

INTISARI

Pengaruh Pemberian Hormon Analog GnRH-III [D-Lys⁶, NHEt] terhadap Tingkat Keberhasilan Pemijahan dan Ekspresi *fsh-lh* pada Ikan Zebra (*Danio rerio* Hamilton, 1822)

Beberapa jenis ikan budidaya mengalami kendala dalam produksi benih karena sulitnya merangsang pemijahan secara alami, sehingga diperlukan teknologi induksi hormon untuk memacu pematangan gonad dan mempercepat pemijahan. Hormon *Gonadotropin-Releasing Hormone* (GnRH) berperan penting dalam mengatur sistem reproduksi ikan melalui stimulasi pelepasan *Follicle-Stimulating Hormone* (FSH) dan *Luteinizing Hormone* (LH). Penelitian ini bertujuan untuk mengetahui pengaruh pemberian hormon analog GnRH-III [D-Lys⁶, NHEt] terhadap tingkat keberhasilan pemijahan dan ekspresi gen *fsh-lh* pada ikan zebra (*Danio rerio*). Penelitian menggunakan rancangan acak lengkap (RAL) dengan tiga perlakuan, yaitu kontrol negatif berupa PBS, hormon analog GnRH-III [D-Lys⁶, NHEt] atau (3-HL), dan Ovaprim sebagai kontrol positif. Parameter yang diamati meliputi persentase keberhasilan pemijahan, waktu laten, serta ekspresi relatif gen *fsh* dan *lh*. Analisis data dilakukan secara deskriptif untuk data pemijahan, sedangkan data ekspresi gen *fsh-lh* dianalisis menggunakan metode Livak ($2^{-\Delta\Delta C_t}$). Hasil penelitian menunjukkan bahwa perlakuan 3-HL menghasilkan persentase keberhasilan pemijahan yang lebih tinggi dibandingkan perlakuan kontrol negatif, meskipun masih lebih rendah dibandingkan kontrol positif. Perlakuan 3-HL juga mampu mempercepat waktu laten pemijahan dengan rata-rata 205 menit, mendekati perlakuan kontrol positif sebesar 201 menit. Analisis ekspresi gen menunjukkan bahwa perlakuan 3-HL menghasilkan ekspresi relatif tertinggi gen *lh* pada ikan jantan dan betina, serta gen *fsh* pada ikan jantan, sedangkan ekspresi relatif gen *fsh* tertinggi pada ikan betina diperoleh pada perlakuan kontrol positif. Hasil penelitian menunjukkan bahwa perlakuan 3-HL bekerja cukup efektif dalam merangsang sistem reproduksi ikan zebra melalui peningkatan ekspresi gen gonadotropin dan percepatan respons pemijahan.

Kata kunci : ekspresi gen *fsh-lh*, GnRH-III, ikan zebra, keberhasilan pemijahan

ABSTRACT

Effect of GnRH-III Analog Hormone [D-Lys⁶, NHEt] Administration on Spawning Success and *fsh-lh* Expression in Zebrafish (*Danio rerio* Hamilton, 1822)

Several cultured fish species encounter constraints in fish seed production due to the difficulty of inducing natural spawning, thus requiring hormonal induction technology to stimulate gonadal maturation and accelerate spawning. *Gonadotropin-Releasing Hormone* (GnRH) plays an important role in regulating the reproductive system of fish by stimulating the release of *Follicle-Stimulating Hormone* (FSH) and *Luteinizing Hormone* (LH). This study aimed to determine the effect of administering a GnRH-III analog hormone [D-Lys⁶, NHEt] on spawning success and the expression of *fsh* and *lh* genes in zebrafish (*Danio rerio*). The study employed a completely randomized design (CRD) with three treatments: a negative control consisting of PBS, a GnRH-III analog hormone [D-Lys⁶, NHEt]/(3-HL), and Ovaprim as a positive control. Observed parameters included spawning success rate, latency period, and relative expression levels of the *lh* and *fsh* genes. Spawning data were analyzed descriptively, while gene expression data were analyzed using the Livak ($2^{-\Delta\Delta C_t}$) method. The results showed that the 3-HL treatment resulted in a higher spawning success rate than the negative control treatment, although it remained lower than that of the positive control. The 3-HL treatment also shortened spawning latency time, with an average of 205 minutes, approaching that of the positive control treatment (201 minutes). Gene expression analysis showed that the 3-HL treatment resulted in the highest relative expression of the *lh* gene in both male and female fish, as well as the highest relative expression of the *fsh* gene in male fish, whereas the highest relative expression of the *fsh* gene in female fish was observed in the positive control treatment. These findings indicate that the 3-HL treatment effectively stimulates the reproductive system of zebrafish by enhancing gonadotropin gene expression and accelerating spawning responses.

Keyword : GnRH-III, *fsh-lh* gene expression, spawning success, zebrafish