

# *Chrysiptera cyanea* (Quoy & Gaimard, 1825)

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## IDENTIFICATION

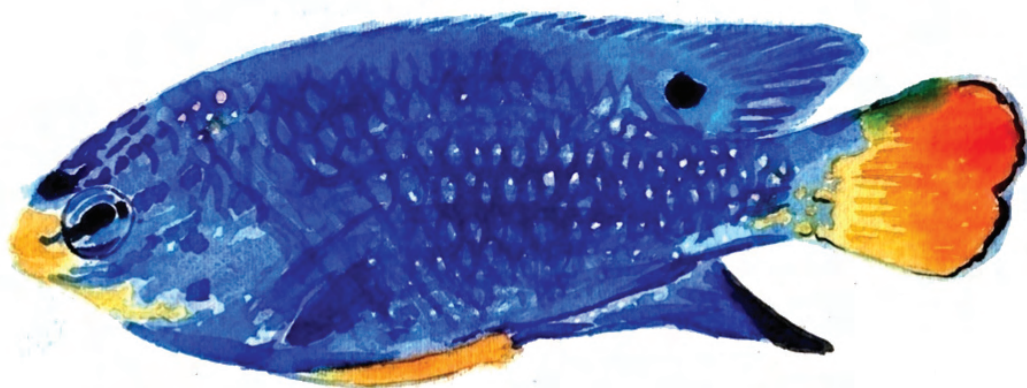
Order	: Perciformes
Family	: Pomacentridae
Common/FAO Name (English)	: <b>Sapphire devil damsel</b>



**Local names:** Not available

## MORPHOLOGICAL DESCRIPTION

The Sapphire devil damsel is characterized by its brilliant blue colour and a small black spot at the posterior base of the dorsal fin. Adult males sometimes develop an orange colour on caudal fin and ventral parts of the body. Females and juveniles usually lack the orange colour. There are 13 dorsal spines and 12-13 soft rays and 2 anal spine and 13-14 anal soft rays.



## PROFILE

### GEOGRAPHICAL DISTRIBUTION

The species is distributed in Indo-West Pacific region from eastern edge of the Indian Ocean and western Australia to New Guinea, New Britain, Solomon Islands, Marianas and Caroline Islands, Indonesia, Philippines, Taiwan and Ryukyu Islands. It is also known from Vanuatu and New Caledonia, Palau and Yap in Micronesia and Samoa. The species has been reported along both the coasts of India, from Lakshadweep and from Andaman Islands.

### HABITAT AND BIOLOGY

The species is marine, reef-associated, non-migratory and inhabits at depths of 0-10 m. Adults are found amongst rubble and coral of clear sheltered lagoons and subtidal reef flats. Generally a single male groups with several females or juveniles. The maximum reported size for the species is 8.5 cm. It is oviparous with distinct pairing during breeding. Eggs are demersal and adhere to the substrate. Males guard and aerate the eggs. Larval duration ranges from 17-21 days.

## BREEDING IN CAPTIVE CONDITIONS

Under captivity, broodstock development, breeding and larviculture techniques were developed and standardized by Mandapam R. C. of CMFRI, India. Broodstock development was done in rectangular 2 t capacity FRP tanks with biological filters. Six juvenile fishes of the sapphire devil damsel collected by liftnet were introduced into the tanks for broodstock development. First spawning was obtained in captivity after 8 months of maintenance in the broodstock tanks. The mature fish ranged in total length from 5-6.5 cm. The day before spawning, the parent fishes actively cleaned the site for attaching the eggs by rubbing it with their pelvic fins and picking off any loose particles or algae with their mouths. During spawning, females attached their eggs on the cleaned site, which were immediately fertilized by the males. Spawning occurred during morning hours. Approximately 2,000-2,500 eggs were present in a single spawn. The eggs were attached on the substrata provided inside the broodstock tanks. The eggs were oval shaped and measured around 1.3 mm in length and 0.6 mm in width. The periodicity of spawning ranged between 5 and 20 days. Hatching took place on the night of 3<sup>rd</sup> day at 28-30 °C. Hatching was delayed to 4<sup>th</sup> day or 5<sup>th</sup> day if the temperature was lower. During this period, the male parent took care of the eggs by protecting them and by fanning them with their pectoral fins and tail.

## LARVAL REARING

The larvae were altricial type with no mouth opening at the time of hatching. The length of newly hatched larvae averaged 2.5 mm and the mouth gape was around 150 µm. Larviculture was done in 5 t capacity FRP tanks by employing green water produced by the microalgae *Nannochloropsis* sp. Different larviculture systems were experimented by varying the cell counts of green water and live feeds. The cell counts of green water were in three ranges -  $19 \times 10^4$ /ml,  $19 \times 10^5$ /ml and  $19 \times 10^6$ /ml. Feeding was performed with different live feeds - enriched rotifer (*Brachionus rotundiformis*) alone, mixed culture of two copepods viz. *Euterpina acutifrons* and *Pseudodiaptomus serricaudatus*, copepods and rotifers together and copepods as starter feed for the first six days followed by enriched rotifers from 7 to 15 dph. Feeding with *B. rotundiformis* alone and with *B. rotundiformis* and copepods together was least successful. Co-culturing of the two selected species of copepods in optimum range of cell count of green water gave the best survival. Survival rate of larvae on 15 dph ranged from 5 to 8 %. A survival rate of 5-6 % was observed in larvae fed with copepods as starter feed up to 6 dph followed by enriched rotifers from 7 to 15 dph. A cell count of  $1 \times 10^5$  cells/ml was found to be optimum, which yielded the maximum larval survival. After 15 dph, the larvae were fed with freshly hatched *Artemia* nauplii. No mortality was observed beyond this period. Metamorphosis of larvae started from 24<sup>th</sup> day and all the larvae metamorphosed by 30<sup>th</sup> day.

## FOOD AND FEEDING

This species feeds on zooplankton, benthic invertebrates and filamentous algae. Its diet includes algae, tunicates and copepods.

## GROWTH RATE

Information not available

## DISEASES AND CONTROL MEASURES

*Chrysiptera cyanea* are prone to parasitic infestations, mainly isopod, *Livoneca* sp. It can be treated either with Trichlorfon (0.25-3.0 mg/l water for 3 days) or formalin (0.1 ml/l for 30-45 minutes or 1.0-1.5 ml/100 l for 2 days). The parasite can also be removed manually with the help of tweezers.

## PRODUCTION, MARKET AND TRADE

### PRODUCTION

Information not available

### MARKET AND TRADE

The sapphire devil damselfish, *Chrysiptera cyanea* is one among the top ten species of marine ornamental fishes in the international trade. It is an excellent marine aquarium fish and is in good demand in the international market. For the years 1997-2002, *Chrysiptera cyanea* was one of the most commonly traded species in the EU and USA, with 11,776 and 73,536 numbers exported and 43,767 and 77,890 numbers imported.

## CHALLENGES TO MARICULTURE

The critical phase of larviculture is initial feeding after mouth opening. After 15 dph, the mouth gape reaches around 450  $\mu\text{m}$ , then it can be fed with freshly hatched *Artemia* nauplii. The absence of any mortality after 15 dph indicates that once the initial feeding problem is solved, larviculture is accomplished easily with conventional live feeds. Thus suitable feed has to be searched and developed for the initial feeding so that survival can be increased.

## FUTURE PROSPECTS

*Chrysiptera cyanea* is one of the top most species in the international aquarium trade. Since breeding and larviculture techniques are already developed, production can be popularized. The breeding technique developed has the potential to be scaled up to commercial level for production of the species.

## SUGGESTED READING

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