Oreochromis 正體中文

System: Freshwater

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Perciformes	Cichlidae

Common name St. Peters fish (English), mojara (English), freshwater snapper (English), tilapia (English), boulti (English), pla nil (English), ngege (English)

Synonym

Similar species *Oreochromis*

Summary

Tilapia (Oreochromis spp.) is the common name applied to three genera of fish in the family Cichlidae: Oreochromis, Sarotherodon and Tilapia. These include over 70 species of fish, at least eight of which are used for aquaculture. Tilapia belong to a family of fish known as cichlids, among which most African members are mouthbrooders. The cage culturing of tilapia results in a reduction of water quality in the surrounding environment, which is particularly worrying when close to ecologically important areas. The unavoidable escape and establishment of wild tilapia from cages has sometimes resulted in other serious problems, such as the decline of culturally valued native fish species, particularly cichlids, and the alteration of natural benthic communities.

view this species on IUCN Red List

Notes
As males grow faster and are more uniform in size than the females manual sexing techniques and reverse sex hormones have been used for tilapia farming. Hybridisation between certain *Oreochromis* species has also been used to create male-only offspring generations (Lazard 1996, in Gupta and Acosta 2004).

Lifecycle Stages
Members of *Oreochromis* spp. commonly exhibit the following sequence of reproductive events (Riedel 1965, Fryer and Iles 1972, in Ven den Berghe Undated). The male will dig a “nest” or “display site” in which to court females. These are constructed in sandy or muddy ground, are up to 15cm deep and 100cm wide, and are subject to aggressive defence (McCraryet *al*. 2001, in Ven den Berghe Undated). The entire bottom of a water body can become covered with these craters, which may become so densely packed that they resemble cells on a bee hive (Mc Kaye *et al*. 1995, in Ven den Berghe Undated). The male fertilises the eggs that have been laid by the courted female. The female will then incubate the eggs directly inside her mouth for three to five days. Larvae will hatch and will be retained in her mouth for a further two weeks. The female will guards her free-swimming young, which hide in her mouth when danger threatens.

Uses
Today tilapia (*Oreochromis* spp.) makes up about 3.5% of the total amount of global aquaculture production. Nile tilapia (*Oreochromic niloticus*) is the most predominant species of tilapia cultured, but at least seven other and a number of hybrids are also commonly farmed (Gupta and Acosta 2004). Tilapia are well adapted to artificial culture environments, gain weight quickly at optimum conditions and reproduce on the farm without special management or infrastructure (Meyer 2002). About 85 countries farm tilapia on some scale including China (an aquaculture giant responsible for half the total production of tilapia) and many South East Asian countries. A huge 98% of these tilapia farms occur outside the fish’s native habitat (FOA 2002, Shelton 2002, in Gupta and Acosta 2004). Tilapia is generally produced in relatively low-input farms for both domestic markets and exportation. Earthen ponds and cage culture in open water bodies are the most common culture systems. Development of the tilapia trade and marketing coupled with the development of the aquaculture industry is becoming more intensive as the fisheries industry comes to rely more and more on fish harvested from farms rather than sea-caught fish. For example, the Genetically Improved Tilapia programme (based on selective breeding) produced a strain of *O niloticus* with growth rate increased by 85% (Eknath and Acosta 1998, in Gupta and Acosta 2004). Hybrids of tilapia have also been used to create increasingly adaptable and hardy fish (commonly referred to as red or golden tilapia). Concerns have been raised about the environmental risk of introductions of ever-improved strains and hybrids of tilapia environmental risk.

Habitat Description
Tilapia (*Oreochromis* spp.) exhibit maximum growth rates at temperatures between 25 and 30°C (Meyer 2002), making them more likely to become established and invasive in tropical climates. However, both tolerance to water temperature and to salinity varies greatly between species. Nile tilapia (*O. niloticus*) are the least cold tolerant of the farmed tilapia and prefer tropical to subtropical climates. Blue tilapia (*O. aureus*) is able to tolerate temperatures as low as 8-9°C, making it more likely to establish in countries with pronounced seasonal temperature variations (Gupta and Acosta 2004).\r\n
Tilapia usually inhabit freshwater habitats, but some species and hybrids are known to be highly euryhaline (capable of tolerating a wide range of salt water concentrations). Blue tilapia, redbelly tilapia (*Tilapia zillii*) and a red tilapia hybrid (*O. mossambicus* and *O. hornorum*) are extremely tolerant of saline waters and used in seawater aquaculture. Saline tolerance is also evident in other red tilapia hybrids, gallilee tilapia (*Sarotherodon galilaeus*), black-chinned tilapia (*S. melanotheron*) and Mozambique tilapia (*O. mossambicus*) and Zanzibar tilapia (*O. hornorum*) (Gupta and Acosta 2004).

Reproduction
Nile tilapia (*Oreochromis niloticus*) and blue tilapia (*O. aureus*) reach sexual maturity at about 5 to 6 months. Mozambique tilapia (*O. mossambicus*) exhibits early reproduction with sexual maturity occurring at 8-9cm (Gupta and Acosta 2004).\r\n
Female tilapia may reproduce once every two months under optimal conditions, with *O. mossambicus*, for example, laying 300 to 500 eggs each time (equivalent to a maximum of 3600 eggs per year) (Riedel 1965, in Ven den Berghe Undated).

Nutrition
The feeding habits of tilapia (*Oreochromis* spp.) are very broad, considering they feed on benthic algae, phytoplankton, macrophytes, zooplankton, fish eggs, fish larvae, and detritus (Alceste and Jory 2000). At least one species, Mozambique tilapia (*O. mossambicus*), has been observed to prefer feeding on macrophytes (aquatic plants), switching to an omnivorous diet only when such sources are depleted or absent (Riedel 1965, in Ven den Berghe Undated). It has been noted that several species of tilapia are stimulated to include fish fry in their diet under oligotropic low-nutrient conditions (Riedel 1965, De Moor *et al*. 1986, Popma and Green 1990, in Ven den Berghe Undated).

General Impacts
Please follow this link for a description of the impacts of this species 'general impacts' compiled by the ISSG.

Management Info
Preventative measures: The use of potentially invasive alien species for aquaculture and their accidental release/or escape can have negative impacts on native biodiversity and ecosystems. Hewitt *et al*, (2006) Alien Species in Aquaculture: Considerations for responsible use aims to first provide decision makers and managers with information on the existing international and regional regulations that address the use of alien species in aquaculture, either directly or indirectly; and three examples of national responses to this issue (Australia, New Zealand and Chile). The publication also provides recommendations for a 'simple' set of guidelines and principles for developing countries that can be applied at a regional or domestic level for the responsible management of Alien Species use in aquaculture development. These guidelines focus primarily on marine systems, however may equally be applied to freshwater.
Copp *et al*, (2005) Risk identification and assessment of non-native freshwater fishes presents a conceptual risk assessment approach for freshwater fish species that addresses the first two elements (hazard identification, hazard assessment) of the UK environmental risk strategy. The paper presents a few worked examples of assessments on species to facilitate discussion. The electronic Decision-support tools- Invasive-species identification tool kits that includes a freshwater and marine fish invasives scoring kit are made available on the Cefas (Centre for Environment, Fisheries & Aquaculture Science) page for free download (subject to Crown Copyright (2007-2008)).
Please follow this link for details on control of this species 'management information' compiled by the ISSG.

Pathway
Intentional unofficial release of fish into new locations or environements: In Mexico it is suspected that the intentional release of tilapia (*Oreochromis* spp.) into water bodies is responsible for its detection in lakes that it has never been previously officially farmed (and that are not connected to water bodies where tilapia is farmed) (Schmitter-Soto and Caro 1997).Cage culture of tilapia (*Oreochromis* spp.) in natural open water bodies has promoted the worldwide proliferation of the fish and allowed for its introduction into new geographic regions, escape into the wild and establishment in native ecosystems.

Principal source:

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

Pubblication date: 2006-01-12

ALIEN RANGE

[1] BANGLADESH
[1] BRAZIL
[1] CAMBODIA
[1] CHINA
[1] COLOMBIA
[1] COSTA RICA
[1] CUBA
[2] ECUADOR
[1] ETHIOPIA
[1] HONDURAS
[1] HONG KONG
[1] INDIA
[1] INDONESIA
[1] ISRAEL
[1] JAMAICA
[1] LAKE VICTORIA
[1] MALAYSIA
[1] MEXICO
[1] MYANMAR
[1] NEPAL
[2] NICARAGUA
[1] PERU
[1] PHILIPPINES
[1] SINGAPORE
[1] SRI LANKA
[1] TAIWAN
[1] THAILAND
[1] VIET NAM
[1] ZIMBABWE

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Centre for Environment, Fisheries & Aquaculture Science (CEFAS)., 2008. Decision support tools-Identifying potentially invasive non-native marine and freshwater species: fish, invertebrates, amphibians.

Summary: The electronic tool kits made available on the Cefas page for free download are Crown Copyright (2007-2008). As such, these are freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance. Toolkits available include 1) FISK- Freshwater Fish Invasiveness Scoring Kit (English and Spanish language version); 2) MFISK- Marine Fish Invasiveness Scoring Kit; 3) MI-ISK- Marine invertebrate Invasiveness Scoring Kit; 4) FI-ISK- Freshwater Invertebrate Invasiveness Scoring Kit and AmphISK- Amphibian Invasiveness Scoring Kit. These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).
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Spanish:
La lista de especies del Sistema de informaci�n sobre especies invasoras de m�xico cuenta actualmente con informaci�n aceca de nombre cient�fico, familia, grupo y nombre com�n, as� como h�bitat, estado de la invasi�n en M�xico, rutas de introducci�n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p�gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci�n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci�n novedades, para conocer los cambios.
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