

## RINGKASAN

Perkembangan sel spermatogenik memerlukan keterlibatan hormon gonadotropin dan hormon testosteron. Selain gonadotropin dan testosteron terdapat hormon lain yang berperan dalam spermatogenesis, yaitu tiroksin. Peranan hormon tiroksin pada spermatogenesis ikan nilem belum diketahui sehingga perlu dilakukan penelitian. Tujuan penelitian ini adalah mengevaluasi perkembangan sel-sel spermatogenik ikan nilem pada kondisi *in vitro* dalam medium yang mengandung tiroksin dengan konsentrasi berbeda dan mendapatkan konsentrasi hormon tiroksin yang sesuai untuk perkembangan sel-sel spermatogenik ikan nilem pada kondisi *in vitro*. Penelitian ini dilakukan secara ekperimental dengan menggunakan Rancangan Acak Lengkap (RAL) dengan 4 perlakuan yaitu tanpa penambahan tiroksin (kontrol), penambahan tiroksin 15 ng.mL<sup>-1</sup>, penambahan tiroksin 30 ng.mL<sup>-1</sup>, dan penambahan tiroksin 45 ng.mL<sup>-1</sup>. Setiap perlakuan diulang sebanyak 6 kali. Parameter yang diukur berupa proporsi dan viabilitas sel-sel spermatogenik. Hasil perhitungan proporsi sel spermatogenik ikan nilem yang dikultur kontrol dan dengan penambahan konsentrasi tiroksin yang berbeda (15 ng.mL<sup>-1</sup>, 30 ng.mL<sup>-1</sup> dan 45 ng.mL<sup>-1</sup>) berturut-turut, yaitu pada spermatogonia 0,403±0,198%, 0,275±0,135%, 0,060±0,079%, 0,074±0,098%; spermatisit 8,325±6,140%, 6,138±3,127%, 10,789±5,536%, 2,323±1,291%; spermatid 9,928±4,853%, 5,767±1,668%, 7,499±1,929%, 2,967±0,423%; dan spermatozoa 2,642±6,549%, 11,751±5,741%, 25,045±8,204%, 23,525±8,450%. Viabilitas sel dalam fragmen testis yang dikultur kontrol dan dengan penambahan konsentrasi tiroksin yang berbeda (15 ng.mL<sup>-1</sup>, 30 ng.mL<sup>-1</sup>, dan 45 ng.mL<sup>-1</sup>) berturut-turut adalah 99,640±0,298%, 99,8548±0,180%, 99,894±0,110%, 99,969±0,039%. Data tersebut menunjukkan bahwa penambahan hormon tiroksin sebesar 15-45 ng.mL<sup>-1</sup> menurunkan proporsi spermatogonia (p<0,01), spermatisit (p<0,05), spermatid (p<0,01), namun meningkatkan proporsi spermatozoa (p<0,05) dan viabilitas sel (p<0,05) dalam fragmen testis ikan nilem. Hasil ini mengindikasikan bahwa tiroksin memiliki peranan dalam spermatogenesis ikan nilem.

Kata kunci : sel-sel spermatogenik, tiroksin, *Osteochilus vittatus*, *in vitro*

## SUMMARY

Development of spermatogenic cell needs involvement of gonadotrophin hormone and testosterone. In addition to gonadotrophin and testosterone, there is another hormone plays a role in spermatogenesis, namely the thyroxine. Role of thyroxine in the spermatogenesis of hard-lipped barb is not known yet therefore it is necessary to do research. The aims of this study were to evaluate the spermatogenic cells development in invitro condition using medium containing different concentrations of thyroxine and to determine concentration of thyroxine suitable for the hard-lipped barb spermatogenic cells development in invitro condition. This study was conducted experimentally using Complete Randomized Design (CRD) consisted of four treatments: control (without thyroxine), 15 ng.mL<sup>-1</sup> thyroxine, 30 ng.mL<sup>-1</sup> thyroxine, and 45 ng.mL<sup>-1</sup> thyroxine. Each treatment was repeated six times. The parameters were the proportion and viability of spermatogenic cells. The results showed that the proportion of spermatogenic cell of the control and the treated groups (15 ng.mL<sup>-1</sup>, 30 ng.mL<sup>-1</sup> and 45 ng.mL<sup>-1</sup>) were spermatogonia 0,403±0,198%, 0,275±0,135%, 0,060±0,079%, 0,074±0,098%; spermatocyte 8,325±6,140%, 6,138±3,127%, 10,789±5,536%, 2,323±1,291%; spermatid 9,928±4,853%, 5,767±1,668%, 7,499±1,929%, 2,967±0,423%; and spermatozoa 2,642±6,549%, 11,751±5,741%, 25,045±8,204%, 23.525±8,450% respectively. Cell viability in the testes fragment of the control and the treated groups (15 ng.mL<sup>-1</sup>, 30 ng.mL<sup>-1</sup>, dan 45 ng.mL<sup>-1</sup> thyroxine) were 99,640±0,298%, 99,8548±0,180%, 99,894±0,110%, 99,969±0,039% respectively. These result showed that addition of 15 ng.mL<sup>-1</sup> to 45 ng.mL<sup>-1</sup> thyroxine decreased spermatogonia (p<0,01), spermatocyte (p<0,05), and spermatid (p<0,01) proportions, on the other hand the thyroxine increased the proportion of spermatozoa (p<0,05) and cell viability (p<0,05) in testes fragment. These results indicated that thyroxine has an important role in spermatogenesis of hard-lipped barb.

**Keywords:** spermatogenic cells, thyroxine, *Osteochilus vittatus*, in vitro