ALBINISM IN RANA PIPIENS (SHREBER)[1]

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Although extreme pallor (sometimes erroneously called albinism) in amphibians has been experimentally produced by the ablation of the hypophysis anlage in anuran embryos (*see* Hogben, 1927) true albinism occurs only rarely (Noble, 1931). During the spring of 1932 there appeared in the fish ponds of the Xenia Fish Hatchery at Xenia, Ohio, a number of albino tadpoles (*Rana pipiens*), a phenomenon which so far as is known, had never before occurred there. Twenty-three of these animals were successfully carried through metamorphosis (Figure 1) by isolating them in a screened portion of one of the ponds, but none was reared through the following summer (Langlois, 1933)[2]. At that time the author was doing some work on the color changes in tadpoles (Federighi, 1934) and so a request for some animals was made, but by that time all were dead.

During the spring of 1934, however, another group of albino tadpoles were noted and four specimens were brought to this laboratory where the skin was examined microscopically.

In its natural live state the tadpole is a light golden yellow, with pink eyes and no black skin pigmentation (Fig. 2) and in all external respects excepting pigmentation the animal seems normal.

Microscopic examinations of the skin shows the complete absence of melanophores (Fig. 3) indicating very clearly that the albinism is due to a lack of black pigment cells and not to melanophores with pigment in a concentrated state.

What has caused this albinism is problematical. According to Haecker (1908) the albino axolotl differs from the normally colored animal by a single Mendelian factor, and Woronzowa (1929) has reported that the implantation of pituitary tissue into the albino race of axolotl caused pigment to develop. Diet may in some cases affect pigmentation but not in this case, because albino and normal tadpoles occur side by side. It is

[1]Identified by Mr. Thomas of the Ohio State University Museum.
[2]Private communication.

interesting to speculate what may be the relative importance of each of these factors; heredity, hormones and diet. The facts that the larva goes through normal metamorphosis and, as mentioned above, that the albino animals have a common diet with normal animals seem to indicate that hormones and diet can play only a small part in this phenomenon. Thus we are forced to the conclusion that heredity is the most important if not the controlling factor. The author hopes to continue this work in order to answer these questions more fully.

LITERATURE CITED

Federighi, H. 1934. Color changes in transplanted tadpole skin. Physiol. Zool., Vol. 7, pp. 271–278.

Haecker, V. 1908. Ueber Axoltolkreuzunger; II, Mitteilung (Zur Kenntnis des partiellen Albinismus). Verh. deutsch. Zoöl. Ges., Bd. 18, pp. 194–205.

Hogben, L. T. 1927. Comparative physiology of internal secretion. Cambridge University Press. 148 pp.

Noble, G. K. 1931. The biology of the amphibia. McGraw-Hill Book Co. x+577 pp.

Woronzowa, M. A. 1929. Morphogenetische Analyse der Färbung bei weissen Axolt Axolotln. Arch. Entw. Mech., Bd. 115, S. 93–109.

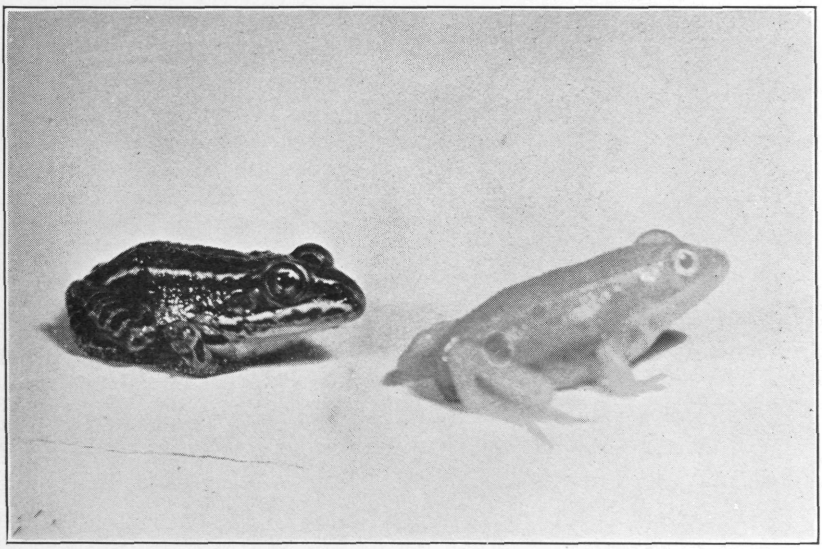

Figure 1. Adult normal and albino frogs. The albino as a tadpole was collected during the spring of 1932. Live specimens.

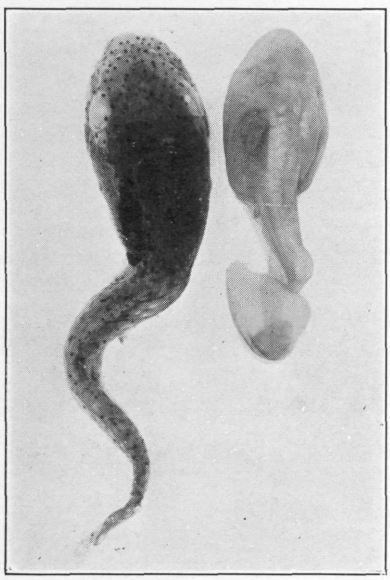

Figure 2. Normal and albino tadpoles. The albino was collected during the spring of 1934. Preserved specimens. The normal tadpole is *Rana catesbeiana*.

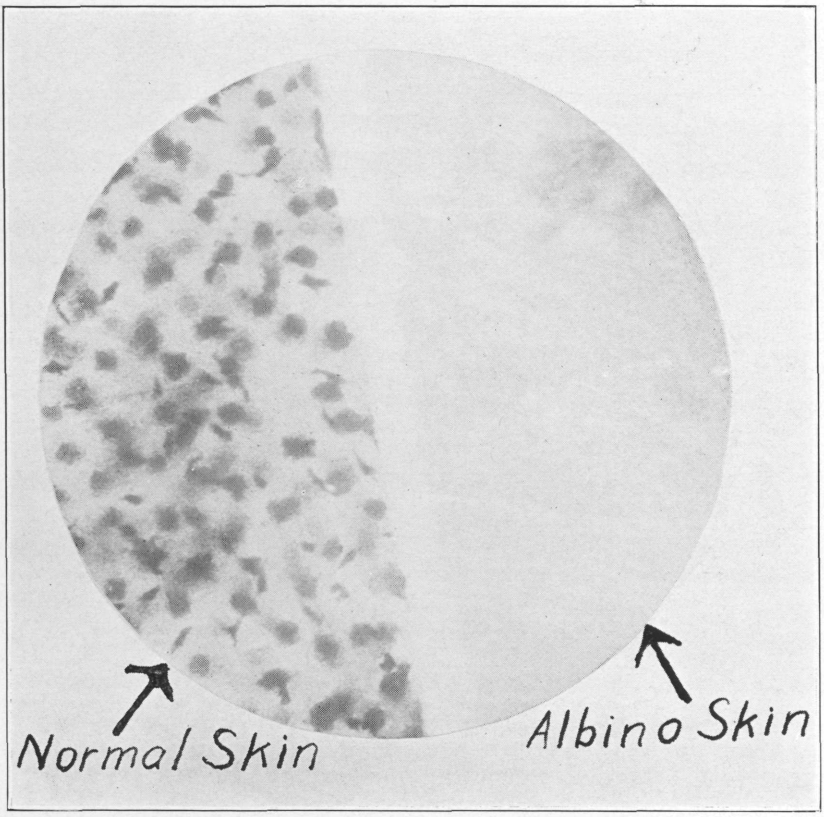

Figure 3. Photomicrograph of the tails of tadpoles shown in Figure 2. Note the entire absence of melanophores in the albino skin.