

## First report of *Saduria (Mesidotea) entomon* (Linnaeus, 1758) (Isopoda: Chaetiliidae) in the Black Sea

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### Abstract

*Saduria entomon* (Linnaeus, 1758) is a glacial relict with a distribution restricted to the Baltic Sea and several lakes in the Scandinavian region. It is also mentioned in arctic shallow waters of the North America, Siberia, and in the Caspian Sea. In February 2009, this isopod was reported for the first time from near the village of Lustdorf, in the Gulf of Odessa, Black Sea, Ukraine.

**Key words:** Baltic Sea, Black Sea, brackish waters, glacial relicts, non-indigenous species, *Saduria entomon*, isopod

*Saduria (Mesidotea) entomon* (Linnaeus, 1758) (Isopoda: Chaetiliidae) is a glacial relict common in the Baltic Sea and several lakes of the Scandinavian region, such as Ladoga, Malaren, Vattern, Vanern, Mjorn (Charlesworth 1957). This isopod entered the Scandinavian region from the Arctic Seas following the ice regression (Ekman 1940, 1953; Segerstråle 1956, 1957). This isopod occurs in shallow estuarine areas in arctic coastal waters of the Beaufort Sea (North America), Siberia near-shores, and in the Caspian Sea (Gurjanova 1933, 1970; Percy 1983).

*S. entomon* is omnivorous scavenger and one of the most important invertebrate predators in the Baltic Sea, which fed on benthic invertebrates, mostly amphipod *Monoporeia affinis* (Crustacea: Pontoporeiidae) (Leonardsson 1986, 1991; Sandberg and Bonsdorff 1990, 1993; Ejdung and Bonsdorff 1992; Hill and Elmgren 1992). It is also an important food item for many of fish species, such as sculpin, cod, and flounder (Leonardsson et al. 1988). This species is good adapted to long periods of hypoxia, common on the bottom of the Baltic Sea (Hagerman and Oksama 1985; Hagerman and Szaniawska 1990).

In February 2009 *S. entomon* (Figure 1) was first recorded from near the village of Lustdorf, 46°20'N, 30°42'E, in the Gulf of Odessa, North-Western Black Sea, Ukraine. Several specimens were found in nets by fishermen, and three of them were brought to the Odessa Branch of the Institute of Biology of the Southern Seas of National Academy of Science of Ukraine for further identification. According to the fishermen, *S. entomon* were found attached to the sprat *Sprattus sprattus phalericus* (Risso, 1826) (Actynopterygii: Clupeidae) and this was not the first time that the isopod had been observed from the Lustdorf area. To confirm the identification of the isopod the author compared the Ukraine material with a specimen of *S. entomon* captured from the Gulf of Gdańsk, Poland, Baltic Sea.

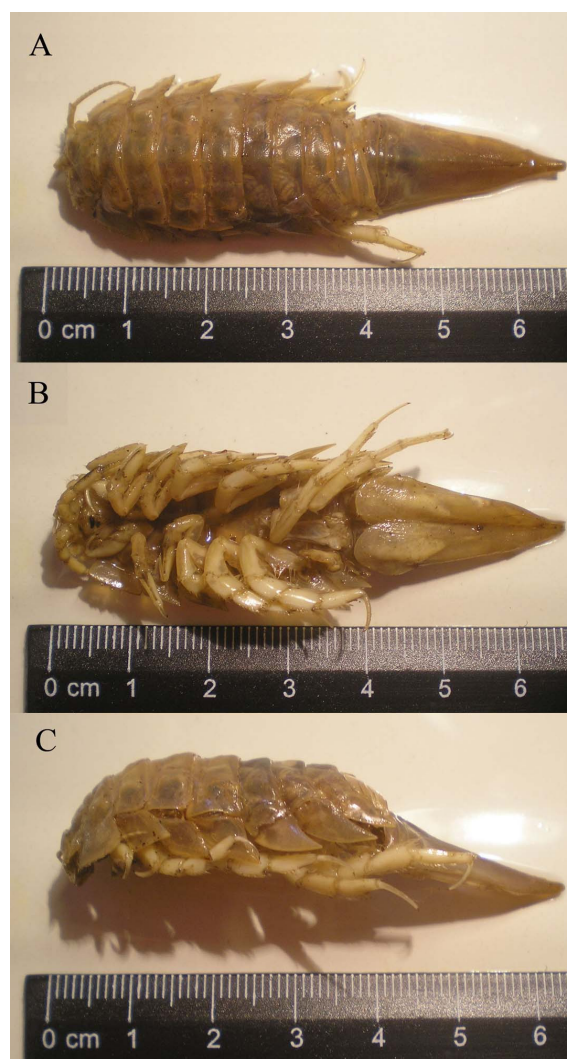
*S. entomon* is found in some freshwater lakes of the Scandinavian and the brackish waters of the Baltic Sea. According to Zenkevich (1963) the Baltic is the most desalinated (6-8‰) sea in the World and the Black Sea has an average water salinity of 18‰. Both seas are therefore classified as brackish according to the Venetian system of water salinity (Dethier 1992). They also have similar geological history being separated for the most part from the Atlantic

Ocean basin. The Black Sea was connected with the Mediterranean Sea about 5-7,000 years ago, and the Baltic Sea to the North Sea nearly 7,000 years ago. These factors caused some similarities in the fauna of these water bodies; for example another isopod, *Idothea balthica* (Pallas, 1772), is common for both Black and Baltic Seas.

*S. entomon* is well adapted to anaerobic conditions due to the presence of respiratory alkalosis (Hagerman and Oksama 1985; Hagerman and Szaniawska 1990). Consequently hypoxic conditions due to the presence of H<sub>2</sub>S in the deep waters, coastal lagoons and estuaries of the Black Sea have not presented a problem to the establishment of this non-indigenous isopod. In fact its presence may be detrimental for other benthophagous species such as gobiids as they compete for the same food source. However, *S. entomon* may become a source of food for some important commercial fish species such as flounder *Platichthys flesus luscus* (Pallas, 1814), turbot *Psetta maxima maeotica* (Pallas, 1814), etc.

The possible way of introduction of *S. entomon* to the Black Sea is ballast waters of shipping transversing the “northern” (Panov et al. 2007), “central” and “southern” invasion corridors (sensu Galil et al. 2007) from the Baltic region. The introduction of this species from the Caspian Sea is also possible via the “northern” corridor, through the Volga-Don canal. Four, less possible rout of introduction with ballast waters is a route around Europe, through the North Sea, Atlantic Ocean, Mediterranean Sea and the Sea of Marmara. This route was proposed as possible way of introduction of the Black-Sea round goby, *Neogobius melanostomus* (Pallas, 1814), to the Baltic Sea (Sapota 2004), but could be used by *S. entomon* to penetrate the Black Sea.

The other possible ways of introduction is transportation of live crustaceans with hull fouling and migration via rivers. The Baltic Sea and Scandinavian lakes are habited by different populations of *S. entomon* and limnetic race is characterized by wide salinity tolerance, but brackish-water race cannot survive in the fresh waters (Lockwood and Croghan 1957). The crustaceans originated from the limnetic population could colonize the brackish waters of the Black Sea using the “northern” corridor, but the brackish-water *S. entomon* could not survive during the transportation/migration through the fresh waters of the rivers. Therefore the introduction



**Figure 1.** *Saduria entomon* caught in the Gulf of Odessa, Black Sea, Ukraine. A – dorsal view, B – ventral view, C – lateral view. Photograph by Y. Kvach

of *S. entomon* to the Black Sea from the Baltic brackish waters in ballast waters seems more likely than the transportation with hull fouling or migration via rivers.

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