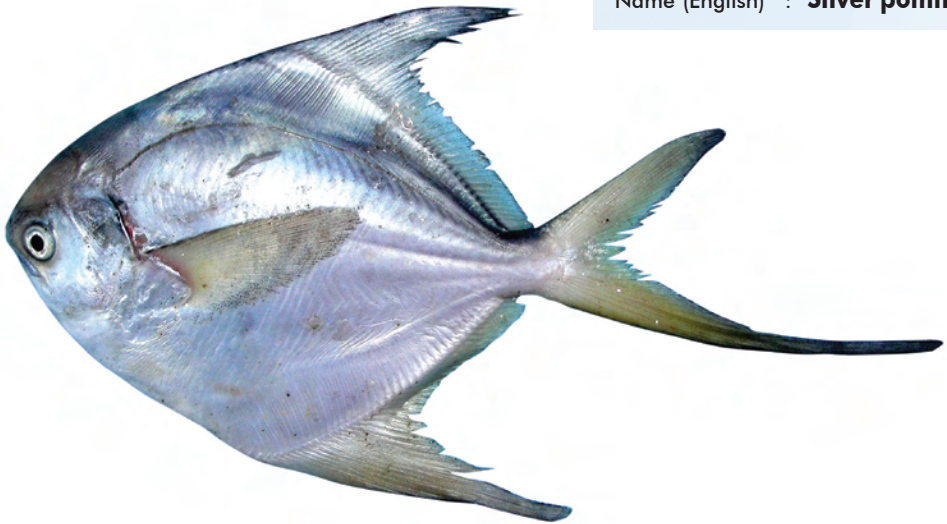


# *Pampus argenteus* (Euphrasen, 1788)

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## IDENTIFICATION

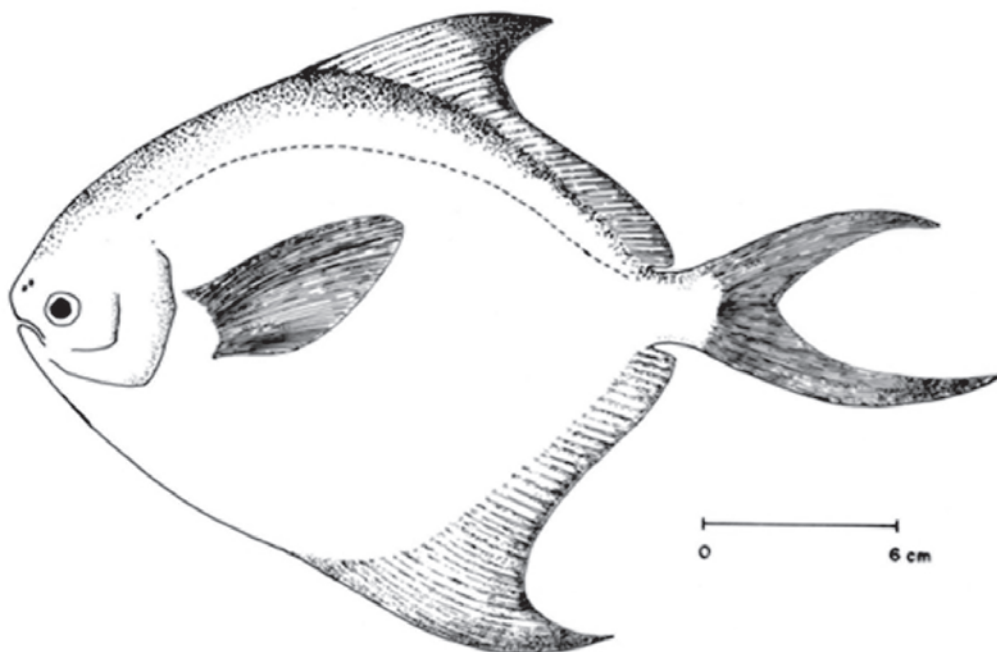
Order	: Perciformes
Family	: Stromateidae
Common/FAO Name (English)	: Silver pomfret



**Local names:** Paplet, Vichuda (**Gujarati**); Paplet, Chandava, Saraga (**Marathi**); Surangat (**Konkani**); Manji, Thondrette/Thondrotte (**Kannada**); Vella-avoli, Karuvolli, Veluthaavoli (**Malayalam**); Karuval, Vavval, Vellavavel, Vellaivaval (**Tamil**); Chanduva, Nallachanduva, Thellachanduva (**Telugu**); Chandee, Ghia (**Oriya**); Chandi, Pomfret (**Bengali**)

## MORPHOLOGICAL DESCRIPTION

Oval shaped compressed body, grey above grading to silvery white towards the belly, with small black dots all over the body. No dorsal spines; dorsal soft rays 37-43. There are 5-10 blade-like spines before the dorsal and anal fins. No operculum; gill opening reduced to a vertical slit on the side of the body; gill membrane broadly united to isthmus. Pelvic fins absent. Deeply forked caudal fin with longer lower lobe. Dorsal, anal and caudal fins falcate.



## PROFILE

### GEOGRAPHICAL DISTRIBUTION

Silver pomfret occurs in Indo-West Pacific waters, from Persian Gulf to Japan (north to Hokkaido), excluding Australia. They are also reported from the Adriatic, Hawaii and north-eastern Atlantic.

### HABITAT AND BIOLOGY

They are schooling meso-pelagic fishes inhabiting shallow to deep waters and muddy bottoms, up to 100 m depth. Young are commonly reported from estuaries. Diet studies have indicated that the diet of silver pomfret consists of a broad spectrum of food types, but was dominated by crustaceans, with copepods and their eggs constituting 39 % and other non-copepod crustaceans constituting 16 %. Other major diet components were Bacillariophyta (21 %), mollusca (11 %), fish scales (10 %), fish eggs and larvae (3 %). Copepods, other non-copepod crustaceans, and molluscs occurred in higher frequencies with an increase in size of fish (up to 18.5-20.4 cm), while Bacillariophytes tended to increase in stomachs at fish sizes between 22.5-24.5 cm.

The females were usually bigger in size than the males in Kuwait waters. The male matures after reaching a size of 13.0 cm and females mature at a size of 16.0 cm standard length. Generally spawning period varies from mid-May to early October in Kuwait waters. The spawning occurred in water depth between 5 and 12 m at temperature range of 26 to 32.8 °C and salinity of 39 g/l. Silver pomfret is a multiple batch spawner. Large females spawned earlier than smaller females and at the spawning site males dominated females by 3:1. Peak spawning occurred in evening hours during outgoing tide. Spawning events were concentrated during the first and third quarters of the moon period, indicating a semi-lunar reproduction cycle. One female would spawn at least six times during the season. The average relative batch fecundity was 176.3 eggs/g somatic weight (SW), corresponding to a relative total fecundity of 1058 eggs/g SW. Bigger fish produced heavier eggs and the egg weight decreased as the spawning season progressed. Maximum reported length: 60 cm; common 30 cm.

## PRODUCTION SYSTEMS

### BREEDING IN CAPTIVE CONDITIONS

Studies on silver pomfret culture have been carried out at Kuwait and China. The larval rearing of silver pomfret was successfully carried out at Mariculture and Fisheries Department, Kuwait Institute of Scientific Research, Kuwait in 2005. The following sections deal with the work carried out at MFD/KISR, Kuwait.

The broodstock was raised from the eggs obtained from the wild at MFD/KISR, Kuwait. The brooders were reared in 125 m<sup>3</sup> tank. The fertilized eggs were obtained through natural spawning as well as induced spawning. The fertilized eggs were spherical, transparent and pelagic in nature. The mean diameter of silver pomfret eggs ranged from 1,050 to 1,120 µm.

### LARVAL REARING

Larvae were reared in concrete tanks containing saline water (25.0 to 28.0 g/l) at water temperature of 19-24 °C. The size of newly hatched larvae averaged 2.4±0.1 mm. The larvae were fed with rotifers (*Brachionus plicatilis*), *Artemia* nauplii and formulated feed. The initial feeding started on the third day after hatching. The length of silver pomfret reached 2.0-2.7 cm after 50 days of culture period from hatching. The survival rate of larvae was 5-14 %. The juveniles attained a size of 3.5 g within 50 days post hatching.

### NURSERY REARING

The silver pomfret fingerlings of size 9-11 g were stocked in FRP tank and were fed with dry feed pellet as well as minced meat for 154 days. The fish attained a size of 19-26 g after 154 days of culture. The fish were fed at satiation rate five times a day at two hours interval starting at 08:00 hrs six days a week. A flow through system was maintained @ 2 l/min for 1 t round FRP tank with a water volume of 500 l.

## GROW-OUT

The culture of silver pomfret has been carried out in tidal fed farm in Balasore, Orissa. Silver pomfret attained a marketable size at the end of second year. Therefore, stocking of alternate series of ponds during successive years would be necessary to ensure harvest from at least 50 % of the pond each year. One hectare of aquaculture pond can be stocked with 12,500 early juveniles and with 80 % survival, the harvest at the end of second year would yield 2 t of silver pomfret.

## FOOD AND FEEDING

The major food item of silver pomfret was zooplankton mainly copepod. In addition to this, fish were fed on artificially prepared pellet and minced meat during culture.

## GROWTH RATE

Under ambient culture conditions the average body weight increased from 3.7 g to 81.9 g within 3 months of culture period. Silver pomfret grows to a size of about 12.5 cm standard length after first year and weighs around 100 g. At the end of the second year, the fish attained a size of 18.0 cm and weighed around 200 g.

## DISEASES AND CONTROL MEASURES

The parasite *Uronema* sp. has been reported to infect sub adult silver pomfret reared in captive condition in Kuwait. The bacterial disease Streptococcosis caused by *Streptococcus agalactiae* has been reported in larval stage of silver pomfret from Kuwait.

## PRODUCTION, MARKET AND TRADE

### PRODUCTION

*Pampus argenteus* is a highly valued food fish with great demand in international and domestic markets. The fishery is an economically significant one, particularly in countries like China, India, Kuwait and Iran.

### MARKET AND TRADE

The species is marketed fresh and frozen. In addition to being a popular foodfish, silver pomfret is also used in Chinese medicine. The price of silver pomfret is around ₹ 400/ kg (US \$ 6-7/kg) in India.

## CHALLENGES TO MARICULTURE

The main researchable issues, which have to be sorted out for this species in India are (i) Domestication of the fish for developing healthy broodstock (ii) Development of broodstock management protocol (iii) Larval rearing protocol: standardization of larval rearing by environmental and nutritional manipulation (iv) Disease and feed management (v) Development of different grow-out systems.

## FUTURE PROSPECTS

Estimates by CMFRI indicate that over the last fifteen years, although the landings of this resource in India has not shown much change, the contribution of this species to the total landing of all pomfrets has reduced from 68.8 % in 1997 to 56.8 % in 2011, which could be cause for concern. With the possible threat of decline in wild catches, it would be apt to develop a suitable aquaculture system for pomfrets in India. This is a promising species for aquaculture production because there is adequate existing knowledge about its biological and technological requirements.

## SUGGESTED READING

Al-Abdul-Elah, K. M., Almatar, S., Abu-Rezq, T., James, C. M. and El-Dakour, S. 2002. Development of hatchery techniques for the silver pomfret *Pampus argenteus* (Euphrasen). *Asian Fish. Sci.*, 15: 107-121.

Al-Abdul-Elah, K. M., Almatar, S., Abu-Rezq, T. and James, C. M. 2001. Development of hatchery technology for the silver pomfret *Pampus* (Euphrasen): effect of microalgal species on larval survival. *Aquacult. Res.*, 32: 849-860.

Almatar, S. M. and James, C. M. 2007. Performance of different types of commercial feeds on growth of juvenile silver pomfret, *Pampus argenteus*, under tank culture conditions. *J. World Aquacult. Soc.*, 38: 550-556.

Almatar, S. M., Lone, K. P., Abu-Rezq, T. S. and Yousef, A. A. 2004. Spawning frequency, fecundity, egg weight and spawning type of silver pomfret, *Pampus argenteus* (Euphrasen) (Stromateidae), in Kuwait waters. *J. Appl. Ich.*, 20 (3): 176-188.

Almatar, S. M., Al-Abdul-Elah, K. M. and Abu-Rezq, T. 2000. Larval developmental stages of laboratory-reared silver pomfret *Pampus argenteus*. *Ichthyol. Res.*, 47: 137-141.

Azad, I. S., Al-Marzouk, A., James, C. M., Almatar, S. and Al-Gharabally, H. 2007. Scuticociliatosis associated mortalities and histopathology of natural infection in cultured silver pomfret (*Pampus argenteus* Euphrasen) in Kuwait. *Aquaculture*, 262: 202-210.

Cruz, E. M., Almatar, S., Al-Abdul-Elah, K. M. and Al-Yaquout, A. 2000. Preliminary studies on the performance and feeding behaviour of silver pomfret (*Pampus argenteus* Euphrasen) fingerlings fed with commercial feed and reared in fiberglass tanks. *Asian Fish. Sci.*, 13: 191-199.

Cruz, E. M., Almatar, S., Al-Abdul-Elah, K. M. and Al-Yaquout, A. 2003. Indoor overwintering of silver pomfret (*Pampus argenteus* Euphrasen) fingerlings in fiberglass tanks. *Asian Fish. Sci.*, 16: 33-40.

Ghosh, S., Mohanraj, G., Asokan, P. K., Dhokia, H. K., Zala, M. S. and Bhint, H. M. 2009. Fishery and stock estimates of the silver pomfret, *Pampus argenteus* (Euphrasen), landed by gill netters at Veraval. Indian J. Fish., 56 (3): 177-182.

Froese, R. and Pauly, D. 2016. *Pampus argenteus* in fishBase. January 2016.

James, C. M. and Almatar, S. 2007. A breakthrough in the spawning of domesticated silver pomfret. Aquacult. Asia-Pacific, 3 (1): 26-28.

James, C. M. and Almatar, S. 2008. Potential of silver pomfret (*Pampus argenteus*) as a new candidate species for aquaculture. Aquaculture Asia Magazine, April - June 2008: 49-50.

Last, P. R., 1997. Stromateidae. Butterfishes, silver pomfrets. In: Carpenter, K.E. and Niem, V. (eds.) FAO identification guide for fisheries purpose. The living marine resources of the western central Pacific, 6.

Narges, A., Preeta, K., Jasem, M., Gholam-Reza, E. and Vahid, Y. 2011. Stock assessment of silver pomfret *Pampus argenteus* (Euphrasen, 1788) in the northern Persian Gulf. Turk. J. Fish. Aquat. Sci., 11: 63-68.

Pati, S. 1984. Possibilities of aquaculture of silver pomfret *Pampus argenteus* (Euphrasen) along the Balasore coast. Proc. Symp. Coastal Aquacul., 3: 782-786.

Peng, S., Chen, X., Shi, Z., Yin, F. and Sun, P. 2011. Survival of juvenile silver pomfret, *Pampus argenteus*, kept in transport conditions in different densities and temperatures. Isr. J. Aquacult. Bamid., 64 (1): 6.

Piper, R., 2010. Re-occurrence of silver pomfret *Pampus argenteus* in the North Sea. Mar. Biodivers. Rec., 3: 102.

Rahman, A. K. A. 2005. Freshwater Fishes of Bangladesh. 2nd ed. Zoological Society of Bangladesh, Dhaka, Bangladesh, 394 pp.

Rahman, A. K. A. 1989. Freshwater fishes of Bangladesh. Zoological Society of Bangladesh. Department of Zoology, University of Dhaka, 364 pp.

Ramasamy, P. and Ramalingam, K, 1989. The occurrence, site specificity and frequency distribution of *Bicotyl vellavoli* on *Pampus chinensis* and *Pampus argenteus*. Int. J. Parasitol, 19: 761-767.

Shafi, M. and Quddus, M. M. A. 1982. Banglades her Matsho Sampad (in Bengali). 1st ed. Bangla Academy, Dacca, 426 pp.

Tang, W. C. 1987. Chinese medicinal materials from the sea. Abstract of Chinese medicine, 1(4): 571-600.