

**The occurrence of
Balanus improvisus
Darwin on *Cerastoderma*
glaucum Poiret and
other bivalves in the
Polish zone of the Baltic**

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Abstract

Balanus improvisus Darwin has been found to occur on the shells of the cockle *Cerastoderma glaucum* Poiret near Redłowo. This is the first report of such an observation from the Baltic Sea.

Cirripedia are the only group of crustaceans (apart from parasites) to lead a sessile existence and are thus a significant component of the benthos. They grow on a variety of surfaces, thriving as they do on both biotic and abiotic substrates. They occur numerously on natural rocky substrates, where they are an important component of the intertidal zone community (Crisp *et al.* 1981, Hui & Moyse 1987). They also colonise man-made structures like buoys, groynes, timber piling, concrete embankments, ships, drilling rigs and other hydrotechnical structures (Tarasov & Zevina 1957, Christie & Dalley 1987, Elfimov *et al.* 1995).

Barnacles also occur on other benthic organisms both sessile and mobile, such as sponges, corals, snails, bivalves, crabs, sea urchins, sea squirts and members of their own species (Moore 1935, Puzanov 1954, Vinogradov 1956, Stubbings 1967, Jeffries *et al.* 1982, Zviaginцев 1984, Anderson 1994).

Furthermore, they are found on representatives of the nekton: sharks, sea turtles, sea snakes, manatees and cetaceans (Ross & Jackson 1972, Jeffries & Voris 1979, Anderson 1994), and even on aquatic insects (Tarasov & Zevina 1957).

In the Polish zone of the Baltic the occurrence of *Balanus improvisus* Darwin, the only Polish representative of the *Cirripedia*, is restricted to a few benthic organisms and man-made substrates. This is due to the nature of the Polish coastline, which consists of cliff sections (clay) and sand dunes; there are no rocky shores (Subotowicz 1982, Rosa 1987). None the less, the sandy and muddy bottom provides appropriate conditions for organisms that in turn are a suitable substrate for epizoites.

As regards benthic substrates, *B. improvisus* occurs in the southern Baltic almost exclusively on the shells of the mussel *Mytilus trossulus* Gould. This bivalve is the dominant element of the bottom fauna in this area, and its sessile habit makes it a convenient substrate for barnacles; in fact, they are a permanent feature of mussel shoals, particularly in the shallow-water zone (Laihonon & Furman 1986, Wiktor 1990). Two other Baltic bivalve species – *Macoma balthica* L. and *Mya arenaria* L. – have different habits, which preclude the colonisation of their shells by barnacles. The soft-shell clam *M. arenaria* buries itself deep in the sand, while the Baltic tellin *M. balthica* burrows into muddy bottom sediments, leaving only the ends of its siphons projecting above the surface (Wenne & Wiktor 1982).

The mode of life of the cockle *Cerastoderma (Cardium) glaucum* Poiret is intermediate between that of the mussel and those of *M. arenaria* and *M. balthica*. In the Baltic, this cockle lives on sandy and sandy-muddy bottoms, often overgrown with algae and vascular plants (Persson 1976). Young specimens usually adhere to plants by means of a byssus. Adult specimens on a muddy bottom lead a life typical of epifauna. On a sandy bottom the lifestyle is more typical of infauna (Yonge 1953, after Wołowicz 1991) as with its short siphons the cockle cannot bore very deeply into the sediments. Such behaviour hinders but does not preclude barnacle colonisation on cockleshells, since only the fore end of the shell is buried.

In June 1995 the author discovered *B. improvisus* on the shells of *C. glaucum* on the beach near the Redłowo promontory. The barnacles were two tiny specimens 1.5 and 2 mm in length (the carina-rostrum diameter) on cockleshells 11 and 14 mm long. This is the first such report from the Baltic, as barnacles have not been observed on any other Baltic molluscs apart from the mussel. The only available information of the occurrence of barnacles on *Cardium* shells comes from the Black Sea region (Caspers 1951).

The dearth of literature data on such observations suggests that they are rather rare occurrences. The sporadic colonisation of cockleshells by barnacles in the southern Baltic can probably be linked with the features of this bivalve as a substrate for epizoites. The spherical shape of the cockleshell, due to the proportional growth of its length, width and height (Wołowicz 1991), means that it is readily rolled along the seabed by water currents. Both the shell and the barnacles attached to it are subject to abrasion by the sand on the bottom (Brock 1979). The cockleshell is thus a very unstable substrate for *B. improvisus*. Besides, the fact that the cockle is partially buried in the seabed is an additional factor inhibiting the attachment of barnacles to cockleshells.

The occurrence of *B. improvisus* on *C. glaucum* could well be a reflection of the tendency of the species to colonise all available habitats, even if they are not always optimal.

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