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82. *Is Parental Care in Fish Prolactin-Dependent?* S. E. WENDELAAR BONGA, A. J. H. DE RUITER, H. SLIJKHUIS,* and L. DIRKS, Departments of Zoology, Universities of Nijmegen and *Groningen, The Netherlands.

In several teleost species prolactin has been implicated in the endocrine control of parental care. However, most studies are concerned with the stimulating effects of prolactin on one aspect of parental care, namely fanning behaviour. We have shown that in male sticklebacks—only males display parental care in this species—prolactin cell activity is increased during the period of intense parental fanning (Slijkhuis *et al.*, in press). Administration of homologous prolactin, by means of implantation of prolactin cell grafts, stimulates fanning behaviour in males in breeding condition. These results are in line with the supposition that prolactin is a parental care hormone in fish, as it is assumed to be in higher vertebrates. However, in the mouth-brooding cichlid *Sarotherodon mossambicus*, a species that does not show parental fanning behaviour, we were unable to demonstrate an increase in prolactin secretion during the period of parental care. Prolactin secretion was estimated by both ultrastructural morphometry and determination of the \[ ^{3}H \text{lysine} \] incorporation rate of the prolactin cells. The measurements were carried out on freshwater fish that show a high basal rate of prolactin secretion, as well as on fish adapted to seawater. In seawater fish the basal rate of prolactin secretion is very low, and any increase in prolactin secretion would have been detected more easily than in freshwater fish. But even in seawater fish that were able to raise young successfully, no change in prolactin secretion could be observed. The results indicate that prolactin is only involved in the endocrine control of distinct aspects of parental care, like fanning behaviour, and not of parental care in general.


(1) *Liza ramada* breeds normally under short photoperiod during the months of December and January. (2) In experimental specimens, short photoperiod induced gonadal growth out of the breeding season. (3) Pinealectomized and control specimens exposed to long photoperiod showed undeveloped ovaries and low gonadosomatic index (GSI). (4) Pinealectomy accelerated ovarian growth in specimens exposed to short photoperiod and stimulated GSI. (5) Doses of 50–250 \( \mu \text{g} \) melatonin per fish injected daily intramuscularly over a month inhibited gonadal growth, reducing the GSI to 1.59 with the low dose and to 0.74 with the high dose, as against 2.4 in controls. Conclusion: The pineal body of *L. ramada* inhibits ovarian activity under short photoperiod, possibly by melatonin secretion. EM study of the pineal body reveals that the ‘‘supporting cells’’ surrounding the photoreceptor cells are intimately connected to nonmyelinated axons. The periphery of the pineal displays numerous capillaries with wide pericapillary spaces.

84. *Increase in LHRH Concentration in Microdissected Hypothalamic Areas of Male Newts Following Stress or Corticosterone Injection.* F. L. MOORE and R. T. ZOELLER, Oregon State University, Corvallis, Oregon.

Plasma corticosteroids levels increase and reproductive functions decrease when male newts (*Taricha granulosa*, Amphibia) and other vertebrates are exposed to stressful environments. It was hypothesized that, during stress-induced inhibition of reproduction, the high titer of corticosterone acts to inhibit the release of LHRH. To test the hypothesis, LHRH was measured in specific brain areas using Palkovits’ punch technique and RIA procedures. When male newts were stressed by confinement in a small box for 1 hr, the concentration of immunoreactive (ir) LHRH increased significantly in the ventral preoptic area (POA), infundibulum (In), and rostral hypothalamus (RH). The irLHRH concentration in stressed newts was higher immediately after stress than at 3 hr after stress. In another study, a single intraperitoneal injection of 25 \( \mu \text{g} \) corticosterone resulted in a significant increase in irLHRH concentration in the POA, In, and RH for males sampled at 0.5 and 6 hr after injection. In both experiments, irLHRH concentrations were greater in the POA and In than in the RH, with no detectable irLHRH in the area of the septal nuclei and amygdala. Assuming that the observed increase in irLHRH reflects decreased release of LHRH, the results of both studies support the hypothesis that the stress-induced rise in corticosterone inhibits reproduction by interfering with LHRH release.

85. *Hormonal Facilitation of Sperm Release from the Spermapheca of the Red-Spotted Newt (Notophthalmus viridescens).* M. P. HARDY and J. N. DENT, University of Virginia, Charlottesville, Virginia 22901.

In most urodeles, fertilization occurs when the stored sperm from the spermapheca encounter ova in the cloaca. A mechanism for synchronizing this meeting appears to be required. Several neurotransmitters and