

FIRST RECORD OF SOUTHERN LANTERNSHARK, *Etmopterus granulosus* (GÜNTHER, 1880) (SQUALIFORMES, DALATIIDAE), IN BRAZILIAN COAST

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This paper presents the first record of the southern lanternshark, *Etmopterus granulosus* (Günther, 1880) off the Brazilian coast, based on an immature male, 364 mm TL, collected in southern Brazilian waters (34°13'S, 50°40'W). The geographic distribution is discussed based on revision of the records and the association with the oceanic currents. Biometric data are compared with southeast Pacific specimens.

É apresentado o primeiro registro do tubarão-vagalume-do-sul *Etmopterus granulosus* (Günther, 1880) na costa brasileira, baseando-se em um macho imaturo, 364 mm CT, coletado no sul do Brasil (34°13'S, 50°40'W). É também discutida a distribuição geográfica da espécie, através da revisão dos registros e da associação com as correntes oceânicas. Dados biométricos são comparados com espécimes do sueste do Pacífico.

The southern lanternshark, *Etmopterus granulosus* (Günther, 1880), was originally described based on specimens collected off the southernmost coast of South America, Straits of Magellan and westward, 220 m depth, during H.M.S. Challenger Expedition (Günther, 1880). The species occurs circumglobally in cool-temperate waters of the southern hemisphere, on the deeper parts of continental shelves and slopes in depths of about 220-1464 m, with records in waters off Chile (Günther, 1880 - original description; Meléndez & Meneses, 1989 - distribution), southern Argentina (Lahille, 1921 - name only), Falklands Islands (Lahille, 1921 - name only), Sierra Leone (Golovan & Pukhorukov, 1986 - distribution), Atlantic coast of South Africa (Gilchrist, 1922; Barnard, 1925; Smith, 1949 - name only; Bass *et al.*, 1986 - distribution; Fricke & Koch, 1990 - systematic; Compagno *et al.*, 1991 - distribution and systematic; Ebert *et al.*, 1992 - diet), Walters Shoals in the Indian Ocean (Last & Stevens, 1994 - distribution), New Zealand (Garrick, 1957 - original description of the junior synonym *E. baxteri*; King & Clark, 1987 - distribution and reproduction; Summers, 1987 - liver oil; Clark & King, 1989 - catch; Clark *et al.*, 1989 - diet; Tachikawa *et al.*, 1989 - systematic; Wetherbee, 1996 - general biology), southern Australia and Tasmania (Pavlov & Andrianov, 1986 - distribution; Deprez *et al.*, 1990 - liver oil; Last & Stevens, 1994 - distribution and description; Bakes & Nichols, 1995 - liver oil). Until the present, proven records of the genus *Etmopterus* in Brazilian

waters involved *E. bigelowi*, *E. gracilispinis* and *E. lucifer* (Soto, 2000). The purpose of this paper is to include *E. granulosus* in the Brazilian oceanic fauna, based on a single specimen collected off State of Rio Grande do Sul.

MATERIALS AND METHODS

During the South Atlantic Expedition return of the Russian R/V "Akademik Kurchatov", a lanternshark was caught by nocturnal pelagic trawl off southern Brazil (34°13'S, 50°40'W) on January 5, 1972, over water approximately 2200 m deep. The specimen, a juvenile male measuring 364 mm TL, was previously identified as *Etmopterus cf. lucifer* and stored at Russian Academy of Sciences. Through photographic, morphologic and biometric analysis, this specimen was re-identified as *E. granulosus*.

Measurements follow Compagno (1984), except FSL and SSL, expressed in percentage of total length, and compared with 17 specimens from the southwest Pacific, comprised of 16 specimens described by Meléndez & Meneses (1989) and one embryo (MOVI 01926) from the pregnant female (MMSA PE011, ~60 cm TL, with 5 embryos), collected by bottom longline off San Antonio (33°35'S, 400 m deep, February 1, 1985), all taken off the Chilean coast.

Acronyms: IOAN - Russian Academy of Sciences (Moscow, Russia); MMSA - Museo Municipal de

Ciencias Naturales y Arqueología de San Antonio (San Antonio, Chile); MNHNC - Museo Nacional de Historia Natural (Santiago, Chile); MOVI - Museu Oceanográfico do Vale do Itajaí (Itajaí, Brasil).

RESULTS AND DISCUSSION

The specimen was identified based on: erect cuspidate dermal denticles on sides of body in regular longitudinal rows on trunk and tail; upper teeth with 3 or fewer pairs of cusplets on each side; black flank marking without a long anterior branch extending in front of pelvic fins; head width about 1.3 times preoral snout; prepiracular length about 1.3 times distance from spiracles to pectoral origins; gill openings less than 1/3 eye length and about as wide as spiracle; origin of first dorsal fin slightly in front of free rear tips of pectoral fins; interdorsal space somewhat less than distance from snout tip to first gill slits; distance between second dorsal base and upper caudal origin about 2.5 in interdorsal space; length of dorsal caudal margin about equal to distance from snout tip to pectoral midbases; and colour brown above with underside of snout and abdomen abruptly black (Compagno, 1984).

Descriptions in the literature of pregnant specimens and embryos of *E. granulosus* are very scarce. According to Wetherbee (1996), of a total of 492 females taken off southern New Zealand, only ten (656 to 761 mm TL) contained ova (40 to 55 mm Ø) in uteri, and none had

any embryos; two of these were caught in July and eight in October. Meléndez & Meneses (1989) reported on 18 specimens (males and females, the smallest one 585 mm TL) off Chilean coast, of which only three contained ova (21.1 to 50.0 mm Ø) in ovaries. The only previous record of embryos was reported by Tachikawa *et al.* (1989) who examined embryos between 178 and 200 mm TL, from New Zealand. This paper records a pregnant female (MMSA PE011, ~60 cm TL), collected in February, off the Chilean coast, that contained five embryos, one of these (MOVI 01926), a male, 142 mm TL. The comparative biometry of the Brazilian and Chilean specimens (Tab. 1) confirms the identification and presents an embryonic allometric relationship in the interdorsal space (IDS), dorsal-caudal space (DCS) and pectoral-pelvic space (PPS).

The unique occurrence of *E. granulosus* at 34°13'S, 50°40'W marks the first record in Brazilian waters, and the northernmost preserved specimen of the southwest Atlantic. According to Brazilian Navy Chart (DHN, 1971, 1989), the specimen was caught in Brazilian waters, to 153 km of the limit of Brazilian Exclusive Economic Zone (EEZ) and to 115 km of Uruguayan maritime boundary. The presence of *E. granulosus* in southern Brazil is not surprising and confirms the association of the records of this species with cool currents of the south hemisphere (Fig. 1). The hiatus in the distribution, between southern Argentina and the present record is probably due to the absence of epi-mesopelagic col-



Figure 1. Distribution of *Etmopterus granulosus* with the first Brazilian record indicated by a triangle.

Table 1. Measurements (% of TL) of the Southwest Atlantic and southeast Pacific specimens of *Etmopterus granulosus*.

	southwest Atlantic (Brazil)		southeast Pacific (Chile)	
Reference	present paper	present paper	Meléndez & Meneses (1989)	
Sex	male	male	males and females	
Stage	juvenile	embryo	juveniles and adults	
n	1	1	16	
Total length TL (mm)	364	142	286-621	
Collection number	IOAN uncat.	MOVI 01926	MNHNC P. 6493-6494-6495-6496-6497	
Measurements			Range	Mean (S)
Precaudal length (PRC)	77.2	71.8	69.9-81.7	74.8(2.81)
Pre-first dorsal length (PD1)	35.2	35.9	30.7-39.8	34.8(2.03)
Pre-second dorsal length (PD2)	62.4	53.5	55.6-66.1	60.8(2.54)
Head length (HDL)	24.5	23.2	20.2-28.7	24.1(1.83)
Prebrachial length (PG 1)	20.6	19.7	17.9-21.3	19.8(0.96)
Prepiracular length (PSP)	13.2	12.0	-	-
Preorbital length (POB)	5.2	4.9	4.5-7.7	5.9(0.79)
Prepectoral length (PP1)	19.2	23.2	22.7-28.7	24.5(1.75)
Prepelvic length (PP2)	53.3	47.2	44.2-54.5	51.5(2.57)
Interdorsal space (IDS)	21.7	12.7	18.3-25.5	21.9(2.26)
Dorsal-caudal space (DCS)	8.8	12.7	7.5-10.8	9.3(0.72)
Pectoral-pelvic space (PPS)	23.6	18.3	18.7-33.9	24.9(3.11)
Pelvic-caudal space (PCA)	12.1	14.1	-	-
Prenarial length (PRN)	2.2	3.5	-	-
Preoral length (POR)	9.6	8.5	-	-
Eye length (EYL)	5.8	7.0	4.3-6.9	5.5(0.56)
Intergill (ING)	3.8	6.3	1.3-6.1	4.0(0.91)
Pectoral anterior margin (P1A)	10.4	9.2	-	-
Pectoral base (P1B)	5.2	5.6	-	-
Pectoral inner margin (P1I)	4.4	4.2	-	-
Dorsal caudal margin (CDM)	23.6	26.1	-	-
Preventral caudal margin (CPV)	12.4	14.1	-	-
Terminal caudal lobe (CTL)	6.0	9.2	-	-
First dorsal base (D1B)	5.2	7.7	-	-
First dorsal height (D1H)	3.6	2.8	-	-
First dorsal inner margin (D1I)	4.4	4.9	-	-
Second dorsal base (D2B)	6.9	9.2	-	-
Second dorsal height (D2H)	4.7	3.5	-	-
Second dorsal inner margin (D2I)	5.2	4.9	-	-
Pelvic base (P2B)	8.0	7.0	-	-
Pelvic height (P2H)	4.1	3.5	-	-
Pelvic inner margin length (P2I)	4.7	5.6	-	-
Pelvic posterior margin length (P2P)	4.7	8.5	-	-
Clasper outer length (CLO)	4.4	2.1	-	-
Clasper inner length (CLI)	5.5	6.3	-	-
Caudal peduncle height (CPH)	4.1	3.5	2.6-3.4	2.3(0.19)
Mouth width (MOW)	12.1	11.3	-	-
Nostril width (NOW)	2.7	2.8	-	-
Internarial space (INW)	3.0	4.9	-	-
Interorbital space (INO)	9.1	10.6	-	-
First spine length (FSL)	3.3	6.3	-	-
Second spine length (SSL)	6.6	9.2	-	-

lections in this region.

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