

Dipturus diehli sp. nov., A NEW SPECIES OF SKATE
(CHONDRICHTHYES, RAJIDAE) FROM SOUTHERN BRAZIL

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A new species of skate, *Dipturus diehli* sp. nov., is described from southern Brazil, based on single specimen, female, 1215 mm DW, collected off State of Santa Catarina (29°39'31"S, 47°50'32"W, 480 m depth). The new species can be distinguished from all other *Dipturus* by the following combination of characters: one median thorn row on disc and 5 thorn rows on tail; median thorn row of the disc with 27 thorns; median thorn row of the tail with 32 intercalated small/great thorns extending from caudal base to first dorsal fin; 8 nuchal thorns; 17 orbital, 9 spiracular, and 4 scapular thorns each side; dorsal and ventral surfaces rough.

Uma nova espécie de raia, *Dipturus diehli* sp. nov., é descrita para o sul do Brasil com base em um único espécime fêmea com 1215 mm LD, capturado frente a costa de Santa Catarina, sul do Brasil (29°39'31"S, 47°50'32"W, 480 m de profundidade). A nova espécie pode ser distinguida de todas as outras espécies de *Dipturus* pela seguinte combinação de caracteres: uma fileira mediana de espinhos sobre o disco e cinco fileiras de espinhos sobre a cauda; 27 espinhos na fileira mediana do disco; fileira mediana de espinhos da cauda com 32 espinhos grandes e pequenos intercalados, estendendo-se da base da cauda até a primeira nadadeira dorsal; 8 espinhos nucais; 17 espinhos orbitais, 9 espinhos espiraculares e 4 espinhos escapulares de cada lado do corpo; superfícies dorsal e ventral espiculadas (ásperas).

The genus *Dipturus* Rafinesque, 1810, is one of the 26 genera of Rajidae, and includes about 29 species (McEachran & Dunn, 1998). It is mainly characterized by possessing a dorsal and ventral dark color, a proportionally elongated stiff snout, and a smooth skin with few tubercles (Compagno *et al.*, 1989; Chen & Joung, 1989). Like most of the rajid skates, the systematics of the *Dipturus* species are notoriously complex. Despite the species diversity, rajids are not morphologically diverse (McEachran & Dunn, 1998). However, the number and arrangement of the thorns and spinules are normally utilized as a good character to distinguish the species of this genus (Stehmann & Bürkel, 1984).

In Brazilian waters, the genus *Dipturus* is poorly known. Nevertheless, three valid species have been recorded off southern Brazil: *D. chilensis* (Guichenot, 1848), *D. leptocauda* (Krefft & Stehmann, 1975), and *D. trachyderma* (Krefft & Stehmann, 1975).

On May 3, 1997, a single specimen of an undescribed *Dipturus* species was collected off southern Brazil by a bottom longline fishing vessel, and later stored in Museu Oceanográfico do Vale do Itajaí (MOVI). The aim of this paper is to describe this new species.

MATERIALS AND METHODS

Measurements (in millimeters and percent of disc width, DW) are those cited by Rosa *et al.* (1987) and Stehmann (1988) (Table 1). The tail of the holotype was broken *intra-vitam*, just behind the first dorsal fin, and thus it was not possible to obtain some measurements. Terminology and arrangement of the spinulation follows Stehmann & Bürkel (1984).

Dipturus diehli sp. nov.

(thorny tail skate, raia-de-cauda-espinhosa)

Figures 1-3

HOLOTYPE – MOVI 08494, female 1215 mm DW, 29°39'31"S, 47°50'32"W, 480 m depth, off State of Santa Catarina, southern Brazil, May 3, 1997, bottom longline, F/V "Master Fish".

DIAGNOSIS – *Dipturus diehli* can be distinguished from all other *Dipturus* by the following combination of characters: one median thorn row on disc and 5 thorn

rows on tail; median thorn row of the disc with 27 thorns; median thorn row of the tail with 32 intercalated small/great thorns extending from caudal base to first dorsal fin; 8 nuchal thorns; 17 orbital, 9 spiracular, and 4 scapular thorns each side, dorsal and ventral surfaces rough.

DESCRIPTION OF HOLOTYPE – Measurements and counts given in Table 1. Disc wider than long, with anterior margins concave and posterior margins convex. Snout much pronounced, preorbital length 31.5% of DW and equal to preoral length. Mouth weakly arched, mouth width 11.4% of DW and approximately equal to internarial space. Teeth pavement-like, without cusp. Upper and lower jaws with 30 and 29 tooth rows, respectively. Nasal curtain with a fringed posterior margin, projecting on the corner mouth (Fig.2). Eight nuchal thorns forming a median row among scapular thorns; 17

orbital, 9 spiracular, and 4 scapular thorns each side (Fig. 3). Dorsal surface with a row of 27 thorns along midline of disc. Five thorn rows on tail, one median and four lateral (two each side). Median thorn row of the tail with 32 intercalated small/great thorns, extending from caudal base to first dorsal fin. The upper lateral thorn rows of the tail with 14 thorns each side, extending from the caudal base to approximately one-half of tail. The lower lateral thorn rows of the tail with 20 (left) and 18 (right) thorns, extending from about over posterior margin of pelvic fin to broken tip of tail (Fig. 1). A prominent lateral tail fold just below to lower lateral thorn row on each side of the tail. Both dorsal and ventral surfaces of the disc rough with small scattered denticles. They are greater and more concentrated on both dorsal and ventral anterior disc margins, as well as on the snout. Color (in ethanol) uniformly dark brown on dorsal and ventral surfaces; thorns hyaline and tooth yellowish.

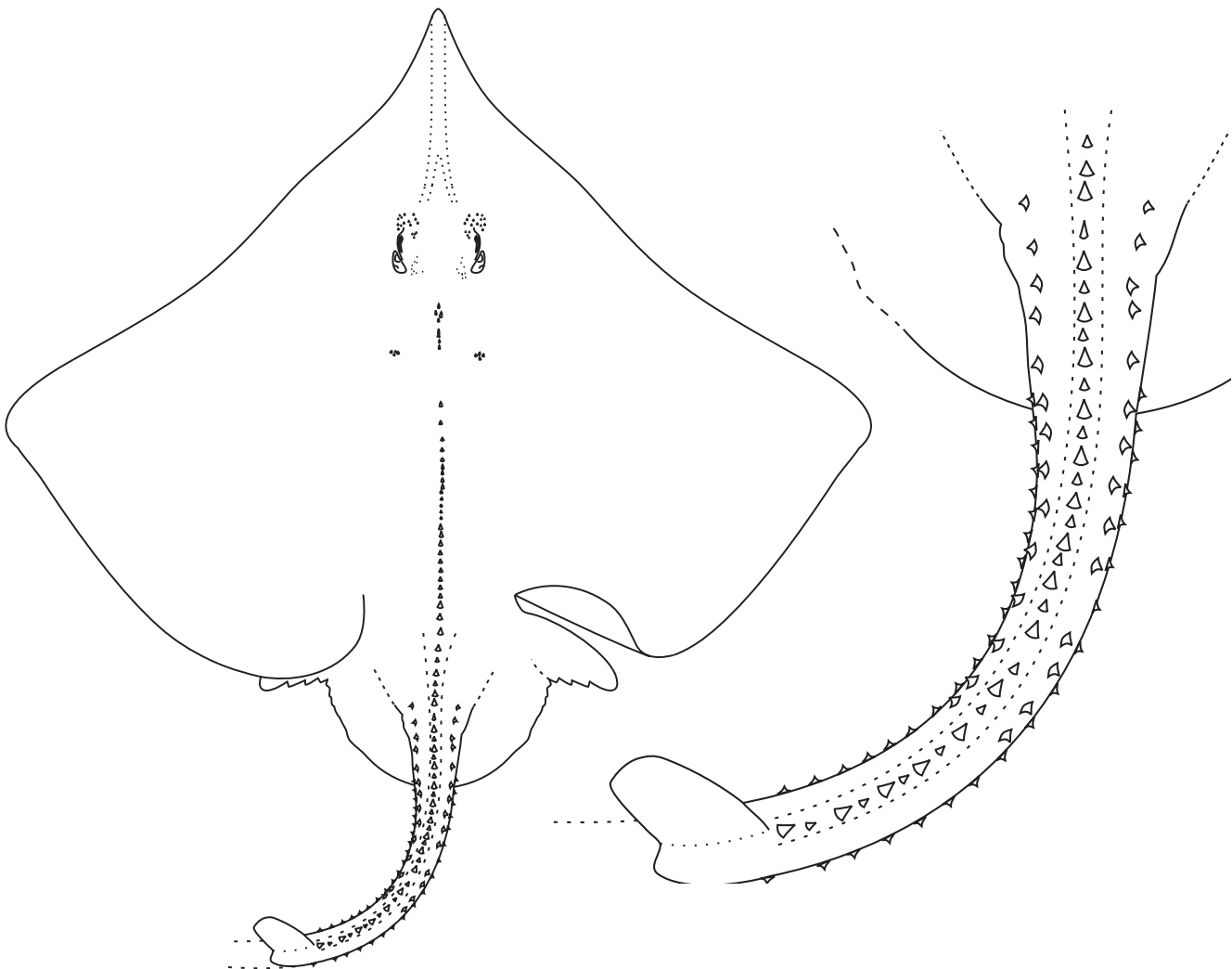


Figure 1. *Dipturus diehli* sp. nov., MOVI 08494, holotype, mature female 1215 mm DW, with close view of the tail.

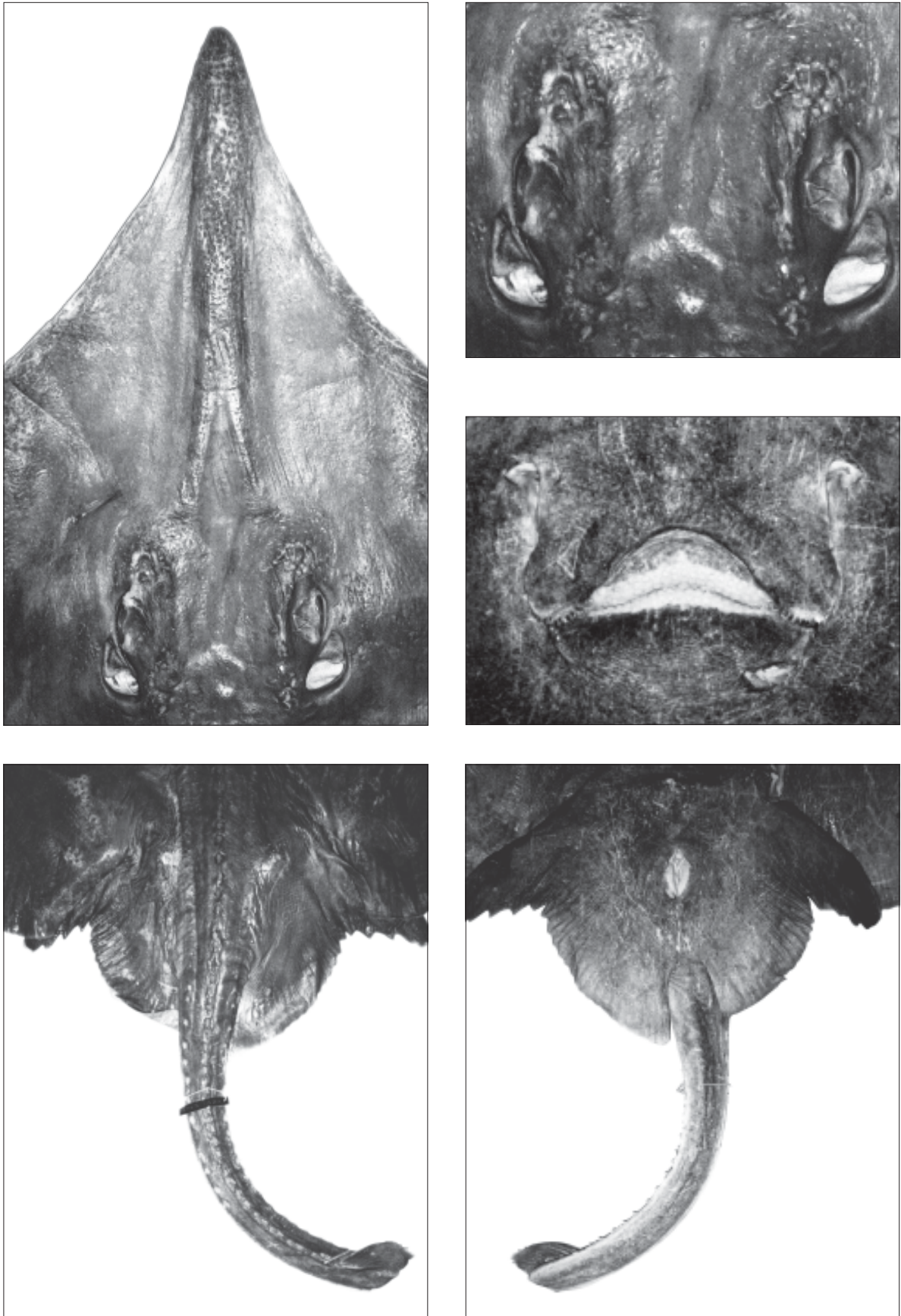


Figure 2. *Dipturus diehli* sp. nov., MOVI 08494, holotype, mature female 1215 mm DW. Left to right and upper to lower: dorsal view of head; interorbital space; mouth; dorsal and ventral view of tail.

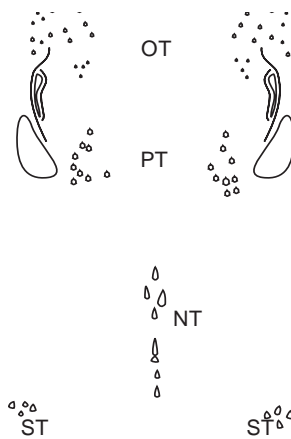


Figure 3. Arrangement of head thorns of *Dipturus diehli* sp. nov. OT, orbital thorns; PT, spiracular thorns; NT, nuchal thorns; ST, scapular thorns.

Table 1. Measurements of the holotype of *Dipturus diehli* sp. nov. (MOVI 08494).

Measurements	mm	% of DW
Disc width	1215	100
Disc length	1012	83.3
Disc length (to axil)	950	78.2
Preorbital length	383	31.5
Prespiracular length	412	33.9
Pre-first dorsal length	1445	118.9
Prenarial length	332	27.3
Preoral length	386	31.8
Prebranchial length	510	42.0
Head length	610	50.2
Intergill length	100	8.2
Snout-vent length	970	79.8
Caudal finfold width (left)	3	0.2
Caudal base width	70	5.8
Caudal base height	45	3.7
Pre-first dorsal fin width	41	3.4
Pre-first dorsal fin height	26	2.1
Eye length	29	2.4
Spiracle width	43	3.5
First gill slit width	24	2.0
Third gill slit width	26	2.1
Fifth gill slit width	18	1.5
First dorsal fin base	66	5.4
First dorsal fin height	36	3.0
First dorsal fin length	82	6.7
Interorbital space	129	10.6
Interorbital (cranial) space	87	7.2
Interspiracular space	110	9.1
Internarial space	145	11.9
Mouth width	139	11.4
Interbranchial space (first)	256	21.1
interbranchial space (third)	222	18.3
Interbranchial space (fift)	171	14.1
Interaxial space	200	16.5

DISTRIBUTION – Southern Brazil, off State of Santa Catarina, 480 m depth.

ETYMOLOGY – The species is named *diehli* in honor of Fernando Luiz Diehl, in recognition of his extensive work and tireless dedication to oceanography in Brazil.

COMPARISONS – Only three other valid species of *Dipturus* occur in the western South Atlantic Ocean: *D. chilensis*, *D. leptocauda*, and *D. trachyderma*. Among these, *D. diehli* is most similar to *D. trachyderma*. Both species are clearly distinct mainly in number of thorn rows on the tail (five vs three), and by presence of four scapular thorns each side in *D. diehli*, absents in *D. trachyderma*.

The remaining species, *D. chilensis* and *D. leptocauda*, are distinguished from *D. diehli* mainly by number of thorn row on the tail (one vs five), median thorn row on the disc (absent vs present), ventral surface (smooth vs rough), number of nuchal thorns (one vs eight), number of scapular thorns each side (absent in *D. chilensis*, one in *D. leptocauda*, and four in *D. diehli*).

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