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Rudra Prasad Nath

Department of Zoology,
Vidyasagar University,
Midnapore, West Bengal, India.

Suman Pratihar

Department of Zoology,
Sukumar Sengupta
Mahavidyalaya, Keshpur,
Midnapore, West Bengal, India.

Jayanta Kumar Kundu

Department of Zoology,
Vidyasagar University,
Midnapore, West Bengal, India.

Morphometric analysis confirm disparity between two related toxic fish species among genus *Lagocephalus*, along Digha coast, West Bengal, east coast of India

Rudra Prasad Nath, Suman Pratihar and Jayanta Kumar Kundu

Abstract

Two closely related puffer fishes *Lagocephalus inermis* (Temminck & Schlegel, 1850) and *Lagocephalus lunaris* (Bloch and Schneider, 1801) were collected from the coastal belt of Digha (between 21°32'N to 21°45'N latitude and 87°32'E to 87°50'E longitude) in West Bengal along the east coast of India. Specimens were collected from different trawling stations of Digha Coastal belt and preserved in 10% formalin solution. Measurement of morphometric and meristic characters were done by using vernier calipers. The total length and fork length of *Lagocephalus lunaris* is different whereas the total length and fork length is same in *Lagocephalus inermis*. Spiny prickles are present on dorsal surface of *Lagocephalus lunaris*. *Lagocephalus lunaris* morphometrically differs from the *Lagocephalus inermis* by the presence of spiny prickles on its dorsal surface.

Keywords: Puffer fish, Tetraodontidae, *Lagocephalus inermis*, *Lagocephalus lunaris*

1. Introduction

Genus *Lagocephalus* under family Tetraodontidae is represented by 11 species worldwide [1]. The present study help us to explore the morphological differences between two closely related puffer fishes *Lagocephalus inermis* (Temminck & Schlegel, 1850) and *Lagocephalus lunaris* (Bloch and Schneider, 1801) collected from the coastal belt of Digha (between 21°32'N to 21°45'N latitude and 87°32'E to 87°50'E longitude) in West Bengal along the east coast of India. Both the species are toxic. *Lagocephalus lunaris* is more toxic in monsoon season. This two closely related species are repeatedly misunderstood by common people. This study helps us to increase knowledge about these two closely related species.

2. Materials and Methods

Thirty specimens from each species were randomly selected for morphometric study. Fishes were preserved in 10% formalin solution. Specimens were photographed and identified up to the species level by employing traditional taxonomic studies based on morphometric and meristic characters [2]. Morphometric parameters were measured up to the nearest 0.01 cm using vernier calipers and details of morphometric measurements of specimens along with their means and standard deviation are provided.

3. Results and Discussions

Smooth backed puffer fish i.e. *Lagocephalus inermis* is reported from the Indian ocean and Indo-west pacific ocean. Dorsal surface of the body is smooth and belly region is covered with spiny prickles. Body is dark grayish green in colour above dorsal region and silvery white below (Fig 1). The gill opening is internally black. Caudal fin is dark distally with white margin [2, 3].

Lunar tail puffer fish or green roughback pufferfish i.e. *Lagocephalus lunaris* is reported from Indian Ocean specifically from South China Sea to Japan [4, 5]. Body is elongated and dorsal surface is convex. Spiny prickles are distributed on the dorsal surface extending from inter-orbital space to origin of dorsal fin. Large and spherical eyes are present with free orbital margin. Inter-orbital space is broad with flat nasal organ. A short papilla is present with two large openings. Dorsal surface is yellowish green in colour an upper side and silvery yellow band running longitudinally along mid lateral side from tip of the mouth to the base of the tail [3] (Fig 2).

Correspondence:

Rudra Prasad Nath
Department of Zoology,
Vidyasagar University,
Midnapore, West Bengal, India.



Fig 1: *Lagocephalus inermis* (Temminck & Schlegel, 1850)



Fig 2: *Lagocephalus lunaris* (Bloch and Schneider, 1801)

Table 1: Morphometric and meristic measurements (cm) of *Lagocephalus inermis* (Temminck & Schlegel, 1850) and *Lagocephalus lunaris* (Bloch and Schneider, 1801) along with their toxicity.

Parameters (Cm)	<i>Lagocephalus inermis</i> (N=30)	<i>Lagocephalus lunaris</i> (N=30)
Morphometry		
Total length (TL)	21.13 ± 2.38	19.33 ± 1.23
Fork length (FL)	21.13 ± 2.38	17.31 ± 1.02
Standard length (SL)	18.53 ± 1.09	15.27 ± 0.89
Body depth (BD)	5.68 ± 0.49	4.65 ± 0.22
Pre orbital length (POL)	2.43 ± 0.55	2.19 ± 0.19
Orbital diameter (OD)	0.92 ± 0.01	1.63 ± 0.08
Head length (HL)	5.11 ± 0.48	5.21 ± 0.31
Pre Dorsal Length (PDL)	12.09 ± 1.05	10.28 ± 1.47
Pre Pectoral Length (PPL)	5.95 ± 0.98	5.56 ± 0.71
Pre Anal Length (PAL)	12.34 ± 1.07	10.26 ± 1.39
Meristic Counts		
Dorsal fin rays	13	12
Pectoral fin rays	16	18
Anal fin rays	12	11
Caudal fin rays	9	9
Toxicity		
	Toxic	Toxic

2. Conclusion

Lagocephalus lunaris and *Lagocephalus inermis* is very common fish throughout the Southeast Indian coast [4]. These two species are not commonly used as food by any economic group of people. They are thrown out as netting waste because tetrodotoxin which is a potent neurotoxin is present in different organs like liver, gonad, skin [6]. The total length and fork length of *Lagocephalus lunaris* is different whereas the total length and fork length is same in *Lagocephalus inermis* [1]. Orbital diameter of *Lagocephalus inermis* is significantly lesser than in *Lagocephalus lunaris*. Meristic counts confirm difference between two species. Spiny prickles are present on the dorsal surface of *Lagocephalus lunaris* which is absent in *Lagocephalus inermis* (Table 1).

3. References

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