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The first record of *Piscicola pojmanskae* Bielecki, 1994 in the Gulf of Gdańsk (the southern Baltic Sea) with species characteristics distinguishing it from *Piscicola geometra* (Linnaeus, 1758)

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Key words: *Piscicola pojmanskae*, *Piscicola geometra*, macrozoobenthos, Baltic Sea

Abstract

Specimens of *Piscicola pojmanskae* were identified in the macrozoobenthos community in *Zostera* meadows in Puck Bay. The presented paper is the first report on the observation of this species in the Gulf of Gdańsk (the southern Baltic Sea). Leeches are a rare component of the benthic fauna in this brackish water area.

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INTRODUCTION

Leeches were found occasionally in the shallow water of the Baltic estuaries (Zettler & Daunys 2007, Żmudziński 1957, Ezhova et al. 2005), including the Gulf of Gdańsk (Żmudziński 1997, Kotwicki et al. 1999). Specimens from the *Piscicola* order were usually classified as the most common Piscicolidae species *Piscicola geometra* (Linnaeus, 1758). Based on the morphological and anatomical studies of specimens, Bielecki distinguished a number of species within this group, e.g. *Piscicola pojmanskae* Bielecki, 1994 (Bielecki 1994, Jueg et al. 2004, Bielecki et al. 2011).

MATERIALS AND METHODS

Single findings of *Piscicola* sp. were reported during sampling of the benthic fauna on Długa Mielizna − a sandy shoal along the Hel Peninsula (Puck Bay). A total of 18 samples (1-3 replicates) were collected by a diver with a modified Kautsky frame (0.2 × 0.2 m) at twelve sites in July 2008, then passed through a 1 mm mesh sieve and preserved with 4% formalin. The sandy bottom at the sampling sites was covered with *Zostera marina* and *Zannichellia palustris* meadows. Leeches were found at the sites with a maximum depth of 3 m and salinity of ca. 7. Specimens were identified using the morphometric analysis.

RESULTS AND DISCUSSION

The analysis revealed the presence of *P. pojmanskae* on Długa Mielizna. A total of eleven specimens of leeches were found at seven sites. The morphological characteristics of *P. pojmanskae* and *P. geometra* are listed in Table 1 (based on Bielecki 1995) (Fig. 1).

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Table 1

Distinguishing characteristics of *P. pojmanskae* and *P. geometra*

Characteristic	*Pisciola pojmanskae* Bielecki, 1994	*Piscicola geometra* (Linnaeus, 1758)
External morphology		
• **Maximum length** • **Body shape**	25 mm short, thickset, slightly flattened	50 mm elongated, cylindrical
• **Shape of suckers**	ellipsoidal, the caudal sucker can be heart-shaped	Circular
• **Coloration pattern**	brown or black melanophores concentrated as transversal stripes	brown or black star-shaped melanophores in one wide stripe in the medial body line on the dorsal side, the stripe interrupted by transversal bright stripes, specific bright cross-shaped spots
• **Distance between gonopores**	6 annuli	4 or 5 annuli
• **Copulatory area and spermatheca opening**	short	elongated
Internal morphology		
• **Ovisacs**	consisted of many lobes, convoluted	consisted of single lobe, non-convoluted
• **Conducting tissue**	long	short
• **Vector tissue**	narrow plate, perpendicular to the long axis of the body	wide plate, parallel to the long axis of the body
• **Ejaculatory duct**	with tendency to form semi-loops and loops	without tendency to form loops, presence of single semi-loops
• **Seminal vesicle**	at the first pair of testisacs	halfway between the first and the second pair of testisacs

To date, this euryhaline species has been found in several reservoirs: freshwater lakes and fish ponds in Poland and Germany (Bielecki 1994, 1995; Bielecki & Dzika 2000; Jueg et al. 2004; Bielecki et al. 2008), β-oligosaline lake Gardno (Bielecki 1994, 1995; Jabłońska-Barna & Bielecki 2003), and the brackish water of the Curonian Lagoon (Zettler & Daunys 2007). At the same time, these water bodies are inhabited by other species of leeches, including *P. geometra* (Bielecki & Dzika 2000, Zettler & Daunys 2007). *P. pojmanskae* has never been reported from the Gulf of Gdańsk.

In the Gulf of Gdańsk, specimens of *P. pojmanskae* were found on vascular plants (mainly *Z. marina*) in 2008 and 2012 and one specimen from the genus *Piscicola* was observed in blue mussel beds in 2010 (Table 2). In the previous reports from the Baltic Sea, the fish leech was collected on macroalgae (Andrulewicz et al. 2004), *Fucus* and mytilid patches (Hansen et al. 2008, Nohrén et al. 2009, Koivisto &

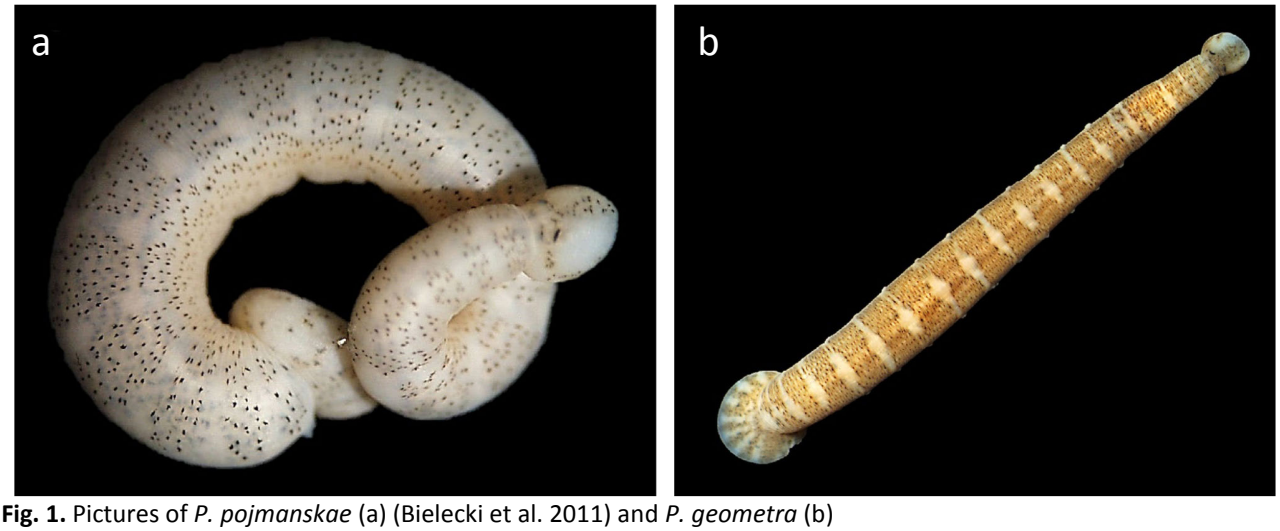

Fig. 1. Pictures of *P. pojmanskae* (a) (Bielecki et al. 2011) and *P. geometra* (b)

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Table 2

Observations of Piscicolidae in the Gulf of Gdańsk

Taxon	Region	Year	Reference
Piscicola geometra	Puck Bay	1962-1963	Żmudziński 1997
Hirudinida	Outer Puck Bay (Długa Mielizna)	1991-1992	Kotwicki et al. 1999
Piscicola geometra	Inner Puck Bay (nearshore off Puck)	1994-1995	Morozińska-Gogol 1999
Piscicola geometra	Puck Bay (nearshore off Hel)	2003	Kvach & Skóra 2007
Piscicola pojmanskae	Outer Puck Bay (Długa Mielizna)	2008	This research
Piscicola sp.	Gulf of Gdańsk (depth 19 m)	2010	Authors' unpublished data
Piscicola pojmanskae	Outer Puck Bay (nearshore off Kuźnica)	2012	Authors' unpublished data

Westerbom 2010), and *Chara* beds (Hansen et al. 2008). When not feeding, most piscicolids live freely on submerged macrophytes or stones where after fertilization they also cement egg-cocoons (Kearn 2004). Most findings of leeches listed in Table 2 took place in summer.

Underwater vegetation and blue mussel beds are typical habitats for small fish like gobies and sticklebacks (Jackowski 2002, Sapota 2004, Nohrén et al. 2009). In the Bay of Puck, *P. geometra* was also found directly on the skin of round goby *Neogobius melanostomus* (Pallas, 1814) (Kvach & Skóra 2007) and stickleback *Gasterosteus aculeatus aculeatus* Linnaeus, 1758 (Morozińska-Gogol 1999). In other areas of the Baltic Sea, the species was also found on the skin of eel *Anguilla anguilla* (Linnaeus, 1758) (Rolbiecki & Rokicki 2006), ninespine stickleback *Pungitius pungitius* (Linnaeus, 1758), viviparous eelpout *Zoarces viviparus* (Linnaeus, 1758) (Zander et al. 1999), and Baltic flounder *Platichthys flesus* (Linnaeus, 1758) (Køie 1999). Leeches occurred also on the skin, the mouth cavity, and the gill of pike-perch *Sander lucioperca* (Linnaeus, 1758) (Rolbiecki 2003) and ide *Leuciscus idus* (Linnaeus, 1758) (Sobecka et al. 2004). Although Piscicolidae are generalists, they infest fewer hosts due to lower levels of prevalence in the estuarine brackish water (Zander et al. 1999). In freshwaters, *P. pojmaskae* was found on the common carp *Cyprinus carpio* Linnaeus, 1758 (Bielecki 1995) and roach *Rutilus rutilus* (Linnaeus, 1758) (Bielecki & Dzika 2000). *P. geometra* is a common and abundant parasite of many fish species, including tench *Tinca tinca* (Linnaeus, 1758), river bream *Abramis brama* (Linnaeus, 1758) and perch *Perca fluviatilis* Linnaeus, 1758 (Bielecki & Dzika 2000, Rückert et al. 2007, Sobecka & Słomska 2007), especially dangerous to fish larvae (Bielecki 1988).

Both *P. pojmanskae* and *P. geometra* inhabit lotic and lentic freshwater, and brackish water estuaries in Europe; they often co-occur with other Hirudinida species (Zettler & Daunys 2007, Bielecki et al. 2011). Due to high ecological tolerance, great abundance and severe damage in fish farming, leeches play an important role in freshwater reservoirs (Koperski 2010, Bielecki et al. 2011), but their role in the brackish water is unknown.

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