WHY TO CONTINUE GROWTH AFTER MATURATION? LESSONS FROM UNIONIDAE MUSSELS

Summary

The overwhelming diversity of life leads researchers to explore mechanisms of formation and evolution of this variability. The life of each individual - between its origin and its end - consists a series of events which can be referred to a story of life. These stories are characterized by considerable variation both within species and between species Evolutionary paradigm perceives this variation as a result of fitness maximization processes. In particular, optimal energy allocation models allow general explanations of the evolution of different types of growth, including indeterminate growth, representated by organisms that increase their body size after maturation. This process may be a consequence of environmental seasonality and/or the existence of a positive relation of production and mortality rates with body size. Some indeterminate growers may display different kinds of parental care, but life consequences of this biological phenomenon have not been studied extensively on theoretical grounds so far. In freshwater mussels of the Unionidae family, the cost of parental care is paid exclusively by females that incubate their offspring (glochidia) in brooding chambers within their gills. Females have to allocate resources to nourish glochidia and may suffer from increased winter mortality and decreased filtration efficiency of their gills. According to theoretical predictions, the negative impact of incubated glochidia on feeding efficiency (with or without increased mortality) may favor the evolution of indeterminate growth, however, many questions concerning energy allocation patterns in this group of organisms remain unanswered. For example, it is unknown why mature males of Unionidae continue growth after maturity, though they do not pay costs of offspring care. A comprehensive study of life histories of these freshwater bivalves performed on both theoretical and empirical grounds is needed to help us to understand the role of parental care in the evolution of energy allocation.