# A STUDY ON THE GENETIC VARIATION, CROSS COMPATIBILITY AND LARVAL REARING OF GOURAMIS (*Trichogaster* spp.)

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MASTER OF SCIENCE

KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

2003

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Thesis Submitted in Fulfilment of the Requirement
for the Degree of Master of Science in the
Faculty of Agrotechnology and Food Science
Kolej Universiti Sains dan Teknologi Malaysia

March 2003

*This thesis is specially dedicated to*
*Father, Mother, sister and Ching*

Abstract of thesis presented to the Senate of Kolej Universiti Sains dan Teknologi Malaysia in fulfilment the requirement for the degree of Master of Science.

# A STUDY ON THE GENETIC VARIATION, CROSS COMPATIBILITY AND LARVAL REARING OF GOURAMIS (*Trichogaster spp.*)


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**March 2003**


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Genetic variation of four species of gouramis from the genus *Trichogaster* namely *T. trichopterus* (three spot gourami), *T. leeri* (pearl gourami), *T. pectoralis* (snakeskin gourami) and *T. microlepis* (moonlight gourami) and three varieties of three spot gouramis namely yellow gourami, cosby gourami and lavender gourami were determined using Random Amplified Polymorphic DNA (RAPD) techniques. A total of seven individuals from each species and varieties were used for RAPD assay using two different primers namely OPA-11 and OPA-12. No polymorphism was detected in blue, lavender and cosby gouramis. The genetic distance between seven pearl gourami individuals were ranged from 0.0000 to 0.0370. The genetic distance obtained from moonlight gourami and snakeskin gourami ranged from 0.0000 to 0.4545 and 0.0000 to 0.2727, respectively.

The Similarity Index (SI) between the species and varieties of gouramis ranged from 0.1063 to 0.5917. RAPD analysis successfully showed that blue, lavender, cosby and yellow gouramis (three spot gouramis) were genetically closely related. However, pearl gouramis were distantly isolated from the varieties in the three spot gouramis, moonlight gouramis and the snakeskin gouramis. This indicates that hybridization attempt between pearl, snakeskin and moonlight gouramis with three spot gouramis would fail, as the genetic distance between them were distantly isolated.

Cross-breeding attempts were performed among the varieties of three spot gouramis and pearl gouramis. All breeding attempts showed that intra-breeding among individuals of blue strain gouramis produced relatively higher percentage of blue three spot gouramis with some number of cosby gouramis. Meanwhile, breeding among individuals of yellow strain gouramis produced all yellow gouramis. The results were also similar for pearl gouramis. Cross-breeding between blue strain gouramis and yellow gouramis were also successful in all breeding attempts. Nevertheless, the cross produced a lower percentage of blue three spot gouramis. Meanwhile, a larger portion of lavender gouramis, which looks similar to the wild form were produced at a higher number. Crossbreeding of pearl gouramis with other varieties was not possible in all breeding attempts. This may be due to the distant genetic relationship between the two species.

Water media plays an important role in the hatching process of gourami eggs. Based on the results of this study, hatching rate was higher in peat water followed by tap water and green water. Black water extract prepared from dried leaves of 'Ketapang' tree

(*Terminalia cattapa*) range at pH 6.0 to pH 6.8 could act as a pH buffer and is most suitable for the incubation of gourami eggs thus creating a slightly lower pH and soft water condition as compared with tap water or green water.

Highest larval survival was observed in probiotic bacteria-added-water. The use of probiotic bacteria (PSB) could enhance the gouramis larval survival due to the bacteria's capability in eliminating harmful nutrients in water such as unionized ammonia, nitrate and nitrite.

Higher growth and survival rates were significantly recorded when gourami larvae were fed with a food mixture consisting of artificial plankton, capsulated micropellet and probiotic bacteria. Larval growth and survival rate were slightly lower when single usage of the mentioned food items were applied.

The use of artificial plankton as starter feed is more suitable as compared to capsulated micropellet. Nevertheless, the usage of food with mixture of probiotic bacteria could enhance the larval growth and survival rate. Based on the current findings of this research, it can be concluded that commercial products with probiotic bacteria can promote the growth and survival rate of gourami larvae.