



Branchiostoma: External features

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***Branchiostoma* (=Amphioxus), the Lancelet: External features**

Branchiostoma, commonly known as lancelets or amphioxus, is a genus of small marine chordates belonging to the subphylum Cephalochordata. These primitive animals are often considered living representatives of the chordate ancestors, sharing many characteristics with the earliest vertebrates, superficially fish-like chordates. They display the simple primitive chordate condition and are considered a blueprint of the phylum Chordata. The most extensively studied cephalochordate type, and also the best known example of protochordates is *Branchiostoma* (= *Amphioxus*) commonly called as 'lancelet' or 'lancet'. It was first described by the German scientist Pallas in 1778. He considered it to be a slug (phylum Mollusca) and named it *Limax lanceolatus*. An Italian scientist Costa (1834) first recognized its chordate nature and described it as *Branchiostoma lanceolatum*. Two years later (1836), Yarrel named it as *Amphioxus lanceolatus*.

Systematic Position

Phylum Chordata

Group Acrania

Subphylum Cephalochordata

Class Leptocardii

Family Braachiostomidae

Type *Brmchimtoma* (=Amphioxus)

(The Lancelet)

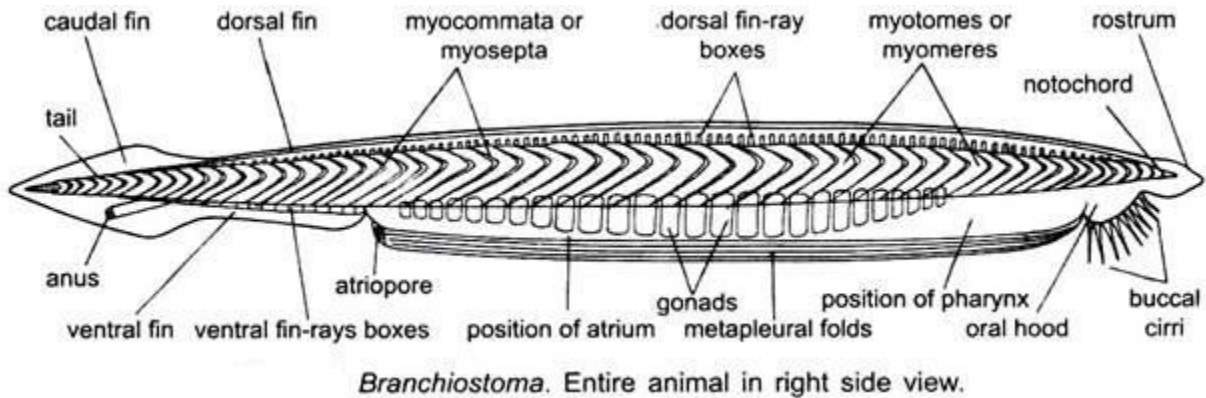
Derivation of Names

The name of the subphylum Cephalochordata (Gr., kephale=head + chorde - cord) is derived from the fact that the notochord extends forward inside rostrum even beyond the so called brain. This feature is encountered nowhere else in chordates. As they lack a skull, the cephalochordates are also called Acrania (Gr., a =absent + kranion = skull).

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The old generic name *Amphioxus* (Gr., amphi= double + oxys = sharp) and the common name 'lancet or lancelet' (a little lance) refer to both ends of the body which are sharp, pointed and lance-like.



Geographical Distribution

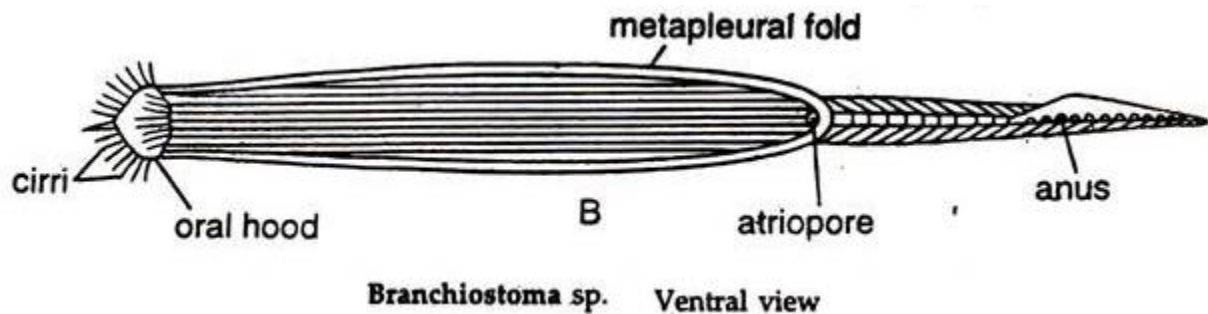
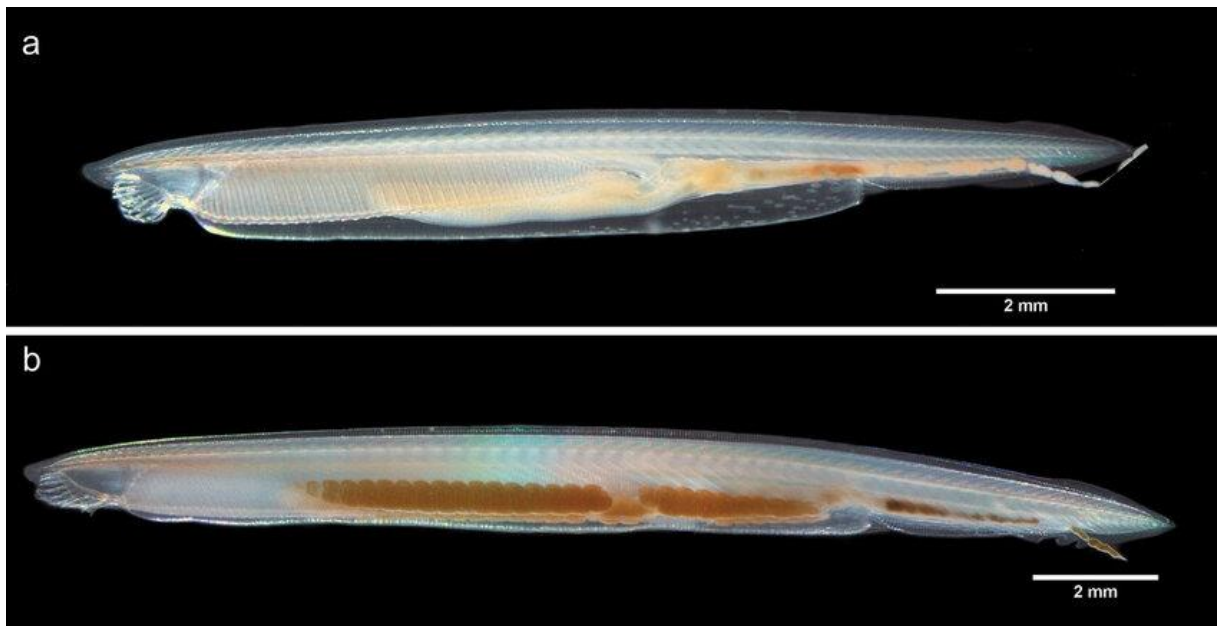
Branchiostoma, commonly known as lancelets or amphioxus, are small, fish-like marine chordates. They are found in various oceans around the world, typically in shallow coastal waters with sandy or muddy substrates. *Branchiostoma* species are distributed globally, but they are most commonly found in temperate and tropical regions. *Branchiostoma* with about 9 species is almost cosmopolitan, reported from different oceans of the world. It is more common in warmer seas, such as Mediterranean and especially abundant near the coasts of China and Japan where it is sold as food. The species common on the Indian sea coasts *Branchiostoma indicum*, *B. pelagicum*.

Overall, *Branchiostoma* species have a widespread distribution in oceans worldwide, although their populations may vary in density depending on factors such as water temperature, substrate type, and food availability.

Habits and Habitat

Branchiostoma is a marine animal commonly found in shallow waters, preferably brackish or salt water, on the sandy coasts. It leads a double mode of life. Mostly it is buried in sand in an upright condition with only the anterior end protruding above the sand. However, at night or dusk, it

come. out of the sand and swims actively by lateral undulating movements of its body caused by muscles. It swims vertically in water. When disturbed, it jumps out of its burrow. swims a short distance, dives back into sand keeping head downwards, makes a U-turn inside so that the anterior end comes up again above the sand. *Branchiostoma* is a typical ciliary feeder. It feeds on planktonic micro-organisms brought along with a respiratory cum food water current which constantly enters the mouth placed on its projecting anterior end, and leaves through the atriopore. Male and female individuals are separate. They release their gametes in water where fertilization takes place. Development is indirect involving a free-swimming larval stage which gradually changes in to adult.



External Features Shape, size and colour. *Branchiostoma* is a small elongated narrow and fish-like animal 5 to 8 cm in length. Body is whitish, somewhat translucent, laterally

compressed, and pointed at both the ends, hence the common name "lancelet" which means "a little lance". The streamline body is well-suited for burrowing as well as swimming. The posterior end is more tapering and pointed than the anterior end.

Division of body. A true head is degenerate and absent. The body is divisible only in two regions. The greater anterior region constitutes the trunk, and a much shorter post anal posterior region is the tail. The anterior end of trunk projects in front as a pointed snout or rostrum.

Apertures. The trunk bears three openings : mouth, atriopore and anus. Anteriorly, below the rostrum is a tentaculated structure, the oral hood, formed by dorsal and lateral projections of the body. It shall be described later as a part of the digestive system. Mouth is a very wide antero-ventral aperture, bordered by the free margin of oral hood. Atriopore is a small mid-ventral rounded aperture, lying just in front of the ventral fin. The large atrial cavity surrounding the pharynx opens to outside through atriopore. Another small aperture, the anus, lies somewhat asymmetrically to the left of mid-ventral line at the base of caudal fin. The small posterior body region behind the anus is the tail.

Fins and folds. *Branchiostoma* bears three longitudinal median or unpaired fins : dorsal, caudal and ventral. The dorsal fin runs as a low, mid-dorsal fold along the entire length of trunk. The ventral fin runs mid-ventrally from caudal fin upto atriopore along the posterior trunk region. The dorsal and ventral fins are internally supported respectively by one and two rows of small rectangular fin-ray boxes, each formed by stiff connective tissue containing a central nodule. Fin rays are lacking in the caudal fin. The structure of fins and fin-ray boxes is different from that in fishes. Paired fins are absent. But, running longitudinally along the ventro-lateral margins of the anterior two-third part of trunk, front oral hood to atriopore, there are two hollow membranous metapleural folds. The two folds are connected by a horizontal fold of body wall, called epipleur, which forms the floor of the atrial cavity inside.

Myotomes and gonads. On each lateral side of body a series of “ < “ shaped muscle bands, called myotomes or myomeres can be seen through the transparent body wall. Between mouth and atriopore a series of gonads can also be seen on either side and below the myotomes.