

FIRST RECORD OF A GIANT SQUID *Architeuthis* sp STEENSTRUP, 1857 (CEPHALOPODA, ARCHITEUTHIDAE) IN BRAZILIAN WATERS

(Primeiro registro de lula gigante *Architeuthis* sp Steenstrup, 1857 [Cephalopoda, Architeuthidae] em águas brasileiras)

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ABSTRACT

A dying specimen of giant squid of the genus *Architeuthis* Steenstrup, 1857 was found by Imaipisca longliner, in September 1989, floating off Santa Catarina State (27° 24' S - 45° 37' W) over a bottom depth of 3,400 m. The specimen was a female with a mantle length of 151 cm and weight of 91 kg (without tentacles). The specimen is preserved in formalin at the Instituto de Pesca in Santos, São Paulo, Brazil.

KEY WORDS: giant squid, Architeuthidae, Brazil, first record

RESUMO

Um espécime moribundo de lula gigante foi encontrado em setembro de 1989, pelo atunheiro Imaipisca, boiando em frente à costa do Estado de Santa Catarina (27° 24' S - 45° 37' W) em local de 3400 m de profundidade. O exemplar, uma fêmea com 91 kg (sem os tentáculos) e 151 cm de comprimento do manto, encontra-se preservado em formalina no Instituto de Pesca, em Santos, São Paulo, Brasil. Este é o primeiro registro de ocorrência do gênero em todo mar brasileiro.

PALAVRAS-CHAVE: lula gigante, Architeuthidae, Brasil, primeiro registro

1. INTRODUCTION

The family Architeuthidae Pfeffer, 1900 includes just the genus *Architeuthis* Steenstrup, 1857, that comprises cephalopods of larger sizes, that can measure up to 20 m, and weigh up to 1,000 kg (ROPER; SWEENEY & NAUEN, 1984). Specimens of this genus are occasionally found moribund at the surface of the ocean, although most of the registers are based on observation taken from analysis of sperm whales (Cetacea) stomach contents (ROPER; SWEENEY & NAUEN, 1984).

About 20 nominal species are included in the genus *Architeuthis*. As they are not appropriately described it is impossible to develop more detailed systematic studies (CLARKE, 1966). TOOL & HESS (1981) described an adult male specimen of this genus, with small size (gladius with 17.9 cm),

what characterizes at least two acceptable species for the genus *Architeuthis* so far (ROELEVELD & LIPINSKI, 1991).

The genus *Architeuthis* has wide geographic distribution, occurring in the three oceans, far from the continental shelf and preferring cold waters. The highest number of registers are from the North Atlantic (Newfoundland - Canada and Norway), South Pacific (New Zealand) and North Pacific (ROPER; SWEENEY & NAUEN, 1984).

According to ROPER; SWEENEY & NAUEN (1984), these giant squids present the following systematic classification:

Sub-class - Coleoidea  
Order - Teuthoidea  
Sub-order - Oegopsida  
Family - Architeuthidae  
Genus - *Architeuthis*

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Other known species of giant squids are *Monoteuthis robustus* weighing up to 50 kg, and *Mesonychoteuthis hamiltoni* reaching 150 kg, with distributions restricted to North Pacific and Antarctic Circle, respectively. In Brazil, the largest registered species was *Thysanoteuthis rhombus*, reaching 20 kg, and found off Rio de Janeiro State

and Santa Catarina State (HAIMOVICI; PEREZ & COSTA, 1989).

According to ROELEVELD & LIPINSKI (1991) each contribution to the knowledge of the natural history of *Architeuthis* will be useful for direct comparisons with other species.

## 2. MATERIAL AND METHODS

A specimen of giant squid, brought to Santos - São Paulo State by the longliner *Imaipesca*, was found moribund in the first week of September 1989 off Santa Catarina State (27° 24' S - 45° 37' W), in area corresponding to a bottom depth of 3,400 m

(FIGURE 1).

The identification of this exemplar was based on CLARKE (1966), ROPER & BOSS (1982) and ROPER; SWEENEY & NAUEN (1984).

Due to the absence of tentacles in this

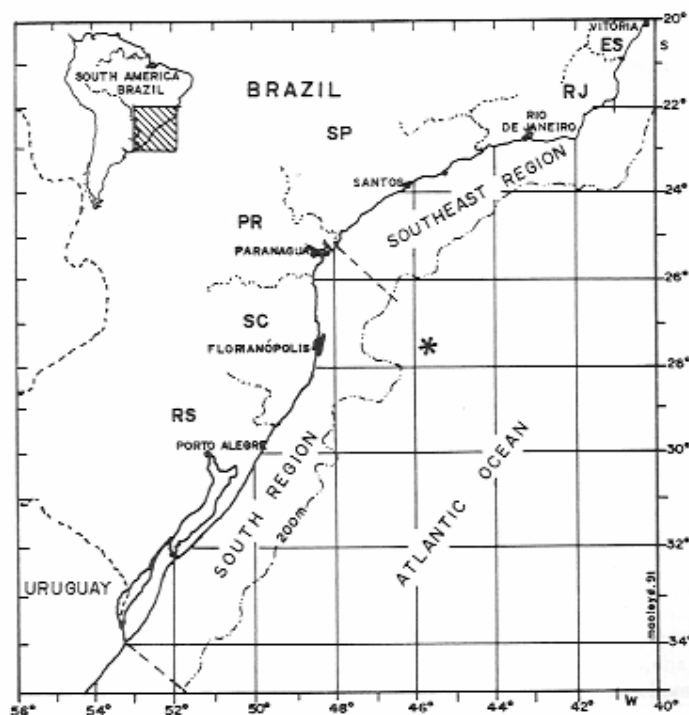


FIGURE 1 - The location (marked by the asterisk) where the studied specimen of *Architeuthis* sp was found

specimen of giant squid, only part of the morphological characteristics cited in literature could be observed. Therefore the maximum length obtained was from tip of tail to tip of arm IV.

After landing the specimen was weighed and frozen at "Taiyo Indústria de Pesca

S.A.". Two months later it was defrosted and measured following ROPER; SWEENEY & NAUEN (1984) (TABLE 1). The specimen preserved in formalin 10%, some suckers in alcohol and formalin and the beak are at Instituto de Pesca (Santos - São Paulo State - Brazil.)

### 3. RESULTS AND DISCUSSION

The specimen (FIGURE 2) was identified as belonging to the genus *Architeuthis*, due to the absence of systematic key for the species of this genus, from the following characters:

- arms without hooks and with suckers in two rows on proximal half of ventral side of arm IV;
- funnel free from mantle and with a funnel-mantle locking apparatus a simple, straight groove and ridge;
- buccal membrane connectives attached to dorsal side of arms IV;
- no suckers on oral surface of buccal lapets and buccal folder;
- many suckers of different sizes (FIGURE 3) on the ventral side of all arms;
- medial posterior borders of fins concaves;
- photophores absent in the surface of man-

tle and head;

- arms with carpal knobs in cluster alternating with carpal suckers.

The dorsal mantle length was of 151 cm, arm IV measured 184 cm. The fin width was 32.5 cm and the length was 55 cm. The total weight of the exemplar, missing both tentacles, was 91 kg (TABLE 1).

The color of stomach and caecum was palish yellow.

FIGURE 4 shows the shape of lower beak at lateral, dorsal and ventral views.

According to the captain of the boat, in this same trip a great piece of squid was observed in the stomach contents of a swordfish (*Xiphias gladius*). In the same week, the crew of another tuna boat operating in the same area, observed a squid of large dimensions floating around the boat. These two

TABLE 1  
Proportional dimensions as percentages of mantle length in four specimens of the genus *Architeuthis*

	specimen from Brazil	BOYLE (1986)	PEREZ-GANDARAS & GUERRA (1989)	
Mantle length	151 cm	175 cm	125 cm	179 cm
Length (fin tail- arm IV)	245.7 %	241.7 %	-	-
Arm length	121.9 % (IV)	127.4 % (I)	-	120.7 % (IV)
	-	121.7 % (II)	-	-
Tail length	2.5 %	-	-	-
Fin width	21.6 %	-	22.4 %	20.1 %
Fin length	36.4 %	40.0 %	45.6 %	40.2 %
Weight	91 kg	186 kg	38 kg	130 kg

registers suggest the occurrence of other specimens of the genus *Architeuthis* in the region.

Two wounds were observed in the mantle of the studied specimen, probably caused by small deep-sea sharks, *Isistius brasiliensis* (JONES, 1971) or *I. plutodus* that

occur in this area, as registered by AMORIM & ARFELLI (1984), SADOWSKY; ARFELLI & AMORIM (1987 and 1988).

In TABLE 1 the proportional dimensions of the Brazilian specimen were compared with two others presented by PEREZ - GANDARAS & GUERRA (1989) and one by BOYLE

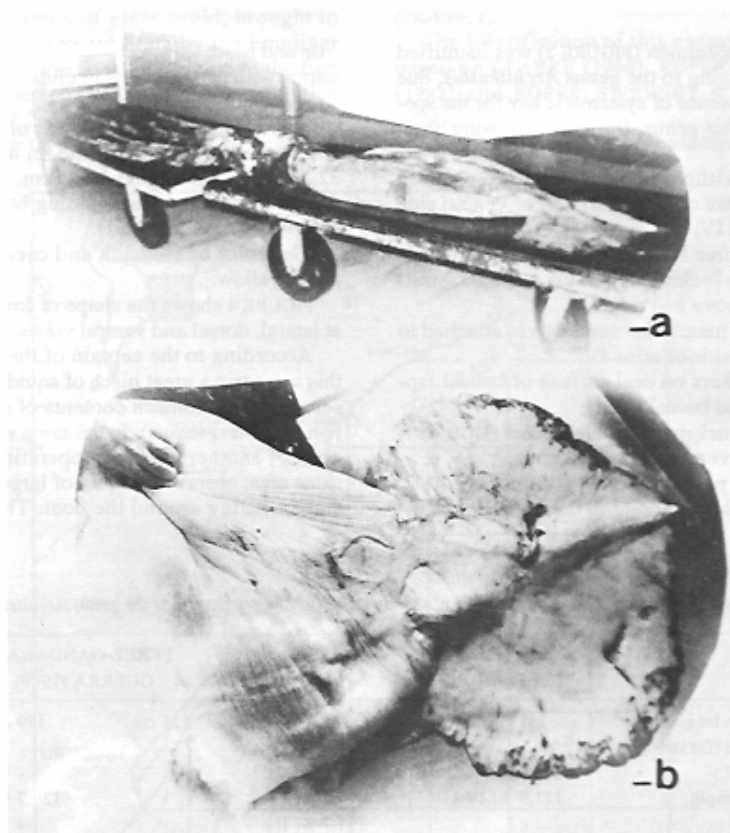


FIGURE 2 - Studied specimen of *Architeuthis* sp, female, 371 cm (tip of tail to tip of arm IV):  
A - whole specimen; B - fin shape

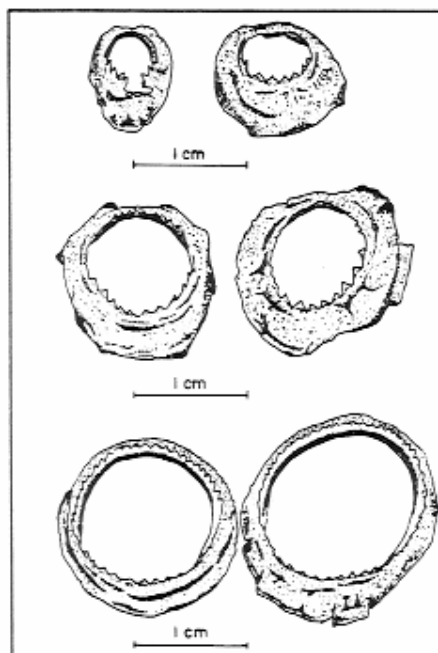


FIGURE 3 - Arm sucker rings of different sizes

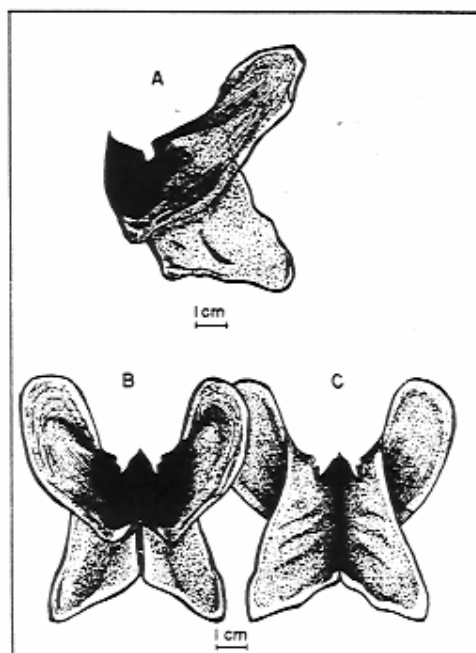


FIGURE 4 - Lower beak of the studied specimen: A - lateral view; B - dorsal view; C - ventral view

(1986). Comparing these specimens, variations were observed in the percentage of the measurements and the shape of the fin.

The fin shape is quite similar to that presented by the squid described by ROELEVELD & LIPINSKI (1991). There is a similarity between the shapes of the nuchal cartilage; the funnel-mantle locking apparatus and the distributions of biserial suckers of the arms base, but the funnel shape is oval instead of rounded, all presented by ROELEVELD & LIPINSKI (1991).

Drastic changes of water temperature in mesopelagic regions, probable habitat of these squids, can be responsible for the rise of these molluscs to the surface (CLARKE,

1966). According to BRIX (1983), *Architeuthis* can be sensitive to temperature changes, dying with the sudden heating of water, that causes a lower dissolution of oxygen in blood. Other records of *Architeuthis* in the Southwest Atlantic suggest that they are related to cold waters, reporting an occurrence near the Falkland Islands (40° - 50° W) (NESIS et alii, 1985). The Subtropical Convergence is a common phenomenon in this area and season, where the cold water mass (Falkland Current) meets the tropical water mass (Current of Brazil). This phenomenon can cause osmotic shock that determines the rise of these organisms to the surface, leading them to death (BRIX, 1983).

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