

**POLYDACTYLUS KONADAENSIS A NEW THREADFIN FISH FROM INDIA
WITH A KEY TO SPECIES OF THE POLYNEMIDAE OF INDIA**

S. S. MISHRA AND S. KRISHNAN

Marine Biological Station, Zoological Survey of India, Madras.

INTRODUCTION

In pursuance of the approved programme of work, a coastal survey has been conducted in the Kakinada-Gopalpur sector, East coast of India during which two adult specimens of the family Polynemidae belonging to the genus *Polydactylus* have been collected from the inshore water near Konada (18.0°N, 83.6°E), north of Visakhapatnam, Andhra Pradesh by shore seining. These specimens differ from all the so far known species of the genus (Day, 1878 ; Weber and de Beaufort, 1922 ; Munro, 1955 ; Misra, 1959 ; Hida, 1967 ; Kagwade, 1970 ; Anonymous, 1974 ; Girija Kumari *et al.* 1983-84 ; Menon and Babu Rao, 1984 ; Talwar and Kacker, 1984 ; Talwar and Jhingran, 1991). They are described here as a new species under the name *Polydactylus konadaensis*. The present description of a new species most probably pertains to an endemic stock since it shows close similarities to *P. sexfilis* (Val.) and dissimilarities possibly due to adaptation.

SYSTEMATIC ACCOUNT

***Polydactylus konadaensis* sp. nov.**

(Plate 1)

Material and methods : Two adult females collected by shore seining, preserved in formaldehyde.

Diagnosis : A *Polydactylus* attaining a standard length of 105.5 mm ; 6 filamentous pectoral rays of which upper 5 extending beyond the tip of pelvic fin ; all upper pectoral rays simple ; no air bladder and pyloric caecae 16 in number.

Range : Konada, Andhra Pradesh, India.

Description : Br. st. vii ; D1. VIII ; D2. I.12 ; A. III. 11 ; P. 15+6 ; V. I.5 ; C. 17 ; L.1. 49 ; L. tr. 5/10 ; g.r. 18+21. Height 3.2-3.3 in S.1., 4.3-4.4 in T.1. Head about 3.25 in S.1., 4.3-4.4 in T.1. Eyes about 4.0 in head, 0.8-0.9 apart and 2.2-2.3 in post-orbital part of head. Inter-orbital space convex. Snout short, 1.3 in eye. Maxillary scaly, 1.8-1.9 in head. Head covered with scales to the end of snout. Anterior and posterior nostrils close together, close to eye. Preoperculum coarsely serrated, lower denticulations stonger. Angle of preoperculum produced and rounded.

Upper lip absent, lower lip well developed but not continuous at symphysis. Narrow bands of villiform teeth on jaws, palatines and vomer. Lateral line more or less straight, a short spine at the beginning of it. Origin of first dorsal in between pectoral and ventral, above the 6th lateral line scale. First dorsal spine minute; second one stronger but shorter (1.5) than the third spine, 1.2 to 1.4 in post-orbital part of head but equal or more than the eye and snout together. Third spine almost $\frac{2}{3}$ of body depth. Origin of second dorsal before that of anal. Spine of second dorsal more than $\frac{2}{3}$ of second spine of first dorsal, longer than the longest anal spine. First anal spine minute. Free border of second dorsal is a bit falcate and of anal almost straight. Caudal 3.8-4.0 in T.l., deeply forked with pointed lobes. Pectoral fins inserted low on body, upper part of its base well below midline of body. Pectoral as long as head without snout, all rays of upper part of pectoral simple. Free pectoral filaments, except the last one, extending beyond the tip of ventral and the longest reaching anal. Ventral equal or shorter than post-orbital part of head, 1.8-2.0 in head. Distance between origin of anal and ventral lesser than head. Least depth of caudal peduncle almost $\frac{2}{3}$ of its length and almost half of the head length. Dorsal, anal and caudal scaly. Body covered with moderate size ctenoid scales. Pyloric caecae 16 in number. No air bladder.

Colour : Golden, pectoral black, pelvic dark in the middle, first dorsal uniformly pigmented black, anal dusky, dorsals and caudal with black margins. No black blotch at the beginning of lateral line. Formalin preserved specimens yellow, brownish above.

Detailed measurements of the holotype and paratype are given in Table 1.

Holotype : ZSI/MBS-F-631, ♀, S. 1. 105.5 mm; Konada, Andhra Pradesh; shore seine; S. Krishnan and S. S. Mishra; 07 iii 1992.

Paratype : ZSI/MBS-F-632, ♀, S. 1. 96.0 mm; other data similar to holotype.

Relationships : Some of the meristic characters of the species under description in relation to the other existing species with simple upper pectoral rays and six free filamentous pectoral rays known from the Indo-west Pacific region are presented in Table 2.

Some of the pectoral rays are branched in *P. sextarius* (Bloch and Schneider) and *P. xanthonemus* (Val.) whereas in *P. konadaensis* sp. nov. all pectoral rays are simple. In *P. hexanemus* (C. & V.), *P. kuru* (Bleeker), *P. pfeifferi* (Bleeker) and *P. sexfilis* (Val.) also all the upper pectoral rays are unbranched. In *hexanemus*, the pectoral is longer than head while the species under description has pectoral shorter than head. In *kuru*, lateral line scale count is more (62-68) whereas in *konadaensis* it is less (49). Due to the presence of smaller eye, shorter caudal lobe, more upper pectoral rays and absence of air bladder it differs from *pfeifferi* which has not been reported in the Indian waters so far.

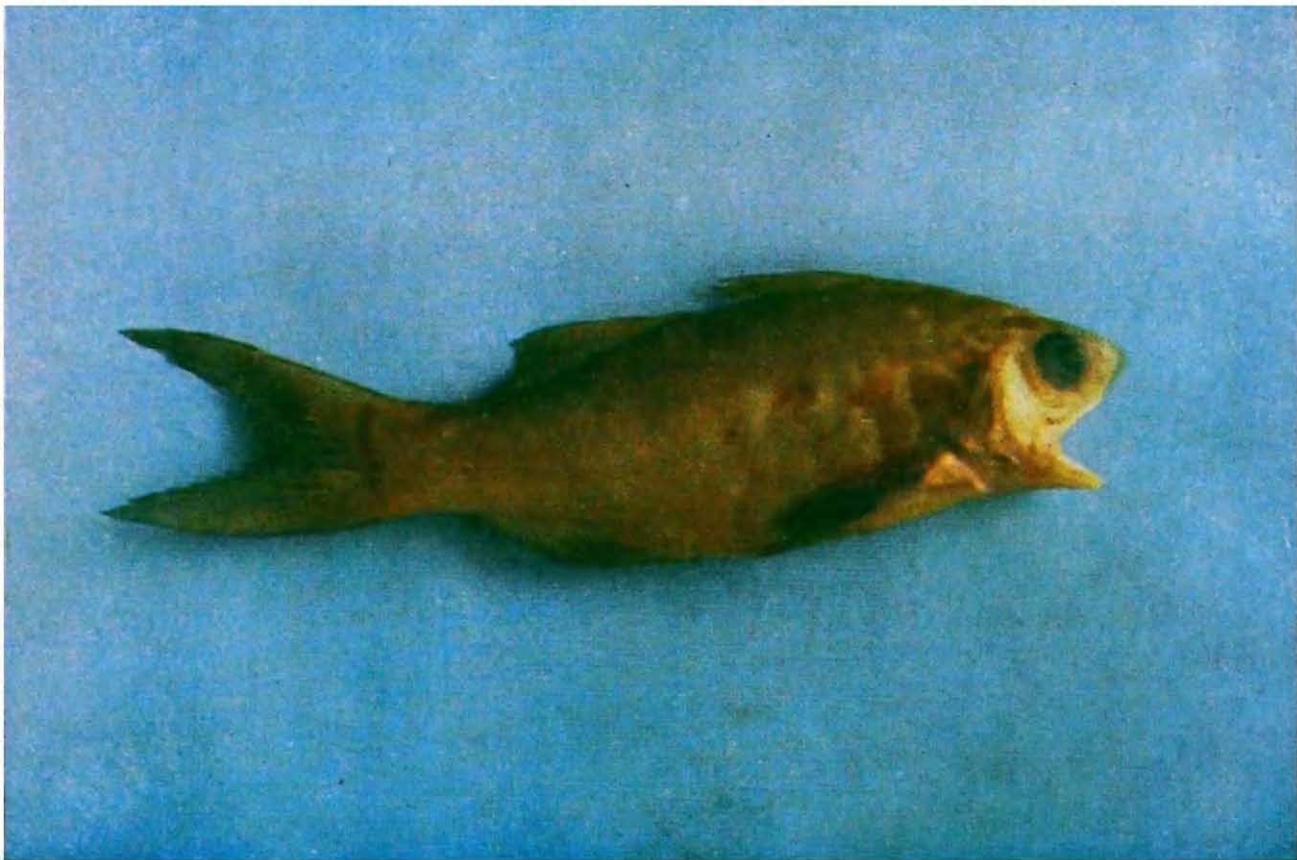
Because of the presence of a more or less comparable number of spines, fin rays, branchiostegal rays and transverse scales ; upper part of pectoral having unbranched rays ; golden body colour, black pectoral and pelvic being dark at the middle, *konadaensis* is comparable to *sexfilis* but variations like (i) higher number of scale in the lateral line (49) ; (ii) lesser height (4.3.) ; (iii) shorter caudal fin (3.8-4.0) ; (iv) bigger eye (4.0) ; (v) incomparably lesser number of pyloric caecae (16) ; (vi) presence of dusky anal fin without black margin ; (vii) upper five of free filamentous rays extending beyond pelvic fin tip (2 in *sexfilis*) ; (viii) absence of air bladder warrant erection of a

Table 1. Measurements of the Holotype and Paratype (in mm)

Characters		Holotype	Paratype
1. Total length	...	142.5	128.0
2. Standard length	...	105.5	96.0
3. Body depth	...	32.5	29.2
4. Head length	...	32.2	29.5
5. Snout length	...	6.2	5.5
6. Eye diameter	...	8.0	7.5
7. Inter-orbital width	...	7.0	6.0
8. Post-orbital length	...	18.0	16.5
9. Least depth of caudal peduncle	...	15.0	14.0
10. Length of caudal peduncle	...	22.0	20.0
11. Length of 2nd dorsal fin base	...	19.8	18.0
12. Length of anal fin base	...	21.5	19.0
13. Length of caudal lobe	...	37.0	32.0
14. Length of pectoral fin	...	26.5	23.5
15. Length of pelvic fin	...	16.5	16.5
16. Anal-vental interspace	...	24.5	23.0
17. Length of maxillary	...	17.0	16.0
18. Length of 2nd spine of 1st dorsal	...	13.0	13.0
19. Length of 3rd spine of 1st dorsal	...	19.5	19.5
20. Length of the spine of 2nd dorsal	...	9.4	9.0
21. Length of the longest (3rd) anal spine	...	8.0	8.0

MISHRA & KRISHNAN

Plate 1



Polydactylus Konadaensis sp. nov.

Table 2. Comparison of fin ray and scale counts, measurement ratios and other characters in five species of *Polydactylus*.

Sl. No.	Characters	<i>konadaensis</i>	<i>sexfilis</i>	<i>pfeifferi</i>	<i>kuru</i>	<i>hexanemus</i>
1.	Soft dorsal rays	12	12-13	11-12	13	12
2.	Anal rays	11	11-12	11	11	11
3.	Simple rays of upper pectoral	15	15	12-14	15-16	13-14
4.	Lateral line scales	49	46	48-50	62-68	47-48
5.	Transverse scales	5/10	5/10	5/10	6/10	5/10
6.	T. l/depth	4.3-4.4	4.5	4.4	4.7-4.8	3.2-4.2
7.	S. l/depth	3.2-3.3	3.3	3.2	3.4-3.5	—
8.	T. l/head	4.3-4.4	4.3	4.5-5.0	4.3-4.7	3.8-4.9
9.	S. l/head	3.25	3.2	3.3	3.0-3.5	—
10.	T. l/caudal	3.8-4.0	3.5	3.7	3.3-3.7	>3.3
11.	Head/eye	4.0	4.5	3.0-3.3	3.2-3.7	3.8
12.	Head/maxillary	1.8-1.9	—	1.75-2.0	2.1-2.3	—
13.	Pectorals	<head	<head	<head	<head	>head
14.	Interorbital space	convex	—	flat	convex	—
15.	Air bladder	absent	present	present	present	?
16.	Pyloric caecae	16	numerous	?	?	?
17.	Free pectoral rays	5 extending beyond ventral fin ; longest close to anal	2 extending to ventral fin tip	longest reaching well on anal	first surpassing ventral tip	longest (4th) reaching to caudal base
18.	Anal fin colour	dusky ; margin not black	free margin black	dusky	hyaline	?

new taxon at the species level. Quite interestingly Day (1878, 1898) found a large air vessel in *sexfilis* and recorded that Cuv. & Val. (1831) reported the absence of it. Gunther (1860) similarly observed that *sexfilis* does not have air bladder but Kagwade (1970) reported the presence of a large air bladder.

In order to accommodate *P. sheridani* (Macleay) reported by Girija Kumari *et al* (1983-84) and *P. konadaensis* sp. nov. a revised working key for the identification of Indian species of polynemids is given below. It is clear that Talwar and Kacker (1984) have mistaken *sexfilis* for *kuru*.

Key to species of the Polynemidae of India

- 1 (a) Lower lip absent except towards the rictus (mouth corners) ; teeth extending on exterior part of jaws ; free pectoral filaments 4. *Eleutheronema tetradactylum*
- (b) Lower lip well developed extending far forward except at the symphysis ; no teeth on exterior part of jaws ; 5 to 7 free pectoral filaments. ... 2
- 2 (a) Pectoral inserted high on body, upper part of its base in level with midline of body or higher ; without a sharp pectoral fold extending down from lower part of base of pectoral fin to cover bases of one or more pectoral filaments ; free pectoral filaments 7, very long, extending beyond caudal fin tip. ... 12
- (b) Pectoral inserted low on body, upper part of its base well below midline of body ; a sharp fold of skin projecting downward or forward from lower end of base of pectoral fin and covering base of one or more of pectoral filaments ; free pectoral filaments 5 to 7, rather short. ... 3
- 3 (a) Pectoral fin with 5 free filamentous rays. ... 4
- (b) Pectoral fin with more than 5 filamentous rays. ... 7
- 4 (a) A distinct dusky blotch present at the beginning of lateral line above the pectoral fin ; scales on lateral series 47 to 50. ... *Polydactylus microstoma*
- (b) No dusky shoulder blotch ; scales on lateral series 60 to 75. ... 5
- 5 (a) Eyes large, 3.8 to 4.0 in head length ; caudal lobe not prolonged into filament ; body with dark narrow stripes along scale rows ; upper pectoral rays simple. ... *Polydactylus plebius*
- (b) Eyes small, about 7 times in head length ; caudal lobes prolonged into filaments ; no stripes along scale rows. ... 6
- 6 (a) Upper pectoral rays simple ; pelvic-anal interspace nearly equal to head. ... *Polydactylus sheridani*
- (b) Upper pectoral rays mostly branched ; pelvic-anal inter-space more than head. ... *Polydactylus indicus*
- 7 (a) Pectoral fin with 6 free filamentous rays. ... 8

- (b) Pectoral fin with 7 free filamentous rays which are short extending to anal fin. ... *Polydactylus heptadactylus*
- 8 (a) Upper pectoral rays mostly branched. ... 9
- (b) Upper pectoral rays simple, unbranched. ... 10
- 9 (a) A large black blotch at the beginning of lateral line ; free pectoral filamentous rays extending to the tip of pelvic fin. ... *Polydactylus sextarius*
- (b) No black blotch at the beginning of lateral line ; free pectoral filamentous rays extending beyond tip of the pelvic fin. ... *Polydactylus xanthonemus*
- 10 (a) Lateral line scales above 60 ; body silvery with narrow brown lines along scale rows ; none of the free pectoral filamentous rays reaching to the pelvic fin tip. ... *Polydactylus kuru*
- (b) Lateral line scales 50 or less ; body golden in colour. ... 11
- 11 (a) Eye 4.5 times in head length ; caudal 3.5 times in total length ; anal fin with black margin ; upper 2 pectoral filamentous rays reaching to tip of pelvic fin or extending beyond. ... *Polydactylus sexfilis*
- (b) Eye 4.0 times in head length ; caudal 4.0 times in total length ; anal fin dusky, without black margin ; upper 5 free filamentous pectoral rays extending beyond tip of the pelvic fin, the longest reaching anal fin. ... *Polydactylus konadaensis*
- 12 (a) 3 upper pectoral filamentous rays extending far beyond caudal fin tip. ... *Polynemus paradiseus*
- (b) 2 upper pectoral filamentous rays extending far beyond caudal fin tip, the third reaching only to the tip of the caudal fin. ... *Polynemus longipectoralis*

SUMMARY

A new species of polynemid fish *Polydactylus konadaensis* collected from Konada, Andhra Pradesh is described. A working key for the polynemid fishes of the Indian waters is provided.

ACKNOWLEDGEMENTS

Our sincere thanks are due to Dr. A. G. K. Menon, Emeritus Scientist, Z. S. I., Madras for confirming identity of samples, guidance and criticism. We are thankful to Dr. A. N. T. Joseph, Scientist-SF, MBS/ZSI, Madras for facilities and encouragement and to the Director, Zoological Survey of India for permission,

REFERENCES

- Anonymous, 1974. *FAO species identification sheets for fishery purposes. Eastern Indian Ocean (fishing area 57) and Western Central Pacific (fishing area 71)*. 3. Fischer, W. & Whitehead, P.J.P. (Eds), Food and Agriculture Organisation of the United Nations, Rome.
- Day, F., 1878. *The Fishes of India*. 2 vols. Reprinted 1958. William Dawson & Sons Ltd., London. xx, 778 pp, 195 pls.
- Day, F., 1898. *The fauna of British India including Ceylon and Burma—Fishes*. 2 : 101-107. To-day and Tomorrow Printers & Publishers, New Delhi. (1989).
- Girija Kumari, S., Ratnamala, B., and Seshagiri Rao, B. V., 1983-84. A new record of the threadfin *Polynemus sheridani* Macleay from India. *Matsya*, 9 & 10 : 196-198.
- Gunther, A., 1860. *Catalogue of the fishes in the British Museum*, 2 : 319-333. A.J. Reprinters, New Delhi (1981).
- Hida, T. S., 1967. The distribution and biology of Polynemids caught by bottom trawling in Indian seas by the RV Anton Brunn, 1963. *J. mar. biol. Ass. India*, 9 (2) : 281-299.
- Kagwade, P. V., 1970. The polynemid fishes of India. *Bull. Cent. mar. Fish. Res. Inst. India*, 18 : 1-69.
- Menon, A. G. K. and Babu Rao, M., 1984. *FAO species identification sheets for fishery purposes. Western Indian Ocean (fishing area 51)*. 3 : Fischer, W., & Bianchi, G. (Eds). Food and Agriculture Organisation of the United Nations, Rome.
- Misra, K. S., 1959. An aid to the identification of the common commercial fishes of India and Pakistan. *Rec. Indian Mus.*, 57 (1-4) : 1-320.
- Munro, I. S. R., 1955. *The Marine and Freshwater fishes of Ceylon*. Narendra Publishing House, Delhi, p. 96-98.
- Talwar, P. K. and Kacker, R. K., 1984. *Commercial Sea Fishes of India*. Ed. Director, Zool. Surv. India, Publ. Zool. Surv. India, p. 743-755.
- Talwar, P. K. and Jhingran, A. G., 1991. *Inland Fishes of India and adjacent Countries*, vol. 2. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, p. 905-912.
- Weber, M. and de Beaufort, L. F., 1922. *The fishes of Indo-Australian archipelago*. 4 : E. J. Brill Ltd., Leiden, Holland, p. 196-218.