INVESTIGATIONS CONCERNING THE REPRODUCTIVE BEHAVIOUR OF MOLLIEENISIA "FORMOSA"

BY HENRY MEYER

Zoology Department, The University of Tennessee

(With Plate X and Thirteen Text-figures)

Among the species of Mollieenisia, a genus of poeciliid cyprinodonts, hybridization occurs and often results in the production of hybrids of peculiar reproductive habits and conditions.

Over a large part of the range of Mollieenisia, there is a form of hybrid origin which Dr Carl L. Hubbs calls M. "formosa" (Pl. X, fig. 1). In appearance it is intermediate between M. sphenops (Pl. X, fig. 2) and M. latipinna (Pl. X, fig. 3). This form exists only as females. Out of two thousand specimens examined from Tamaulipas and Texas, Dr Hubbs has not found a single male. This raises the question as to how such a form can continue its existence. In the Tamaulipas region, where it lives well inward of the coastwise range of M. latipinna, it is found with M. sphenops and supposedly mates with males of that group. In Texas, where it abounds in the recesses of the Brownsville region, considerably farther north than the M. sphenops occurs, it is found with M. latipinna and here presumably mates with males of this group. These presumptions have been verified by means of extensive aquaria tests performed by C. L. & L. C. Hubbs (1932). Several of these forms, M. "formosa", from Forlorn in Tamaulipas, which had presumably mated with males of M. sphenops, and others from Brownsville, Texas, which had presumably mated with the very different males of M. latipinna, have produced young in the laboratory after having been transported from their natural habitats. Not one of the young produced from these females have in their adult condition shown any approach toward the characters of the male involved. The characters of the mother seem to have been inherited as a whole. Although the broods have been large and numerous, not a single male has appeared among them. These results and presumptions have been verified also by control matings. Virgin females of this unisexual species mate readily with males of either parent species and soon become pregnant, but the result is always the same, female offspring with

1 Contribution from the Department of Zoology, University of Michigan.
all the characters of their mothers. This has been demonstrated consistently in stocks from both Tamaulipas and Texas. These localities are shown on the map (Text-fig. 1).

Given an explanation as to how this group continues its existence, two other questions become of importance, namely, what type of reproduction will account for the production of purely female broods of young and what is the cause of the purely matroclinous inheritance? In the paper by C. L. & L. C. Hubbs the results of their investigations on this peculiar form up to that time have been discussed and they also suggest answers to these questions. They say: "The consistent and abundant production of purely matroclinous and constantly female offspring by this hybrid form of fish finds its most plausible explanation as parthenogenesis. It is not a spontaneous parthenogenesis, since many controls, unmated, have shown no indications of becoming pregnant. We provisionally assume that we are dealing with a case of gynogenesis (parthenogenetic development initiated by sperm which for some reason is prevented from taking part in heredity)—a condition recorded as naturally occurring among invertebrates, but not among vertebrates."