

Balanus improvisus



Taxon	Family /Order/ Class/ Phylum
<i>Balanus improvisus</i> Darwin, 1854	Balanidae / Sessilia / Maxillopoda / Arthropoda

COMMON NAMES (English only)

Bay barnacle
Acorn barnacle

SYNONYMS

None.

SHORT DESCRIPTION

This sessile crustacean has a white and conical shell (up to 17 mm in diameter and 10 mm in height) with a diamond-shaped slightly toothed opening. It occurs in marine and brackish environments and filter feeds on detritus and phytoplankton.

BIOLOGY/ECOLOGY

Dispersal mechanisms

Planktonic larvae are dispersed with water currents.

Reproduction

Acorn barnacles are hermaphrodites and are also able to be facultative self-fertilisers. Self-fertilisation appears to take place somewhat later than cross-fertilisation. Fertilised eggs develop within the ovisac, present in the mantle cavity. Free swimming naupliar larvae hatch from the eggs. Other naupliar instars occur before the transformation to cyprid larvae. The cyprid larvae settle on hard substrate and transform into barnacles. Settlement is influenced by light (larvae are appositively phototrophic), flow velocity and quality of the substratum.

Known predators/herbivores

Mussels and other suspension feeders can filter cyprid larvae from the water column, flounder may feed on adult acorn barnacles.

Resistant stages (seeds, spores etc.)

None.

HABITAT

Native (EUNIS code)

A1: Littoral rock and other hard substrata, A3: Infralittoral rock and other hard substrata, A4: Circalittoral rock and other hard substrata, X1: Estuaries, X3: Brackish coastal lagoons – adult forms, A7: Pelagic water column – larvae. Inhabits littoral and sublittoral stony and rocky bottoms, often can be found on ship hulls, hydro-technical constructions, on sluices, sometimes attaches to crayfishes, crabs and other animals. It also can be found attached to algae (such as bladder wrack *Fucus vesiculosus*).

Habitat occupied in invaded range (EUNIS code)

A1: Littoral rock and other hard substrata, A3: Infralittoral rock and other hard substrata, A4: Circalittoral rock and other hard substrata, X1: Estuaries, X3: Brackish coastal lagoons – adult forms, A7: Pelagic water column – larvae. Brackish water bays, estuaries and various marine habitats with hard substrata (stones, rocky shores and man-made constructions such as breakwaters and ships) from boreal to tropical waters. The depth range is from 0 (splash zone) to ~90 m.



Balanus improvisus on a surface of a navigational buoy

Photo: Sergej Olenin

Habitat requirements

The temperature range is 0-30 °C; optimum conditions for free swimming larvae is ~14 °C. It does not reproduce in fresh water. It has optimum activity at 6-30 PSU and maximal larval settlement is found in mid-salinities. They can stand 0.3 – 0.4 mg/l concentration of NH₄. Lives up to the splash zone, does not tolerate desiccation. The minimum oxygen concentration < 1 ml/l.

DISTRIBUTION

Native Range

Atlantic; most likely from American coast.

Known Introduced Range

Atlantic coast of Europe, Baltic and Black Seas, African coast, Japan, Australian East Coast, New Zealand, Pacific coast of USA, Mexico, Columbia, Peru.

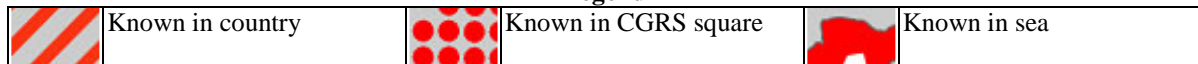
Trend

Spreading.

MAP (European distribution)



Legend



INTRODUCTION PATHWAY

Transported as a fouling organism on ship's hulls, or as planktonic larvae in ballast water; it is also common as an epibiont on imported oysters.

IMPACT

Ecosystem Impact

They can dominate the community by competing for space and food. They change the habitat, fouling blue mussels and oysters.

Health and Social Impact

Sharp shells on the beach may cause human injuries.

Economic Impact

It causes fouling of water intake pipes and heat exchangers, underwater constructions and ships' hulls.

MANAGEMENT

Prevention

Mid ocean exchange of ballast water is necessary to get rid of planktonic larvae. It is important to control mussels and oyster export, as well as boats and other movable equipment which may be contaminated with living barnacles.

Mechanical

They can be physically removed from ship hulls, by high temperatures (tolerates 36° C for 30 hours) and by oxygen deficiency (e.g., one of parallel pipelines closed for 3-4 weeks)

Chemical

Antifouling paints and chlorine treatment of water intake pipelines during the most intensive settling period (0.1-0.5 mg/l) can be efficient.

Biological

Unknown.

REFERENCES

Leppäkoski E (1999) *Balanus improvisus* (Darwin 1854), Balanidae, Cirripedia. In: Exotics across the ocean. Case histories on introduced species: their general biology, distribution, range expansion and impact. Published by University of Kiel, Germany, Department of Fishery Biology, Institute for Marine Science: 49-54

Weidema IR (2000) Introduced species in the Nordic countries. Nord 2000 13, p 242

Hayward PJ, Ryland JS (1996) Handbook of the marine fauna of North-West Europe. Oxford University Press

OTHER REFERENCES

Jarvekiulg A (1979) Donnaya fauna jugo-vostochnoj chasti Baltijskogo morya (The bottom fauna of the eastern part of the Baltic Sea). Valgus, Tallinn

Furman ER, Yule AB (1990) Self-fertilisation in *Balanus improvisus* Darwin. J of Experimental Marine Biology and Ecology, vol 144 (2-3): 235-239

Gollasch S, Leppäkoski E (1999) Initial Risk Assessment of Alien Species in Nordic Coastal Waters. Nord 1999 8, p 245

Author: Sergej Olenin

Date Last Modified: September, 2006