

GENETIC DIVERSITY, MIGRATION, AND REPRODUCTION OF RELEASED HATCHERY-REARED JAPANESE FLOUNDER *PARALICHTHYS OLIVACEUS*

Tetsuo Fujii*, Toshiaki Ito, and Mutsumi Nishida
Japan Sea National Fisheries Research Institute
Fisheries Research Agency
Suido, Niigata 951-8121, Japan
tefujii@affrc.go.jp

Japanese flounder *Paralichthys olivaceus* is one of the most important fish for the coastal fisheries in Japan and approximately 25 million hatchery-reared juveniles have been released annually to enhance the stock. As a result of the stock enhancement program, more than 10% of landed flounder is comprised of the released fish in some regions. It is necessary to consider how to conserve the genetic diversity of the wild population of Japanese flounder under successive mass releases of hatchery-reared juveniles.

Genetic diversity, migration, and reproduction of released hatchery-reared flounder were investigated by DNA analysis. Results of analyzing 40 groups of juveniles from 12 hatcheries showed that the genetic diversity of hatchery-reared juveniles was lower than that of the wild population especially when cultured fish were used as parents. It was suggested that using enough (more than 100) fish from the wild population as a brood stock, collecting eggs at the middle of the spawning season, and collecting eggs more than 3 times in one season with more than three days interval between collections were important to increase the genetic diversity of juveniles.

The migration of released flounder was investigated by using DNA tags. Released flounder tend to migrate against the ocean current as they grew and flounder from several hatcheries were caught at the same spawning area after they matured. The genetic diversity of released flounder recaptured at a spawning area was as high as the diversity when released. This finding suggested that the genetic diversity of released juveniles was maintained to maturity. The most important component of the stock enhancement program is considered to be maintaining high genetic diversity among the hatchery-reared juveniles.

Recent DNA surveys of newly settled wild juveniles proved the successful reproduction of released flounder. The magnitude of the contribution of released flounder varied depending upon the density of released flounder in the spawning area and the distance from the particular spawning area. Continuing investigations on genetic variability of both the wild population and hatchery-reared juveniles is needed to conserve the genetic diversity of the Japanese flounder.