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Olive flounder culture in South Korea

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High-value fish lead aquaculture production

The olive flounder (*Paralichthys olivaceus*) has ranked at the top of production among cultured finfish in Korea for more than 10 years. In 2006, the fish contributed almost 38 percent of the country's total finfish aquaculture production.

P. olivaceus is an important aquaculture species due to its high growth rate, feed efficiency, tolerance to water temperature changes, and resistance to diseases. It is further supported by the availability of seedling production from hatcheries.

The olive flounder is very popular among Koreans for its good taste and dressout yield. It is served in several ways, with hoe being the most popular of all.



Olive flounder are raised in flow-through systems at land-based facilities on the south and west coasts of Korea.

Production

The Republic of Korea is the top global producer of olive flounder. It produced over 70 percent (42,187 metric tons, or MT) of the global supply in 2005. The second-largest producer was Japan (10,686 MT), followed by Argentina and Uruguay, countries with production from only capture sources (Table 1).

Bai, World production (mt) of olive flounder, Table 1

Country	Aquaculture	Capture
Republic of Korea	40,075	2,112
Japan	4,591	6,095
Argentina	–	7,073
Uruguay	–	190

Table 1. World production (mt) of olive flounder in 2005.

Source: Food and Agriculture Organization of the United Nations

Thanks mainly to increasing aquaculture production, total olive flounder production in Korea increased continuously over the last 20 years, from 2,967 MT in 1985 to 46,150 MT in 2006. In line with the general trend of fisheries production in Korea, capture olive flounder production has leveled off.

The predominance of olive flounder in the Korean aquaculture sector is due to favorable government policies geared toward production of high-value species. As shown in Table 2, the 2006 value of olive flounder aquaculture production was U.S. \$458.9 million. This was a 351 percent increase from the \$101.8 million value recorded in 1995.

Bai, Olive flounder production (mt) in Korea, Table 2

	1980	1985	1990	1995	2000	2005	2006
Culture	19	84	1,037	6,733	14,127	40,075	43,852
Capture	3,862	2,883	2,462	1,914	1,607	2,112	2,298
Total	3,881	2,967	3,499	8,647	15,734	42,187	46,150
Culture Value (U.S. \$1,000)	11.1	69.6	32,236	101,753	168,232	346,510	458,932

Table 2. Olive flounder production (mt) in Korea, 1980-2006.

Sources: Food and Agriculture Organization of the United Nations, Ministry of Maritime Affairs and Fisheries, Republic of Korea

Culture systems

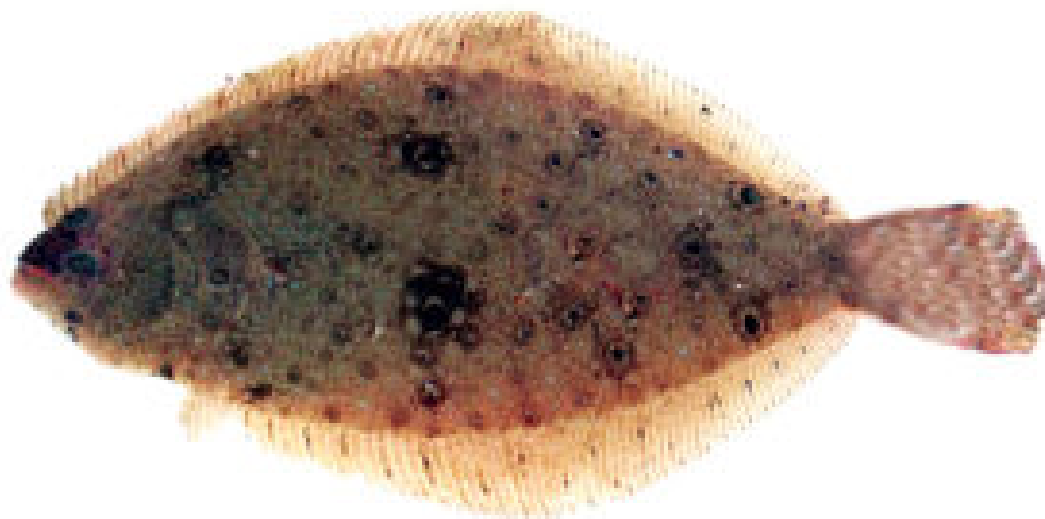
Olive flounder are mainly produced in flow-through systems at land-based facilities. These facilities are concentrated on the south and west coasts of Korea, mainly in Jeju-do. The farms produce on average about 110 MT flounder per year.

Located on the coast, the farms have access to seawater, which is pumped directly from the open sea into the head tanks and subsequently supplied to the fish tanks. While water quality in these production areas is generally good, farmers also monitor it and apply any necessary treatments.

Seedstock, feeding

Seedstock production for olive flounder has been established for many years in Korea. Broodstock are caught from the wild or selected from farmed fish at least 3 years old. The natural spawning season is usually April to June, but under culture conditions, spawning occurs from April to May. Year-round spawning is achieved through manipulation of the culture environment for selected batches of flounder broodstock.

Farmers are encouraged to use commercial feeds to minimize water pollution and the risk of disease outbreaks that can be associated with feeding raw fish or moist pellets, but some farmers still use raw fish or farm-made pellets. To make the pellets, fish



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like mackerel and gizzard shad are ground and mixed with other ingredients, sometimes including commercial powder feeds, before being formed into pellets.

Research and development

The major government aquaculture research institutes are the National Fisheries Research Development Institute and various universities, including Pukyong National University. These institutions played important roles in the establishment of hatchery-based seed production technology and formulation of feed for olive flounder, and are currently conducting research geared toward further development of olive flounder aquaculture.

Ongoing research is evaluating various nutritional requirements of olive flounder to further improve the existing formulated feed. Studies are also ongoing in the area of fishmeal substitution by plant proteins, as well as improvements in the digestibility of feeds to reduce nutrient loads in effluent water. The development of immunity stimulants is another active area of study.

Trends, issues

Together with health concerns, the improved purchasing power of consumers has led to a dramatic increase in the consumption of aquatic products, including olive flounder. The industry will likely continue expanding, and value-added products will be developed to meet consumers' preferences.

The Korean government has been pursuing a long-term aquaculture development program through the expansion of cultivation areas and intensified development of both profitable and unexploited species like olive flounder. However, there has also been growing concern about pollution of public waters near olive flounder culture facilities, some of which discharge effluents into the sea. Further development of highly digestible diets and additional effluent treatments can reduce the nutrient load of the effluents.

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