https://doi.org/10.24199/j.mmv.1962.25.01

# SIPHAMIA ZARIBAE WHITLEY (FAMILY APOGONIDAE), WITH SOME OBSERVATIONS ON ITS ECOLOGY.

*R. J. Slack-Smith, Department of Zoology, University of Queensland, Brisbane.*

## I. Introduction.

During ecological studies at Heron Island, Great Barrier Reef (Lat. 23° 27′ Long. 151° 58′) Dr. R. Endean of the Department of Zoology, University of Queensland observed a small fish living commensally amongst the spines of the urchin *Echinothrix calmaris* (Pallas). On 24th August, 1957, the author collected 23 specimens at Heron Island from this host. They were determined to be a previously undescribed species of *Siphamia*. A description was prepared but just prior to its submission for publication, Whitley's brief description and name was received by the author (Whitley, 1959). As this account contains observations on the ecology of this species as well as an independently prepared full description and illustration, it is here submitted with appropriate alterations. This species is particularly noteworthy as it is the first record of commensalism in this genus.

The record of this species from Australia greatly enlarges the known distribution of the genus which has been previously illustrated by Smith (1955, p. 62, fig. 1). Indeed, careful faunistic studies will undoubtedly show that it is a truly tropical Indo-Pacific genus.

## II. Description.

## Family APOGONIDAE.

## Subfamily *SIPHAMIINAE*.

## Genus *SIPHAMIA* Weber.

*Siphamia* Weber 1909, p. 168 (Genotype *Siphamia tubifer* Weber): Fowler & Bean 1930, p. 142; Shultz et. al. 1953, p. 414–29; Smith 1955, p. 61–6.

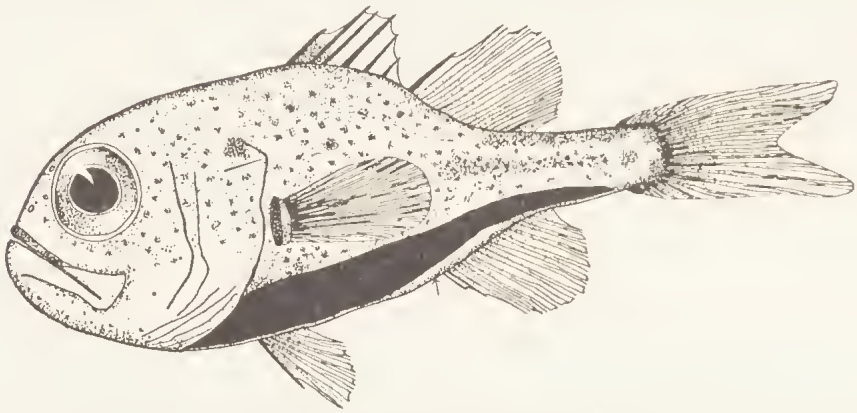

Figure 1.—*Siphamia zaribae* Whitley. 24 mm. specimen, Reg. No. A 150, National Museum of Victoria, from Heron Island, Queensland.

Shultz et. al. (1953) have revised the genus *Siphamia* and have constructed a comprehensive key to the species. This revision has been commented on by Smith (1955) who further divides this subfamily into the genera *Siphamia* Weber, *Scopelapogon* Whitley (1933) and *Adenapogon* McCulloch (1921).

The genus *Siphamia* as defined by Smith (1955) has not previously been recorded from Australia.

### *SIPHAMIA ZARIBAE WHITLEY.*

*Siphamia zaribae* Whitley 1959, Aust. Zool. 12, 4, p. 323.

All material was collected from one specimen of *Echinothrix calmaris*. This was found on the outer reef flat of the northern reef at Heron Island amongst dead coral and rubble on 24th August, 1957. The fish were observed in association with this species of urchin in other outer reef-flat localities but were not collected.

$D^1$ VI; $D^2$ I, 9; fourth spine longest and thickest, second 0·3—0·5 in first, second and third about equal. A. II, 9; second spine 0·6 in first. C. vii, 15, vii; moderately forked, least length at fork about 1·5 in greatest length to caudal flexure; 1·5 in head. Least height of caudal peduncle 2·4 in greatest peduncle length. P. 15; 4·2 to 4·3 in standard length; rounded. V,I,5; second ray longest.

Greatest depth 2·2 to 2·7 in standard length; head 2·2 to 2·4, depth of head 0·9 to 1·1. Snout 4·9 to 5·5 in head; eye 2·7; 1·1 in interorbital. Maxillary reaches to about 0·6 in eye; length 1·8 to 2·0 in head; expansion 4·5 to 5·5 in head. Teeth in villiform bands in jaws, on vomers and palatines. Vomer prominent. Interorbital convex, 2·7 to 3 in head. Preopercular ridge entire; edge denticulated, teeth longest at angle. Gill rakers 1 + 1 + 5; long and slender. Tongue thick and pointed.

Scales in 20 vertical rows to caudal base, 1 or 2 more on latter; 5 predorsal; 2 rows above lateral line, 7 below; 1 or 2 rows on cheek; deciduous. Snout naked. Scales with 9 basal striae.

Lateral line indistinct, about 20 pores visible.

Peritoneal gland reaches to base of caudal in adults, not so far in juveniles (reaches just past anal base in 12·0 mm juvenile).

*Colour.*—Body and head densely covered with (fully or partially contracted) melanophores, the overall colour varying from complete black to grey with a black stipple. Three more or less distinct horizontal bands on tail; the first follows the posterior portion of the lateral line, the second the mid-axis of the peduncle and the third is formed by the completely black peritoneal gland on the ventral portion of the peduncle. Some smaller specimens show an indistinct spot at the caudal base.

In life, small red chromatophores are also present on the body and fins and their combination with the melanophores produces the deep red-black colouration similar to that of the host. On preservation in formalin these red chromatophores fade to very indistinct darker edged white spots. Caudal and pectorals hyaline. Basal two-thirds of first dorsal, basal third of second dorsal and anal dark black-brown. Iris dark.

*S. zaribae* differs from the remainder of this genus in having only 6 dorsal spines. It resembles *S. arygrogaster* in having 9 anal rays.

It is unique in having a completely black peritoneal gland.

*Material*: Nat. Mus. Victoria *Reg. No.* A.150, 1 specimen, 20 mm. in standard length; Nat. Mus. Victoria *Reg. No.* A.151, 7 specimens, 18·5 mm. to 9·5 mm.; Aust. Mus. Sydney *Reg. No.* IB.4129, IB.4132; 6 specimens, 18·0 mm. to 11 mm.; Queensland Mus. Brisbane *Reg. Nos.* I.8154–I.8160, 7 specimens 18 mm. to 10·5 mm.

## III. Ecology.

A number of examples of commensalism of varying degrees of intimacy have been observed amongst reef fish. A loose association occurs between a number of small pomacentrids and various corals; particularly between *Pomacentrus sufflavus* Whitley and *Porites andrewsi* Vaughan and *Acropora breuggamanni* (Brook) (Slack–Smith ms). As the yellow colour of this fish blended well with the similar colour of the corals it is probable that this association is concerned with protective colouration and is not a true example of commensalism. Patton (personal communication) records that several species of *Gobiodon* occurred commensally in pairs amongst branches of the corals *Pocillopora damicornis* (Linnè) and *Porites andrewsi*. These fish were rarely observed outside the corals. Closer commensalism occurs between *Amphiprion spp.* and various large reef anemones. *A. percula* (Lacépède) is confined to *Stoichactis kenti* (Haddon and Shackleton) and *A. melonopus* Bleeker and *A. bicinctus* Ruppell to *Stoichactis haddoni* (Saville–Kent) (Saville–Kent 1893).

On the Great Barrier Reef *Carapus homei* (Richardson) lives commensally in the rectum of *Holothuria mammifera* Saville–Kent (Saville–Kent, 1893 and Roughley, 1936) and on the Hawaiian reefs a similar relationship occurs between *Carapus homei* and various holothuria (Tinker, 1944). Shultz (1943) records 2 species of Carapidae from the Samoan and Phoenix Islands but does not mention if they were taken from holothuria. le Danois (1957) illustrates the shrimp fish *Aeoliscus stringatus* (Günther) swimming amongst the long spines of the urchin *Diadema sp.* This association is not very close as these fish are frequently observed away from the urchin. *Paramia bipunctata* Lachner have been recorded between the spines of *Diadema sp.* from the Red Sea (Lachner, 1955). This is the first record of commensalism between an apogonid and an urchin. Lachner used the term " inquilinism " for this particular relationship.

Undisturbed *Siphamia zaribae* were observed to swim around the basal half of the spines of *Echinothrix*, blending almost perfectly with its red-black colouration. However, when the host was disturbed they swam towards its corona and lay parallel to its spines. Violent disturbance of the urchin was necessary to make them move from this position, in fact, many still remained when it was taken from the water. This behaviour made collection of specimens a simple matter. If the fish alone were returned to the water they darted into the shadows of the nearest cover and remained hidden until the host was thrown back. They then immediately swam back to their former positions amongst the spines. Although these fish have not been observed feeding it is most unlikely that they move far from their host under normal conditions.

## IV. Acknowledgments.

Thanks are due to Professor W. Stephenson, Dr. M. C. Bleakly and Mr. D. J. Woodland for helpful criticism and advice in the preparation of the manuscript.

This research was financed from Commonwealth Research monies of the University of Queensland.

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