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## FURTHER STUDIES ON THE TRUNCUS ARTERIOSUS OF RANA

By

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(Four Text-Figures)

Since studying the *Truncus arteriosus* of *Rana* found in the eastern portion of the United States, I have had an opportunity to investigate two common species found in Japan, *Rana temporaria* and *Rana nigro-maculata*. Both species have been checked with the findings made in the North American forms. As was to be expected, *Rana temporaria* as it exists in Japan was found to be identical with *Rana temporaria* of Europe. Consequently there is nothing new to report concerning this species in comparison to the European *Rana temporaria*. However, a slight variation occurs in checking it with *Rana pipiens* and *sphenocephala*.

A cross section of *Rana temporaria* (Fig. 1) shows the anterior bulbus valves presenting close similarity to *Rana pipiens*. The main difference is in relation to *Valve 1*.

In this series the valve is composed of a distinct dorsal portion (Valve 1. B); the ventral portion or Valve 1. A being fused with the Septum bulbi and the beginnings of the Septum principale. Boas ('82) has pointed out the fact that Rana temporaria in some cases deviates from the normal condition, in that the Septum principale does not divide the valve into two pockets. It is to be remembered also, that Rana catesbeiana differes in this respect though in a slightly different manner, since, in that species the Septum principale fails to join up with the Septum balbi and Valve 2.

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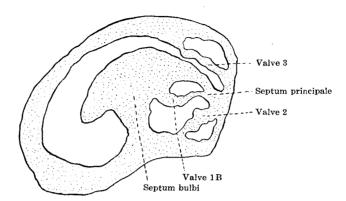


Fig. 1. Cross section through the anterior  $Bulus\ cordis\ valves$  of  $Rana\ temporaria$ . ca.  $\times 10$ .

In Rana nigromaculata an apparently abnormal situation exists. (Fig. 2.) We find that Valve 1 does not exist as a separate structure but is fused with the anterior margin of the Septum bulbi and the beginnings of the Septum principale. There is thus no bisection of Valve 1

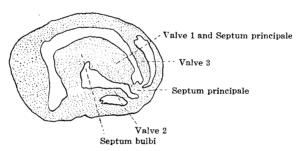
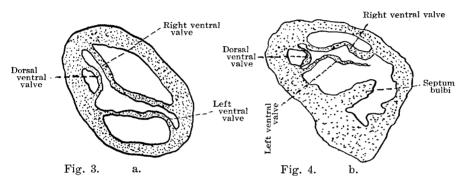


Fig. 2. Cross section through the anterior *Bulbus cordis* valves of *Rana nigromaculata*. ca. ×8.

by the *Septum principale*. The structure appears thick and heavy in cross section; this being the only evidence for supporting a view-point that *Valve 1* is fused with the *Septum bulbi*, since it is far to heavy to be single.

The middle portion of the *Bulbus cordis* is normal in both species. The large *Septum bulbi* is the same in shape and size as in the American *Rana*. However, the posterior cordis valves are interesting in one or two respects. With *Rana temporaria* as found in Japan, one meets

identical conditions to those noticed by GAUPP ('96) in European Rana (Fig. 3). The Dorsal ventral valve appears strong and well developed between the Left and Right ventral valves. In Rana nigromaculata such is not the case (Fig. 4). The Dorsal valve is weak and does not make its appearance until the Septum bulbi is free and well developed. That is to say, the Dorsal valve appears more anteriorly in Rana nigromaculata than in Rana temporaria.



Figs. 3-4. Cross sections through the posterior *Bulbus cordis* valves.

a. *Rana temporaria*. b. *Rana nigromaculata*. ca. ×8.

At this level also, the *Left ventral valve* is weak and has broken away from the bulbus wall. Otherwise the condition is similar to that found in American *Rana*.

This slight variation in Rana nigromaculata from the American Rana and Rana temporaria is interesting though difficult to explain.

## Acknowledgments

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