

Abstract

The area of the first two pharyngeal arches (mandibular and hyoid) represents an evolutionarily very flexible part of the vertebrate head. An example of such flexibility is the spiracular region, comprising the two arches together with the first pharyngeal endodermal pouch (also called spiracular or hyomandibular), which physically separates them. This pouch is able to break through to the outside creating a small paired opening on the dorsal part of the head behind eyes, termed the spiracle. The spiracle in its typical form can be found in the majority of chondrichthyans and in some basal ray-finned fishes (bichirs, sturgeons and paddlefishes) and serves usually as an additional inhalatory opening for water (in chondrichthyans, when the mouth is occupied) or air (in bichirs, providing the majority of their respiration). This opening apparently has its origins in an ancestral hyomandibular gill slit, which was reduced in size and displaced dorsally by migrating hyoid arch supporting the jaws. In recent tetrapods, including humans, the spiracular cavity corresponds to the cavity of the middle ear, obtaining the function of receiving and transmitting sound waves. This thesis summarizes known important aspects of the spiracular region in terms of morphology, ontogeny and phylogeny of vertebrates.