

First record of rare fish snake blenny *Lumpenus lampretaeformis* (Walbaum 1792) in the Puck Bay

Pierwsze odnotowanie rzadkiego gatunku ryby taśmiaka długiego *Lumpenus lampretaeformis* (Walbaum 1792) w wodach Zatoki Puckiej

Authors' Contribution:

A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

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Abstract: Snake blenny was noted for the first time in the Puck Bay [see Fig.1] on depth 42.1 m. This part of the Bay is connected with Gdańsk, deep with the maximum depth of 118 m. Snake blenny is probably a post glacial relict fish species in the Baltic. It prefers comparatively deep waters between 30 m to 120 m, as those water depths probably holds the suitable habitat for the fish for spawning and feeding life. However, considering snake blenny's low tolerance for oxygen deficiency, which may occur in deepest parts of the Gulf of Gdansk, this species may be endangered in this area.

Keywords: Snake blenny, *Lumpenus*, Puck Bay, relict, anoxia

Streszczenie: Taśmiak długi *Lumpenus lampretaeformis* (Walbaum 1792) został odnotowany po raz pierwszy w wodach Zatoki Puckiej na głębokości 42,1 m (rys 1.) w bezpośrednim sąsiedztwie Głębi Gdańskiej gdzie maksymalna głębokość dochodzi do 118 m. W Bałtyku ryba ta jest prawdopodobnie reliktem pochodzenia polodowcowego. Siedliskiem taśmiaka długiego, zarówno dla celów rozrodczych jak i żerowiskowych, w Bałtyku są wody w zakresie głębokości od 30 m do 120 m. Biorąc pod uwagę wrażliwość tego gatunku na niedobory tlenowe, które występują w Bałtyku w szczególności w najgłębszych partiach wód włączając tu Głębę Gdańską, jego siedliska mogą być zagrożone.

Słowa kluczowe: Taśmiak długi, *Lumpenus*, Zatoka Pucka, relict, niedobory tlenowe

Introduction

Snake blenny *Lumpenus lampretaeformis* (Walbaum 1792) is a marine fish species belonging to the prickleback family Stichaeidae. It's the only species of the genus *Lumpenus* (Reinhardt 1836) in the Baltic Sea (Fritz 1996, Reichholf & Steinbach 1998). In Poland this species is under partial protection (Regulation 2014). In the Baltic Sea, the snake blenny is probably a post-glacial relict species (Bagge 1981, Klenz 1997, Klenz 2003, HELCOM 2007), originating from the last Scandinavian glaciation, often referred to in Poland as the Baltic Glaciation (see Szafer 1953). Until now this species has been found in deeper waters (from 30 m to 120 m) from the Skagerrak strait to the Gulf of Finland (HELCOM 2007). The Puck Bay constitutes an exception to this with no earlier occurrences (Skóra 1993). In

its adult stage the snake blenny is a demersal fish tied to sand and silt sediments, and less often gravel sediment (Fritz 1996, Reichholf & Steinbach 1998). The species is sensitive to oxygen deficiency (HELCOM 2007), and considering that anoxia is a common occurrence in the deepest parts of the Baltic Sea (Hansson et al. 2011, Hansson & Andersson 2013, 2014), the habitats of snake blennies may be degraded, and the species itself may be used as an important indicator of the ecological condition of deeper sea waters.

Description of catch site

Snake blenny was noted within the boundary of the outer part of the Puck Bay. The agreed upon border of the Bay from open

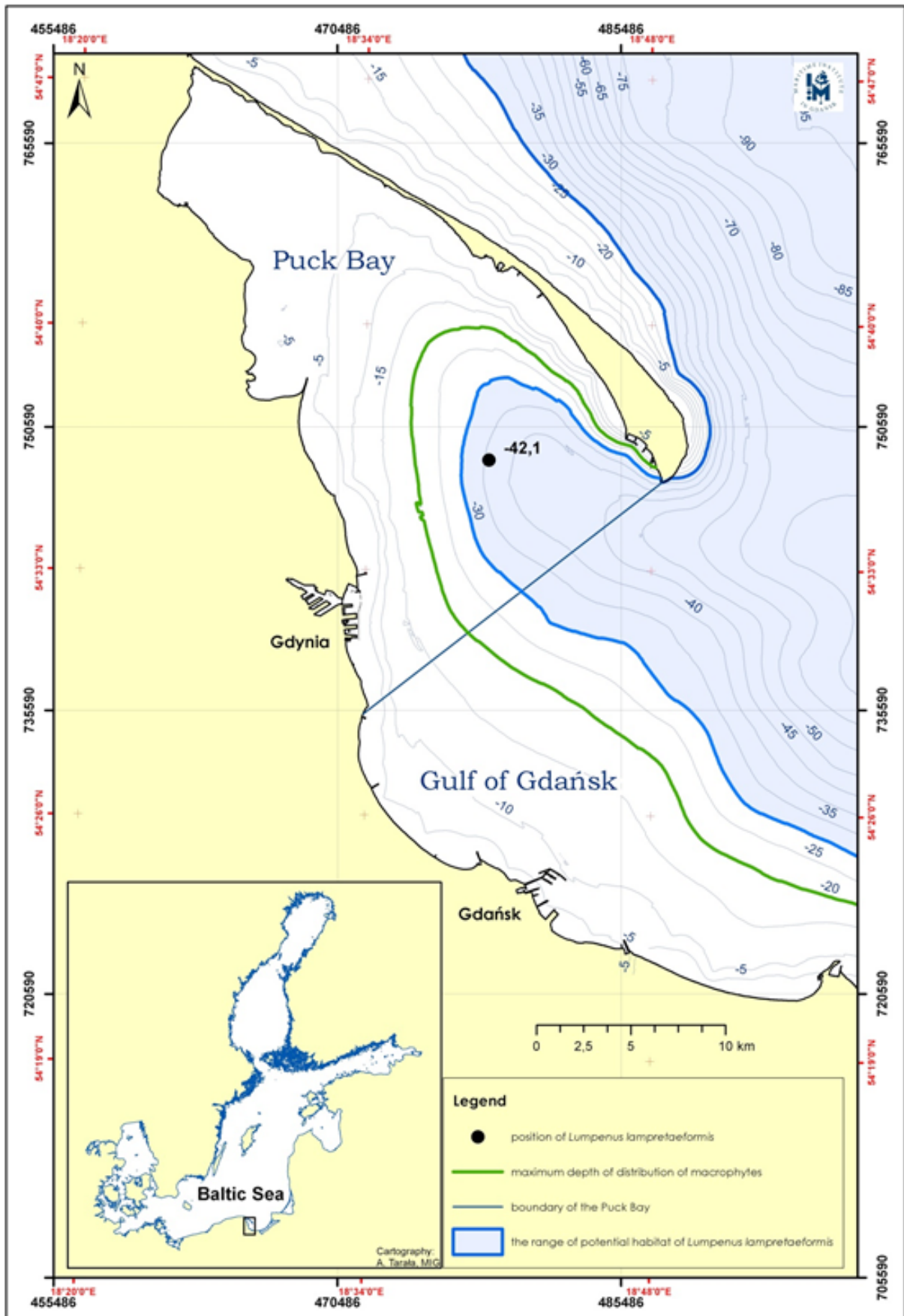


Fig1. The new record and possible occurrence of snake blenny *Lumpenus lampretaeformis* in the Puck Bay
Source: Maritime Institute in Gdańsk (made by Anna Tarała)



Fig 2. Snake blenny *Lumpenus lampretaeformis*, Puck Bay. Source: Maritime Institute in Gdańsk

sea is the line between Hel Peninsula to Kępa Redłowska Natural Reserve (Fig. 1). The deepest part of the Bay, where snake blenny was found at 42.1 m, is located near the Hel Peninsula. It forms a tunnel which gets shallow in the north-east direction until it reaches a depth of 54 m near the Hel Peninsula and connects with the deepest parts of the Gulf of Gdańsk and Gdańsk Deep, with the maximum depth of 118 m. This tunnel observes an intense water flow dynamic (Kruk-Dowgiałło 2000, Rudowski et al. 2015). Water circulation in the bottom part of this tunnel is strongly dependent on the deep sea waters with higher salinity coming from the Gdańsk Pool (Nowacki 1993). A frequent occurrence in these waters is upwelling (Nowacki 1993).

Macrophytobenthos is non-existent at a depth of below 20 m in the Puck Bay (Kruk-Dowgiałło 2000). Below this depth, the only form of life belongs to the animal world. The largest amount and biomass of zoobenthos are the groups Bivalvia (dominant *Macoma baltica*), Oligochaeta, Polychaeta, Crustacea and Priapulida (based on research conducted in the abovementioned tunnel at the depths between 30 m to 50 m) (Osowiecki 1995). Demersal ichthyofauna in that tunnel is unknown and data regarding it comes solely from commercial fishery. The place where the snake blenny was found is situated in the ICES SD 26 and statistical rectangle S5, where the main species caught are the pelagic species herring (*Clupea harengus*) and sprat (*Sprattus sprattus*), and the demersal species cod (*Gadus morhua*) and flounder (*Platichthys flesus*). Additionally, fish such as garfish (*Belone belone*), perch (*Perca fluviatilis*), turbot (*Scophthalmus maximus*), eel (*Anguilla anguilla*) and Zander (*Sander lucioperca*) are also caught (CMR 2005 - 2014)

Description of specimen and catch method used

A specimen of snake blenny with the total length (Lt.) of 27 cm (fig. 2) was noted in April 2014 in the Puck Bay at depth of 42.1 m in an area south-west from the Gdańsk Deep near to the Hel Peninsula. The specimen was characterized by an elongated slippery body with numerous irregular brown spots with a sin-

gle dorsal fin almost the entire length of the body and a single, engaged two thirds anal fin. Anal orifice is located in the center of the body and the head is small and constitutes an extension of the body.

Scientific catch was done by standardised bottom trawl used in accordance with ICES recommendations (International Baltic Fish Survey Trawl) using as mesh size of the codend of the trawl equal to 20 mm. Trawling speed was 3 knots and the otter board was spread at 40 m, and a transect was equal to 550 m and 22 000 m² were trawled.

Discussion

This study presents the first record of an adult specimen of the snake blenny in the Puck Bay. The place of record is found in the deepest part of the outer Puck Bay, and connects to the deeper part of the Gulf of Gdańsk. The tunnel, along with the entire deep part of the Gulf of Gdańsk, is within depth tolerance for this species (depths between 30 m to 118 m), and likely holds a suitable habitat for snake blenny. In the deepest parts of the Gulf of Gdańsk anoxia occurs, which snake blenny is sensitive to, whereas most of the bottom zone up to 30 m is oxic (Hansson et al. 2011, Hansson & Andersson 2013, 2014). Significant water circulation in the direction of the tunnel, from open parts of the Gulf of Gdańsk likely yields sufficient water exchange that further can create favourable conditions for snake blenny to reside in. Considering the dietary preference of this species, which is Oligochaeta, Polychaeta or Crustacea (Firtz & Miltz 1996, Muss & Nielsen 2013), the habitat in which the species is found is also suitable for the species. Snake blenny itself is also a food source for cod (*G. morhua*) or mammals such as harbor seal (*Phoca vitulina*) (Tollit et al. 1998) which are also found in this area.

It's necessary to determine what the state of population of snake blenny is in the waters of the Gulf of Gdańsk in order to enable protection of the species as it is under partial protection (Regulation 2014). The snake blenny populations in the Baltic Sea, probably being relics of post glacial fauna and found only at significant depths below 30 m, can display a certain level

of population isolation. Noting of a specimen of this species in the north-eastern part of the Baltic Sea, which indicates a high probability of existence of this species in that area, can be a reference point in studying the Baltic population of this

fish. Considering snake blenny's low tolerance for low oxygen levels, this fish may be used in the future as an indicator of the ecological condition of the deep water areas in the Baltic Sea. This however requires numerous studies in that direction.

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