

Short Communication

The first record of *Maeotias marginata* (Modeer, 1791) (Cnidaria, Hydrozoa) from Finland, northern Baltic Sea

Mikael von Numers

Department of Biosciences, Environmental and Marine Biology – Åbo Akademi University, BioCity, FI-20520 Turku/Åbo, Finland

E-mail: mnumers@abo.fi

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Abstract

The hydromedusa, *Maeotias marginata* (Cnidaria, Hydrozoa), was observed in the low salinity (ca 4) archipelago of Southwest Finland in the northern Baltic Sea in August 2012. The species is considered to be native to the Sea of Azov. The only previous records of *M. marginata* in the Baltic are from 200 km south in western Estonia, in 1999-2003.

Key words: Ponto-Caspian; hydromedusa; Finland; ballast water; archipelago; first record

Introduction

The Baltic Sea can be regarded as a “brackish-water island” surrounded by land and isolated from other brackish-water bodies by physical (ocean and land) barriers (Leppäkoski et al. 2009). The Black Sea, the Caspian Sea, the Sea of Azov, and many estuaries are similar islands. Ship traffic is the most important vector for the spread of aquatic organisms into the coastal waters of northwestern Europe, including the Baltic Sea (Leppäkoski and Olenin 2001). A common source of non-indigenous aquatic species to European and North American waters is the Ponto-Caspian region (Leppäkoski et al. 2009). Here I report on the first record of the Ponto-Caspian hydromedusa *Maeotias marginata* (Modeer, 1791), (Cnidaria, Hydrozoa) in Finnish coastal waters, which represented the northernmost finding of the species in the world to date. The only previous records from the Baltic Sea are from about 200 km south in Estonia between 1999 and 2003 (Väinölä and Oulasvirta 2001; Simm and Põllumäe 2006). The possible connection between the new record and the Estonian records was briefly discussed.

Results

A specimen of *Maeotias marginata* was collected in the municipality of Naantali (N 60.4887, E 21.7707) in the archipelago of SW Finland in the northern Baltic Sea during August 2012 (Figure 1). The distance to the port city of Naantali is about 20 km. The area belongs to the inner archipelago zone close to the mainland, with shallow (< 8 m depth) and low salinity (ca. 4) water. Water temperature was 17°C and the depth at the collection site was about 1 m. Substrate was mostly glacial till. The water was somewhat turbid. The vegetation was comprised mainly of *Stuckenia pectinata* (Linnaeus) Börner, 1912 and *Potamogeton perfoliatus* (Linnaeus). On the date of capture of the specimen, there was a bloom of cyanobacteria (*Anabaena* sp. and *Aphanizomenon flosaquae* Ralfs ex Bornet and Flahault, 1888) at the site. *Maeotias marginata* was seen among 3-4 specimens of the native scyphomedusa *Aurelia aurita* (Linnaeus, 1758). The specimen was easily distinguished from the *Aurelia* by its smaller size (diameter ca. 4 cm), faster rhythmic pulsating movements and the four linear radial

Figure 1. Location of first capture of *Maeotias marginata* in the archipelago of SW Finland (star) in 2012 (N 60.4887, E 21.7707), and the Estonian localities from 1999 (Vainölä and Oulasvirta 2001; solid circle) and 2002 – 2003 (Simm and Põllumäe 2006; solid triangle).



Figure 2. Side view (left) and bottom view (right) of the first specimen of *Maeotias marginata* from Finnish coastal waters. The three of the four linear radial canals are clearly discernible in the right view. Photographs by Mikael von Numers.

canals forming a cross. On closer inspection, the dense fringe of long tentacles along the bell margin could clearly be seen. The specimen was captured and put in a glass bowl. It was carefully photographed (Figure 2), and after a few hours in the bowl, it was released in the same place as it was captured.

Discussion

Maeotias marginata is of Ponto-Caspian origin (Mills and Rees 2000). It is considered a distinct species, but the early history of its nomenclature is complicated (Hummelinck 1941, Mills and Rees 2000). The first record of *M. marginata* is from the Netherlands in 1762 (Mills and Rees 2000). The Ponto-Caspian population from the estuaries of Don and Kuban rivers in the Sea of Azov was initially described as *M. inexpectata* (Ostroumoff, 1896), but the Ponto-Caspian and Dutch forms are now considered to be conspecific (Mills and Rees 2000). The species has also been recorded from western France (Denayer 1973) and from temperate North American estuaries (Mills and Sommer 1995). The first finding of *M. marginata* from the Baltic Sea is from August 1999, from the shallow waters of the Väinameri region in western Estonia (Figure 1). About a dozen specimens were collected in four locations at depths of 1 to 5 m (Väinölä and Oulasvirta 2001). The environmental conditions were similar to those of the present area, with a salinity of 6-7 and a water temperature of 17.6°C. Extensive sampling in the Väinameri area in 2002 to 2004 (Simm and Põllumäe 2006) resulted in four additional specimens: two small individuals (bell diameter 1.5 and 3.0 mm) in 2002, and two larger individuals (15 and 30 mm) in 2003. Since 2003, no additional specimens have been found in coastal waters of Estonia (Arno Põllumäe and Mart Simm, University of Tartu, Estonian Marine Institute, pers. com., November 2012).

Maeotias marginata likely was introduced through the benthic polyp stage carried in ships' ballast to the Väinameri region (Väinölä and Oulasvirta 2001). Hydrozoan polyps propagate asexually and produce resting stages (e.g. Mills and Sommer 1995). According to Väinölä and Oulasvirta (2001) the Estonian population may have been spreading asexually, budding and cysting (but not producing medusae) for some time before the observations were made in 1999.

This might also be the case in the SW archipelago of Finland. Väinölä and Oulasvirta (2001) relate the sudden occurrence of *M. marginata* to the unusually warm summer of 1999. The summer of 2012 was not warm, however, suggesting there might be other factors involved.

The time lag between the Estonian finding and the present study is 9 years. While field workers are currently alert to the possibility of finding introduced species, one has to understand that the likelihood of detecting cryptic species such as *M. marginata* is still very small. The species might have been present in Finnish waters in its benthic phase for several years, but not detected. Based on this single record, it is not possible to conclude whether the species has recently been introduced by shipping to the nearby Naantali harbour, or if it has spread unaided from the Estonian sites. The fact that the distance from the Estonian sites is about 200 km of open sea, and that *M. marginata* has not been recorded in Estonia since 2003, makes the last alternative less likely. The low salinity and shallow archipelago of SW Finland should provide suitable environment for the species. Even the winters with ice cover may not pose a problem because the native habitat in the Sea of Azov is often ice covered during the winter (Kosarev et al. 2007).

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References

- Denayer J-C (1973) Trois méduses nouvelles ou peu connues des côtes françaises: *Maeotias inexpectata* Ostroumov, 1896, *Blackfordia virginica* Mayer, 1910, *Nemopsis bachei* Agassiz, 1849. *Cahiers de Biologie Marine* 14: 285–294
- Hummelinck PW (1941) Medusenfundes von *Maeotias marginata* (Moeder) in den Niederlanden. *Zoologischer Anzeiger* 136: 9–17
- Kosarev A Kostianoy A Shiganova T (2007) The Sea of Azov. In: Kostianoy A Kosarev A (eds), *The Black Sea environment*. Springer, pp 63–89
- Leppäkoski E, Shiganova T, Alexandrov B (2009) European enclosed and semi-enclosed seas. In: Rilov G, Crooks JA (eds), *Biological Invasions in Marine Ecosystems: Ecological, Management, and Geographic Perspectives*. Springer, pp 529–547, http://dx.doi.org/10.1007/978-3-540-79236-9_30
- Leppäkoski E, Olenin S (2001) The meltdown of biogeographical peculiarities of the Baltic Sea: the interaction of natural and man-made processes. *Ambio* 30: 202–209, <http://dx.doi.org/10.1579/0044-7447-30.4.202>

- Mills CE, Rees JT (2000) New observations and corrections concerning the trio of invasive hydromedusae *Maeotias marginata* (= *M. inexpectata*), *Blackfordia virginica*, and *Moerisia* sp. in the San Francisco Estuary. *Scientia Marina* 64 (Suppl. 1): 151–154
- Mills CE, Sommer F (1995) Invertebrate introductions in marine habitats: two species of hydromedusae (Cnidaria) native to the Black Sea, *Maeotias inexpectata* and *Blackfordia virginica*, invade San Francisco Bay. *Marine Biology* 122: 279–288
- Ostroumoff A (1896) Zwei neue Relicten-Gattungen im Azow'schen Meere. *Zoologischer Anzeiger* 19(493): 30
- Simm M, Põllumäe A (2006) Distribution and population dynamics of selected pelagic alien invertebrate species in Estonian marine waters. In: Ojaveer H, Kotta J (eds), Alien invasive species in the north-eastern Baltic Sea: population dynamics and ecological impacts. *Estonian Marine Institute Report Series* 14: 6–11
- Väinölä R, Oulasvirta P (2001) The first record of *Maeotias marginata* (Cnidaria, Hydrozoa) from the Baltic Sea: a Pontocaspian invader. *Sarsia* 86: 401–404