



GLOBEFISH

GLOBEFISH RESEARCH PROGRAMME



The Ornamental Fish Trade

Volume 102

The Ornamental Fish Trade

Production and Commerce of Ornamental Fish: technical-managerial and legislative aspects

by

Pierluigi Monticini

(November 2010)

The GLOBEFISH Research Programme is an activity initiated by FAO's Products, Trade and Marketing Service, Fisheries and Aquaculture Policy and Economics Division, Rome, Italy and financed jointly by:

- NMFS (National Marine Fisheries Service), Washington, DC, **USA**
- FROM, Ministerio de Agricultura, Pesca y Alimentación, Madrid, **Spain**
- Ministry of Food, Agriculture and Fisheries, Copenhagen, **Denmark**
- European Commission, Directorate General for Fisheries, Brussels, **EU**
- Norwegian Seafood Export Council, Tromsø, **Norway**
- FranceAgriMer, Montreuil-sous-Bois Cedex, **France**
- ASMI (Alaska Seafood Marketing Institute), **USA**
- DFO (Department of Fisheries and Oceans), **Canada**
- SSA (Seafood Services Australia), **Australia**

*Food and Agriculture Organization of the United Nations, GLOBEFISH, Products, Trade and Marketing Service, Fisheries and Aquaculture Policy and Economics Division
Viale delle Terme di Caracalla, 00153 Rome, Italy – Tel.: (39) 06570 52692
E-mail: GLOBEFISH@fao.org - Fax: (39) 06570 53020 – www.globefish.org*

2.5.1 Marine Aquarium Council (MAC)

MAC is an international, multistakeholder, non-profit, non-governmental organization that brings together conservation organizations, fishermen, exporters, importers, public aquariums, hobbyist groups and government agencies, all of which are involved in the trade of ornamental fish and invertebrates.

MAC's mission is to protect coral reefs and other marine ecosystems through the creation of standard labour and certification procedures capable of binding the various stakeholders in the sector. MAC promotes sustainable development; it creates incentives for certification and increases the awareness of rural people in the environment. Activities include:

- production of independent best practice certificates;
- public awareness raising with regard to marine ecosystem conservation;
- promotion of sustainable exploitation of reef ecosystems through responsible fishing practices;
- promotion of health and quality of marine ornamental organisms through responsible collection and quarantine;
- promotion of best practices in packing, handling and shipping;
- promotion of training and education for fishermen;
- application of a ban on fishing of marine ornamental organisms which are either endangered or unsuitable for aquariums;
- application of a ban on capture of non-targeted species; and
- support of sustainable aquaculture.

The mortality of tropical fish prior to reaching the aquarium market is estimated at around 80%. This high figure is due to a range of factors, including poor capture and husbandry practices, stress and poor shipping practices. The ornamental fish trade is a potentially sustainable activity capable of supporting rural coastal communities. However, it is essential that destructive practices cease and fishermen be educated in the sustainable harvesting of tropical fish.

2.5.2 Fish

The ornamental marine fish trade concerns about 1 500 varieties from over 50 families, and the number of fish caught is approximately 20–25 million.

Around 400 species from 75 families are exported from the Philippines, a major supplier of marine aquarium fish.

Preferences for particular sizes, colours or rarity can produce extremes in selective harvesting. Fish of a length of about 2–10 cm are preferred and the colour and shape are very important.

Many dealers prefer fish from areas where animals are known to be caught and handled well, because they survive longer. For this reason, fish from the Red Sea or Central Pacific islands often command higher prices than those from the Philippines and

Indonesia, where fishing methods may even include the use of cyanide and where poor shipping and handling practices are not uncommon (Sale, 2006).

The Pomacentridae family accounts for about half of the catch: angelfish, surgeonfish and butterfly fish are the main species caught; *Chromis vividis* (green damselfish) and *Amphiprion ocellaris* (clown anemone fish) are the most marketable.

2.5.3 Corals

A total of 140 species of hard coral (*Scleratinia* spp.) are on the market with about 12 million pieces traded. They belong to various genera, including *Trachyphyllia*, *Euphyllia*, *Goniopora*, *Acropora* and *Pterogyra*, and account for about 56% of the coral trade.

About 60 kinds of soft coral (approximately 400 000 pieces) are also caught and sold. *Sarcophyton* and *Dendronephytya* are the most common and widespread species; the latter has the added advantage of being adaptable and easily bred in captivity. Most of the soft corals traded originate from the Indo-Pacific Ocean.

Studies of the coral trade originating in the Philippines and Indonesia describe how the Philippines has been a major source of coral in international trade for a long time.

2.5.4 Invertebrates

More than 500 species – an estimated 10 million specimens – of invertebrate (other than corals) are sold for ornamental purposes. They include shellfish, shrimps and anemones, with the latter accounting for about 15% of the invertebrate market.

Marine ornamental shrimps are mainly collected in the Indo-Pacific Region, but also in the Caribbean (Calado, 2008). The number of marine ornamental shrimps collected each year from coral reefs worldwide may be 10 times higher than the currently reported figure. Destructive techniques (e.g. the use of cyanide), commonly employed to capture marine ornamental fish in Southeast Asia, are not suitable for the collection of marine ornamental shrimps, which are collected by divers equipped with small tubular hand nets and slim rods.

Breeding in captivity has grown, thanks to scientific research; but the high costs have limited development and the sector currently accounts for 1% of fish, 1% of corals and 20% of giant clams (*Tridacna* spp.).

2.5.5 Conservation of ecosystems and prevention of destructive practices

Bad fishing practices have been used for years to increase the catch and they are very difficult to eradicate. The use of cyanide (*sodium cyanide*) or other chemicals to stun reef fish results in:

- high mortality rate post-capture;
- coral habitat destruction; and
- killing of non-target specimens, including species of sessile invertebrates.

Extraction of live rock, on the other hand, results in:

- erosion; and
- loss of important marine habitats and coastal zones.

While dynamite is not actually used for the capture of ornamental fish, it is still used in food fishing in many countries and causes serious indiscriminate damage to all species of fish and to the reef; it is even more dangerous than cyanide.

2.5.6 Human impact

Fishing for marine ornamental fish species has a negative effect on coral reefs – indeed, studies reveal decreases in catches. However, there is also evidence that in some cases the catch has remained constant over time.

In order to achieve sustainability, it is necessary to limit the catch, depending on the resilience of the species and on the size of the ecosystem in question. Some Asian countries and South America have imposed restrictions on the capture of certain fish species following their decrease in number. If fishermen continue to fish certain species as before, the ecosystem will be affected.

2.5.7 Post-capture mortality rates

Numerous factors contribute to post-capture mortality: physiological damage, use of chemicals, poor preparation procedures for stocking, and disease. The highest losses occur as a result of poor shipping practices, which cause stress and related illnesses. Approximately 15% of fish die immediately after being caught, another 10% during the various stages of transport, and about 5% in stocking stations.

Experiments have shown that by following the correct fishing practices, improving stock and transportation, and increasing skills and education, the overall mortality rate can fall below 5%. Sessile organisms have a lower post-capture mortality rate compared with coral fish, as the short-term stress is lower. The use of UV light and skimmers can drastically reduce losses by maintaining high water quality in the stocking facilities.

2.5.8 Technical aspects: collection

Fishermen work individually or in small family groups, often operating also as wholesalers and exporters. They work with basic equipment, catching fish with different types of nets (e.g. hand nets, cast nets); fishermen in Sri Lanka use simple nets, while in Australia and Pacific networks they use wide barrier nets. Fishing without damaging either the prey or the coral reef requires experience and skill. The techniques adopted vary, depending on the country, the type of fish or, in the case of sessile invertebrates, the coral reef.

Once caught, coral and fish are placed in plastic containers or bags. Corals are wrapped in layers of plastic. In order to avoid damage to the bladder, fish are placed at a depth of 3 m for 30–40 minutes until they reach a stage of decompression. Catches may be