

Recombinant luteinizing hormone development to improve the reproductive performance of female Malaysia catfish, *Hemibagrus nemurus* (Valenciennes, 1840)

ABSTRACT

Gonadotropins (GTHs), follicle-stimulating hormone (FSH), and luteinizing hormone (LH) are the major regulators of gonadal development in fish. This study reported the production of recombinant LH (rLH) in *Hemibagrus nemurus*. A single-chain rLH from *H. nemurus* was cloned into pET-32 and expressed in *Escherichia coli*. A specific band at 45.4 kDa was detected; this band corresponded to the molecular size of fusion rLH. Immature female *H. nemurus* were divided into four different treatment groups. Each group received a single injection of either 1X PBS, 0.5 ml/kg Ovaprim, rLH50 µg/kg, or rLH150 µg/kg. Gonad histology revealed that the fish treated with rLH50 µg/kg, rLH150 µg/kg, and Ovaprim could induce oocyte maturation at 48h post injection (p.i.). The 17^β-estradiol (E2) plasma level in fish treated with rLH50 µg/kg significantly increased after 12h p.i., and the level was sustained up to 24h p.i. The mRNA expression levels of GTH subunits also significantly increased in fish treated with rLH50 µg/kg after 48h p.i. Fish treated with Ovaprim showed significantly increased E2 plasma levels after 6h p.i., but this level decreased after 12h p.i. No significant increase was found among mRNA subunits in fish treated with Ovaprim after 48h p.i. Treatment with rLH150 µg/kg had a weak stimulatory effect on the E2 production and the mRNA transcript level of GTH subunits.

Keyword: Gonadotropin; Single-chain recombinant protein; 17^β-estradiol