

SHORT COMMUNICATION

The first finding of *Sabella pavonina* (Annelida: Sabellidae) in the Black Sea

Natalya Boltachova, Elena Lisitskaya, Nelli Sergeeva

Kovalevsky Institute of Marine Biological Research RAS, 2, Nakhimov avenue, Sevastopol, 299011, RUSSIA

*Corresponding author: nserg05@mail.ru

Abstract

Sabella pavonina Savigny, 1920 (Annelida, Sabellidae) was recorded for the first time in the pre-bosphoric region of the Black Sea in 2010. One specimen of this species was encountered among samples collected at 82 m depth during the cruise 15/1 of RV «Maria S. Merian» (Germany). The specimen found is morphologically similar to the deep-water populations of *S. pavonina* in the Mediterranean Sea.

Keywords: Polychaeta, *Sabella pavonina*, Black Sea

Received: 29.07.2017, **Accepted:** 30.09.2017

The Istanbul Strait's outlet area of the Black Sea (pre-bosphoric region) is of great interest from the point of view of the Black Sea colonization by representatives of the Mediterranean fauna (Yakubova 1948). Unusual conditions in this region allow species not common in other Black Sea regions to live there and that is why much more Mediterranean bottom fauna species are recorded in this area when compared to the other regions of the Black Sea. The distribution of 33 polychaeta species is limited to this area within the Black Sea. Some of them, such as *Sternaspis scutata* (Ranzani 1817) and *Dipolydora caulleryi* (Mesnil 1897) form stable populations there with high abundance (Rullier 1963; Kiseleva 2004; Kurt-Şahin and Çınar 2012).

Seven species belonging to seven genera of Sabellidae are known from the Black Sea (Marinov 1990; Kiseleva 2004; Kurt-Şahin and Çınar 2012; Çınar *et al.* 2014; Boltachova and Lisitskaya 2016; World Register of Marine Species 2017). Three of them, *Potamilla torelli* (Malmgren, 1866), *Jasmineira caudata* Langerhans, 1880, and *Megalomma vesiculosum* (Montagu, 1815) have only been recorded in the pre-bosphoric region (Rullier 1963; Marinov 1977; Kiseleva 2004; Kurt-Şahin and Çınar 2012).

Zoobenthic samples were collected during the cruise 15/1 of RV «Maria S. Merian» (Germany) in April 2010. Bottom sediments were sampled with the help of a boxcorer and a video-guided multicorer (TVMUC). Each core had a 9.5 cm diameter covering an area of 70.9 cm² (Lichtschlag *et al.* 2015). An unknown representative of Sabellidae was found at station № 298 (41°22.31' N; 29°8.32' E) in the bottom sediment column of one core of TVMUC, taken from 82 m water depth (Figure 1). Water salinity and oxygen content were 18.62‰ and 9.59 mg/l, respectively. Sediment of the station was aleuritic mud. The photos were taken by «Canon Digital Ixus 90 IS Camera» and a «Sony cyber-shot 16.2».

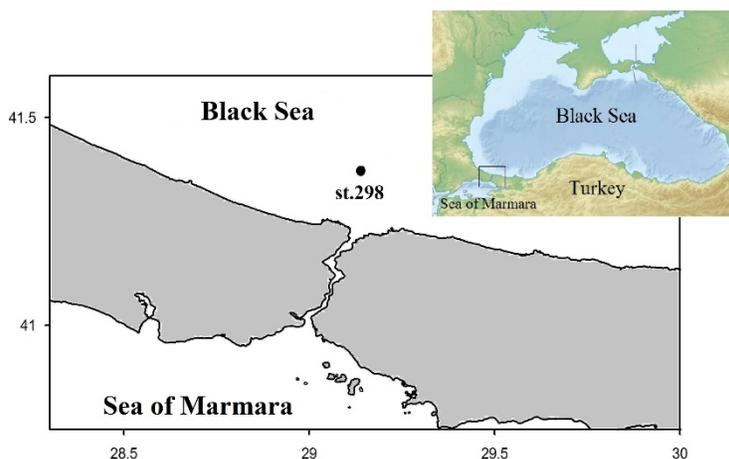


Figure 1. The sampling station (№ 298) where the specimen of *Sabella pavonina* was found.

Sabella pavonina Savigny, 1920
(Figures 2-4)

Sabella pavonina: Knight-Jones and Perkins 1998: 397-401, figs. 1, 5, 30 A-M; Zhirkov 2001: 552-553, figs. 1-15; Giangrande *et al.* 2014: 102-106, figs. 2-8, 10, 11.

Description

The specimen complete, inside a thin, strait, silty tube of gray color (Figure 2). Body pale yellow, length of specimen without crown – 140 mm, with crown – about 160 mm. Width of thoracic part – 4 mm, length – 10 mm. Body cylindrical, narrowing to the posterior end (Figure 3 C).



Figure 2. *Sabella pavonina* in the bottom sediment column of the multicorer



Figure 3. *Sabella pavonina* A, D: ventral view of anterior end; B: location of neurochaetae on abdomen; C: general view; E: dorsal view of anterior end; F posterior end with pygidium.

Scale: A, F-1mm, B-0.025mm, C-5mm, D-4mm, E-2mm

Thorax with 8 chaetigers, abdomen 165 chaetigers. 78 radioles arranged in two semicircles, more radioles (58) on left one (Figure 3 A, D). They are linked by a membrane at base; twisted in spiral, particularly noticeable on left side. Radioles thin, long, non-pigmented, without eye spots, with short pinnules, arranged in two rows. Radiole tips blunt, bare, without pinnules. Length of dorsal lips about $\frac{1}{4}$ of

radioles length. Collar with four blades, ventral blades longer than dorsal ones (Figure 3 E).

Chaetigers 1 longer than others; first ventral shield wider than others. Thoracic notochaetae two different forms, longer and shorter hooded chaetae (Figure 4 A–E); thoracic neurochaetae – in two rows: uncini of acicular type with finely toothed crest (Figure 4 H), companion chaetae geniculate with broad asymmetrical blades (Figure 4 F, G). Ventral shields clearly divided into two parts along middle part by a faecal groove, only in abdominal section. Chaetae of abdominal fascicles resembling morphology of thoracic chaetae, but abdominal neurochaetae arranged spirally (Figure 3 B). Pygidium with two rounded papilla, without eyespots (Figure 3 F).

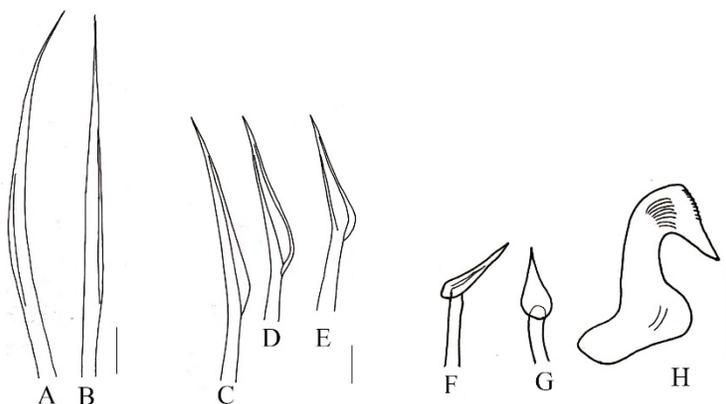


Figure 4. Chaetae of *Sabella pavonina*: A–E – thoracic notochaetae; F, G – companion chaetae, H – thoracic uncinus. Scale 50 μ m.

Remarks

The morphological characteristics of the Black Sea specimen coincide with the previous descriptions of *Sabella pavonina* by Knight-Jones and Perkins (1998), Zhirkov (2001) and Giangrande *et al.* (2014). However, the pigment bands on the radioles of *S. pavonina* mentioned by Knight-Jones and Perkins (1998) were absent on the Black Sea specimen.

Ecology and Distribution

S. pavonina is widely spread in the north-western Atlantic and the Mediterranean Sea (Knight-Jones and Perkins 1998; Giangrande *et al.* 2014). It inhabits areas protected from waves with a sediment of silty sand at 3-10 m depths in the Mediterranean Sea. It also constitutes dense populations offshore on different habitats at 100-130 m depths (Giangrande *et al.* 2014). The morphometric analysis has shown that there is a significant morphological difference between populations living in these habitats. Specimens of *S. pavonina* at deep sea are

mainly characterized by having longer radioles and the absence of pigmentation on radioles. Giangrande *et al.* (2014) postulated that these two populations might in fact belong to different species. The specimen we found in the pre-bosphoric region was morphologically similar to the deep-water populations of the species in the Mediterranean Sea. It was found at a depth of 82 m on muddy sediments where the salinity of water was 18.62 ‰. The dominant macrofauna associated with the specimen were mollusk *Modiolula phaseolina* (Philippi, 1844) and brittle star *Amphiura stepanovi* Djakonov, 1954.

Acknowledgments

R/V «Maria S. Merian» (Germany) 15–1 was an interdisciplinary and international cruise in the framework of the 7th FP EU project "HYPOX" (*In situ monitoring of oxygen depletion in hypoxic ecosystems of coastal and open seas, and land-locked water bodies*) EC Grant 226213. We are grateful to Professor Antje Boetius for providing this opportunity to participate in the project and the RV «Maria S. Merian» cruise, and we thank all colleagues for collaboration in collecting benthic materials. We indebtedly appreciate our colleague Dr. Anton Nadolny for photos of the given species.

References

- Boltachova, N.A., Lisitskaya, E.V. (2016) The first finding of *Pseudopotamilla reniformis* (Bruguière, 1789) (Annelida, Sabellidae) in the subtidal zone of the Black Sea. *Russian Journal of Biological Invasions* 7(3): 205-208.
- Çinar, M.E., Dağlı E., Kurt-Şahin, G. (2014) Checklist of Annelida from the coasts of Turkey. *Turkish Journal of Zoology* 38: 734-764.
- Giangrande, A., Caruso, L.P.G., Musco, L., Licciano, M. (2014) Variability among Mediterranean populations of *Sabella pavonina* (Annelida: Sabellidae). *Italian Journal of Zoology* 81(1): 100-111.
- Kiseleva, M.I. (2004) Polychaeta of the Black and Azov Seas. Izd. Kolsk. Nauch. Ts. RAN, Apatity, 409 pp. (in Russian)
- Knight-Jones, P., Perkins, T.H. (1998) A revision of *Sabella*, *Bispira* and *Stylomma* (Polychaeta: Sabellidae). *Zoological Journal of the Linnean Society* 123: 385-467.
- Kurt-Şahin, G., Çinar, M.E. (2012) A check-list of polychaete species (Annelida: Polychaeta) from the Black Sea. *Journal of the Black Sea/Mediterranean Environment* 18(1): 10-48.
- Lichtschlag, A., Donis, D., Janssen, F., Jessen, G. L., Holtappels, M., Wenzhöfer, F., Mazlumyan, S., Sergeeva, N., Waldmann, C., Boetius, A. (2015) Effects of

fluctuating hypoxia on benthic oxygen consumption in the Black Sea (Crimean shelf). *Biogeosciences* 12: 5075-5092.

Marinov, T. (1977) Fauna of Bulgaria. In: Bristle Worms (Polychaeta). Vol. 6. Bulgar-skata Akademijana Naukite, Sofia, 258 pp. (in Bulgarian)

Marinov, T.M. (1990) The Zoobenthos of the Bulgarian Sector of the Black Sea. Bulgar-skata Akademijana Naukite, Sofia, 195 pp. (in Bulgarian)

Rullier, F. (1963) Les annelides polychetes du Bosphore, de la Mer de Marmara et de la Mer Noire, en relation avec celles de la Mediterranee. *Rap. Comm. int. Mer Medit.* 17: 161-260.

Yakubova, L.I. (1948) Features of the biology of Prebosphoric sector of the Black Sea. *Trudy Sevastopol'skoj, Biologicheskoy Stantsii* 6: 274-285. (in Russian)

World Register of Marine Species (2017) World Polychaeta database. <http://www.marinespecies.org/traits/aphia.php?p=taxdetails&id=985> Accessed on 27.09.2017.

Zhirkov, I.A. (2001) Polychaetes in the Arctic Ocean. Yanus-K, Moscow 631 pp. (in Russian)