

# *Lethrinus nebulosus* (Forsskal, 1775)

B. Santhosh and M. K. Anil

## IDENTIFICATION

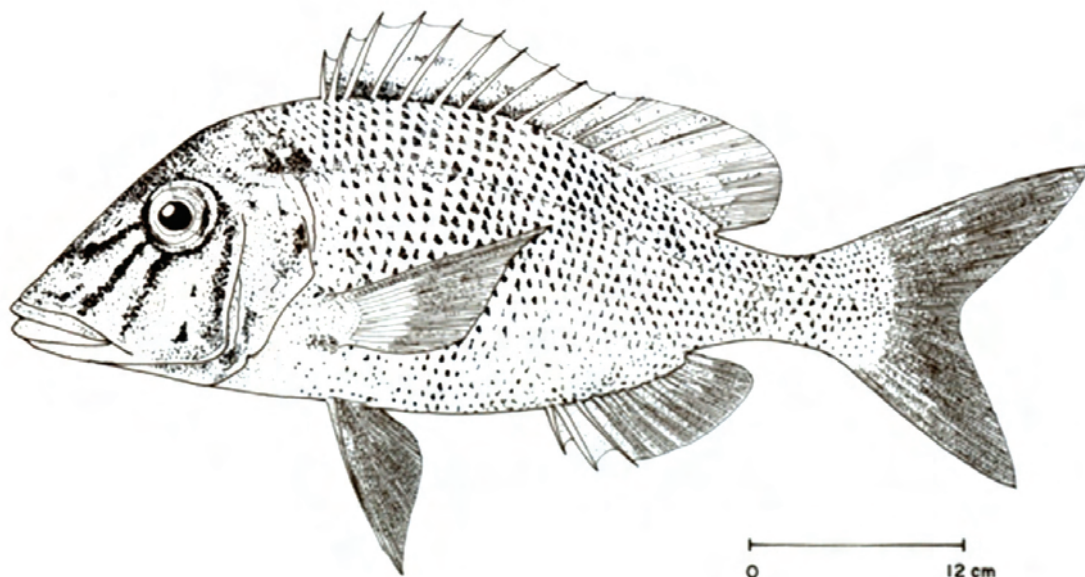
Order	: Perciformes
Family	: Lethrinidae
Common/FAO Name (English)	: Spangled emperor



**Local names:** Dhamil (**Marathi**); Kokkaru (**Kannada**); Chemballi, Kadu, Velameen (**Malayalam**); Koranguvela, Koranguvelu, Pulli vela meen, Valameen, Velameen, Vela meen (**Tamil**); Karwa (**Telugu**)

## MORPHOLOGICAL DESCRIPTION

Body is moderately deep, yellowish brown colour with bluish spots and streaks dorsally and pale white with faint yellow lines ventrally. The scales on the dorsal sides are with a blue central mark surrounded with yellow-olive colour which gives a spangled appearance. The head has several characteristic silvery blue streaks radiating forward and ventrally from eye. Upper parts of the pectoral fins are also with faint blue colour. Dorsal fin is with 10 spines and 9 soft rays and anal fin is with 3 spines and 8 soft rays. Cheek is scale-less and inner surface of pectoral fin is densely covered with scales. The fins are dusky white with yellowish tinge and reddish colour is present on the edge of the dorsal fin. Juveniles are with blotches or stripes especially in the chin region.



## PROFILE

### GEOGRAPHICAL DISTRIBUTION

This fish is widely distributed in the equatorial areas of Pacific and Indian Oceans especially Red Sea, Persian Gulf, southern India, east Africa to southern Japan and Samoa and between Queensland and northern New South Wales in Australia.

### HABITAT AND BIOLOGY

*Lethrinus nebulosus* inhabits near shore areas with rocky or sandy bottom, seagrass areas, mangrove areas and coral reef areas ( $36^{\circ}$  N- $32^{\circ}$  S) within a depth range of 0-75 m. They appear to be more common in outer coastal waters to the west and east of Australia than they are in the north. Juveniles and sub adults are often seen in large schools but adults are more solitary or form small groups. The species is carnivorous and prefers bivalves and gastropods. Food items include smaller fishes, crustaceans, annelids and echinoderms. This fish is a protogynous hermaphrodite which attains sexual maturity within 3-5 years. Small young fishes (2-3 years) will be females and change to males around the age of 4-5 years with mean length of 40 cm. The fish can live upto 30-40 years.

Reports say that the fecundity of this species ranges from 4-7 million. The spawning season is well defined, occurring once a year during March, April and early May off southern Arabia. The spawning peak was found to be after full moon. Almost all spawning activity occurs within three lunar cycles and stops after new moon. This is the largest emperor fish which grows up to 90 cm size and more than 10 kg.

## PRODUCTION SYSTEMS

### BREEDING IN CAPTIVE CONDITIONS

Artificial breeding and seed production technologies were developed in Japan, Taiwan and China. This species has already been farmed in China and Taiwan in sea cages. The larvae of this species have been used as feed for culture of Pacific blue fin tuna in Japan. This has good potential to tolerate wider salinity ranges and can be farmed in euryhaline conditions also. However, the detailed report is not available.

### LARVAL REARING

Information not available

### NURSERY REARING

Information not available

### GROW-OUT

Information not available

### FOOD AND FEEDING

Information not available

### GROWTH RATE

Information not available

### DISEASES AND CONTROL MEASURES

Several fragmented reports are available especially on the taxonomic descriptions of monogenean, digenean and crustacean parasites infecting *Lethrinus nebulosus*. Reports of diseases and control measures are rare. Red sea bream iridoviral disease was reported from Australia. Monogenean *Calydiscoides* spp. has been reported from New Caledonia. *Encotyllabe* infestation was also reported from Philippines.

## PRODUCTION, MARKET AND TRADE

### PRODUCTION

Information not available

### MARKET AND TRADE

Commercial level culture operations of this species were reported from China and Taiwan but there is no report available on the production of this species. Market and trade is still dependent on natural production. This fish is mostly marketed in fresh and frozen condition. The price of spangled emperor is around ₹ 250/ kg in India.

## CHALLENGES TO MARICULTURE

Standardisation of breeding protocol is essential for this species. More basic research is required for studying the breeding biology, brood-stock development and breeding operations for this species. Cost effective culture technologies should also be evaluated before large scale seed production.

## FUTURE PROSPECTS

This species is comparatively hardy and can tolerate a wide range of salinity. It is also not a very sensitive fish to environmental changes. Commercial farming is in progress in Taiwan and China. The species has very good market in India also.

## SUGGESTED READING

Akazaki, M., Tokito, A., Takamatsu, S., Nakajima, H. and Kawahara, H. 1989. Spawning behavior, embryonic development and metamorphosis of larvae of the lethrinid fish, *Lethrinus nebulosus*. Bull. Fac. Agric. Miyazaki Univ., 36 (1): 165-173.

Allsop, D. J. and West, S. A. 2003. Constant relative age and size at sex change for sequentially hermaphroditic fish. J. Evol. Biol., 16: 921-929.

FBA. 1998. Field survey of fish seed production. Fish Breeding Association of Republic of China (unpublished survey data sheets), p. 285-299.

Grandcourt, E. M., Al Abdessalaam, T. Z., Francis, F. and Al Shamsi, A. T. 2010. Reproductive biology and implications for management of the spangled emperor *Lethrinus nebulosus* in the southern Arabian Gulf. J. Fish Biol., 77 (10): 2229-2247.

Haga, Y., Naiki, T., Tazaki, Y., Takebe, T., Kumon, K., Tanaka, Y., Shiozawa, S., Nakamura, T., Ishida, S., Ide, K., Masuma, S. and Takeuchi, T. 2010. Effect of feeding and yolk-sac larvae of sapangled emperor *Lethrinus nebulosus* at different ages on survival and growth of Pacific bluefin tuna *Thunnus orientalis* larvae. *Aquacult. Sci.*, 58 (4): 491-499.

Froese, R. and Pauly, D. 2011. *Lethrinus nebulosus* in fishBase. January 2016.

[http://zipcodezoo.com/Animals/L/Lethrinus\\_nebulosus/](http://zipcodezoo.com/Animals/L/Lethrinus_nebulosus/)

Justine, J-L., Beveridge, I., Boxshall, G. A., Bray, R. A., Moravec, F. and Whittington, I. D. 2010: An annotated list of fish parasites (Copepoda, Monogenea, Digenea, Cestoda and Nematoda) collected from Emperors and Emperor Bream (Lethrinidae) in New Caledonia further highlights parasite biodiversity estimates on coral reef fish. *Zootaxa*, 2691: 1-40.

Liao, I. C. 1997. Larviculture of finfish and shellfish in Taiwan. *J. Fish. Soc. Taiwan*, 23(4): 349-369.

Lucas, J. S. and Southgate, P. C. 2012. *Aquaculture: Farming Aquatic Animals and Plants*. John Wiley and Sons. New Jersey, USA, 612 pp.

Mahmoud, H. H., Ali A. F. and Gab-Alla, A. 1998. Effect of gonadal infection by nematode parasite on the fecundity of the sea bream *Lethrinus nebulosus* in Ras Mohamed marine park, Northern Red Sea. *Egypt. J. Aquat. Bio. Fish.*, 2(2): 19- 34.

Marriott, R. J., Jarvis, N. D. C., Adams, D. J., Gallash, A. E., Norriss, J. and Newman, S. J. 2010. Maturation and sexual ontogeny in the spangled emperor *Lethrinus nebulosus*. *J. Fish Biol.*, 76: 1396-1414.

Rascalou, G. and Justine, J-L. 2007. Three species of Calydiscoïdes (Monogenea: Diplectanidae) from five *Lethrinus* spp. (Lethrinidae: Perciformes) off New Caledonia, with a description of *Calydiscoïdes terpsichore* sp. *Folia Parasitol.*, 54 (3): 191-202.