Epinephelus lanceolatus (Bloch, 1790)

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IDENTIFICATION

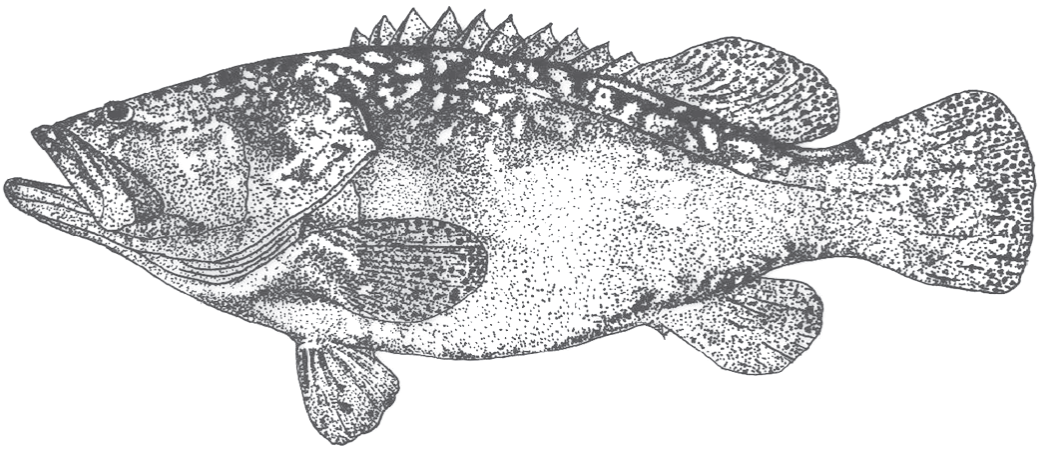
Order	:	**Perciformes**
Family	:	**Serranidae**
Common/FAO Name (English)	:	**Giant grouper**

Source of image : CMFRI, Kochi

Local names: Wekhali, Wekhru (**Gujarati**); Gobra, Hekru (**Marathi**); Kolaji (**Kannada**); Kolameen, Varayan kalawa, Pulli, Kadal karoopu (**Malayalam**); Ulta kalawa (**Tamil**); Bontoo (**Telugu**)

MORPHOLOGICAL DESCRIPTION

The giant grouper is characterized by its huge adult size, robust body, body depth of about 2.3-3.4 times of standard length (SL). Head length is 2.2-2.7 times in standard length, inter-orbital area is flat to slightly convex, preopercle is rounded. Eyes small; eye diameter 5.8-14 in head length; maxilla reaches past vertical at rear edge of eye; mid-lateral part of lower jaw is with 2 or 3 rows of teeth (for 20-25 cm SL fish) and increasing to 15-16 rows in a fish of 177 cm standard length. Gill rakers of juveniles are 8-10 on upper limb, 14-17 on lower limb; rudiments in adults are difficult to distinguish from the bony plates covering the gill arch. Dorsal fin with 11 spines and



14-16 rays, anal fin with 3 spines and 8 soft rays; pectoral-fin rays of 18-20; short pelvic fins and not reaching anus; caudal fin is rounded. Cycloid scales present on the body; body with auxiliary scales also; lateral body scales smooth with 54-62 lateral line scales. Colour of adults mottled green-grey to grey-brown colour, with small black dots on the fins, juveniles with variegated brown and yellow colour, and yellow fins with dark brown or black spots.

PROFILE

GEOGRAPHICAL DISTRIBUTION

Epinephelus lanceolatus is the most widely distributed grouper but, rarely found at all locations; it is available throughout the Indo Pacific region including Red Sea. It occurs from Red Sea to Algoa Bay (South Africa) and eastward to Pitcairn Islands, including Hawaii (USA). In the western Pacific, it ranges northward to southern Japan and southward to Australia (from northern Western Australia to northern New South Wales). It is found in the entire Indian Ocean, but is rarely seen north of the Maldives. In south and south-east Asia, the fish is recorded from Japan, mainland China, Hainan Island, Philippines, Thailand, Malaysia and Indonesia. From Indian waters this species is reported from Andaman and Nicobar Islands and from the coasts of Andhra Pradesh and Odisha.

HABITAT AND BIOLOGY

Epinephelus lanceolatus is the largest of all coral reef dwelling bony fishes. It tends to be single and inhabits lagoon and seaward reefs at depth of a few to at least 50 m. Large individuals often have a home in a cave or wreck in which they frequently stay. The fish has been caught at depth of 100 m, but it is more often found in shallow waters. It even swims into brackish water areas. Individual fish of more than a meter long have been caught from close to shore and in harbours. Large adults are encountered offshore on wrecks and in areas of high relief; they appear to occupy limited home ranges with little inter-reef movement, and the same individuals were seen at specific reef sites for more than a year. Juveniles hide in reefs and are rarely seen; mostly bentho-pelagic and benthic in nature.

The fish mostly dwells in coral reefs and mainly feeds on spiny lobsters. It is also known to eat a variety of fishes including small fishes, sharks, and juvenile of sea turtles, octopuses and spiny lobsters. In South African estuaries, the main prey item is the mud crab. They are not fast swimmers over long distances and they often lie in wait for their prey or use their mouths and gills as powerful pumps to suck their prey from crevices. All food is swallowed as whole.

Like many other grouper species, it is a protogynous hermaphrodite. Spawning occurs during the summer months and is strongly influenced by the cycle of the moon. The females release eggs while the males release sperm into the open offshore waters. After fertilization, the eggs are dispersed by the water currents. The larvae transform into inch-long juveniles around 25 days after hatching. This animal is slow to reproduce. Life span of the species is observed to be 25-50 years.

This is the largest bony reef fish in the world and can grow up to 3 m long and 600 kg in weight, but more commonly they grow to 1.3 m in length and weigh 400 kg. The longest scientifically measured individual is 270 cm (8.86 feet) long and the maximum published weight for this species is 400 kg. This fish is believed to reach sexual maturity when it is around 105-130 cm long. Many species of grouper form spawning aggregation, but such behavior has not been commonly observed in this species.

CONSERVATION

STATUS OF STOCK

Presently, this species is listed as "Vulnerable" on the IUCN Red List of threatened species. In mid 1990s, IUCN recognized its vulnerability with respect to exploitation and categorized this under the vulnerable species. It means this species is likely to become endangered unless the circumstances threatening its survival and reproduction improve and it needs special concern because it is sensitive to pressure by human activities or natural events. Recent studies showed that the population trend of the species has been decreasing at 20 % every ten years, meaning its numbers are declining in the wild worldwide due to overfishing. Apart from overfishing, they require relatively large areas of reef to support their population.

NEED

Worldwide, the population of this species has declined drastically due to various commercial and recreational fishing activities, including the live reef food fish trade and the marine aquarium fish trade. These activities have adversely impacted the populations of this species. Being such a large predator, it is rare, even in areas unexploited by fishing practices and it has nearly been removed in areas where it has been heavily fished. In many places, it has all but disappeared primarily due to spear fishing. Since the species takes decades to grow, and juveniles are also relatively uncommon, there is little chance of giant individuals reappearing in unprotected areas.

Different sizes of this species have advantages in different aspects, like the gall bladder of the big giant grouper is an item of strong magical-medical significance to cure "soul loss and ease pain", and even today, the highly distinctive thick walled stomach of the species sells for a high price and the skin is appreciated. Compared to flesh of big grouper, the flesh of small fish is quite palatable and having good market demand around the world. The most preferred market size of this species is 45 to 90 cm in length mostly in south-east Asian markets, especially Hong Kong. Most fish that are sold by the live reef food fish trade are sub-adults that are sexually immature, hence limiting the numbers of fish that can survive to reproduce. Hong Kong is the major importer, and the source countries of the species includes Indonesia, Philippines, Australia, Malaysia, India (Andaman Islands) and Thailand. The retail price varies between US $ 100 to 169/kg depending on the size and small sized individuals fetch more prices, since it is mostly preferred. Apart from its trade as food fish, juvenile fishes are also found in the pet (aquarium) trade. When it is young, it sports beautiful colors and moves gracefully. This fish has been exploited heavily for the above mentioned reasons, and its population is getting reduced around the world. Due to the low level of abundance and its vulnerability to overfishing, this species should be totally protected by developing strategies like total ban on catch and existing stock should be replenished by declaring marine protected areas, installing Fish Aggregating Devices (FAD) and sea ranching.

STRATEGIES

This species is presently under vulnerable category and therefore, many countries are following different management strategies to protect this species. In Australia, the status of this species varies among the various territories. It is a protected species in New South Wales (NSW) waters under the Fisheries Management Act 1994 and in Queensland waters it is protected since 2003, where it is classified as "no take species" for recreational fishing and heavy penalties apply for taking or processing them. It is also protected in the waters of Western Australia. Under the Northern Territory Regulation Act, no species of the genus *Epinephelus* are taken if it exceeds 120 cm (almost 4 feet) in length. Similarly in New Zealand, this species is under the protected species list.

In India, it is a protected species and it is restricted to part II A of schedule I under the Indian Wildlife Protection Act 1972 (IWPA). Around the Indian coast, *E. lanceolatus* is distributed widely, but not very common with the exception of the waters of the Union Territory of Andaman Islands, the Laccadive Islands and in the Gulf of Mannar. To protect this species, India has imposed a total ban on capture and

sale of the species. Shipment and marketing of the species is also prohibited. Accidental catches together with other groupers do occur, but these fishes cannot be openly marketed. In India, all the state governments have taken initiatives to protect this species by creating awareness through notices and appointing field staff for monitoring their capture and sale along with other protected species.

ISSUES

Presently, giant grouper stock is getting reduced worldwide, and there are several challenges existing in order to maintain and augment the decreasing stock. The major challenges are: late maturity, and extended time for population doubling, issues in hatchery technology, vast reef area requirement and management issues in implementing laws. The major issue is that of late sexual maturity of this species. The approximate size of sexual maturation for *E. lanceolatus* is 105-110 cm total length, which means that all smaller individuals and maybe some larger individuals are consumed before they reach sexual maturity. Fishing activity usually removes the largest size fish and therefore, old fishes are caught first, which leads to non-availability of species for reproduction to rejuvenate the stock. The minimum time required for population doubling is more than 14 years; therefore, doubling of the population takes time. Since this species dwells in reef areas, a large area of reef is required to maintain this large predator fish. Management issues include non-availability of biological information on migration, population structure and stock status for decision making on conservation plan.

FUTURE PROSPECTS

Epinephelus lanceolatus has high market demand in south-east Asian countries because of its meat quality and medicinal value. This species is protected and its fishing has been banned, but fishes from mariculture facilities using hatchery reared seeds are traded in south-east Asian markets. At present, seed production technology is restricted to Taiwan, Indonesia and Malaysia. If the seed production technology is developed and adopted in other countries as well, it might be helpful in replenishing the depleted stocks through sea ranching and also meet the market demand across the world. In India, availability of this species has been reported along the coast, so like other marine species such as cobia and pompano, the brood stock development and seed production technology can also be developed for this species. If the technology is developed, it can be utilized for sea ranching across the Indian coast, especially in marine protected areas for stock rejuvenation. In addition, with available seed resources, the mariculture activities of the species can be developed by farming them in cages, and this in turn will help in increasing the revenue though live fish trade, since it fetches high price in the live fish market

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