

Book Review

Viviparous Fishes. Edited by Mari Carmen Uribe and Harry J. Grier. New Life Publications, Mexico, 2005. 603pp. ISBN 0-9645058-5-1.

Viviparity in fishes is an extremely complex phenomenon, since it involves numerous modifications in the reproductive systems of both males and females. The viviparous species of teleosts, unlike other groups of vertebrates, do not present typical oviducts. The adaptations that involve the gestation only occur in the ovary and embryo. Modifications in the reproductive system of males are also decisive, since they need to reach internal fertilization or internal gametic association. Among the 25.000 species of teleost fishes, approximately 500 fish species are viviparous. Half of these species are predominantly fresh water species, belonging to three families inside the order Cyprinodontiformes, the Anablepidae, Goodeidae and Poeciliidae, and one family inside the order Atheriniformes, the Hemiramphidae. The poeciliids are the most numerous, with approximately 200 species, followed by the goodeids with 36 species. The species that belong to these families present a great variability in their reproductive biology and in their life history patterns. Different poeciliids exhibit from the primitive lecithotrophy to the specialized matrotrophy, and some of them present superfetation. A large number of these fishes are bisexual, but some can be unisexual like *Poecilia formosa* that reproduces through gynogenesis or like the species of the genus *Poeciliopsis* that reproduce through hybridogenesis.

Most of the fresh water viviparous fish species are now endangered. The 2003 IUCN red list of endangered animals considers that 33% of the goodeid species are endangered and even extinct. The main causes responsible for this are of anthropic origin, and include the destruction of habitats, pollution, and introduction of exotic species.

The book *Viviparous Fishes*, perfectly edited by Mari Carmen Uribe and Harry Grier, brings important information about this group of fishes, from basic aspects on reproductive biology to systematic, evolution and conservation. This book was the result of the various presentations and discussions between many researchers in the area, during the II International Symposium on Viviparous Fishes, which took place in Querétaro, Mexico. The book involves four large themes: systematic, biogeography and evolution; reproduction; genetics, ecology and conservation; and the viviparous fish of the Goodeidae family. Renowned researchers from the area explore each one of these themes, whose articles provide us with current information and high quality illustrations.

The topic that involves systematic, biogeography and evolution presents the phylogenies of the genus *Poecilia* of

the Atherinomorphs, denoting the distinctive reproductive system of the last group. Another article presents the evolution of the genus *Sebastes*, which, apart from the majority of the viviparous teleosts, incorporated in its reproductive strategy the best aspect of the oviparity (high fecundity) with the best aspect of viviparity (greater survival of embryos and larvae (larva)). However, the article about Fish Viviparity: Diversity, Biogeography, and Conservation is lacking a larger presentation and discussion about the groups of viviparous fishes in general.

Most of the book, with 23 articles, is dedicated to the topics about reproduction, genetics, ecology and conservation. In the part about reproduction, we can find a wide description from the development and modifications in the reproductive system of males and females, their morphology, anatomy, to the adaptations of spermatozooids to internal fertilization. In the theme dedicated to genetic, ecology and conservation we also find information of great relevance. There are a larger number of articles on conservation, which makes sense, considering that there is a large number of endangered viviparous species in Mexico, vulnerable or even extinct. To those starting in ichthyology and to those interested in understanding the reproductive biology of viviparous species, its origin and evolution and current state of conservation, this part of the book is crucial.

One of the last themes is dedicated exclusively to the viviparous species of the Goodeidae endemic from Mexico, considered national biological treasures. This part has articles varying from general anatomy and sexual dimorphism found in this group, to subjects like the status of conservation, the main problems affecting the populations of these species, as well as perspectives and solutions for the clear decline of the group. The last article presents many photographs of the goodeid fish species currently known, along with map of distribution, biogeographic information and state of conservation. In this part, the reader is informed about the critical situation of the goodeid fishes, such as the species *Characodon garmani*, already extinct, and the species *Skiffia francesae* existent only in captivity, as well as the efforts of many researchers to revert this situation.

One of the objectives expected by Mari Carmen Uribe and Harry Grier, in editing this book, was that it could be used to provide a better comprehension and protection of the biological diversity of viviparous fishes. Having read this book, I strengthen that this objective has been well achieved.

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