

## OCCURRENCE AND MORPHOMETRY OF RETICULATE UNICORNFISH, *NASO RETICULATUS* (RANDALL, 2001) IN PAKISTAN

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### ABSTRACT

The reticulate unicornfish, *Naso reticulatus* is well known, distributed from Indonesia, Taiwan, Philippines and east coast of India. The range distribution of this species is now extended to further west to the coast of Pakistan. The morphometric characters of the specimens collected from off Malan and Churna Island (Balochistan) along Pakistan coast comes in conformity with those reported from other Indo-Pacific areas.

**Keywords:** Pakistan, *Naso reticulatus*, morphometry

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### INTRODUCTION

Surgeon fishes belonging to family Acanthuridae was represented in Pakistan by 8 species belonging to genus *Acanthurus* and one species of *Ctenochaetus* (Hoda, 1985,1988; Hussain, 2003; Jalil and Khalil, 1972, 1981; Murray, 1880; Qureshi, 1969; Randall, 1984). Genus *Naso* also belonging to family Acanthuridae, however, has not been reported from Pakistan previously. A number of specimens of *Naso* were collected from Karachi, Pakistan during past few years. It is now identified as *Naso reticulatus* (Randall, 2001). The present paper describes the species and compares the morphology of the specimens collected from Pakistan with those collected from other parts of the world.

### MATERIAL AND METHODS

Although a number of specimens of *Naso reticulatus* were observed during the past few years from fish landing centre at Karachi, however, for the taxonomic purposes only following 2 specimens were examined in detail.

# Acan-278/2009/MFD51 cm. April 16, 2009-KFH collected from off Malan, along Balochistan coast (Fig. 1).

# Acan-612/2013 MFD- 57 cm. October 14, 2013 –KFH collected from Churna Island (Fig. 2).

The information about date and place of collection of the specimens were obtained from fishermen. The specimens were kept in ice for further study. In the laboratory specimens were preserved in 5 % neutralized formalin and deposited in the Museum of Marine Fisheries Department. Various body measurements of the each specimen were recorded according to the method of Randall (2001).

### RESULTS

#### Taxonomic description

**Fin Formula:** D, V+29; A, II+27; P, 17; V, I+3; GR, 11-12

**Measurements:** Body depth 3.1 to 3.6 in standard length; body width 2.8 to 2.9 in body depth; head length 4.1 to 4.6 in standard length; no horn or protuberance on forehead or snout; dorsal profile of head convex with slight angularity before eye; snout length 1.5 in head length; orbital diameter 4.75 to 5.5 in head length; caudal peduncle slender, the depth 4.7 to 5.5 in head length; caudal-peduncle length 1.6 to 1.7 in head length. Two keeled bony plates on each side of the caudal peduncle (Fig. 3), the anterior longer, its greater depth 3.9 to 4.1 in head length; anterior edge of keels slightly concave and nearly perpendicular to body, the tip sharp and slightly antrorse, the outer edge rounded (Fig. 4).

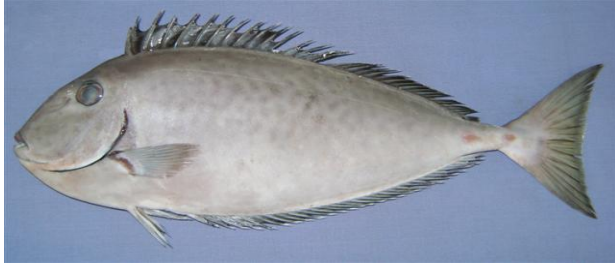


Fig. 1. *Naso reticulatus* collected from Karachi Fish Harbour on 16<sup>th</sup> April 2009



Fig. 2. *Naso reticulatus* collected from Karachi Fish Harbour on 14<sup>th</sup> October 2013



Fig. 3. *Naso reticulatus*: A lateral view of the caudal peduncle with keeled bony plates.

**Mouth:** Terminal and small, the gape slightly oblique; upper jaw length 4.8 to 5.3 in head length; teeth very small, pointed, compressed, with finally serrated edges, 64 in upper jaw and 60 in lower. Upper lip broad medially (its height  $\frac{1}{2}$  orbit diameter) and narrowing sharply to corner of mouth; lower lip thin, free only on posterior  $\frac{1}{2}$  of lower jaw. Tongue very short and broadly rounded.

**Nostril:** Posterior nostril very small, round to elliptical, in front of eye by a distance equal to  $\frac{1}{2}$  orbit diameter; anterior nostril antero-ventral to the posterior, about twice as large, nearly circular, with a low fleshy rim and a small pointed posterior flap. An obliquely groove forming a sinuous curve as it passes from in front of eye to below nostrils, ending about  $\frac{1}{2}$  distance to upper lip; groove very deep below and a short distance in front of nostrils, then progressively shallower anteriorly (Fig. 5).

**Scales:** Scales highly modified, very small and close-set, each with an elevated dense mass of spicules that expand to form a flattened outer surface; spicules project posteriorly; head fully scaled except for opercular membrane; membranes of dorsal, anal, and paired fins naked; anterolateral side of alternate spines and soft rays of dorsal and anal fins with fine scales like those of body but much smaller; caudal fin densely covered with very small scales; paired fins with very fine scales on rays. Lateral line approximately paralleling dorsal contour of body; but bores not externally visible.

**Fins:** All dorsal, pectoral and anal soft rays branched except upper 2 pectoral rays which are unbranched. Pseudobranchial filaments very slender. Origin of dorsal fin above upper end of gill opening, the predorsal length 3.95 to 4.1 in standard length; dorsal and anal spine slender but transversely broad basally, especially the first, which is longest, 2.8 to 3.1 in head length; last dorsal ray 4.5 to 5.5 in head length; remaining spines progressively shorter; origin of anal fin below base of the 5<sup>th</sup> dorsal spine; 1st anal spine 4.2 to 4.6 in head length; 2nd anal spine 4.05 to 5.1 in head length; caudal-fin length 3.9 to 5.15 in SL, the fin emarginate without filaments; pectoral fins short; origin of pelvic fins slightly posterior to lower base of pectorals; pelvic fins short, not reaching origin of anal fin.



Fig. 4. *Naso reticulatus*: Caudal peduncle with keeled bony plates (anterior view).



Fig. 5. *Naso reticulatus*: Head showing eye, nostrils and nostril notch

**Colour:** Body light brown dorsally, shading to whitish ventrally, the back above lateral line with numerous very small dark brown spots, forming short lines with Celtic pattern to stronger and darker reticular pattern on the body; some small dark brown spots below lateral line also forming short and wavy lines, but most markings as irregular dark brown lines; head darker brown than body except for a broad pale zone anterior and posterior to eye; cheek and side of snout below groove with a dark reticulum pattern; opercular membrane black; a large irregular dark brown blotch below and extending slightly above anterior part of pectoral fin; dorsal fin with dark brown spines and rays and nearly black membranes; anal fin with light brown rays, gray membranes that shade to blackish distally, and a pure white margin; caudal fin dark gray-brown with dark brown spots and lines, the lines paralleling the rays; pectoral fins pale gray, shading to blackish distally, with a broad dark brown bar at base; pelvic fins with white rays and gray membranes.

#### Meristic Comparison

Comparison is made of the meristic values of the specimen collected from Pakistan with those reported from Indonesia, Taiwan and India. It is evident that the specimens collected from various parts of Indo-Pacific area including those from Pakistan have almost comparable proportions (Table I).

#### DISCUSSION

In this study we present occurrence of *Naso reticulatus* identified on the morphological characters. This species was originally described by Randall (2001) from Taiwan and Indonesia. Unlike most other members of the genus

*Naso*, this species lacks protuberance, horn on forehead and snout. On each side of the caudal peduncle, two keels are present with anterior edge of the keels slightly concave whereas outer edge is rounded. This species which is commonly known as reticulated unicornfish has a limited distributional record (Froese and Pauly, 2015). It was also collected from Dumaguete, Philippines (Randall, 2002; Russell, et al., 2012) and from West Bengal, India (Mohapatra *et al.*, 2013). Present paper extends its distribution to further west to the northern Arabian Sea along the Pakistan coast.

Table 1. Comparison of meristic counts of *Naso reticulatus* collected from Pakistan. with Indonesia (Randall, 2001), India (Mohapatra *et al.*, 2013) and Taiwan (Randall, 2001). Measurements are expressed as percentage of standard length (SL).

| Parameters                 | India | Taiwan | Indonesia | Present study |       |
|----------------------------|-------|--------|-----------|---------------|-------|
|                            |       |        |           | Sp. 1         | Sp. 2 |
| SL (mm)                    | 456.0 | 490    | 428       | 382           | 458   |
| Body depth                 | 31.8  | 32.5   | 31.3      | 36.6          | 34.3  |
| Head length                | 22.4  | 21.8   | 23.0      | 23.8          | 24.5  |
| Snout length               | 15.4  | 14.5   | 15.4      | 13.9          | 12.9  |
| Orbit diameter             | 4.6   | 4.6    | 5.3       | 5.0           | 4.4   |
| Interorbital width         | 7.5   | 7.4    | 7.3       | 7.9           | 8.1   |
| Caudal peduncle depth      | 4.2   | 4.0    | 4.0       | 5.0           | 5.2   |
| Caudal peduncle length     | 14.0  | 13.5   | 14.1      | 13.6          | 14.6  |
| Anterior peduncle plate    | 5.5   | 5.5    | 5.8       | 91.6          | 92.8  |
| Upper jaw length           | 4.4   | 4.2    | 4.6       | 4.7           | 4.6   |
| Predorsal length           | 26.1  | 25.5   | 26.2      | 28.5          | 27.3  |
| Preanal length             | 33.6  | 33.7   | 34.0      | 32.7          | 31.7  |
| Prepelvic length           | 25.2  | 25.1   | 25.8      | 28.0          | 26.9  |
| First dorsal spine length  | 7.7   | 7.7    | *         | 9.4           | 7.9   |
| Second dorsal spine length | 7.6   | 7.4    | 7.6       | 8.9           | 7.9   |
| Fifth dorsal spine length  | 6.8   | 6.4    | *         | 9.2           | 6.8   |
| Last dorsal ray length     | 5.5   | 5.3    | 5.6       | 5.0           | 4.4   |
| First anal spine length    | 4.0   | 4.8    | 5.1       | 5.8           | 5.7   |
| Second anal spine length   | 5.5   | 5.3    | *         | 6.5           | 4.8   |
| Caudal fin length          | 20.6  | 19.5   | 21.7      | 30.1          | 28.4  |
| Pectoral fin length        | 13.2  | 13.0   | 14.3      | 15.4          | 14.2  |
| Pelvic spine length        | 8.1   | 8.0    | 8.8       | 9.2           | 7.6   |
| Pelvic fin length          | 8.8   | 8.5    | 0.5       | 10.2          | 8.3   |

\* Asterisk indicates broken part.

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(Accepted for publication March 2015)