

Abstract

The primary mouth develops during early embryogenesis at the anterior end of the forming head and it is created from the ectoderm and the endoderm that directly juxtapose. The primary mouth is the first connection of the digestive system with the outside, which is undoubtedly a crucial step for further development of an organism. In most vertebrates, the primary mouth is getting opened by perforation of a thin septum, the oral membrane. The oral membrane is formed from the ectoderm and the endoderm, when the ectoderm pushes against endoderm. Surprisingly, developmental formation of the primary mouth is not identical in all vertebrates and we can commonly recognize three main developmental modes. In the most vertebrates clades, the primary mouth forms via the so called stomodeal invagination, which is often exemplified in the frog *Xenopus leavis*. The primary mouth of salamanders and lungfishes forms via the so called stomodeal collar and the primary mouth of teleost fishes forms via the so called stomodeal wedge. Moreover, in the hagfishes, the development of the primary mouth seems similar to the stomodeal invagination, but with some substantial differences in later formation. The particular mode of the primary mouth formation probably depends on the course of embryonic development and spatial possibilities of the embryo. The ancient type of the primary mouth formation in vertebrates is probably the stomodeal invagination.