

Barnacles

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Balanus balanus

Class: Maxillopoda
Order: Sessilia
Family: Balanidae
Genus: Balanus

Distribution

Barnacles collectively are global in distribution. The Family *Balanidae* are the stalkless barnacles and the Genus *Balanus* includes the acorn and rock barnacles.

Habitat

Barnacles are encrusters, attaching themselves permanently to a hard substrate. The most common, "acorn barnacles" grow their shells directly onto substrates, they do not use stalks.

Food

Most barnacles are filter feeders. They feed by capture of zooplankton using modified thoracic limbs. When they feed, they open the plates at the top of their shells, and stick out their feathery, fan shaped legs.

Reproduction

These are hermaphrodites. Each barnacle contains both male and female reproductive organs.



These are very prolific and easily seen on the shoreline nearby.

This species *Balanus balanus* is distributed over the entire northern hemisphere. It occurs in large numbers in the more northerly seas including the Arctic Ocean. It has been introduced to Argentina where it is displacing other species and is considered invasive. It is abundant in Nova Scotia coastal waters including Burntcoat Head.

Although they have been found at water depths up to 600 m most barnacles inhabit shallow waters, with 75% of species living in water depths of less than 100 m. *Balanus balanus* is a cold water species found between low water and from 60 to 150 metres deep. They attach themselves to a variety of substrates including bedrock, boulders, pebbles and shells. They will also attach themselves to man made objects such as docks and the hulls of various sizes of water craft. They seem to favour habitats with strong currents.

They are sessile (non-motile) suspension feeders, and have two nektonic (active swimming) larval stages. Post larval barnacles dwell continuously in their shell. They send out feathery "legs" into the water at high tide to catch plankton as it floats by. These feathery appendages beat rhythmically to draw plankton and detritus into the shell for consumption. The "legs" push the plankton down into their opening (mouth). Comb-like structures near the mouth remove the plankton from the legs before they stick out again for more. The first larval stage feeds on coastal plankton. The second does not eat.

This species cross-fertilize with adjacent barnacles. Fertilisation takes place over the course of a few days in each group of barnacles. They brood fertilized eggs within their shells. Eggs change colour from cream to orange and then to a greyish-brown as they begin to develop.



Development

After about forty days of embryonic development, the nauplii (larvae) are released into the water. This is the first freely swimming larval stage. They settle into beds of plankton to feed and further develop, molting several times as they grow. It takes about one month to develop to their second larval stage. They become cypris larvae. This is a non-feeding, swimming phase prior to becoming an adult.

Characteristics

The adult outer shell is steeply conical and circular in shape. The cone base has an irregular edge. The usual diameter is two to three cm but can grow to five cm. It has prominent longitudinal ridges and has a greyish-white appearance.

Adaptations

They are well adapted against water loss. When intertidal zones become dry they close their trap doors. Closure of these plates also provides protection from predators. Plate thickness builds up with the accumulation of calcite crystals.

Status/Threats

Globally they are under no particular threat. They are very prolific.

Sightings in Nova Scotia

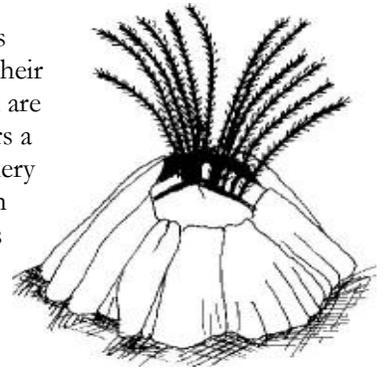
Easily seen in coastal areas including locally.

Nauplii: The number of nauplii produced in a single yearly brood varies with the age and size of the parent. It is estimated a young adult at one year of age may produce 3,000 to 4,000 and a two year old measuring on average 20 mm is capable of producing up to 20,000. Larger individuals at 30 mm may produce even more.

Cypris: This is an active site-selection phase when the cypris are seeking permanent attachment prior to becoming adults. They are able to delay metamorphosis until a suitable substrate such as a rock or stone is located. When the cypris larvae have selected a site and are ready to settle they “glue” their heads to hard surfaces. Once attached, they change into juvenile barnacles, miniatures of the adults.

Young adults: Each builds its own fortress, a cone-shaped limestone shell with a trap door in the ceiling. The newly metamorphosed cyprid develops slowly reaching 1 mm diameter in a few weeks and 7 mm by fall. The growth rate then slows over the winter and the year old barnacle averages 8 mm.

They typically possess six overlapping plates and two sets of opercular plates to protect their opening. The cover plates protecting the lid are shaped like a bird’s beak. When water covers a barnacle, the trap door opens, and the feathery legs emerge to sweep the water for plankton and detritus. When the tide is out, barnacles close their trap doors to conserve moisture. They spend the rest of their lives in this position—head down and feet up.



Within the intertidal zone, different species of barnacle live in very tightly constrained locations, allowing the exact height of an assemblage above or below sea level to be precisely determined. Clustering is a component of fertilization, allowing for insertion of the long, extensible penis from one barnacle into the mantle of a nearby mate. They are stationary and it is essential that the barnacles live no more than three to five centimetres apart to mate. Cement glands within the antennae produce the strong, brown glue that fastens it to its base.

They are vulnerable to dredging and to sedimentation reducing suitable substrata for settlement by larvae.

These occur in many coastal areas and are easily seen on the nearby shoreline.

