**RELEASING-HORMONE AND MELATONIN RECEPTORS IN THE BRAIN OF A VENEZUELAN CATFISH, “SIERRA NEGRA” (Oxydoras sifontesi)**

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**Introduction:**

*Oxydoras sifontesi* has an annual gonadal cycle closely related to changes in the environmental conditions of Venezuelan floodplain. In fish, melatonin receptors have been detected in all of the different brain areas. Physiological data have suggested an involvement of melatonin in the synchronization of rhythmic processes, including the annual cycle of reproduction and behaviour. *O. sifontesi* presents an annual variation in plasma melatonin concentration inversely related to the annual gonadal maturation cycle [1], which suggest a putative role for melatonin as the endocrine messenger of daily and seasonal photic information to the neuroendocrine system. On the other hand, it is well known that gonadotropin releasing hormone (GnRH) is involved in the hypothalamic control of reproduction in fishes. However, there is currently little evidence supporting a major role for melatonin in the control of reproduction in teleost. In this work we aimed to localize melatonin receptors and gonadotropin releasing hormone (GnRH) producing neurons in the telencephalon and diencephalon of *O. sifontesi*.

**Methods:**

Adults male and female *O. sifontesi* were sampled from the Portuguesa River (Portuguesa State, Venezuela). The brains were rapidly dissected after decapitation of anaesthetized fish. Tissue was freeze in dry ice and processed by cryostat sectioning for autoradiography or previously fixed by intracardiac perfusion for immunohistochemical techniques. Detection of melatonin receptors were realized by in vitro autoradiography, using 2-[^125]I iodomelatonin (I-mel) as a radioligand. The analysis of immunoreactive neurons to GnRH (GnRHir) was performed using anti-LHRH antibody (Sigma).

**Results and Discussion:**

**Telencephalon:** Melatonin receptors and GnRHir were detected mainly in the dorsal and ventral telencephalon of *O. sifontesi*. The existence of both melatonin receptors and GnRH producing hormones in the same telencephalic areas, suggests that in *O. sifontesi* both systems are associate, and that melatonin acts like an inhibitor and/or stimulator GnRH production.

**Diencephalon:** GnRHir was located in all nuclei of the preoptic area, however, melatonin receptors were only detected in the *nucleus parvocellularis anterioris* and *preopticus magnocellularis* of *O. sifontesi*. The GnRHir present in the preoptic area of *O. sifontesi*, as in other vertebrates, may act like a hipophysiotropic factor [2]. Therefore, Falcon et al [3] have suggested that preoptic area of fish may be a key point for the photoneuroendocrine regulation. In this sense, melatonin, in *O. sifontesi*, may have a role in the integration of the photoperiod information.

**Hypothalamus:** High density of GnRHir somas was found in the following hypothalamic nuclei: *anterioris hipotalamis* (NAH), *diffussus lobi inferioris* (NDLI), *lateralis tuberis* (NLT), *anterioris tuberis* (NAT), *diffusus torus lateralis* (NDLT), *posterioris tuberis* (NPT) and *recessus posterioris* (NRP). In teleosts, the NLT has been described as the main area that communicates directly with the pituitary gland [4]. Melatonin receptors were located in NAT, NDLT, NRL and NLT. The presence of immunoreactive somas and fibres and melatonin receptors in common areas of the hypothalamus, suggests that in *O. sifontesi* both systems may be associated and to act of direct form in the modulation of the pituitary secretions.

**Conclusion:**

These findings agree with the concept that melatonin has a role in the modulation of the production of GnRH in this species like has been reported in various species of teleosts.

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**References:**


