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1931

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CONCERNING THE METHOD OF INFECTION
BY DIPLORCHIS RANAE OZAKI, 1931

by

Satyu Yamaguti

Translated by

Adrian R. Lawler

Translation Series No. 18

VIRGINIA INSTITUTE OF MARINE SCIENCE
Gloucester Point, Virginia
1967



Preface
to Translation¹

Translation of this paper was undertaken as part of a long-term research project on the systematics, host-specificity, and zoogeography of monogenetic trematodes.²

An effort has been made to keep this translation as near the original as possible. It is probably inevitable, however, that some of the nuances of meaning in the original have been distorted or lost. For this we apologize to the author and the reader.

This translation is intended as a service to researchers. Though effort has been made to make it comprehensible, accurate and useful, it is likely that improvements can be made. Should literary improvements or verification appear desirable it is suggested that the researcher make his own translation. We will appreciate constructive suggestions for improvements in this and future translations.

¹Virginia Institute of Marine Science Translation Series No. 18.

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(Aus dem Parasitologischen Laboratorium der Kaiserlichen
Universität, Kyoto, Japan.)

CONCERNING THE METHOD OF INFECTION
BY DIPLORCHIS RANAE OZAKI, 1931

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Satyu Yamaguti

Ozaki maintained that the larvae of Diplorchis ranae (as with Polystomum integerrimum) upon metamorphosis of the tadpole abandon the wasting gill cavity, where they had settled themselves, migrate through the entire digestive tract and penetrate the urinary bladder, where they undergo further development until sexual maturity. During the examination of the urinary bladders of adult frogs (Rana rugosa), captured in nature, I found on five occasions during September of the years 1935, 1938, and 1939 and on one occasion during the month of October in 1939 several larvae, 0.8-2.25 mm long and 0.2-0.6 mm wide, among the fully developed specimens of Diplorchis ranae. This discovery contradicts the noteworthy observation of Zeller that the ages of the polystomes which are found in the same frog agree, and caused me to undertake a re-examination of the method of infection by the parasites.

On 6 September 1936, 15 tadpoles of Rana rugosa [collected] from Tarumi [near Kobe, Japan], where the frog trematode could never be found in spite of my zealous searches, were placed together, in a glass dish, with the newly hatched larvae of Diplorchis ranae, whereas from 15 September to 24 September I exposed five young frogs, reared in our aquarium, to a direct infection by the named larvae. On September 30, two larvae from the wasting gill cavity, each one actively moving out of the stomach and intestine, and five from the urinary bladder were obtained from a tadpole which had already undergone metamorphosis. At the same time, the urinary bladders of two young frogs of the second series of tests were found to be infected with several larvae. The remaining experimental animals of both groups produced almost identical results in the following days. The larvae removed from the urinary bladders were, as a rule, somewhat further advanced in their development.

On 6 September 1938, four young frogs (Rana rugosa) from Tarumi were placed in an aquarium with the embryonic eggs of Diplorchis ranae. Two hundred and thirty four days afterward

I found two larvae in the urinary bladder of an experimental frog, and 36 days later /after the first discovery/ two young worms likewise in another frog. The rest of the frogs produced negative results.

From these experimental results one may conclude that the larvae of Diplorchis ranae can not only migrate through the digestive tract into the urinary bladder but also enter it directly from the outside. The possibility of an infection through the "anus" was also recently emphasized by Paul for Polystomum integerrimum nearcticum. After the larvae enter the urinary bladder, they undergo slower development, in agreement with the observation of Zeller on Polystomum integerrimum. They could not, however, develop to sexual maturity on the gills, therefore the so-called "dimorphic evolution" of Gallien does not take place here.

LITERATURE CITED

- Gallien, L. 1935. Experimental research concerning the dimorphic evolution and the biology of Polystomum integerrimum Fröelich /in French/. Trav. Sta. Zool. Wimereux 12 (1): 131 p.
- Ozaki, Y. 1932. On the life history of the polystome trematode, Diplorchis ranae /in Japanese/. Dobutsugaku Zasshi 44 (519): 16-17.
- Paul, A. A. 1933. Life history studies of North American freshwater polystomes. J. Parasitol. 24(6): 489-507.
- Zeller, E. 1876. Further contributions to the knowledge of the polystomes /in German/. Z. Wiss. Zool. 27(2): 238-274.