

## Karyotipe dan hibridisasi ikan pelangi Irian (Famili Melanotaeniidae)

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### Abstrak

Penelitian ini mendeskripsikan variasi kromosom dan karyotipe 5 spesies ikan pelangi Irian, yaitu *Glossolepis incisus*, *Melanotaenia boesemani*, *M. lacustris*, *M. maccullochi*, dan *M. praecox*. Sel metafase diperoleh menggunakan teknik jaringan padat. Larva ikan direndam dalam kolkisin dosis 0,07--0,09% selama 7,5 -- 9,0 jam dan dianalisis setelah diwarnai dengan Giemsa.

*Glossolepis incisus*, *M. boesemani*, *M. maccullochi*, dan *M. praecox* masing-masing memiliki 48 kromosom diploid, sedangkan *M. lacustris* memiliki 46 kromosom diploid. Karyotipe *G. incisus* terdiri dari 7 pasang kromosom berbentuk subtelosentrik (ST), dan 17 pasang lainnya berbentuk telosentrik (T).

Karyotipe *M. boesemani* terdiri dari 4 pasang kromosom berbentuk ST dan 20 T, *M. maccullochi* terdiri dari 4 pasang ST dan 20 T, dan *M. praecox* terdiri dari 1 ST dan 23 pasang lainnya berbentuk T. Karyotipe *M. lacustris* terdiri dari 9 pasang submetasentrik (SM), 3 ST, dan 10 T. Selain itu pada *M. lacustris* juga diperoleh sepasang kromosom yang tidak identik yang diduga sebagai kromosom seks. Karyotipe *Melanotaeniidae* cenderung didominasi oleh bentuk T. Terdapat spesifikasi perlakuan kolkisin dalam memperoleh sel metafase dengan sebaran kromosom terbaik, dan terdapat keanekaragaman karyotipe pada 5 spesies ikan pelangi Irian. Perkerabatan antara *G. incisus* dengan *M. lacustris* diduga relatif tidak dekat dibandingkan antara *G. incisus* dengan spesies lainnya.

.....Karyotipe and Hybridization of Irian's Rainbowfish, (Melanotaeniidae) Rainbowfish (Melanotaeniidae family) have several species (i.e. *Melanotaenia*, *Glossolepis*) that are endemic in Irian Jaya. Attractive color and shape of this fish have an economical value (especially the male fish) as the ornamental fish, that caused the exploitation of this fish so intensified. The problem of this fish are poor biological (genetics) information, and in rearing are low survival rate, growth rate, and male percentage. Therefore, a genetic research (such as cytogenetic) and genetic manipulation (i.e. hybridization) of this fish are needed.

Cytogenetic study of this fish was focussed on the karyotype to identify characteristics of chromosomes. This research was conducted from March 2000 at Laboratory of Genetic and Fish Reproduction, Faculty of Fisheries and Marine Sciences, Bogor Agricultural University, Darmaga Bogor. And further the hybridization is carried out to get a good performance of hybrid in case of growth rate, survival rate, and male percentage. This research was conducted from October 1999 at R & D Center for Limnology-LIPI, Cibinong-Bogor.

Fish samples (*G. incisus*/Gi, *M. boesemani*/Mb, *M. lacustris*/Ml, *M. maccullochii*/Mm, and *M. praecox*/Mp) were collected from R & D Center for Limnology-LIPI, Cibinong. Chromosome plates were prepared by solid tissue technique from 10-30 days old larvae and were analyzed after staining with Giemsa. Some larvae were exposed to 0.07-0.09 % colchicine for 7.5-9 hours, then to 0.075M KCl hypotonic solution for 90-100 minutes, and finally were fixed with Carnoy's solution. The intergenus hybridization (reciprocal) among these species by pairing a couple of broodstock of each species. Observation were conducted in three replicates on fertilization rate (FR), length of incubation period of hatching (LIP), hatching rate (HR), survival rate (SR), growth rate, and male percentage.

Diploid chromosomes number of these fish are 46-48. Karyotyping of *G. incisus* showed that 48 chromosomes consist of 7 subtelocentrics (ST) and 17 telocentrics (T). Karyotyping of *M. boesemani* showed 48 chromosomes consist of 4 ST and 20 T. Karyotyping of *M. lacustris* showed 46 chromosomes consist of 9 submetacentrics (SM), 3 ST, and 10 T with 1 ST and 1 T on the no.23. This result indicates that *M. lacustris* has a sex chromosome. Karyotyping of *M. maccullochi* showed 48 chromosomes consist of 4 ST and 20 T and karyotyping of *M. praecox* showed 48 chromosomes consist of 1 ST and 23 T. There were differences in chromosomes numbers and 13 chromosomes pairs between *G. incisus* and *M. lacustris* according to the morphological analysis. Based on these evidences, it is suggested that 2 species is not closely related compared to the others. The highest hatching rate was demonstrated from crossing between a *G.incisus* x *M. lacustris*, whereas crossing of a *M.lacustris* x *G.incisus* resulted a total mortality of embryos three days after spawning, and the crossing between 31 *G.incisus* x 9 *M. praecox* were failed to spawn. Among those hybrids, were found that c *M.praecox* x 9 *G.incisus* showing the highest growth rate, whereas the highest survival rate (SR) was shown by the d *G.incisus* x 9*M.boesemani* crossing. Crossing of c*G.incisus* x 9*M. lacustris* and o*M\_ maccullochi* x9 *G.incisus* resulted 100% male (monosex hybrids), while the other combinations increased the male percentage.