

Eleutheronema tetradactylum (Shaw, 1804)

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IDENTIFICATION

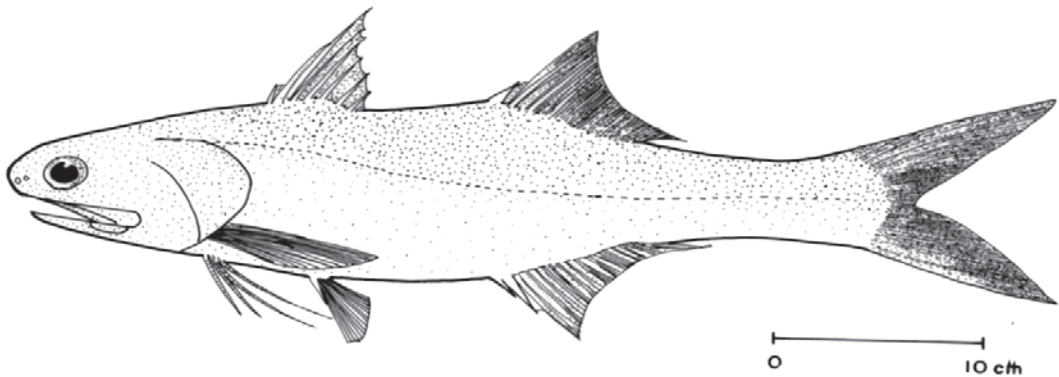
Order	: Perciformes
Family	: Polynemidae
Common/FAO Name (English)	: Fourfinger threadfin



Local names: Rawas (**Marathi**); Vameenu (**Kannada**); Bameen, Thamuthi, Vazhmeen, Norakudiyar, Wahmeen (**Malayalam**); Pozhakkala, Yevakal (**Tamil**); Maga (**Telugu**); Guchhia, Sahal (**Bengali**)

MORPHOLOGICAL DESCRIPTION

There are 9 dorsal spines and 13-15 dorsal soft rays. There are 3 anal spines and 14-16 anal soft rays. The species has 4 unbranched pectoral filaments. Vomer has deciduous tooth plates on both sides, except in juveniles. Villiform teeth present. Posterior part of maxilla is deep, 3-4 % of standard length. There is a short tooth plate extension onto lateral surface of lower jaw. Air bladder is absent. Colour silvery-green with yellowish-white on the sides and abdomen.



PROFILE

GEOGRAPHICAL DISTRIBUTION

Eleutheronema tetradactylum is distributed in Indo-West Pacific from Persian Gulf to Papua New Guinea and northern Australia. In India, it occurs all along east and west coasts and forms a major fishery in Sunderbans on the east coast and Mumbai and Saurashtra on the west coast.

HABITAT AND BIOLOGY

Adults occur in shallow coastal waters and also ascend rivers, mainly in the winter. Juveniles are found in estuaries. Smaller fish form loose schools, however, larger fish are either solitary or move in pairs. It is carnivorous and the choice of feed varies according to size. Larvae (7-30 mm total length) feed mainly on copepods and mysids and occasionally also consume shrimp larvae. Juveniles (31-60 TL) feed on shrimps and mysids. It has been observed that the fish is a protandrous hermaphrodite and it becomes female after 2 years. Recent study from India indicates that mean length of male fish is 240 mm TL, with transition to female starting from 288 mm TL. Mature females were > 380 mm TL. However, gonochoristic individuals have also been reported for this species from Australia and India. Two spawning seasons, i.e. January-April and July-September, have been reported from the west coast of India with a single spawning event for a fish in a season. The species matures at a size between 36 and 39 cm. Gonadosomatic Index (GSI) ranged between 1.04 to 18.33 and ova diameter of fully matured egg varied between 400 μm to 790 μm with fecundity 1.0-2.09 million. The species can grow to more than 1 m in length with a maximum life span of 7 years.

BREEDING IN CAPTIVE CONDITIONS

Detailed information on commercial scale breeding and seed production of the species in captivity is scarce. However, reports mention that a private hatchery in Malaysia has achieved breeding in captivity, but seed production could not be achieved. Limited information is available from India, but there are reports on collection of eggs from naturally matured fish in the Tua Nali area in the Chilka Lake during January-June. Matured oozing eggs of 625-860 μm were collected from fish measuring 575-715 mm in length. The collected eggs were characterized by a single oil globule measuring 274-366 μm in size. In an another experiment, fertilized eggs were collected from same area using tow net, the collected developing eggs measuring 720 to 990 μm and showing blastoderm disc with a single oil globule ranging from 270 to 370 μm .

LARVAL REARING

Larval rearing of the fish in confined environment is not known. However, an attempt was made to hatch and rear the larvae in confined environment using wild collected eggs in West Bengal, India. The fertilized eggs collected from wild hatched after 12-14 h. The hatchlings measured 1.45 to 1.55 mm, characterized with 27 myotomes including an un-segmented mesoderm. Immediately hatched out larvae exhibited a tendency to float with their belly up. One day old larvae attained a length of 1.80 mm with considerably reduced size of yolk and oil globule. However, all hatched out larvae died after 32 hours post hatching, by which time they reached a size of 1.95 to 2.1 mm.

NURSERY REARING

Information not available

GROW-OUT

This species has been identified as one of the potential candidate species for culture in most of the Asian countries like Malaysia, Singapore, Thailand and China. It has been cultured in earthen ponds and cages using wild seed. There is limited information on the details of grow-out culture. A study was conducted to estimate their growth performance in Bangladesh using wild collected seeds of 36.14 g in brackish water ponds. Fish grew to 80 g in 45 days with a stocking density of 0.5 individuals/ m^3 in earthen ponds. Average growth rate ranged from 0.56 to 2.8 g/day with 70-80 % survival rate. During grow out, the fishes were fed with chopped low value fish and the observed FCR was 2.3.

FOOD AND FEEDING

This species is carnivorous with characteristics exhibiting its predatory, voracious and cannibalistic nature. The young fish feed on zooplankton like copepod nauplii and amphipods with their filter feeding mechanism. As they grow in size, they feed on larger plankton like mysids, megalopa larvae, shrimp and fish larvae. Adult fish feed on polychaetes, decapods, stomatopods, shrimps and fish. In grow out, this species feeds on chopped low value fish.

GROWTH RATE

The observed growth rate in earthen pond culture varied from 0.56 to 2.80 g/day during 45 days culture of wild seed (36.14 g). It has been observed in different studies that stocking density, water quality parameters and feeding affects their growth rate. In Chilka Lake, India, the early broodstock of this species is reported to grow very fast in the first year up to 30 cm, then growth slows down and it reaches 47.5 cm in second year and 60 cm in the third year.

DISEASES AND CONTROL MEASURES

Two protozoan diseases have been reported from this species:

1. Neoechinorhynchus Disease - This is a parasitic infestation caused by *Neoechinorhynchus* sp. Infestation is common in the intestine and viscera.
2. Procerovum Disease - This is a parasitic infestation caused by *Procerovum calderoni*. Infestation occurs in the musculature and base of fins.

PRODUCTION, MARKET AND TRADE

PRODUCTION

Aquaculture production of the fish has been reported from three countries viz., Singapore, Taiwan province of China and Thailand. The estimated production in 2007 from this region was 914 t. Of the three countries, production was mainly from Taiwan province of China. Total capture fisheries production for the year 2011 was 11,149 t, with major catch coming from Indonesia.

MARKET AND TRADE

This is an excellent food fish, forming a good fishery in the Hooghly estuary of India. The average estimated price of the fish was ₹ 270-290/kg. The fish is sold as live in south-east Asian markets. A survey conducted in Malaysian fish markets indicates that the fish is sold for ₹ 340/kg in live and ₹ 250/kg in dead condition.

CHALLENGES TO MARICULTURE

Presently, there is very little scientific information available on biology, ecology and culture of *E. tetradactylum* from India which is hindering its mariculture. Though the fish is a high value finfish, many of the culture aspects have not yet studied. Breeding of the fish in confined environment has been initiated, but needs to be standardised further. Similarly, larval rearing, nursery rearing and disease management also needs to be studied and standardised.

FUTURE PROSPECTS

The demand for *Eleutheronema tetradactylum* is high in the domestic market and is growing at a rapid pace. The fish is one of the highly esteemed table fish both at home and abroad. If a higher yielding culture technology (mono or poly) for *E. tetradactylum* becomes established, utilizing the abandoned coastal shrimp ponds of sub-tropical and tropical countries, with encouraging economic profits for farmers, a noteworthy and huge fish industry could come forward.

SUGGESTED READING

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