

ZENETOS, A., VASSILOPOULOU, V., SALOMIDI, M. & POURSANIDIS, D. 2007. Additions to the marine alien fauna of Greek waters (2007 update). JMBA Biodiversity Records, ref.no. 5928.

WEBSTER, H., 1879. Annelida Chaetopoda of New Jersey. *Annual Report of the New York State Museum,* 101-128.

Submitted: October 2008
Accepted: November 2008
Published on line: December 2008