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Oestradiol and prostaglandin F2α regulate sexual displays in females of a sex-role reversed fish

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Abstract

The mechanisms regulating sexual behaviours in female vertebrates are still poorly understood, mainly because in most species sexual displays in females are more subtle and less frequent than displays in males. In a sex-role reversed population of a teleost fish, the peacock blenny *Salaria pavo*, an external fertilizer, females are the courting sex and their sexual displays are conspicuous and unambiguous. We took advantage of this to investigate the role of ovarian-synthesized hormones in the induction of sexual displays in females. In particular, the effects of the sex steroids oestradiol (E2) and testosterone (T) and of the prostaglandin F2α (PGF2α) were tested. Females were ovariectomized and their sexual behaviour tested 7 days (sex steroids and PGF2α) and 14 days (sex steroids) after ovariectomy by presenting females to an established nesting male. Ovariectomy reduced the expression of sexual behaviours, although a significant proportion of females still courted the male 14 days after the ovary removal. Administration of PGF2α to ovariectomized females recovered the frequency of approaches to the male's nest and of courtship displays towards the nesting male. However, E2 also had a positive effect on sexual behaviour, particularly on the frequency of approaches to the male's nest. T administration failed to recover sexual behaviours in ovariectomized females. These results suggest that the increase in E2 levels postulated to occur during the breeding season facilitates female mate-searching and assessment behaviours, whereas PGF2α acts as a short-latency endogenous signal informing the brain that oocytes are mature and ready to be spawned. In the light of these results, the classical view for female fishes, that sex steroids maintain sexual behaviour in internal fertilizers and that prostaglandins activate spawning behaviours in external fertilizers, needs to be reviewed.

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