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Abstracts

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VILLE DE SAINT-MALO
INFLUENCE OF INTRAVENTRICULAR INJECTIONS OF MELATONIN ON GTH2 RELEASE FROM THE PITUITARY OF MATURE CARP FEMALES (CYPRINUS CARPIO L.)

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The pineal gland has been implicated in the control of circadian organization and rhythmicity in behavioral activities of teleost fish (Kavaliers 1981). Recently, Kezuka et al. (1989) reported that the pineal gland is involved in determining the timing of the preovulatory gonadotropin surge in mature female goldfish. Also, pinealectomy in mature carp females retard the final oocyte maturation (Popek et al. 1989). The aim of the present study was to determine the effects of melatonin on GTH2 secretion in sexually mature carp females.

For the studies a total of 26 mature 5-year-old female carp, weighing on average 3.2 kg, were used. All fish were placed in the basins of 1.6 m² in water which temperature was electronically controlled and maintained constant at 20°C. Artificial lighting L:D=16:8 was provided, switched on at 04:00. In all females injections were performed with a needle located in the third brain ventricle, according to the stereotaxic technique of Peter (1970). Melatonin (Sigma, USA), was given at a dose of 1µg/lµl/kg of body weight. Central females received injections of physiological solution.

Group 1, comprising 12 females injected at 20:00 (moment of switching off the light). Blood samples were collected from dorsal aorta through the polyethylene tubing (according to the method of Soivio et al. 1975) starting at 19:45 (presample), and from 20:00 to 20:50 with 10 min. interval.

Group 2, comprising 14 females injected at 24:00. Blood samples were collected starting at 23:45 (presample), and from 24:00 to 01:30 with 10 min. interval. The GTH2 levels were determined by RIA (Breton et al. 1971). The results were calculated statistically using analysis of variance and Duncan’s test.

Intraventricular injections of melatonin performed at 20:00 (group 1) did not cause any changes in blood GTH2 levels in comparison with control fish. In females of group 2 (injection of melatonin at 24:00) it was found that during 30 min. after injection of melatonin GTH2 levels increased significantly (p<0.05) in comparison with the GTH2 levels before injection as well as with GTH levels in control fish. After next 40 min. GTH2 levels returned to the basal level.

These results suggest that the moment in which melatonin injections were performed is very important because the stimulating effects on the GTH2 release from pituitary were observed only by midnight, in the moment of the highest level of endogenous melatonin. They suggest also that in mature carp females melatonin takes part in the control of GTH2 release, probably through the hypothalamus.