

NOTICE OF PUBLICATION



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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Endocrine regulation of prolactin cell function and modulation of osmoreception in the Mozambique tilapia

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Prolactin (PRL) cells of the Mozambique tilapia, *Oreochromis mossambicus*, are osmoreceptors by virtue of their intrinsic osmosensitivity coupled with their ability to directly regulate hydromineral homeostasis through the actions of PRL. Layered upon this fundamental osmotic reflex is an array of endocrine control of PRL synthesis and secretion. Consistent with its role in fresh water (FW) osmoregulation, PRL release in tilapia increases as extracellular osmolality decreases. The hyposmotically-induced release of PRL can be enhanced or attenuated by a variety of hormones. Prolactin release has been shown to be stimulated by gonadotropin-releasing hormone (GnRH), 17- β -estradiol (E2), testosterone (T), thyrotropin-releasing hormone (TRH), atrial natriuretic peptide (ANP), brain-natriuretic peptide (BNP), C-type natriuretic peptide (CNP), ventricular natriuretic peptide (VNP), PRL-releasing peptide (PrRP), angiotensin II (ANG II), leptin, insulin-like growth factors (IGFs), ghrelin, and inhibited by somatostatin (SS), urotensin-II (U-II), dopamine, cortisol, ouabain and vasoactive intestinal peptide (VIP). This review is aimed at providing an overview of the hypothalamic and extra-hypothalamic hormones that regulate PRL release in euryhaline Mozambique tilapia, particularly in the context on how they may modulate osmoreception, and mediate the multifunctional actions of PRL. Also considered are the signal transduction pathways through which these secretagogues regulate PRL cell function.

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