

Triploid hybridization as a reproductive containment method of
genetically modified fish, exemplified by
fast-growing transgenic mud loach

Yoon Kwon Nam^{a,*}, In-Seok Park^b and Dong Soo Kim^a

^a*Department of Aquaculture, Pukyong National University, Busan 608-737*

^b*Faculty of Marine Science, Korea Maritime University, Busan 606-791*

Transgenic triploid hybrid between fast-growing transgenic mud loach (*Misgurnus mizolepis*) males and cyprinid loach (*M. anguillicaudatus*) females were generated and their performance on growth, feed conversion ability and reproduction were evaluated. Although the growth accelerations of diploid and triploid transgenic hybrids were not as much as those of original transgenic mud loaches, they still represented persistent growth stimulation ranging 11 to 28 fold when compared to their non-transgenic counterparts, with significantly improved feed conversion efficiency up to 2-fold (compared to non-transgenic hybrid) and 1.5-fold (compared to non-transgenic mud loach) in maximum. The gonad development of diploid hybrids was fertile in histological views regardless of transgenic genotypes but the extent of development in hybrid fish were less than mud loach diploids at the same age. On the other hands, very stringent sterility was obtained in both sexes of the triploid hybrid transgenics: ovary and testis from transgenic triploid hybrids were significantly depressed and any notable sign for maturation to ovum or spermatids was not detected. No viable embryo was obtained in a fertilization trial using the suspension prepared from the minced testes of transgenic triploid hybrids. This study may indicate the potential usefulness of triploid hybridization as a mean for reproductive containment of transgenic mud loach.

*Corresponding author: yoonknam@pknu.ac.kr