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Induction of triploidy in Patin bunga, *Pangasius sutchi* by heat shock treatment. / Rahimaton Raisyah Muhammad.

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**INDUCTION OF TRIPLOIDY IN PATIN BUNGA, *Pangasius sutchi*
BY HEAT SHOCK TREATMENT**

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**This research report is submitted in partial fulfillment of the requirement of the
degree of Bachelor of Science in Agrotechnology
(Aquaculture)**

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ABSTRACT

The use of triploidy induction, in aquaculture has attracted considerable attention. Triploidy induction is an effective way to achieve sterility in fish. Sterility confers a potential additional advantage, as the energy invested in reproduction can be diverted to somatic growth. Triploidy induction is a process whereby an entire chromosome set is added to a fertilized egg. The objectives of the present study were to determine the possibility of inducing triploid *Pangasius sutchi* using heat temperature shocks and to determine the success of triploid by erythrocytes measurement. Heat shock treatments were applied to the eggs 2 minutes after fertilization. Fertilized eggs were subjected to preselect temperatures at 36, 38, 40 and 42°C at duration time 0.5, 1.0, 1.5 and 2.0 minutes. Control groups were kept separately at ambient temperature (26.5°C). The success of triploidy were assessed by erythrocytes measurement. Sampling to determine growth rates (total length) were also be carried out until the larvae reached 6 weeks of age. From the results, it was proven that the average size were greater than those of diploids with approximately 1.51 times larger than the diploids. Success of triploidy were obtained through heat shocked at all temperature tested except for the temperature of 36°C at 2 minutes, 40°C at 1 minute, 42°C at 0.5 minute and 2.0 minutes duration. One hundred percent of triploidy was produced in patin, *Pangasius sutchi* by heat shocked treatment at 36°C at 1.0 minute, 38°C at 0.5 and 1.5 minutes also 40°C at 2.0 minutes of duration. Among of this four treatments, the best treatment was the 40°C at 2.0 minutes of duration prior to the highest growth rate.

ABSTRAK

Penghasilan triploidi dalam akuakultur telah menarik perhatian ramai. Penghasilan triploidi adalah merupakan kaedah yang efektif untuk menghasilkan kemandulan bagi ikan. Kemandulan berpotensi meningkatkan dan menggalakkan tumbesaran kerana tenaga yang sepatutnya digunakan bagi prduksi akan digunakan pada pertumbuhan somatik. Kebiasaannya, triploidi dihasilkan melalui rintangan bahan kimia, tekanan serta kejutan suhu pada telur yang telah tersenyawa. Objektif kajian ini adalah untuk menentukan kemungkinan untuk menghasilkan triploidi pada ikan patin bunga, *Pangasius sutchi* melalui kejutan suhu panas dan juga untuk menentukan kejayaan triploidi melalui teknik pengukuran sel darah merah. Selepas telur disenyawakan, kejutan suhu dilakukan selepas tempoh dua minit. Terdapat empat suhu berbeza iaitu 36, 38, 40 and 42°C dan pada selang masa berbeza iaitu 0.5, 1.0, 1.5 dan 2.0 minit. Manakala sebagai kawalan, telur dibiarkan pada suhu persekitaran (26.5°C). Kejayaan ditentukan melalui pengukuran sel darah merah. Malah, kadar pembesaran turut diukur pada setiap minggu selama enam minggu. Keputusannya, saiz sel darah merah bagi triploidi adalah 1.51 kali ganda lebih besar dari saiz sel darah merah bagi diploid. Setiap suhu pada setiap selang masa telah berjaya menghasilkan triploidi kecuali pada suhu 36°C (2 minit), 40°C (1 minit) dan 42°C (0.5 minit dan 2.0 minit). Manakala 100% triploidi telah berjaya dihasilkan pada suhu dan selang masa 36°C (1.0 minit), 38°C (0.5 dan 1.5 minit) serta 40°C (2.0 minit). Suhu 40°C pada selang masa 2.0 minit adalah suhu dengan selang masa terbaik bagi menghasilkan triploidi berdasarkan keputusan 100% dan pertumbuhan yang paling pesat.