11967

Effect of Testosterone Propionate on Anal Fin Transformation of Female Viviparous Teleost, Xiphophorus Helleri Heckel.

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While working on another problem, Essenberg[1] observed and recorded 2 cases of natural complete sex-reversal in this species, from female to male. He reported that the anal fin of the normal female consists of 10 pairs of rays, all of which are approximately of the same length and diameter. During the period of natural sex-reversal, he also observed a medial thickening of the third pair of rays, as well as elongation of the third, fourth, and fifth pairs of rays, to approximately twice the length of the original fin. The first, second, and sixth to tenth pairs of rays remained constant in length. The apex of the third pair of rays together with the fourth and fifth pairs formed hooks and counterhooks for anchorage to the female genital pore during copulation.

In connection with another study of experimentally induced sex-reversal in the female of the same species, Baldwin and Goldin[2] treated 91 virgin females with testosterone propionate* over a period of approximately 19 weeks. Controls treated with pure sesame oil showed no response. Each treated fish received 0.5 mg testosterone propionate in 0.02 cc sesame oil weekly. This treatment causes, among other changes,[2] the transformation of the normal female anal fin into an organ that simulated in structure the male copulatory organ, the gonopod.

Experimental. The normal anal fins of the experimental female fish consist of 10 pairs of rays of approximately the same length and diameter. In general, after administration of testosterone propionate, the third pair of rays thickened to several times their normal diameter. The third, fourth, and fifth pairs of rays elongated to approximately twice the original length of the fin. In addition, the tips of the third, fourth, and fifth pairs of rays form knob-like projections which appear to be the anlage of the copulatory hooks of

[1] Essenberg, J. M., *Biol. Bull.*, 1926, **51**, 98.

[2] Baldwin, F. M., and Goldin, H. S., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 813.

* By the courtesies of Dr. G. Stragnell of the Schering Corporation, and of the Ciba Pharmaceutical Products, Inc.

later development. Subsequently, these knob-like projections appear to have grown slightly to form bulges on the dorsal and ventral margins of their respective rays. The knobs of the ends of the third and fifth pairs of rays develop into primitive copulatory hooks which soon become fully developed. The knob-like projections of the fourth pair of rays appear to have undergone an early development to form accessory copulatory hooks, or counterhooks, to supplement those of the third and fifth pairs of rays. These accessory hooks which began their development just previously, soon appear as fully formed accessory copulatory hooks. Symmetrical teeth-like projections are noted on the third, fourth, and fifth pairs of rays. Thus, the experimentally induced changes in the normal female anal fin simulate the structural configuration of the normal male anal fin, referred to as the gonopod.

Conclusions. The transformation of the normal female anal fin into a male-like gonopod is induced by prolonged administration of testosterone propionate. Such treatments influence this secondary sex characteristic in all cases, from female to male, over an interval of approximately 5 months. These experimentally induced transformations of the normal female anal fin into that of a male-like gonopod were observed in all of 91 specimens so treated.

11968 P

Secretion of Orally Administered Radio-Iron in the Milk of Cows.

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The purpose of this experiment was to determine the percentage of ingested iron taken up by the whole blood and that secreted into the whole milk of cows.

Methods. Radio-iron ($_{26}Fe^{59}$) produced in the Berkeley cyclotron was converted into an iron chloride solution,[1] each cc of which contained 4 mg of $FeCl_3$ and emitted, on the day of administration, 1820 counts/sec. of gamma radiation. (Only gamma radiation was measured.)

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[1] Austoni, M. E., Rabinovitch, A., and Greenberg, D. M., *J. Biol. Chem.*, 1940, **134**, 17.