

6 Abstract

One aspect of this work was to examine the influence of artificial inducers, activators and inhibitors of metamorphosis known from hydrozoans on the metamorphosis of scyphozoan larvae. In the investigated larvae of semeanostomeae competence for metamorphosis was similar to hydrozoan larvae but different from the closely related *Rhizostomea Cassiopea*. These results might lead to a new discussion of the evolution of Cnidarians.

Strobilation in *Aurelia aurita* can be induced by lowering water temperature. Population density plays a role as well. The temperature change is independent of the absolute starting temperature. Already a small change is sufficient in order to induce strobilation, but only significant changes in water temperature result in high strobilation rates after two weeks.

Strobilation becomes detectable in morphology when underneath the ring of tentacles the first ring furrow develops. Further segments are formed successively in basal direction. These segments do not intercalate. Afterwards the segments develop more and more structures of ephyrae. Segmentation stops before it reaches the foot region, so the foot keeps the polyp quality and regenerates head structures. The determination of tissue and segmentation are coupled processes. Determination advances the visible segmentation by about one day. Segmentation can also start at a wound and continue in an apical direction. As a result, the strobilae formed are bipolar. Cutting experiments suggest that neither head nor foot are necessary for the progress of strobilation. Therefore it is an autonomous process. As in the segmentation of higher organisms strobilation proceeds sequentially from pole to pole. In contrast to somitogenesis in *Aurelia aurita* the speed of segmentation is position-dependent. In vertebrates the segment size correlates with the size of the embryo. In *Aurelia* the size of the segments is almost constant.

As part of this work, a differential expression analysis led to the isolation of sequences whose expression is switched on or upregulated during strobilation.