

REPORT ON A COLLECTION OF TONGUE SOLES
(*CYNOGLOSSUS* SPP.) FROM MOPLAH BAY WITH A
DESCRIPTION OF *C. LIDA* (BLEEKER)

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ABSTRACT

A sample of soles consisting of *Cynoglossus semifasciatus*, *C. dubius*, *C. puncticeps*, and *C. lida* obtained from Moplah Bay, Cannanore, was examined biologically as well as ichthyologically. The results are described. *C. semifasciatus* and *C. puncticeps* were biologically in the same phase as at Calicut during the period.

Morphometric and ichthyological data are tabulated for the species other than *C. semifasciatus* and a description is given for *C. lida* (Bleeker) for the west coast of India based on four specimens from Cannanore and six from Calicut.

INTRODUCTION

A sample of 49 specimens of tongue soles (*Cynoglossus* spp.) was collected on 14th February 1968 from the Moplah Bay, Cannanore*. The sample was interesting in that as many as four species were represented in it, including also the common Malabar Sole, *C. semifasciatus* Day. The present note deals with the biological findings on this material (examined after preservation in formalin) together with certain morphological and ichthyological data on the species other than *C. semifasciatus*. A description of *C. lida* (Bleeker) is also included as the species has not so far been described from this coast. The present author (Seshappa 1970) has made a morphometric study of *C. lida* in comparison with four other species from the west coast.

SPECIES COMPOSITION

The four species represented in the sample were as follows:

Species	Numbers	Percentage in total numbers
<i>C. semifasciatus</i>	28	57.14
<i>C. dubius</i>	14	28.57
<i>C. lida</i>	4	8.16
<i>C. puncticeps</i>	3	6.12

* I am thankful to Shri G. Venkataraman, Research Officer, for kindly collecting the sample for me.

C. SEMIFASCIATUS

The following size distribution was noticed in the *C. semifasciatus*-component of the sample:

Total length (cms)	Males	Females	Total number
9-9.9	0	1	1
10-10.9	0	0	0
11-11.9	1	4	5
12-12.9	4	3	7
13-13.9	8	5	13
14-14.9	0	0	0
15-15.9	1	1	2
Totals	14	14	28

The females had the ovaries in various maturity stages as follows:

Stage	No.	Size range
I	1	9.2 cm
II	4	11.1 to 11.8 cm
III and above	9	12.8 to 15.1 cm

The last category included five specimens which had already spawned. The gonads were all normal in appearance.

Scale examination revealed that 18 out of the 28 specimens of *C. semifasciatus* (size range 12.3 to 13.9 cm) had one growth ring, two specimens (size 15.1 cm in both cases) had two rings, while the remaining ten (size range 9.0 to 12.0 cm), were without any rings. The sample was thus dominated by the 1-ring class of individuals. The mode in the size distribution is in the 13-13.9cm group, 20 out of the 28 specimens measuring from 12.1 to 13.9 in total length. These correspond to 1-ring class or the 1-year-old class of soles.

The size trends and stages of maturity noticed in the species from this sample indicated that the trends were roughly similar to those noticed at Calicut during the same month.

C. DUBIUS

The 14 specimens of *C. dubius* had their size and sex distribution as follows:

Total length (cm)	Male	Female	Total
15-15.9	1	0	1
16-16.9	0	0	0
17-17.9	0	0	0
18-18.9	1	0	1
19-19.9	3	1	4
20-20.9	3	2	5
21-21.9	1	0	1
22-22.9	1	0	1
23-23.9	1	0	1
Total:	11	3	14

All the three females had the ovaries in stage I of maturity only. Morphometric and ichthyological data on six of the 14 specimens of *C. dubius* are given in Table 1.

C. PUNCTICEPS

Of the three specimens of *C. puncticeps* in the sample, two were females measuring 11.2 cm and 14.6 cm in total length and one was a male measuring 10.9 cm. The larger of the females was in stage IV of maturity while the smaller was in stage III. A growth ring was noticed in the scales of the larger female indicating that it had perhaps completed one monsoon in its life assuming that the growth rings are similar to those of *C. semifasciatus*. This assumption seems to be reasonable from data on the occurrence of these rings in the scales of occasional specimens of this species examined from the departmental samples at Calicut from time to time.

The larger of the specimens of *C. puncticeps* in the present sample had a normal shape while the two smaller specimens had the posterior regions slightly more tapering than normal. Morphometric and ichthyological data on the three specimens are given in Table 2.

C. LIDA

Specimens of *C. lida* are not always common in the collections at Calicut though George (1958) found this as a normal component of the Malabar-sole catches of the West Coast. The four specimens obtained in the present collection from Moplah Bay measured 13.7, 14.7, 14.5 and 14.7 cm, respectively, in total length, two of these being females (in stage I of maturity), one a suspected male, and the other not determined for sex. The morphometric and ichthyological data on these four specimens are given in Table 3. Similar data for six specimens of *C. lida* from West Hill, Calicut, are given in Table 4 for comparison with the Cannanore data.

Regarding the systematic characters of *C. lida* there are some differences noticeable among the descriptions of previous authors. Day (1878) mentions that the angle of the mouth is midway between the snout and the gill opening; but his drawing (Plate XCVII, Fig. 3) actually shows the angle of the mouth to be somewhat nearer the snout than the gill-opening. As this character is contradicted by Norman (1928), Punpoka (1964) as well as Weber and Beaufort (1929), and also from the findings of the examination of the present material (both from Cannanore and from Calicut), it is a bit difficult to fix the identity of the species described as *C. lida* by Day, who also states that there is a lateral line present on the blind side of the body; this lateral line is clearly absent in the present material and this is in accordance with the descriptions of the above three authorities. There is a similar difference of opinion regarding the extent of the rostral hook which reaches to below the lower eye

in the present material as described by Norman (1928) and Punpoka (1964), but Day (1878) states that the rostral hook just covers the symphysis of the lower jaw. The extent of the rostral hook, the position of the angle of the mouth and the absence of a lateral line on the blind side seem so important that Day's *lida* may clearly be a different species altogether.

As *Cynoglossus lida* has so far not been described from this coast a description of the same is given below on the same lines as given by Norman (1928) whose account is the most recent for the Indian forms; the description given here is based on the ten specimens the details of which are shown in Tables 3 and 4. Table 5 also gives a few of the chief morphometric and meristic values of the present material in comparison with similar values given by Norman and Punpoka.

DESCRIPTION OF *CYNOGLOSSUS LIDA* (Bleeker) FROM THE WEST COAST OF INDIA

Head 4.1 to 4.6 in body length, depth 4.0 to 4.4 in body length; snout rounded, 2.1 to 2.4 in head; eye 11-14 in head, greater than inter-orbital width; upper eye a little in advance of lower; angle of mouth almost level with the hind margin of the lower eye, and situated slightly nearer the gill-opening than the end of the snout. There are two nostrils on the ocular side, a simple one between the anterior halves of the eyes and a tubular one in front of the lower eye. D.103-109; A.80-84; C.10-11. Scales are ctenoid on both sides and number 94-104 in a longitudinal series along the median lateral line; there are two lateral lines on the eyed side, separated by 15-16 series of scales. There is no distinct lateral line on the blind side. The colour is brownish; fins are lighter; there is a dark blotch on the operculum; the blind side is uniform whitish, the margins showing yellowish tint in some specimens (in formalin).

Described from ten specimens, 4 from Cannanore (13.7-14.7 cm total length; 14.2.1968), and six from West Hill (7.6-18.6 cm in total length; November 1967 to April 1968). Fig. 1 shows the eyed side view and the blind side view of two different specimens of *C. lida* from West Hill.

REMARKS

This study would appear to indicate, subject to the limitations of the smallness and the singleness of the sample, that both *C. semifasciatus* and *C. puncticeps* are more or less in the same biological phases in the fishery at both Moplah Bay and Calicut during the period.

The occurrence of a high percentage of *C. dubius* in the sample may also not be an unusual phenomenon as the species had occurred in Calicut also in some numbers during some of the earlier weeks; the occurrence of *C. lida*

TABLE 1. *Morphometric*
Species: *Cynoglossus*
(from Moplah Bay,

Characters	1	2	3
1. Sex	Male	Male	Female
2. Age	1 ring in scales	1 ring in scales	1 ring in scales
3. Total length	20.75	20.39	20.10
4. Body length	19.32	18.98	18.73
5. Head length to opercular angle	4.71	5.00	4.80
6. Max. Head length	4.71	5.00	4.80
7. Snout length	2.10	2.20	2.15
8. Max. depth	4.70	4.60	4.45
9. Depth at opercular angle	4.31	4.20	4.15
10. Diameter of eye	0.33	0.34	0.34
11. Inter-orbital width	(Approximate) 0.27	0.27	0.27
12. L. eye: angle of mouth	a.m. very slightly behind eye margin	a.m. almost level with hind margin of left eye	a.m. level with hind margin of left eye.
13. Rostral hook from end of snout	2.42	2.42	2.35
14. Angle of mouth from end of snout	2.67	2.77	2.75
15. D	115	113	116(?)
16. A	91	86	88
17. C	11	11	12
18. Nostrils	Upper simple between eyes and lower tubular in front of lower eye	As in previous specimen	As in previous specimen
19. L. lines (eyed side)	2	2	2
20. L. lines (Blind side)	1	1	1
21. Scales (eyed side)	cycloid (ctenoid at sides in posterior regions)	As in previous specimen	As in previous specimen
22. Scales (Blind side)	Cycloid	Cycloid	Cycloid
23. L.l. scales (median)	117(?) (some scales lost)	113	114(?)
24. L.tr. (max.)	20(?) (many scales lost)	20	20(?)
25. Remarks: (Colour in formalin etc.)	Dusky brown fins and operculum darker. Lower side whitish with margins yellow.	Colour as in previous specimen	Colour as in previous specimen. Many of the scales on the eyed side are shed.

and Ichthyological data.

dubius

Cannanore, 14-2-1968)

4	5	6
Female	Male	Male
1 ring in scales	2 rings (?) in scales	1 ring in scales
22.33	23.15	19.35
20.80	21.48	17.80
5.33	5.20	4.58
5.33	5.20	4.58
2.40	2.21	2.00
4.98	5.11	4.50
4.75	4.5 + ? (slightly distorted)	4.12
0.35	0.35	0.34
0.30	0.31	0.23
a.m. almost level with hind margin of left eye.	a.m. level with hind margin of eye	As in previous specimen
2.52	2.41	2.20
3.00	2.90	2.41
113	114	113
90	90	90
12	11	12
As in previous specimen.	As in previous specimen	As in previous specimen
2 (on the head, the supra- orbital line is forked in front; preopercular line has branch)	2 (on head extra branches to mandibular-line)	2 (on head, line to rostral hook has an extra loop, Supra-orbital projects beyond usual distance)
1	1	1
As in previous specimen	As in previous specimen	As in previous specimen
Cycloid	Cycloid	Cycloid
112	116? (Approximate)	112
20	20?	20
Colour as in pre- vious specimen. Many scales shed.	Colour as in previous specimen. Scales mostly shed.	Pale uniform brown dark; opercular blotch; fins darker than body. Lower side whitish with yellow margin. Some of the scales are shed.

TABLE 2. *Morphometric and Ichthyological data.*Species: *Cynoglossus puncticeps*

(from Moplah Bay, Cannanore, 14-2-1968)

Characters	1	2	3
1. Sex	Female (stage IV)	Female State III	Male
2. Age	1 ring (?) in scales	No rings in scales	No rings in scales
3. Total length	14.58	11.25	10.95
4. Body length	13.47	10.25	10.05
5. Head length to opercular angle	2.55	1.95	1.90
6. Max. Head length	2.55	2.00	1.90
7. Snout length	0.67	0.60	0.55
8. Max. depth	3.80	2.84	2.89
9. Depth at opercular angle	3.50	2.52	2.40
10. Diam. of eye	0.21	0.18	0.20
11. Interorbital width	0.11	0.10	0.10
12. L. eye: angle of mouth	a.m. level (almost) with hind margin of eye	As in previous specimen	a.m. below posterior 3rd of left eye
13. Rostral hook from and of snout	1.01 (obl.) (approximate)	0.82 (obl.)	0.67 (obl.)

14. Angle of mouth from end of snout	1.12 (obl.) (approximate)	0.93 (obl.)	0.90 (obl.)
15. D	101	99	103
16. A	79	78	78
17. C	10	10	10
18. Nostrils	Upper between eyes simple; lower tubular in front of 1. eye	As in previous specimen	As in previous specimen
19. L. lines (eyed side)	2 (cephalo dorsal does not reach snout; preopercular has loop)	2 (cephalo dorsal not reaching snout tip)	2 (cephalo dorsal not reaching snout tip)
20. L. lines (Blind side)	0	0	0
21. Scales (eyed side)	Ctenoid	Ctenoid	Ctenoid
22. " (Blind side)	Ctenoid	Ctenoid	Ctenoid
23. L.I. scales (median)	101	103	106 (caudal end unusually tapered and long)
24. L.tr. (max)	17	17	18
25. Remarks: Colour in formalin etc.	Brown back ground with groups of dark spots. Fins lighter; rays dark.	Brown back ground with groups of dark spots. Fins lighter; rays dark.	Colour like previous specimens. Black spots well-marked and numerous groups across body. Row of such groups along margins of body.

TABLE 3. *Morphometric and Ichthyological data.*Species: *Cynoglossus lida*

(from Moplah Bay, Cannanore, 14-2-1968)

Characters	1	2	3	4
1. Sex	Male ?	?	Female (Stage I)	Female (Stage I)
2. Age	Scale ring not visible	No clear ring	No clear ring in scales	No rings in the scales
3. Total length	13.71	14.70	14.52	14.70
4. Body length	12.65	13.48	13.42	13.70
5. Head length to opercular angle	2.80	3.00	3.01	3.00
6. Max. Head length	2.80	3.00	3.01	3.00
7. Snout length	1.20	1.40	1.32	1.32
8. Max. depth	2.95	3.23	3.35	3.07
9. Depth at opercular angle	2.55 (approximate)	? (too distorted)	3.01	2.73
10. Diameter of eye	0.22	0.23	0.22	0.21
11. Inter-orbital width	0.16	0.16	0.15	0.16
12. Eye: angle of mouth*	a.m. almost level with hind margin of left eye.	a.m. very slightly behind level of eye margin.	As in previous specimen.	a.m. almost level with hind margin of left eye
13. Rostral hook from end of snout	1.77 (obl.)	1.77 (obl.)	1.77 (obl.)	1.70 (obl.) (snout tip slightly damaged)

14.	Angle of mouth from end of snout	1.65 (obl.) 106	1.82 (obl.) 104 + (partly damaged)	1.77 (obl.) 107 ? (including stumps near caudal)	1.77 (obl.) 103 + ? (damaged)
15.	D				
16.	A	84	80 + ? (partly damaged)	82	83
17.	C	10	10	10	10
18.	Nostrils	Simple one between eyes anteriorly and tubular one in front of lower eye.	As in previous specimen	As in previous specimen.	As in previous specimen
19.	L.lines (eyed side)	2	2	2	2
20.	L.lines (Blind side)	0	0	0	0
21.	Scales (eyed side)	ctenoid	ctenoid	ctenoid	ctenoid
22.	Scales (Blind side)	ctenoid	ctenoid	ctenoid	ctenoid
23.	L.I. scales (median)	94	96 (?)	98	97
24.	L.tr. (max.)	15	15	15	15
25.	Remarks: (Colour in formalin etc.)	A more or less uniform pale brown. Dark blotch on operculum.	Colour as in previous specimen; slightly paler. Snout tip very pale with sensory canal branches very faint.	A more or less uniform brown; dark blotch on operculum; snout tip very pale as in previous specimen.	Colour more or less as in previous specimen; on the head the sensory canal branch on rostral hook is faint but other branches on all parts of body and head are well developed.

* Angle of mouth slightly nearer the gill opening than the end of snout, in all the specimens; rostral hook reaches to below anterior part of lower eye in all the specimens.

TABLE 4. *Morphometric and*Species:
(West Hill)

Date & Details of collection Characters	West Hill P. Vala 3F. 24-11-67	West Hill P. Vala 3F. 22-12-67	No. 1, K 6 F West Hill P. Vala 22-3-68
	1	2	3
1. Sex	Indet ?	?	Female
2. Age	Less than one year	Less than one year	On clear ring in scales
3. Total length	7.62	10.80	16.33
4. Body length	7.00	9.95	15.21
5. Head length to opercular angle	1.62	2.30	3.45
6. Max. Head length	1.65	2.33	3.45
7. Snout length	0.69	0.97	1.55
8. Max. depth	1.71	2.31	3.63
9. Depth at opercular angle	1.60	2.11	3.22
10. Diameter of eye	0.15	0.20	0.30
11. Inter-orbital width	0.07	0.11	0.17
12. Leye: angle of mouth*	Almost level	Almost level	Level
13. Rostral hook from end of snout	1.01 (extends to below middle of eye.)	1.40	2.11 (reaches to below middle of eye.)
14. Angle of mouth from end of snout	0.98	1.38	2.02
15. D	108	108	109
16. A	83	82	82
17. C	11	11	10
18. Nostrils	Simple one between eyes and tubular in front of left eye.	As in previous specimen	As in previous specimen.
19. L.lines (eyed side)	2; Cephalodorsal does not reach snout tip; supra-orbital forked at end.	2; Supraorbital and cephalodorsal lines not reaching snout; pre-orbital line present.	2; A faint line on rostral hook also.
20. L.lines (Blind side)	0	0	0
21. Scales (eyed side)	ctenoid	ctenoid	ctenoid
22. Scales (Blind side)	ctenoid	ctenoid	ctenoid
23. L.l. scales (median)	100	104	101
24. L.tr. (max.)	16	15	15
25. Remarks: (Colour in formalin etc.)	Dusky brown mottled with darker patches; operculum dark; lower side whitish, fins also dusky above, whitish below. Lower lip has two upward processes.	<i>Snout albinoid.</i> more or less uniform dusky brown on eyed side and whitish on lower side. Lower lip has two upward processes, operculum dark.	Colour brown generally as in previous specimen. Colour darker along middle of eyed side and behind operculum. Snout normal but with whitish tip.

Ichthyological data.

Cynoglossus lida
material)

No. 2, 6F	No. 3, 6F,	3F, 26-4-68
West Hill P. Vala	22-3-68	
22-3-68		
4	5	6
Female	Female	Male
One ring in	Two rings in	Two clear rings
scales	scales (?)	in scales
15.43	17.38	18.62
14.33	16.16	17.42
3.22	3.82	4.05
3.22	3.82	4.05
1.42	1.75	1.71
3.50	4.00	4.30
3.13	3.60	3.93
0.28	0.30	0.34
0.18	0.19	0.20
Level	Level	Level
2.00 (reaches to below middle of eye.)	2.30, reaches anterior 1/3rd of eye	2.38, reaches middle of eye
1.91	2.25	2.30
108	108	107
81	84	81
10	10	11
As in previous specimen	As in previous specimen	As in previous specimen
2; Rostral hook line present.	2; Rostral hook line joins supraorbital and cephalodorsal	2; all lines on head complete
0 ctenoid ctenoid	0 ctenoid ctenoid	0 ctenoid ctenoid
101	101	99
16	16	15
Colour as in previous specimen but slightly darker generally; snout normal but with whitish tip.	Colour as in previous specimen. Snout tip white.	Colour as in previous specimen. Lateral line system well developed and normal.

* Angle of mouth is slightly nearer the gill opening than the end of the snout.

TABLE 5. Comparison of some morphometric and meristic data on *C. lida* from West Coast (Cannanore-Calicut) with the same given for the species by Norman (1928) and Punpoka (1964).

Characters	Present data	Norman (1928)	Punpoka (1964)
1. Head in body length	4.1-4.6	4-4½	4.4-4.6
2. Height in body length	4.0-4.4	4-4 2/5	4-4.2
3. Snout in head	2.1-2.4	2½-2½	—
4. Eye in head	11-14	9-10½	9-11
5. No. Dorsal fin rays	103-109	99-112	99-112
6. No. Anal fin rays	80-84	75-87	75-87
7. No. Caudal fin rays	10-11	—	—
8. L.tr. (maximum)	15-16	13-15	13-15
9. L.l. (median)	94-104	99-104	82-95

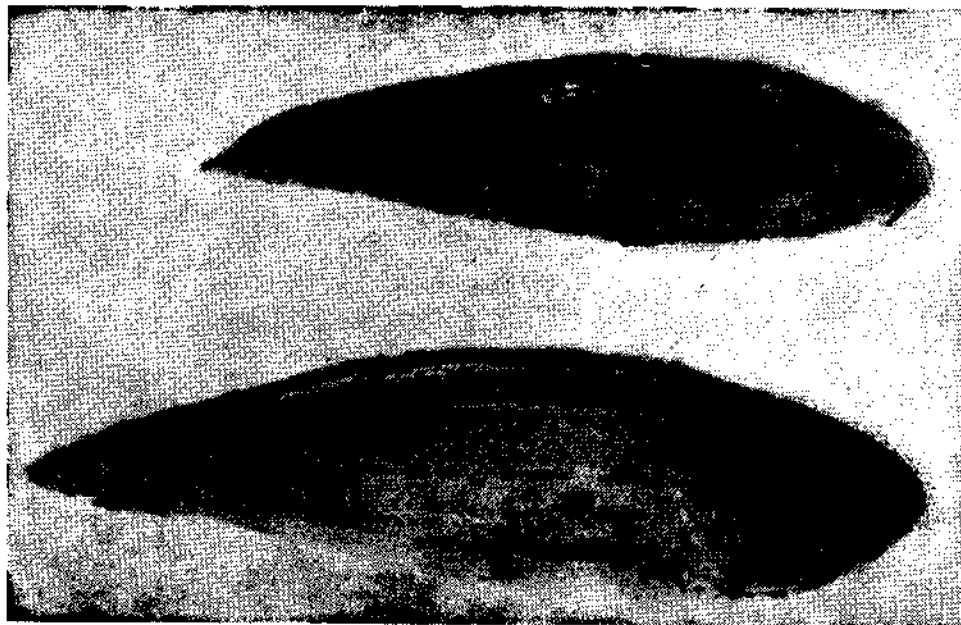


FIG. 1. A blind-side view and an eyed side view of *C. lida*. (The two photographs are of different specimens both from West Hill, Calicut.)

also cannot be considered a speciality as six specimens occurred in the departmental 6-fathom collections at West Hill on the 22nd March 1968, though very rare on earlier occasions.

The normal trend at Calicut is for *C. semifasciatus* to form practically the entire catch of soles with the other species occurring only as occasional specimens, with the exception of *C. dubius* which may occur in some numbers during certain parts of the year, especially in the commercial landings.

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