ABSTRACT

Serum levels of 17α-hydroxyprogesterone, testosterone, 11-ketotestosterone, cortisol and testicular histology during the first reproductive cycle (age 18-29 months) of *Labeo rohita*, a Pakistani major carp.

Irfana Liaqat

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This thesis documents the annual seasonal testicular histology and profiles of the primary reproductive steroids 17α-Hydroxyprogesterone, testosterone (T), 11-Ketotestosterone (11-KT) and cortisol in the reproductive cycle of male *Labeo rohita* from the age of 18 to 29 months. The maturity of the testis was divided into four stages based on histological observations and macroscopic appearance. These are immature and developing stage (November to February), developed and maturing stage (March to May), ripe and running stage (June to July), spent and regressed stage (August to October).The pattern of seasonal change in gonadosomatic index (GSI) clearly reflected testicular maturity. The levels of 17α-Hydroxyprogesterone ranged between 1.57 and 5.21 ng ml^{-1}. The results showed that the testosterone titers were lower during the winter months when the gonads were quiescent however, with the increase in water temperature and photoperiod in spring (March) and summer (June-July), the testes became active physiologically. The concentrations of T and 11-KT fluctuated significantly during the sexual maturity stages however showing a similar pattern and significantly correlated to GSI changes. 11-KT levels increased during late spermatogenesis, to reach 6.20 ng ml^{-1}.

Cortisol, the stress hormone, showed higher values in winter and autumn as compared to minimum values in spring. With this comprehensive database of information provided by the present study about the reproductive endocrinology and biology of *Labeo rohita*, this species is now available as a model to further examine the dynamics of the steroid hormones, control of reproduction, spawning and spawning behavior.

Key Words: *Labeo rohita*; Testis; 17α-hydroxyprogesterone; Testosterone; 11-KT; Cortisol; Annual testicular Cycle; Histology; Gross changes.