



***Rhinopias eschmeyeri* Condé, 1977 (Family Scorpaenidae) - a new record from Indian waters**

Molly Varghese

Central Marine Fisheries Research Institute, P. B. No. 1603, Ernakulam North P.O., Cochin - 682 018, Kerala, India. E-mail: mollykandathil@hotmail.com

Abstract

The Eschmeyer's scorpionfish, *Rhinopias eschmeyeri* is reported for the first time from the Indian waters. Two specimens of this species were collected from trawlers operated in Gulf of Mannar, southeast coast of India, during November, 2009. Comparison of morphometric and other characters with the holotype and other reported specimens confirm the identification.

Keywords: *Rhinopias eschmeyeri*, first record, Scorpaenidae

Introduction

The fishes under the family Scorpaenidae are bottom-living, mostly found around reef or rocky areas in tropical, temperate and cold waters of all seas. They are predators that lie in wait for their prey, pouncing on them with a swift motion combined with suction caused by the rapid opening of the large mouth. Although these fishes commonly are reddish in colour, many have patterns that effectively camouflage them against the substrate. These are moderately compressed to robust fishes, with large spiny heads. The dorsal, anal and pelvic spines are usually supplied with venom glands. Fertilization is mostly internal. About 375 species are recorded in the family (Fischer and Bianchi, 1984). The family is divided into nine subfamilies (Eschmeyer, 1986).

The genus *Rhinopias* Gill, 1905 comes under the subfamily Scorpaeninae and is characterised by the presence of 12 spines on dorsal fin, 3 spines on anal fin, 15-18 pectoral fin rays, head and body strongly compressed, normal cycloid scales on body and with skin flaps on head. This genus was reviewed by Eschmeyer *et al.* (1973) who recognised the following four valid species: *R. aphanes* Eschmeyer, 1973; *R. argoliba* Eschmeyer, Hirotsuki and Abe, 1973; *R. frondosa* (Günther, 1892) and *R. xenops* (Gilbert, 1905). Later, *R. eschmeyeri* Condé, 1977 and *R. cea* Randall and DiSalvo, 1997 were added (Motomura and Johnson, 2006). Specimens of

Rhinopias are very rare in museum collections (Eschmeyer *et al.*, 1973). Motomura and Johnson (2006) described *R. eschmeyeri* as poorly known. The holotype of *R. eschmeyeri*, MAN (Museum-Aquarium de Nancy, Nancy, France) 10475 was collected from Mahebourg, Mauritius, Mascarenes, southwestern Indian Ocean and the original description of this species appeared in *Revue Française d'Aquariologie Herpetologie* v. 4, no. 1 (Eschmeyer, 2010). This species is not reported from India so far and the specimens collected in the present study are deposited in the Marine Biodiversity Referral Museum at CMFRI, Cochin (Accession No: GB.38.24.39.1).

Material and Methods

Two specimens examined in the present study were collected from Gulf of Mannar, at 09°10'11.83"N lat. and 78°50'51.11"E long., caught by a trawler from a depth of about 40 m during November, 2009. Thirty seven morphometric measurements were taken following Motomura (2004) and are given in Table 1. The morphometric measurements and other characters are compared with those of the holotype specimen from Mauritius and those collected by Motomura and Johnson in 2006 from the Indo-West Pacific Ocean (Mascarene Islands to Japan and Australia; hereafter called as IWPO). The systematic position of *Rhinopias*

eschmeyeri:

- Order : Scorpaeniformes
 Family : Scorpaenidae
 Subfamily: Scorpaeninae
 Genus : *Rhinopias* Gill, 1905
 Species : *Rhinopias eschmeyeri* Condé, 1977

Results and Discussion

The diagnostic, morphometric and meristic characters of the specimens collected during the present study are presented in Table 1 and Fig. 1.

The species is distinguished by the presence of one small black spot, slightly greater than pupil diameter, in the middle of the membrane between the seventh and eighth dorsal-fin soft rays, dorsal profile of snout curved, initially convex, then deeply concave; interorbital space deep, occipital pit moderately deep; the distal margins of the spinous and the soft-rayed portions of the dorsal fin, pelvic, anal and caudal fins without notches or very weakly notched, membrane of the spinous dorsal fin notably fleshy, tips of each caudal-fin ray divided into four branches, dorsal-fin spines relatively soft and tips bending easily under slight pressure.

Description: Dorsal fin with 12 spines, 9 rays; anal fin with 3 spines, 5 rays; pectoral-fin rays 16, pelvic-fin with 1 spine and 5 rays and soft rays of dorsal fin branched. The measurements of holotype specimen (MAN 10475), other specimens from Indo-West Pacific Ocean (IWPO) and those collected during the present study from Gulf of Mannar,



Fig. 1. *Rhinopias eschmeyeri* Condé, 1977

southeast coast of India, as percentages of standard length and head length are given in Table 1.

From Table 1, it is observed that all the measurements of the specimens collected during the present study are within the range of holotype and or other specimens collected from the Indo-West Pacific Ocean. The length of first spine of the dorsal-fin is 1.4 in second spine length (1.5 in holotype and 1.3-1.6 for IWPO specimens); fourth spine longest and its length greater than upper-jaw length; the spine lengths decreasing gradually from fourth to eleventh. The eleventh spine is the shortest and its length is 3.0-3.3 in twelfth spine (3.4 in holotype and 2.4-3.4 in IWPO specimens). Soft rays of anal fin branched and length of third anal spine is the longest. Third soft ray of the anal fin is the longest and is slightly longer than the longest dorsal-fin soft ray. Length of anal-fin rays progressively decreases from third to fifth; posterior branch of last ray of anal-fin joined by membrane to caudal peduncle for less than one-fourth of its length and membranes between rays weakly notched. Uppermost ray of pectoral fin is unbranched, lower 8 rays (7 in holotype and 5-8 in IWPO specimens) are unbranched and fleshy and remaining rays are branched. Ninth ray of pectoral fin is the longest (10th in holotype and 8th-10th in IWPO specimens), its length greater than the longest dorsal spine length; membrane between branched rays reaching upto tip of each ray and membrane between fleshy unbranched rays are notched.

Posterior margin of opercular membrane and upper end of pectoral-fin base reaching a vertical near fifth dorsal spine base; origin of pelvic fin slightly posterior to pectoral-fin base and origin of first anal spine below that of last dorsal spine. All the rays of pelvic fins are branched, second ray longest, posterior branch of last ray joined by a membrane to abdomen for more than two-thirds of its length. Head and body strongly compressed, head width is less than greatest body width. Body deep, deepest at origin of fourth or fifth dorsal-fin spine; body depth 2.3 (2.7 in holotype and 2.0-2.7 in IWPO specimens) and head length is less than body depth. Caudal fin with 14 rays and 12 of these are branched; 8th ray is the longest; posterior margin of the fin is double truncated.

Table 1. Morphometric characters of *Rhinopias eschmeyeri*, expressed as percentages of standard and head lengths; comparison between holotype and other specimens

Characters	Holotype MAN 10475	Indo-West Pacific Ocean (Mascarene Islands to Japan and Australia) n = 9	Gulf of Mannar (southeast coast of India) n = 2
Standard length (mm)	148.1	100.6-166.3	122.5 - 128
% of standard length			
Body depth	47.5	45.7-53.2	46.3-48.3
Body width	21.6	17.1-24.4	20.0-20.8
Head length	47.7	44.7-50.9	45.7-47.3
Snout length	19.7	19.7-21.6	19.6-19.7
Orbit diameter	7.8	6.9-8.9	7.6-8.1
Interorbital width ¹	7.6	5.8-9.0	6.2-7.1
Interorbital width ²	6.8	5.5-8.7	6.7-6.8
Upper- jaw length	21.9	20.1-23.3	22.1-22.8
Depth of posterior margin of maxilla	7.8	6.9-8.6	7.1-7.2
Postorbital length	21.2	18.8-22.7	20.3-20.4
Predorsal-fin length	37.3	36.1-40.8	37.5-37.9
Preanal-fin length	78.7	70.0-78.7	77.8-77.9
Prepelvic-fin length	49.1	43.9-48.9	46.5-49.2
1st dorsal-spine length	17.2	14.2-18.5	15.8-16.1
2nd dorsal-spine length	23.1	21.7-26.9	21.5-22.6
3rd dorsal-spine length	26.2	24.4-32.9	26.6-28.0
4th dorsal-spine length	26.1	22.6-31.0	27.7-28.2
5th dorsal-spine length	23.4	20.5-26.3	24.5-25.3
6th dorsal-spine length	20.0	17.2-24.2	21.1-22.7
7th dorsal-spine length	16.1	15.1-20.8	19.1-19.2
8th dorsal-spine length	14.1	12.9-18.5	16.5-16.9
9th dorsal-spine length	10.4	11.9-15.4	14.0-14.5
10th dorsal-spine length	5.2	7.2-10.2	6.8-6.9
11th dorsal-spine length	4.8	3.9-6.0	4.3-4.8
12th dorsal-spine length	12.8	12.9-16.3	14.4-14.5
Longest dorsal-ray length	22.2	19.6-26.7	22.0-22.3
1st anal-spine length	5.8	7.4-9.6	5.7-6.3
2nd anal-spine length	12.3	13.1-15.4	13.0-13.5
3rd anal-spine length	14.0	14.3-17.3	16.3-16.6
Longest anal-ray length	23.3	23.4 - 27.2	24.2-24.5
Pectoral-ray length	36.5	33.5-39.3	35.8-36.4
Pelvic-spine length	12.8	12.2-15.2	14.1-15.3
Longest pelvic-ray length	23.4	21.3-26.2	24.8-24.9
Caudal-fin length	32.3	32.6-36.8	32.8-34.3
Caudal-peduncle length	12.7	11.9-14.4	11.7-12.1
Caudal-peduncle depth	11.5	11.7-13.9	11.8-12.3
% of head length			
Snout length	41.4	42.4-46.1	41.4-43
Orbit diameter	16.3	15.5-19.3	16.0-17.8
Interorbital width ¹	15.9	12.3-18.6	13.1-15.6
Interorbital width ²	14.3	11.9-17.9	14.2-14.8
Upper- jaw length	45.9	44.9-48.2	48.2-48.4
Depth of posterior margin of maxilla	16.9	14.5-16.9	14.9-15.7
Postorbital length	44.5	40.9-44.6	43.1-44.3

¹at vertical midline of eye

²at posterior end of preocular spine base

A fleshy tentacle on the supraocular spine and another one on posterior lacrimal spine are present. The posterior tip of the tentacle on posterior lacrimal spine is not reaching to posterior margin of maxilla. Scales are absent on head, but present on entire lateral surface of body. Lateral line is sloping steeply downward above posterior margin of upper opercle. Interorbital space is deep and about half of orbit is extending above dorsal profile of head. Preocular spine is simple and directed dorsally, supraocular spine is located anterior to vertical midline of eye and postocular spine is triangular in lateral view and bigger than supraocular spine. The occipital pit is moderately deep and the space between ventral margin of orbit and suborbital ridge is very broad.

Colour: The specimens collected in the present study are reddish in colour (Fig. 1). The colour of *R. eschmeyeri* varies considerably, white, beige, reddish-brown, brown, pink, orange, and bright red individuals were recorded (Motomura and Johnson, 2006).

Distribution: *R. eschmeyeri*, is recorded so far from western Indian Ocean (Seychelles, Mauritius and Réunion), eastern Indian Ocean (Western Australia) and western Pacific Ocean (Japan, Vietnam and Queensland, Australia) based on collected specimens and from Indonesia, Japan and Philippines based on underwater photograph of this species. Again, Motomura and Johnson (2006) collected this species from the Indo-West Pacific Ocean. Recently, Shao *et al.* (2008) reported this species from southern Taiwan, northern South China Sea. The current record adds India (Gulf of Mannar, southeast of India) in the range of distribution of *R. eschmeyeri*.

R. eschmeyeri differs from other species of *Rhinopias* with respect to black spot on soft dorsal fin, number of pectoral-fin rays, membrane and notches of spinous portion of dorsal fin, notches in the distal margins of soft portions of dorsal, pelvic, anal and caudal fins, tips of caudal fin rays, type of dorsal fin spines, etc. The black spot present in *R. eschmeyeri* is absent in *R. argoliba*, *R. cea* and *R. xenops*. The size of the single spot is usually smaller than orbit diameter in *R. eschmeyeri* while in *R. aphanes*, double spots usually much larger than orbit

diameter is reported. Compared to 16 pectoral-fin rays, 18 are present in *R. argoliba*, *R. cea* and *R. xenops*. The membrane of spinous dorsal fin is notably fleshy and without notches or with very weak notches in *R. eschmeyeri* while it is strongly notched in *R. aphanes* and *R. frondosa* and also not fleshy in *R. aphanes*. The distal margins of the pelvic, anal and caudal fins are strongly notched in *R. aphanes*. Besides, the tentacles on the supraocular and posterior lacrimal spines in *R. aphanes* and *R. frondosa* are long and with distinct branches. Tips of each caudal fin ray are unbranched in juveniles but divided into two branches in the adults and the dorsal fin spines remain firm and strongly pointed at their tips in *R. aphanes*.

The comparison of the diagnostic characters, description and morphometric characters of the specimens collected in the present study with those of the holotype and other non-type specimens of this species confirm the identification of the current specimens as *Rhinopias eschmeyeri* Condé, 1977.

Acknowledgements

The author is grateful to Dr. G. Syda Rao, Director, CMFRI and Dr. Mary K. Manisseri, Head, Marine Biodiversity Division, CMFRI, Kochi for their encouragements. The author expresses her sincere gratitude to Dr. Hiroyuki Motomura, Section Editor, Ichthyological Research and Associate Professor, Kagoshima University Museum, Japan for confirming the identification of the specimens, providing the holotype details and other reprints required for this publication and to Dr. Eschmeyer Bill for guidance and support extended for this work. The author wishes to express her gratitude to Dr. G. Gopakumar, Scientist-in-Charge and Dr. V. S. Kakati, Principal Scientist, MRC of CMFRI, Mandapam for their timely support and encouragements. The author is deeply indebted to Smt. P. M. Geetha, Shri A. Gandhi and Shri M. Seeni of CMFRI for the help rendered during the course of this study.

References

- Fischer, W. and G. Bianchi. 1984. FAO *Species Identification Sheets for Fishery Purposes. Western Indian Ocean* (Fishing Area 51). Vol. 4. FAO, UN, Rome.

- Eschmeyer, W. N. 1986. *Smith's Sea Fishes*. In: M. M. Smith and P. C. Heemstra (Eds.) Springer-Verlag Berlin Heidelberg New York London Paris Tokyo, p. 463-478.
- Eschmeyer, W. N. (Ed.). Catalog of Fishes. <http://research.calacademy.org/ichthyology/catalog/fishcatmain.asp>. version (06/05/2010).
- Eschmeyer, W. N., Y. Hirotsuki and T. Abe. 1973. Two new species of the scorpionfish genus *Rhinopias*, with comments on related genera and species. *Proc. Calif. Acad. Sci.*, 39(4): 285-310.
- Motomura, H. 2004. A new species of scorpionfish, *Scorpaena cocosensis* (Scorpaeniformes: Scorpaenidae) from the Cocos Islands, Costa Rica, eastern Pacific Ocean. *Copeia*, 4: 818-824.
- Motomura, H. and J. W. Johnson. 2006. Validity of the poorly known scorpionfish, *Rhinopias eschmeyeri*, with redescription of *R. frondosa* and *R. aphanes* (scorpaeniformes: scorpaenidae). *Copeia*, 3: 500-515.
- Shao, K. T., H. C. Ho, P. L. Lin, P. F. Lee, C. Y. Tsai, Y. C. Liao and Y. C. Lin. 2008. A checklist of the fishes of southern Taiwan, Northern South China Sea. *Raffles B. Zool.*, 19: 233-271.

Received : 10/06/10

Accepted : 14/12/10

Published : 15/06/11