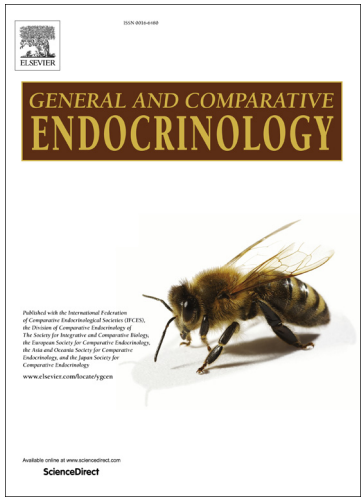

Research paper

Crustacean cardioactive peptides: expression, localization, structure, and a possible involvement in regulation of egg-laying in the cuttlefish *Sepia officinalis*

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Abstract

The cuttlefish (*Sepia officinalis*) is a cephalopod mollusk distributed on the western European coast, in the West African Ocean and in the Mediterranean Sea. On the Normandy coast (France), cuttlefish is a target species of professional fishermen, so its reproduction strategy is of particular interest in the context of stock management. Egg-laying, which is coastal, is controlled by several types of regulators among which neuropeptides. The cuttlefish neuropeptidome was recently identified by Zatylny-Gaudin et al. (2016). Among the 38 neuropeptide families identified, some were significantly overexpressed in egg-laying females as compared to mature males.

This study is focused on crustacean cardioactive peptides (CCAPs), a highly expressed neuropeptide family strongly suspected of being involved in the control of egg-laying. We investigated the functional and structural characterization and tissue mapping of CCAPs, as well as the expression patterns of their receptors. CCAPs appeared to be involved in oocyte transport through the oviduct and in mechanical secretion of capsular products. Immunocytochemistry revealed that the neuropeptides were localized throughout the central nervous system (CNS) and in the nerve endings of the glands involved in egg-capsule synthesis and secretion, i.e. the oviduct gland and the main nidamental glands. The CCAP