Maturational gonadotropin hormone (GtH) and gonadotropin releasing hormone (GnRH) changes during growth and sexual maturation on female carp

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MATURATIONAL GONADOTROPIN HORMONE (GtH) AND GONADOTROPIN RELEASING HORMONE (GnRH) CHANGES DURING GROWTH AND SEXUAL MATURATION ON FEMALE CARP (Cyprinus carpio L.)

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Summary

Changes in gonadotropin hormone (GtH) levels in the blood and pituitary as well as changes in gonadotropin releasing hormone (GnRH) content in the pituitary and hypothalamus during growth and sexual maturation of carp females were investigated.

Introduction

The profile hormones during the life of carp has been reported sofar only for steroids.

It was the reason why it was decided to measure from 5 months after hatching to first sexual maturity, GtH levels in the blood and pituitary and hypothalamus of common carp maintained in growing ponds.

Material and Methods

Experiment lasted from June 1981 till August 1985. Fish were kept in a typical earth en pond. Each day at 10^{00} water temperature was recorded, 20 cm over bottom.

Sampling was performed on the following days: 29 November 1981, 26 March 1982, 28 June 1982, 20 October 1982, 16 December 1982, 24 March 1983 and later monthly till August 1985, on 10-20 females.

Blood samples were taken from fish 5 h after sunrise and after killing, gonads (from 20 October 1982), hypothalami (from 19 June 1984) as well as pituitaries (from 29 October 1981) were collected.

Blood serum was preserved with merthiolate and kept at -20°C as well as the hypothalami and pituitaries until the measurement of GtH by RIA (according to Breton et al., 1971) and GnRH.

Results

GSI was showing great variability during growth and sexual maturation. It was found that blood GtH levels were not changing much during all investigated period, except at the beginning of vacuolisation of the oocytes when peaks of GtH were observed. GtH in the pituitary started to accumulate from 13 months and GnRH from 33 months of age, GnRH levels in the pituitaries being very low before this time. GnRH contents in the hypothalami were also low increasing during females lives and showing great variations. No significant relations between all the studied parameters were found, except significant correlation between age and GSI as well as between age and GnRH content in the pituitary.

Discussion

This work which is the first to describe ovary changes from the beginning of oogenesis to the end of vitellogenesis, allows us to propose a model concerning changes in the ovary in relation to gonadotropin and GnRH variations for carp in a temperate climate.

During the first 3 years of female life there is a synchronous development of the ovary characterized by a gradual increase in pituitary GtH levels while pituitary GnRH contents increased lately.

During this period, blood GtH levels did not change substantially. During the second phase ovaries undergo an asynchronous development. This phase is initiated on the ovaries beginning vacuolisation by a release to the blood of a great amount of GtH. It ends up when fish are five years old and at this time the ovary contains oocytes at the end of vitellogenesis. This asynchronous development of the ovaries is characteriyed by great variations in GtH (plasma and pituitary) and in GnRH (pituitary and hypothalamus) contents without clear parallel changes in all these parameters.

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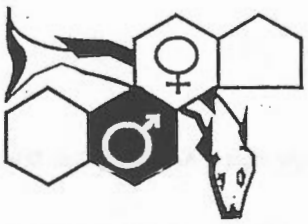

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