First occurrence of the invasive alien species *Streblospio gynobranchiata* (Rice & Levin, 1998) and *Polydora cornuta* Bosc, 1802 (Polychaeta: Spionidae) on the coast of Abkhazia (Sukhum Bay, Black Sea)

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Hydrobiological studies on the Abkhazian coast of the Black Sea have been carried out until the mid-1980s and they were discontinued completely in 1991 due to USSR collapse. A complex investigate of the environment and biota of the deep-water Gudauta area (Matishov et al., 2014) and a climate variability of temperature along the coast of the Republic of Abkhazia (Kostianoy et al., 2017; Lebedev et al., 2017) were conducted nowadays.

![Figure 1. Location of the stations where specimens of alien spionid polychaete were found.](image-url)
This study reports the first occurrence of an alien spionid polychaetes *Streblospio gynobranchiata* (Rice & Levin, 1998) and *Polydora cornuta* Bosc, 1802, in the Abkhazian coast and new locality for distribution of the species in the Black Sea. Three stations in Sukum Bay (port area) at the depths of 3–5 m were sampled with a Petersen grab (0.04 m² capture area) on September 2016 (fig. 1). Temperature of water at which stations were located reached 27.5°C. The mud bottom sediments at the site of sampling consisted of black and dark gray silted sand with the smell of hydrogen sulfide. Samples were thoroughly washed through a sieve with the mesh size of 0.5 mm and fixed with 4% formaldehyde solution in sea water. In the laboratory, worms were sorted and identified to species under a stereomicroscope, and preserved in 70% ethanol.

Morphological characteristics of the specimens of *S. gynobranchiata* and *P. cornuta* collected from Sukhum Bay (fig. 2) are similar to those descriptions from the bays of Sevastopol and Novorossiysk and adjacent waters (Boltacheva, 2008; Boltacheva, Lisitskaya, 2007; Radashevsky, Selifonova, 2013).

**Figure 2.** Alien spionid polychaetes from Sukhum Bay, Black Sea. A – general view of *Streblospio gynobranchiata* (female, length 6.35 mm), B,C – *Polydora cornuta* morphology (fifth chaetiger): major spines with tooth (at) and companion chaetae (bc). Scale bars: 10 μm.

*Streblospio gynobranchiata* differs from the other species of *Streblospio* in having a gametes from chaetigers 7–8. Female brooding structures: dorso-lateral digitiform epithelial extensions from chaetigers 19–21 to chaetigers 26–30. Abkhazian specimens of species were 6.35–7.5 mm long and 0.5 mm wide for 55–59 chaetigers. Its population density varied from 25 to 400 ind./m², at the average values 150±10.8 ind./m². Maximal density of species recorded at station 1, located near of estuary river Basla. *S. gynobranchiata* inhabit the upper layer of muddy sediments containing hydrogen sulphide and it includes on the list of worst invaders. Species was recently introduced and is currently spreading in the Mediterranean, Black and Caspian Seas. The first record of *S. gynobranchiata* in the Black Sea was reported from the polluted sediments of Novorossiysk Bay (Murina et al., 2008) and later reported from the Aegean Sea, Turkey (Çinar et al., 2005), the southern part of the Caspian sea (Taheri et al., 2008), and the Sevastopol Bay, Crimea (Boltacheva, 2008), and the Golden Horn Estuary, Bosphorus Strait (Çinar et al., 2009), and was subsequently reported from the northeastern Black Sea (Bolshoi Utrish, Snake Lake) (Selifonova, 2015). Recently, Semin et al. (2017) recorded this species from Taganrog Gulf, the Sea of Azov.

*Polydora cornuta* mainly differs from the other species of *Polydora* in having a slender, subdistal longitudinal flange on falcate spines of fifth chaetiger and is unique in the morphology of companion chaetae.
on fifth chaetiger, adhering closely to the convex side of the spines (see fig. 2). Our specimens collected from Sukhum Bay are up to 10–13 mm long and 1.1 mm wide for 57–60 chaetigers. Population density of *P. cornuta* varied from 25 to 50 ind./m², at the average values 25±11.1 ind./m². At sampling stations there were the specimens in muddy tubes. Despite the fact that genuine *P. cornuta* is a tubedwelling species unable to bore into calcareous substrata, long time in the Black Sea this species was misidentified as *P. ciliata*. Re-examination of species of the “Polydora-complex” (Radashevsky, 2005; Surugiu, 2005) revealed that seven species names belonging to the genera *Polydora*, *Dipolydora*, and *Pseudopolydora* have been cited for the Black Sea to date. Recently, *P. cornuta* is known from the north-western Black Sea (Radashevsky, 2005; Surugiu, 2005; Vorobyova, Bondarenko, 2009), the Crimea, the northern Black Sea (Boltacheva, Lisitskaya, 2007), the Bosporus region and the Sea of Marmara (Karhan et al., 2008; Çınar et al., 2009). Bolshoi Uturisk (Snake Lake) and Tuapse harbor, the northeastern Black Sea (Selifonova, 2011; Radashevsky, Selifonova, 2013), the Sea of Azov (Radashevsky, Selifonova, 2013; Boltacheva, 2013). The species is nowadays cosmopolitan. It is being widely distributed by shipping and aquaculture. *P. cornuta* is now considered to be one of the worst invasive species in soft bottom communities in the Mediterranean Sea (Zenetas et al., 2005). This species is characterized by ability to colonize disturbed and polluted substrata and to establish high density populations in a short time.

The origin of the populations of *S. gynobranchiata* and *P. cornuta* from Sukhum Bay have been linked probably to the introduction of them by shipping, as it was previously found in and around large commercial harbours which host many inter-oceanic cargo ships. Our findings show that currently this a new locality for distribution of alien spionid polychaete in the Black Sea. The reproduction strategy of *S. gynobranchiata* (Boltacheva et al., 2015) can facilitate fast and potentially massive expansion of the invasive alien along the Black Sea coast shoreline.

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**References**


