

## Postlarvae and juveniles of *Thyrsitops lepidopoides* CUVIER (Pisces : Gempylidae)

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### Abstract

Five postlarval and 2 juvenile specimens referable to gempylid fish, *Thyrsitops lepidopoides* CUVIER, collected from the southeastern coast of Brazil are examined. Their meristic and morphological features are described

The postlarvae can be easily distinguished from other larval forms of the family by the smooth-edged spines of the dorsal and pelvic fins. Body pigmentation, head spination, and meristic counts of the fin spines are also distinctive for the species. Juveniles of this fish are characterized by the straight lateral line, 2 pairs of the fang-like teeth on upper jaw, and the fin ray counts, which distinguish them from *Thyrsites atum* EUPHRASEN.

These specimens were caught by the subsurface larva-net tow and by the hand-line. *T. lepidopoides* spend the early stages near sea surface.

### Introduction

A member of the gempylids, *Thyrsitops lepidopoides* CUVIER, is known from the eastern coast of South America from Brazil to Argentina and from the coast of Chile (GOOD and BEAN, 1895; FOWLER, 1944; GREY, 1953; PARIN and BEKKER, 1972). Despite increasing knowledge of gempylid fishes in recent years, little is known about the early life history of *T. lepidopoides*. This paper describes the postlarval and juvenile forms referable to *T. lepidopoides* taken from the western South Atlantic Ocean.

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### Materials and methods

Specimens used in this study were collected from off the southeastern coast of

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Brazil by the R/V Shoyo Maru of the Fisheries Agency. Five postlarvae ranging from 5.0 mm to 8.1 mm in standard length were collected by the larva-net tow at Lat. 23°22.7' S, Long. 42°20.5' W on December 9, 1968. Two juveniles, 123.3 mm and 137.5 mm SL, were attracted under a night light and taken by hand-line in the harbor of Rio de Janeiro on December 1, 1965 (Fig. 1).

Treatment of the samples, and methods of counts and measurements of specimens followed NISHIKAWA and NAKAMURA (1978). Measurements were made using the dial caliper for juvenile specimens and under the binocular microscope for postlarval specimens. The largest postlarval specimen examined (8.1 mm SL) was cleared and stained with alizarin red by the HOLLISTER's technics modified by CLOTHIER (1950) for counting the fin spines and vertebrae.

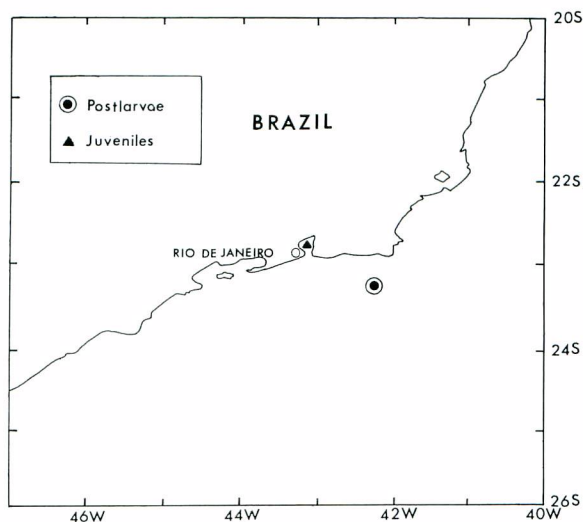


Fig. 1. Localities of capture of larval and juvenile *T. lepidopoides*.

### Description of early stages

#### Postlarval stage

In the smallest specimen of 5.0 mm SL (Fig. 2a), the head is relatively large, about 45% of the body length. The mouth is large, and the posterior end of the maxillary reaches below the middle of the eye. The supraorbital crest is feeble. The nasal opening is a single pore, and is situated nearer to the eye than to tip of the snout. Five small teeth are present only on the upper jaw. There are 2 rows of spines along the margin of the preopercle; one in the inner row and 3 in the outer row. Lower 2 preopercular spines in outer row are larger than the remaining one. A spine is on the opercle. There are 2 small spines at the temporal region. The tip of the notochord is turned upward. Broad and smooth-edged 10 spines are discernible in the dorsal fin. The pelvic fin is developed,

consisting of a broad and smooth-edged spine followed by 5 soft rays. The tip of the pelvic spine well exceeds the anus located a little posterior to the middle of the body.

Pigmentation of the body and head is slightly developed. In the head region, only the top including the forebrain area is pigmented. A row of pigment dots is present along the dorsal fin base posterior to the 5th spine. The conspicuous chromatophores are present near the soft dorsal and anal fin bases, and in the marginal part of the dorsal fin membrane between 1st and 4th spines. The anterodorsal wall of the abdominal cavity is feebly pigmented.

In a larger specimen 7.5 mm SL (Fig. 2b), the nasal opening is elongated and has a constriction in the mid part. The dorsal profile of the head is gently arched from snout to the nape. Small conical teeth are present on both jaws. Both dorsal and anal fins are

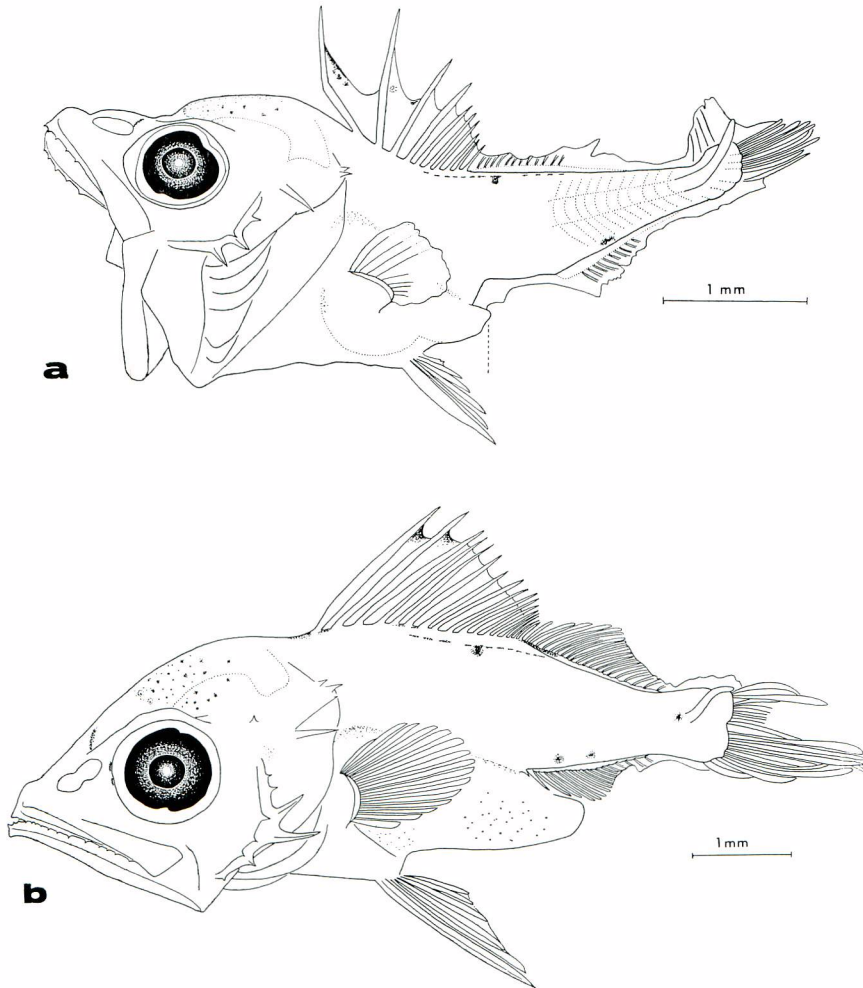


Fig. 2. Postlarvae of *T. lepidoides*, a : 5.0 mm SL, b : 7.5 mm SL.

**Table 1.** Measurements and counts for larval and juvenile *T. lepidopoides* described. Numerals in parentheses show percentages to standard length.

	Length in mm	Length in mm	Length in mm	Length in mm
<b>Measurements</b>				
Standard length	5.0	7.5	123.3	137.5
Fork length	—	—	131.0	146.0
Head length	2.2 (44.0)	3.4 (45.3)	35.3 (28.6)	38.8 (28.2)
Maximum body depth	—	2.5 (33.3)	22.0 (17.8)	22.6 (16.4)
Body width	—	—	10.0 (8.1)	10.1 (7.3)
Snout length	0.6 (12.0)	1.1 (14.7)	13.2 (10.7)	14.7 (10.7)
Upper jaw length	—	1.8 (24.0)	16.1 (13.1)	17.6 (12.8)
Eye diameter	0.6 (12.0)	0.9 (12.0)	6.1 (4.9)	6.4 (4.7)
Orbit diameter	0.8 (16.0)	1.2 (16.0)	6.5 (5.3)	6.9 (5.0)
Interorbital width	—	—	6.0 (4.9)	6.7 (4.9)
Pelvic spine length	0.9 (18.0)	2.0 (26.7)	—	—
Least depth of caudal peduncle	—	0.7 (9.3)	6.2 (5.0)	6.4 (4.7)
First dorsal fin base length	—	—	46.9 (38.0)	52.6 (38.3)
Second dorsal fin base length	—	—	20.2 (16.4)	21.8 (15.9)
Anal fin base length	—	—	18.6 (15.1)	19.8 (14.4)
Snout to dorsal fin origin	2.2 (44.0)	3.5 (46.7)	33.5 (27.2)	37.6 (27.3)
Snout to pectoral fin origin	2.2 (44.0)	3.4 (45.3)	36.5 (29.6)	40.4 (29.4)
Snout to pelvic fin origin	3.0 (60.0)	3.8 (50.7)	43.9 (35.6)	48.2 (35.1)
Snout to anterior margin of anus	3.4 (68.0)	—	78.8 (63.9)	86.7 (63.1)
<b>Counts</b>				
Dorsal fins	X, 12	XVII, 20	XVII, i, 15+4	XVII, i, 15+4
Anal fin	10	II, 16	II, 17+4	II, 16+4
Pectoral fin	10	15	15	15
Pelvic fin	I, 5	I, 5	I, 5	I, 5
Branchiostegals	7	7	7	7

fairly developed. The dorsal fin consists of broad and smooth-edged 17 spines and 20 soft rays. The anal fin comprises 2 small spines and 16 soft rays. Posterior several soft rays of both dorsal and anal fins are slightly wide-spaced for future finlets. The pelvic fin is fully developed and the spine is longer than the rays. The pectoral fin reaches the full adult complement with 15 rays. About 15 caudal fin rays are discernible. With 3 inner and 6 outer preopercular spines, the head armatures become more distinct than in the earlier stage. Of these, 2 large angular spines are bent upward. An isolated, small spine is present on the postorbital region.

Pigmentation on the abdominal cavity is advanced. The pigment dots appear on both anterior and posterior margins of the orbit. There is a round patch of the pigments on the postorbital region. The large chromatophores are present near the bases of the dorsal and anal fins, and on the caudal peduncle. The dorsal fin membrane between 1st and 3rd spines is distally pigmented.

Juvenile stage

The counts and measurements of 2 juvenile specimens, 123.3 mm and 137.5 mm SL, are shown in Table 1. The following description is primarily based on the larger one (Fig. 3).

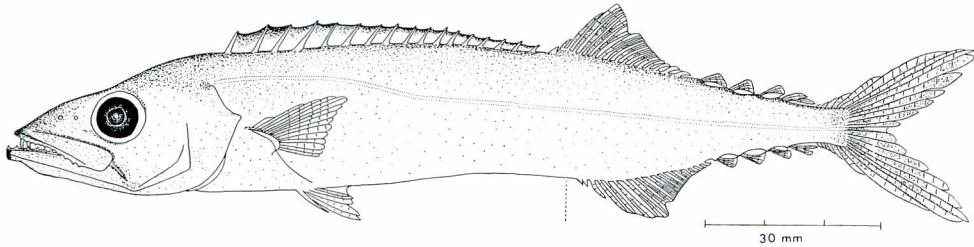


Fig. 3. Juvenile of *T. lepidopoides*, 137.5 mm SL.

The body is rather slender and compressed, and similar to the adult in shape. The head is moderately large, more than 1/4 of the body length. The dorsal profile of the head is slightly concave in the interorbital region. The snout is moderately long, twice the eye diameter. The lower jaw slightly projected beyond the tip of the snout. The mouth is

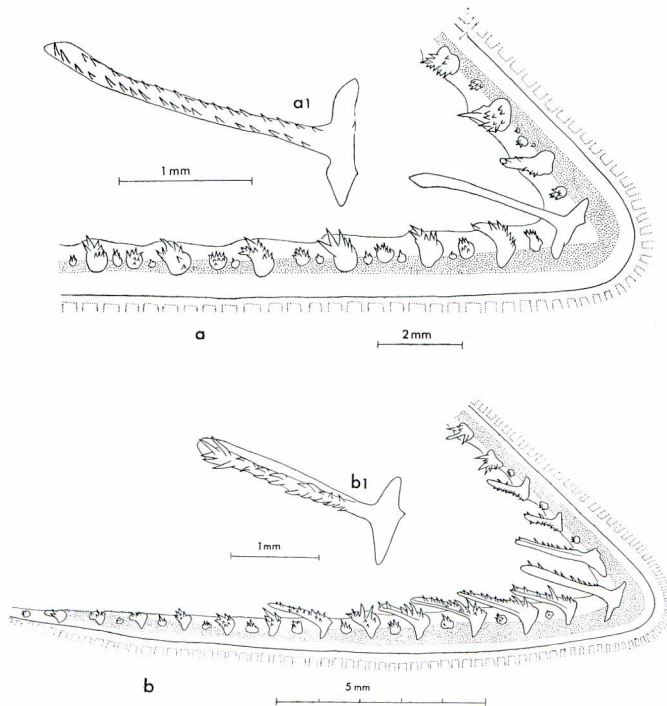


Fig. 4. Outer view of gill rakers on first gill arch, a : 123.3 mm SL, b : 137.5 mm SL, a1 and b1 showing the inner surface of gill rakers at angle.

large, the posterior end of the maxillary reaching below the middle of the eye. A distinct groove is found on the posterior part of the gape of the mouth as seen in the scombrid fishes. Of two pairs of the fang-like teeth on the upper jaw tip, the posterior pair is much larger than the anterior one. Lateral teeth on both jaws are conical. Those on the lower jaw are larger than those on the upper. The vomer is V-shaped, with small conical teeth. A single series of the sharp conical teeth is present on the palatines. The preopercular and temporal spines and the supraorbital crest are completely degenerated. The gill rakers on the first gill arch in 2 juveniles are shown in Figure 4. The gill rakers of the smaller specimen are tubercle and armed with small spines except for the angular one which is long and provided with many distinct spines in 2 rows on its inner surface (Fig. 4a). In the larger specimen, however, several gill rakers on both limbs become increasingly elongated toward the angular one (Fig. 4b). In both specimens, small tubercle-like accessory rakers between the long gill rakers are implanted. The shape of the gill rakers of these specimens is similar to those of *Neopinnula* and *Tongaichthys* in this family, described by MATSUBARA and IWAI (1952) and NAKAMURA and FUJII (1983). The spinous dorsal fin is low, originating slightly posterior to the upper corner of the opercle. The spinous dorsal fin base is long, being twice as long as the soft dorsal fin base. The anal and soft dorsal fins are similar in shape, whereas the anal fin base is slightly shorter than the soft dorsal fin base. The anal fin originates behind the soft dorsal fin origin. Four finlets are distinct in both dorsal and anal fins. The pelvic fin is situated a little behind the pectoral fin base, consisting of a small spine and 5 soft rays. The pelvic soft rays are much longer than the spine. The innermost pelvic ray is connected to belly by the membrane. The lateral line is single and almost straight, starting at the upper corner of the opercle and running backward along the mid-lateral line to the base of the middle caudal ray. The caudal fin is deeply forked.

In formalin preserved specimens, the body and head are brown above, greyish white below. The distal part of the spinous dorsal fin is black throughout its length. The caudal fin and the anterior part of the soft dorsal fin are slightly dark. Other fins are pale.

### Identification and discussion

Lacking the serrated fin spines typical of the early postlarvae of most gempylid fishes, the specimens examined in this report have the well-developed dorsal and pelvic spines and the conspicuous head spination, both common to the larval forms of the family Gempylidae.

In the southeastern coast of Brazil where the present specimens were collected, the following three species of Gempylidae are known to occur: *Thyrsites atun* EUPHRASEN, *Thyrsitops lepidopoides* CUVIER, and *Paradiplospinus gracilis* (BRAUER) (GOOD and BEAN, 1895; BUSSING, 1965; PARIN and BEKKER, 1972). Among them, larvae of *P. gracilis*, recently reported from the South Atlantic Ocean (NISHIKAWA, 1984), are clearly separated

from the former two species in the following points ; many dorsal spines, slender body, and absence of the pelvic soft rays and dorsal and anal finlets. Therefore, the present specimens having both finlets and pelvic fin developed are most likely to be either of the remaining two. According to ROBERTSON and MITO (1979) who figured the larval *T. atun* of 10.5 mm and 18.1 mm TL from the New Zealand waters, the species differs from the present specimens in the dorsal spine counts, more slender body, and well developed body pigments. The smooth-edged dorsal and pelvic spines in the postlarval and juvenile stages seem to be a distinctive character of this species, and could be used to distinguish the larval *T. lepidopoides* from the known larval forms of all the other gempylids (Voss, 1954 ; STRASBURG, 1964 ; YEVSEYENKO and SEREBRYAKOV, 1974 ; GORBUNOVA, 1977 ; NISHIKAWA and NAKAMURA, 1978 ; NISHIKAWA, 1982).

Meristic and external features of 2 juvenile specimens examined agree well with the description for *T. lepidopoides* by GOOD and BEAN (1895), and PARIN and BEKKER (1972). The fin ray counts and the appearance of spines (not serrated) in postlarval specimens examined agree with those of the present two juvenile specimens. Despite considerable size differences of the available specimens, these postlarvae and juveniles could be safely referred to *T. lepidopoides* based on the evidences mentioned above and the locality of their occurrence.

Although GOOD and BEAN (1895) considered *T. lepidopoides* to be a deep water species, all specimens examined in this study were taken from the water shallower than about 50 meters deep. Therefore, it is concluded that the species lives near the sea surface at the early stages of life.

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クロタチカマス科 *Thyrsitops lepidopoides* CUVIER  
の後期仔魚および稚魚

西川 康夫

摘 要

南西大西洋のブラジル南東沿岸沖から得られたクロタチカマス科と推定される7個体の後期仔魚および稚魚標本について計数計測形質ならびに成長に伴う形態の変化を検討し記載した。検討の結果、これらの標本はクロタチカマス科の1種 *Thyrsitops lepidopoides* CUVIER と同定された。

*T. lepidopoides* の後期仔魚は背鰭、腹鰭等の棘条がよく発達している点、頭部の棘の発達が著しい点等クロタチカマス科の幼期に一般的に見られる諸特徴を有している。しかし、本種の仔稚魚は従来報告されているクロタチカマス科の仔稚魚とは背鰭および腹鰭の棘の外縁部に鋸歯がない点で明瞭に相違し、この特徴により容易に識別される。体表の黒色素胞の分布状態、頭部特に前鰓蓋骨上の棘の形状、更にまた各鰭条の計数値も本種幼期の識別形質として有効である。

本種の仔稚魚は科内において近縁とされ形態的にも類似する *Thyrsites atun* EUPHRASEN の仔魚とは上顎の牙状歯の数、側線の形状、および各鰭の鰭条数等に相違があることで容易に識別される。

調査標本のうち、後期仔魚は亜表層（およそ20~50 m 深度）における稚魚網の水平曳きによって採集され、稚魚標本はリオ・デ・ジャネイロの港内で釣りによって採集された。従って本種は幼期においては表層近くに生息する事が考えられる。