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LONCHOPISTHUS MEADI, A NEW JAWFISH FROM THE COAST OF RIO GRANDE DO SUL, BRASIL (PISCES, OPISTHOGNATHIDAE)

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ABSTRACT

A new species of the opisthognathid genus Lonchopisthus *is described. Remarks are made on the genus* Lonchistium *Myers, which is shown to be a synonym of* Lonchopisthus *Gill.*

INTRODUCTION

During the years 1968 and 1969 the research vessel "Prof. W. Besnard" of the Instituto Oceanográfico da Universidade de São Paulo made six exploratory cruises to the coast of the state of Rio Grande do Sul. This was a joint program (Instituto Oceanográfico da Universidade de São Paulo and the Rio Grande do Sul state government through its Grupo Executivo do Desenvolvimento da Pesca — GEDIP) to investigate the fishery resources of the Rio Grande do Sul continental shelf. The fishes collected on these cruises are now in this Museum and among them we found 16 specimens of a new species of *Lonchopisthus*, which is described below.

This work is the first of a series on the fishes collected during those cruises. It is with a great pleasure that we name this new species in honour of Dr. Giles W. Mead, curator of fishes of the Museum of Comparative Zoology, Harvard University, in recognition of his unfailingly generous help and specifically of his contribution to the knowledge of the genus *Lonchopisthus*.

METHODS AND MATERIALS

In all characters studied (meristic and body proportions), sexes were initially handled separately. Sex differences were found only with regard to orbital diameter; therefore in regression analysis where this character is involved, males and females are plotted separately.

Measurements and counts were made on the left side of the specimens. The measurements were taken with a micrometer to the nearest tenth of one millimeter, and the counts with the help of a thin needle, both under the stereomicroscope.

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1. Museu de Zoologia, Universidade de São Paulo. Bolsista do Conselho Nacional de Pesquisas.
2. Estagiário do Museu de Zoologia, Universidade de São Paulo.

Measurements

Standard length — from tip of snout to caudal base.
Head length — from tip of snout to posteriormost tip of opercle, including its membranous edge.
Trunk length — standard length minus head length
Body depth — from origin of dorsal fin to insertion of ventral fin spine.
Predorsal distance — from tip of snout to origin of dorsal fin.
Preanal distance — from tip of snout to origin of anal fin.
Caudal peduncle depth — is the least depth of the caudal peduncle.
Horizontal orbital diameter — is the maximum length of orbital diameter, measured horizontally inside the orbital ring.
Vertical orbital diameter — is the maximum length of orbital diameter, measured vertically inside the orbital ring.
Interorbital width — is the least width of bony interorbital.
Maxillary length — this measurement was taken from the anterior tip of maxillary to the posteriormost tip of its expanded part. The anterior ascending maxillary process is not involved in this measurement.
Premaxillary length — from anterior tip of premaxillary to posteriormost bony tip.

Counts

Dorsal fin — the last two close-set rays were counted as one.
Anal fin — the last two close-set rays were counted as one.
Caudal fin — only branched caudal rays were included in the counts.
Gill rakers — this count includes the total number of gill rakers and rudiments on the first gill arch.
Lateral line pores — this count refers to the number of pores along the lateral line.
Scales above lateral line — is the number of scales in a vertical row from the origin of dorsal fin to lateral line.
Scales below lateral line — is the number of scales in a vertical row from origin of anal to lateral line.

Lonchopisthus meadi, sp. n.
(Fig. 1)

Holotype: MZUSP 8014, female. "Prof. W. Besnard" Cruise VI, Station n. 554, Rio Grande do Sul; 32°12'S. lat., 50°12'W. long., March 9, 1969; 149 m.

Paratypes: MZUSP 8015-17. "Prof. W. Besnard" Cruise VI, Station n. 554, Rio Grande do Sul; 32°12'S. lat., 50°12'W. long.; March 9, 1969, 149 m. MZUSP 8018-19. "Prof. W. Besnard" Cruise V, Station n. 449, Rio Grande do Sul; 32°01'S. lat., 50°05'W. long.; Dec. 7, 1968; 161 m. MZUSP 8020. "Prof. W. Besnard" Cruise II, Station n. 306, Rio Grande do Sul; 32°S. lat., 50°05'W. long.; June 24, 1968; 178 m. MZUSP 8021-29. "Prof. W. Besnard" Cruise V, Station n. 437, Rio Grande do Sul; 30°23'S. lat., 48°37'W. long.; Dec. 4, 1968; 199 m.

Diagnosis

D. XI+12; A. III+12; P. 20-21; V. I+5; 11-12 branched caudal fin rays; 26-29 pores in the lateral line; 5 scales above lateral line, 14-16 below; 14-15+27-28 gill rakers on first gill arch.

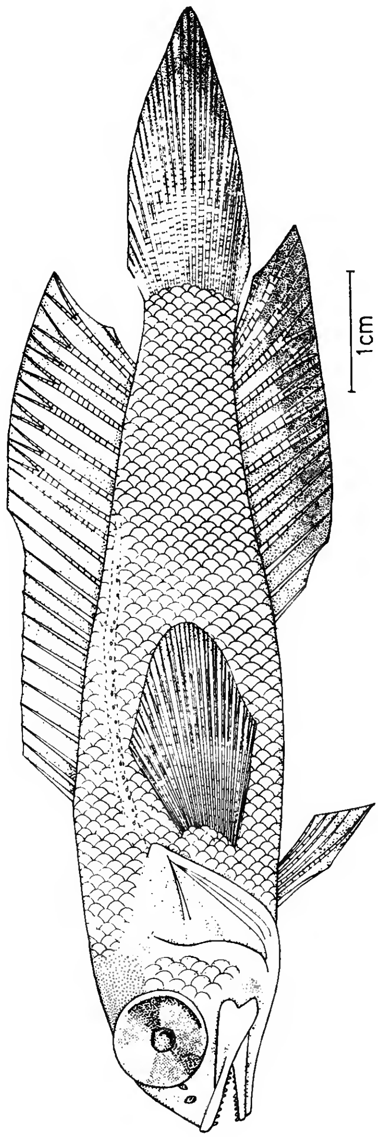


Fig. 1, *Lonchopisthus meadi*, sp. n., holotype, MZUSP 8014, a female 58,8 mm S. L.

Description

Body small (S. L. 50,5-62,8 mm) and compressed. Dorsal outline slightly more curved than ventral. Maximum depth of body at the beginning of dorsal fin.

Head anteriorly rounded. Mouth terminal, lower jaw projecting slightly when mouth is open. Eyes large, much larger than snout, about one third as long as head; the upper part of the eye enters into dorsal profile of the head. Interorbital very narrow, its least width much shorter than orbital diameter. Two nostrils, the anterior tubular and smaller than the posterior, which is situated above and closer to the anterior border of the orbit. Premaxillary slightly protractile, its posterior bony part not reaching posterior margin of orbit; each premaxillary with 18-25 irregularly spaced pectinate teeth. Maxillary nearly straight, posteriorly expanded and notched, reaching and in some specimens surpassing posterior margin of the orbit. There are 18-22 irregularly spaced pectinate teeth on each dentary and two additional teeth behind the normal row of teeth in some specimens. Vomer and palatines edentulous.

Opercle with a spine on its upper part. This spine is largely covered by skin and does not reach the opercular membrane which ends in a prominent angular flap. 14-15+27-28 gill rakers on first gill arch.

Scales cycloid, imbricate, embedded in the skin. Head naked, except for a patch of scales on the preopercle and another on the upper part of opercle. Body, base of pectoral and base of caudal fins scaled. Lateral line incomplete, beginning above upper part of opercle, running very close to the back and extending to below the fourth or fifth dorsal fin ray. 26-29 pores along lateral line. 5 scales from dorsal fin origin to lateral line, 14-16 from lateral line to origin of anal fin.

Origin of dorsal fin much nearer to tip of snout than to caudal base. Last dorsal fin rays reaching beyond caudal fin base when

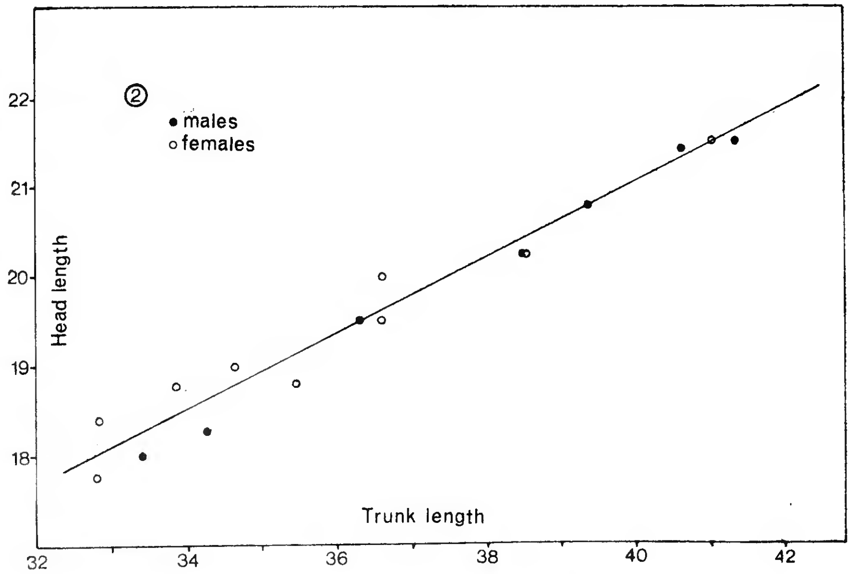
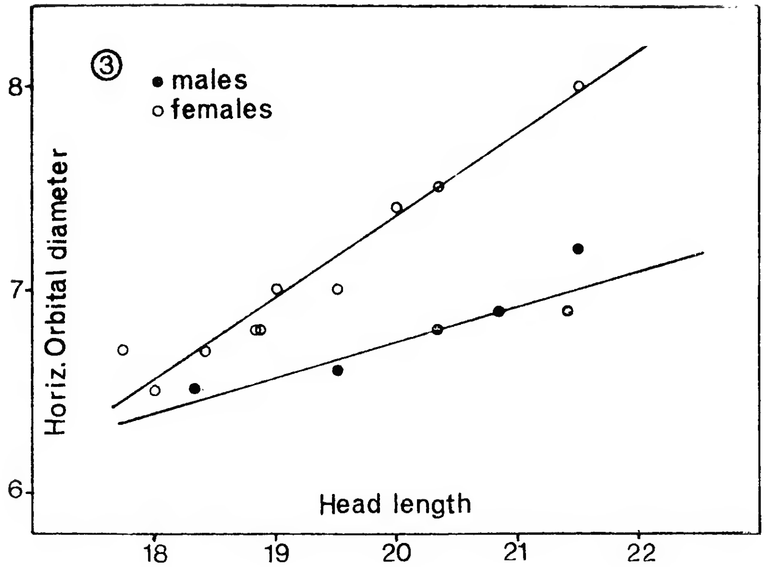


Fig. 2, Linear regression of head length on trunk length.



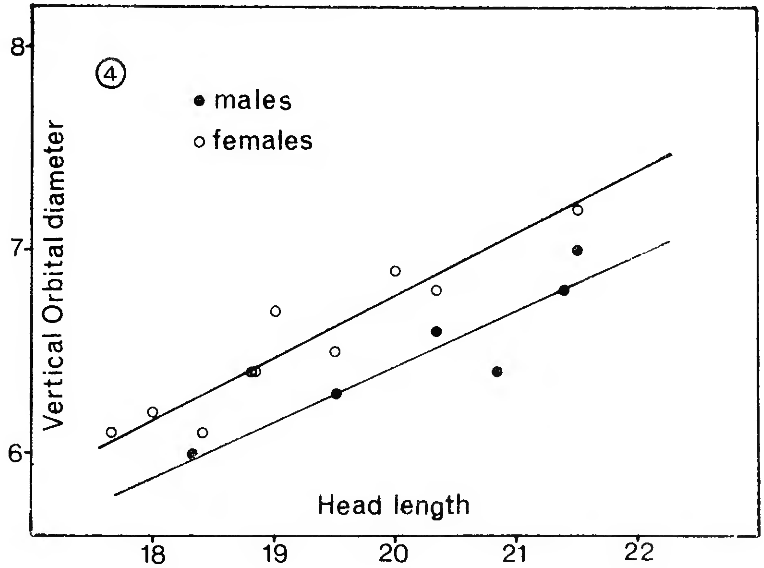


Fig. 3, Linear regression of horizontal orbital diameter on head length.
Fig. 4, Linear regression of vertical orbital diameter on head length.

TABLE 1

Measurements (mm)

	A	B	C	D	E	F	G	H	I	J	K	L
8014	58.8	20.3	38.5	18.2	20.8	35.4	7.3	7.5	6.8	1.8	10.4	8.5
8015	62.5	21.5	41.0	19.0	21.3	39.3	7.4	8.0	7.2	1.9	11.3	9.7
8016	51.3	18.0	33.3	15.2	18.1	31.0	6.7	6.5	6.2	1.5	8.8	8.1
8017	53.6	19.0	34.6	16.0	19.1	34.0	6.8	7.0	6.7	1.7	10.0	8.7
8018	56.1	19.5	36.6	16.5	19.0	35.0	6.0	7.0	6.5	1.8	10.0	8.7
8019	52.6	18.3	34.3	15.2	17.9	31.8	6.1	6.5	6.0	1.5	10.0	8.2
8020	56.6	20.0	36.6	17.0	20.0	35.0	7.1	7.4	6.9	1.8	10.7	9.4
8021	62.8	21.5	41.3	18.8	21.7	38.6	8.0	7.3	7.0	2.0	11.9	10.0
8022	62.0	21.4	40.6	18.1	20.4	37.4	7.5	6.9	6.8	1.9	11.3	9.2
8023	60.1	20.8	39.3	18.6	20.8	37.0	7.6	6.9	6.4	1.9	10.8	9.3
8024	58.7	20.3	38.4	16.8	20.0	36.8	6.9	6.8	6.6	1.8	11.0	8.8
8025	55.8	19.5	36.3	16.0	18.8	34.3	7.0	6.6	6.3	1.9	10.3	8.5
8026	52.6	18.8	33.8	15.4	18.8	32.8	6.4	6.8	6.4	1.8	9.5	8.4
8027	50.5	17.7	32.8	14.6	18.0	30.6	6.3	6.7	6.1	1.8	9.3	8.1
8028	51.7	18.4	33.3	14.5	19.0	32.2	5,8	6.7	6.1	1.7	9.2	7.8
8029	54.2	18.8	35.4	15.3	19.4	33.0	6.7	6.8	6.4	1.8	9.7	8.7

A - Standard length
B Head length
C - Trunk length
D - Body depth
E - Predorsal distance
F - Preanal distance
G - Caudal peduncle depth
H - Horizontal orbital diameter
I - Vertical orbital diameter
J - Interorbital width
K - Maxillary length
L - Premaxillary length

TABLE 2

Counts

	A	B	C	D	E	F	G	H	I
8014	XI+12	III+12	20	I+5	12	14+27	28	5	15
8015	XI+12	III+12	21	I+5	11	14+28	26	5	16
8016	XI+12	III+12	21	I+5	12	14+27	28	5	16
8017	XI+12	III+12	21	I+5	12	15+28	29	5	16
8018	XI+12	III+12	20	I+5	11	14+27	27	5	14
8019	XI+12	III+12	20	I+5	12	14+27	26	5	-
8020	XI+12	III+12	21	I+5	12	14+27	29	5	14
8021	XI+12	III+12	20	I+5	12	15+27	26	5	16
8022	XI+12	III+12	21	I+5	12	14+27	26	5	14
8023	XI+12	III+12	21	I+5	12	14+27	26	5	15
8024	XI+12	III+12	21	I+5	12	14+27	27	5	15
8025	XI+12	III+12	20	I+5	12	14+27	25	5	15
8026	XI+12	III+12	20	I+5	12	15+28	28	5	14
8027	XI+12	III+12	20	I+5	12	14+27	26	5	15
8028	XI+12	III+12	21	I+5	12	14+28	28	5	14
8029	XI+12	III+12	20.	1+5	12	15+28	29	5	14

A - Dorsal fin
B Anal fin
C - Pectoral fin
D - Ventral fin
E - Branched caudal rays
F - Gill rakers
G - Lateral line pores
H Scales above lateral line
I Scales below lateral line

depressed. Spinous dorsal fin with 11 spines, lower than soft dorsal which has 12 rays, the last 8-10 branched. Anal fin with 3 spines and 12 rays, the last 8-10 branched, its origin under first dorsal fin ray. Last anal fin rays reaching beyond caudal fin base when depressed. Pectorals inserted a little behind opercular flap, posteriorly extending to beyond anal fin origin. There are 20-21 pectoral fin rays, the uppermost and lowermost two simple, the rest branched. Caudal fin lanceolate, with 24 rays including the procurrent rays; 16 segmented caudal rays, 11-12 of which are branched.

Color immediately after capture: silvery with scatered dark green blotches throughout the body. Opercle and pectoral fin bases pink. Top of head dark. Anal fin black, tip of anal fin rays blackier than the rest of the fin. Tip of dorsal fin rays, median caudal fin rays and inner rays of ventral fins black. Spinous dorsal fin and pectoral fin with a coloration similar to that of the body.

Ground color in alcohol light brown, top of the head and snout a little darker. Posterior part of soft dorsal, tip of median caudal fin rays and innermost ventral fin rays black. Anal considerably darker than the other fins, the tip of its rays black. Pectorals pale.

The measurements of the specimens are shown in table 1 and the counts in table 2; the regression data in table 3 and figures 2-4.

TABLE 3

Regression data

Regression	N	b	a	r^2	F
Head length x trunk length	16	0.42 ± 0.022	4.19 ± 0.81	0.96	357.47
Body depth x standard length	16	0.35 ± 0.027	-3.51 ± 1.55	0.92	167.30
Predorsal distance x standard length	16	0.26 ± 0.028	4.69 ± 1.62	0.85	83.93
Preanal distance x standard length	16	0.61 ± 0.043	-0.10 ± 2.44	0.93	203.47
Horiz. orbital diameter x head length (males)	6	0.18 ± 0.040	3.05 ± 0.81	0.84	21.47
Horiz. orbital diameter x head length (females)	10	0.38 ± 0.034	-0.40 ± 0.66	0.94	126.07
Vertical orbital diameter x head length (males)	6	0.27 ± 0.056	1.02 ± 1.14	0.85	22.89
Vertical orbital diameter x head length (females)	10	0.30 ± 0.036	0.76 ± 0.70	0.89	68.47
Horiz. orbital diameter x maxillary length (males)	6	0.35 ± 0.047	3.01 ± 0.51	0.93	55.26
Horiz. orbital diameter x maxillary length (females)	10	0.59 ± 0.051	1.19 ± 0.51	0.94	131.95
Vert. orbital diameter x maxillary length (males)	6	0.51 ± 0.049	0.90 ± 0.54	0.96	107.77
Vert. orbital diameter x maxillary length (females)	10	0.46 ± 0.047	1.93 ± 0.47	0.92	94.62
Maxillary length x head length	16	0.64 ± 0.061	-2.32 ± 1.21	0.88	107.35
Caudal peduncle depth x body depth	16	0.34 ± 0.040	1.12 ± 0.67	0.83	72.23

N Number of specimens
b - Regression coefficient ± its standard deviation
a - Regression constant ± its standard deviation
r^2 - The square of correlation coefficient
F Variance ratio

DISCUSSION

Mead (1959) reviewed the species of *Lonchopisthus*. According to him, four nominal species should be included in the genus: *L. lindneri* Ginsburg, *L. micrognathus* (Poey), *L. vanderbilti* Mowbray, and *L. higmani* Mead. He separates *L. higmani* from the others mainly because it is the only species with some caudal fin rays branched. *Lonchopisthus meadi,* sp. n., has also branched caudal rays and in this respect it is closer to *L. higmani* than to any other species of *Lonchopisthus*. However, the number of branched rays in our species is much higher (11-12) and there is also a considerable difference in the number of dorsal and anal fin rays and gill rakers, these counts being much lower for *L. meadi,* sp. n. The opercular spot so characteristic of Mead's species is absent in specimens of *L. meadi,* sp. n.

Myers (1935) described a new genus and species, *Lonchistium lemur,* based on a single specimen caught in Puerto Rico off Punta Boca Juana; he characterized his new genus by having only 2 anal spines. Cervigon (1966) identified 4 specimens from the Islas Los Hermanos, Venezuela, as *L. lemur,* but having found 3 anal spines in all specimens, he suggested *Lonchistium* to be a synonym of *Lonchopisthus.* He thinks the presence of a third spine could have escaped Myers' examination due to the small size of his specimen. We received, through the kindness of Dr. Stanley H. Weitzman, measurements and meristic data and an X-ray of Myers' holotype. The latter shows the presence of 3 anal spines, the first very small. We observed also that *Lonchistium* has the same basic number of vertebrae found in all the species of *Lonchopisthus.* The validity of Myers' genus therefore, seems to be untenable and we consider *Lonchistium* Myers, synonymous with *Lonchopisthus* Gill.

Lonchopisthus meadi, sp. n., and *L. lemur* have the same number of dorsal and anal rays and spines but the number of pectoral rays and gill rakers is quite different. *L. meadi,* sp. n. has 20-21 pectoral rays and 14-15+27-28 gill rakers on the first gill arch. These counts for *L. lemur* are respectively 17-18 and 13+25. Unfortunately other important characters such as number of branched dorsal, anal and caudal fin rays and number of scales could not be compared since they are not mentioned in the original description. According to Myers (1935: 3) the single specimen on which the description is based had the fins broken and was almost without scales. Another feature that must be taken into consideration is that *L. lemur* and *L. meadi,* sp. n., were caught in different geographic areas which belong to two different zoogeographical regions.

In the study of body proportions, the regressions of orbital diameter on head length (figs. 3 and 4) revealed a significant difference between males and females. The regression of head length on trunk length (fig. 2), on the other hand, did not show any sex differences, clearly indicating that the differences found are related exclusively to the proportional differences between orbital diameter and head. There seems to be then, sexual dimorphism within the species, the females having a larger eye.

The regression lines for males and females in figure 3 (horizontal orbital diameter) are divergent and almost parallel in figure 4 (vertical orbital diameter), showing that there is a differential growth rate involving vertical and horizontal orbital diameters. This strongly suggests that not only size but also shape of the eye plays an important role in sex recognition. Further studies are needed to show if this kind of dimorphism occurs also in other species of *Lonchopisthus.*

The known species of the genus *Lonchopisthus* are confined to the Western Atlantic: *L. micrognathus* (Poey), Cuba; *L. vanderbilti* Mowbray, Cuba and Gulf of Mexico; *L. lindneri* Ginsburg, Gulf of Mexico and off Texas; and *L. higmani* Mead, Suriname and off Venezuela. The occurrence of *L. meadi,* sp. n., in Rio Grande do Sul represents the first record of the genus in the South Atlantic.

We thank Dr. Stanley H. Weitzman of the United States National Museum for the data and the X-ray of the holotype of *L. lemur,* Miss Francisca C. do Val for the drawing of *Lonchopisthus meadi,* sp. n. and Drs. Giles W. Mead and Paulo E. Vanzolini who read and criticized the manuscript.

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