

# The Technical Development of Sustainable Seed Production for Black Sea Turbot

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In Turkey, development of new target fish for farming is required by fish farmer because the market becomes saturated with farmed sea bass and gilthead sea bream. The Black Sea turbot (local name: Kalkan, scientific name: *Psetta maxima*) is one of the most valuable fish in Turkish market. Until recently, consumer demand for turbot has been filled by captured natural fish, since sufficient turbot juvenile has not been available for farming. On the other hand in natural sea, depletion of resources of Black Sea turbot is feared. Consequently technical development for management and propagation of the resource is very important.

In April 1997, the Fish Culture Development Project in The Black Sea started at the Central Fisheries Research Institute (CFRI) in Trabzon, Turkey as five years collaboration between Japan International Cooperation Agency (JICA) and Ministry of Agriculture and Rural Affairs (MARA). Technical development for seed production of Black sea turbot is carried out in the project. At present we are carrying out the follow up project of 2.5 years.

Since the time of signing follow-up program of 'Fish Culture Development Project in the Black Sea' under the agreement between Japan International Cooperation Agency (JICA) and Trabzon Central Fisheries Research Institute, Ministry of Agriculture and Rural Affairs (MARA), we have focused on several technical subjects for the development of fish culture in the coastal waters of the Black Sea. The studies of the project were initially dependent on the achievement of developing seed production and rearing techniques and transfer these techniques to Turkish side. Recently works have been grouped in to the three main aspects; on developing spawning techniques of hatchery-bred stock, improvement of larval survival and nutritional studies for larvae to adult Black Sea turbot.

As a result of these activities, spawning techniques in hatchery-bred broodstock was improved and first time 5,889 juveniles (48 mm TL) were produced, survival rate of larvae at 20 mm TL was increased to over 10 %, which was

the important aim of the project, with a mean 11.7% survival, while it was 4% prior to follow up program and 139,200 larvae in production tanks and 10,000 larvae in experimental tanks (100 mm TL) were produced in 2002 whereas this number was 8,000 ind. in 1998, 27,000 ind. in 2000 and 14,000 ind. in 2001.

Table 1: Japan counterparts of follow up project

Name	Duties	Sections	Years
Dr. Shiro HARA	Project Leader	Broodstock	2002
Goro NAZAKI	Expert, Project Coordinator	Feed Development	2002-2003
Hiroshi IWAMOTO	Project Adviser	Seed Production	2003-2004
Sohei KINO	Expert, Project Coordinator	Feed Development	2003-2004

Till now, maturation and spawning of target species under different conditions, evaluation of nutritional assessment for larvae/juveniles, manipulation of environmental conditions for larvae/juveniles rearing and conducting health control in larval/juvenile rearing have been improved by resulting with obtaining eggs from hatchery grown broodstock, inducing spawning for wild-caught spawners and attaining high survival rate for larvae/juveniles. However, it is need to be continued to improve and maintenance the satisfactory results of these studies.

In January 2005, The Technical Development of Sustainable Seed Production for Black Sea Turbot started at CFRI, as a new two-year project between JICA and MARA. In this new project, VHSV (Viral Hemorrhagic Septicemia Virus) control and egg and larval quality evaluation techniques have been developed.

## **New Project**

The "Fish Culture Development Project in the Black Sea" was commenced from April 1997 through October 2004 for seven and half years targeting the "Kalkan seed production" in Central Fisheries Research Institute (CFRI) in

Trabzon, in terms of spawning and seed production techniques of the turbot has been strengthened and secured. Overall achievement of the project in comparison with the project purpose was satisfactory at the time of the final evaluation.

However unpredictable fish disease, which was VHS, occurred in 2004, and it is suspected as one of the causes of heavy mortality of the seeds. Furthermore occurrence of dropsy heavily seen at the Former Project since the beginning is considered as one of the cause of mortality, as well. Therefore, there are strong needs on development of VHS prevention and dropsy countermeasures for Black Sea Turbot seed production method at the CFRI together with development of waste water treatment system for the hatchery in order to disinfect discharges to protect environment.

### Outline of the Project

**Overall Goal:** Sustainable seed production of Black Sea Turbot is developed.

**Project Site:** Trabzon Central Fisheries Research Institute (CFRI)

**Duration:** 2 years from January 2005

**Implementing Agency of the Project:** General Directorate of Agriculture Production and Development, Ministry of Agriculture and Rural Affairs

### Project Purpose

Quality of produced seeds of black sea turbot is improved at Trabzon Central Fisheries Research Institute (CFRI).

- Manual for VHS preventive measures is developed

- Guideline for dropsy countermeasures is developed

### Outputs

- Preventive measures against VHS are developed

- Countermeasures against dropsy are developed

### Activities

- Equipping necessary facilities and equipment.

- Conducting the training of PCR method to detect VHSV.

- Examining problem of current seed production method for Black Sea Turbot.

- Develop and introduce the preventive measures against VHS into the seed production method for Black Sea Turbot.

- Develop the criteria of quality eggs/larvae.

- Examine problems of current seed production method for Black Sea Turbot against the dropsy.

- Develop and introduce countermeasures against the dropsy into the seed production method for Black Sea Turbot.

### Principal Input

Japanese Side:

- Long term expert in the field of Epidemic Prevention.

- Short term experts in the field of Seed Production, Fish Diseases and Water System. (Others will be dispatched based on the necessity)

- Necessary facilities and equipments for VHS prevention and waste water treatment system

- Training of Turkish personnel in Japan (when necessity' arises)

Turkish Side:

- Counterpart personnel in the Field of Project Manager, Coordinator (MARA, CFRI), Hatchery Manager, Seed Production System, Live Food Management, Brood Stock Management, Disease Control and Mechanical Management.

- Necessary facilities and equipments other than Japanese inputs

- Spare parts for existing facilities and equipments

- Counter budget to manage and maintain CFRI

### Precondition

- Two veterinarians should be assigned as the counterpart of Disease Control Section.

- Should be revised concerning intensity level of UV.