

The evolution of the reproductive forms of Chondrichthyes – a literature review

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Abstract

Reproduction is important since it regulates the size of, and replacement rate within, populations. Nowadays a lot of Chondrichthyan populations (which include sharks, rays, skates and chimaeras) are under pressure because of the increasing fisheries. The aim of this study therefore was to set apart how reproductive forms of Chondrichthyans evolved through time; in general six reproductive forms can be found: egg laying, retained egg laying, yolk sac live bearing, ovum eating live bearing, placental live bearing and uterine milk live bearing; and draw conclusions regarding the impact this has for the future Chondrichthyan populations.

In most research, including a phylogenetic tree of reproductive forms, it is concluded that egg laying is the first reproductive form (primitive) present and placental live bearing is the last reproductive form (modern) appearing in the group of Chondrichthyans. Looking at different phylogenetic trees which take as many species of Chondrichthyans as possible into account, a different conclusion was drawn.

Egg laying seems more likely to have appeared together with yolk sac live bearing.

From those two reproductive forms the other forms have evolved independently. The appearance of reproductive forms seems related to the circumstances in which the related species live. It appeared difficult to draw conclusions for the fate of future populations. Although it could not be found if species are able to switch from one reproductive form to another, it could be found species can regulate reaching maturity.

So it appears the Chondrichthyans are capable of regulating the replacement rate within populations a little which may help surviving under the increasing fisheries but still a lot of research is necessary.