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Short comunication

First records of the blue stingray, *Dasyatis chrysonota* (Smith, 1828) (Chondrichthyes: Dasyatidae), off the coast of Israel (eastern Mediterranean)

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Two blue stingrays, Dasyatis chrysonota *(Smith, 1828), caught off the Mediterranean coast of Israel, are the first recorded for the Levant. The species was hitherto known in the Mediterranean Sea only in the Gulf of Gabès in southern Tunisia. The distribution of this western Atlantic species is discussed below.*

Key words: Chondrichthyes, Dasyatidae, *Dasyatis chrysonota*, Mediterranean Sea, Southern Tunisia, Coast of Israel

INTRODUCTION

Two specimens of the blue stingray *Dasyatis chrysonota* (Smith, 1828) off the coast of Israel are hereby reported for the first time. Prior to this record, four species of the genus *Dasyatis* were known in the eastern Levant: the common stingray *Dasyatis pastinaca* (Linnaeus, 1758), the roughtail stingray *D. centroura* (Mitchill, 1815), the pelagic stingray *D. violacea* (Bonaparte, 1832) and the Tortonese stingray *D. tortonesei* Capapé, 1977. The common stingray is the most abundant in the area (BEN-TUVIA, 1971; GOLANI, 1996, 1997). Previous records of *D. chrysonota* in the Mediterranean were reported only in the Gulf of Gabès, southern Tunisia, central Mediterranean (Fig. 1) by MAURIN & BONNET (1970) and QUIGNARD & CAPAPÉ (1971). In this paper, we describe two *D. chrysonota* specimens collected off the Mediterranean coast of Israel and comment on the distribution of the species in the area and in the Mediterranean Sea.

MATERIALS AND METHODS

The first specimen was captured off the Haifa-Nahariya coast (Fig. 1) on May 18, 1985, by a trawl on a sandy muddy substrate at 50 m. It was a juvenile male, 150 mm disk length, 369 mm total length and 149 g in mass. The second was captured on June 16, 1987, off Haifa by a trawl at an unknown depth. It was also a juvenile male, 195 mm disk length, 445 mm total length and 445 g in mass. Both specimens are preserved in alcohol in the ichthyological fish collection

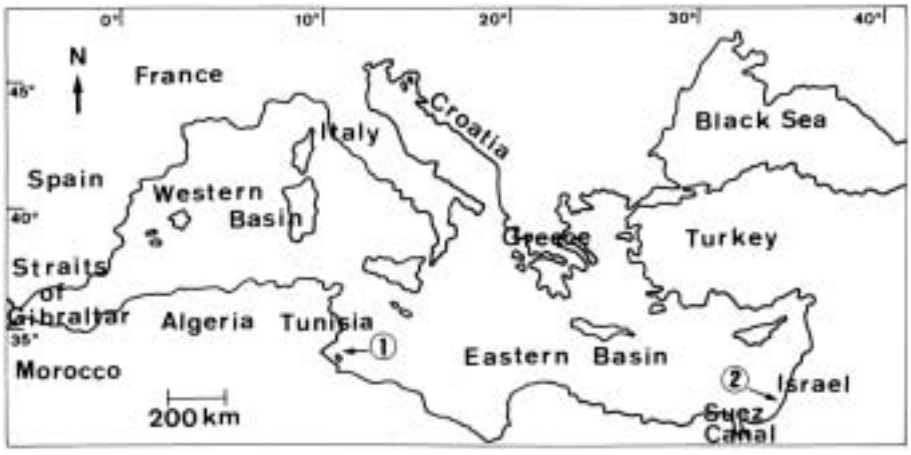

Fig. 1. Map of the Mediterranean Sea showing the capture sites of Dasyatis chrysonota: *1. Gulf of Gabès in southern Tunisia. 2. Coast of Israel*

of the Hebrew University of Jerusalem. The first specimen received catalogue number HUJ 13768 and the second specimen, HUJ 12450 (Fig. 2). Measurements (Table 1) and counts follow COMPAGNO & ROBERTS (1984), COWLEY & COMPAGNO (1993) and CAPAPÉ et al. (2002). The claspers were measured according to COLLENOT (1969).

Fig. 2. Dasyatis chrysonota, *230 mm disc width (HUJ 12450), Haifa. Photo: Dr. David DAROM*

Table 1. Measurements (in mm) and proportional measurements expressed as a percent of disk width (% of DW) from the two Dasyatis chrysonota *captured off the Mediterranean coast of Israel*

Reference	HUJ 13768		HUJ 12450	
Measurement	mm	% of DW	mm	% of DW
Disk width	171	100	230	100
Disk length	150	87.7	195	84.8
Disk depth	25	14.6	46	20.0
Total length	369	215.7	445	193.4
Eyeball length	13	7.6	17	7.4
Cornea	10	5.8	12	5.2
Pre-orbital length	34	19.9	44	19.1
Interorbital width	33	19.3	42	18.2
Spiracle width	10	5.8	13	5.6
Spiracle length	14	8.2	18	7.8
Nasal curtain	23	13.4	28	12.1
Interspiracular width	30	17.5	33	14.3
Preoral length	37	21.6	47	20.4
Mouth width	21	12.3	23	10.0
First gill slit	4	2.3	5	2.1
Second gill slit	7	4.1	9	3.9
Third gill slit	6	3.5	8	3.4
Fourth gill slit	6	3.5	7	3.0
Fifth gill slit	5	2.9	6	2.6
Width between first gill slit	36	21.0	44	19.1
Width between fifth gill slit	19	11.1	27	11.7
Snout tip to eye	33	19.3	43	18.7
Snout tip to mouth	32	18.7	43	18.7
Snout tip to first gill slit	50	29.0	60	26.0
Snout tip to fifth gill slit	71	41.5	96	41.7
Snout tip to pelvic fin	132	77.2	175	76.1
Snout tip to vent	124	72.5	166	72.1
Snout tip to sting	231	135.1	265	115.2
Pectoral fin anterior margin	117	68.4	149	64.8
Pectoral fin posterior margin	101	59.0	130	56.5
Pectoral fin inner margin	24	14.0	29	12.6
Pelvic fin anterior margin	30	17.5	41	17.8
Pelvic fin base	27	15.8	34	14.8
Span of pelvic fins	60	35.1	73	31.7
Clasper length	31	18.1	39	16.9
Tail base width	18	10.5	21	9.1

Table 1. cont'd

Tail base depth	9	5.2	11	4.8
Tail length	235	137.4	267	116.1
Ventral tail fold length	58	33.9	75	32.6
Dorsal tail fold length	55	32.1	66	28.7
Sting length	49	28.6	63	27.4

DESCRIPTION OF THE SPECIMENS

The disk rhomboid has slightly convex anterior margins at the level of the eyes while the posterior margins are anteriorly straight and posteriorly convex. The snout is pointed. The pelvic fins are quadrangular with rounded outer corners. The tail is slender and slightly depressed dorso-ventrally. The dorsal and ventral surfaces of the tail have a fold posterior to the sting but it does not extend to the end of the tail.

The disk depth is 14.6-20.0%, disk length 84.8-87.7%, preoral length 20.0-21.6%, pelvic span 31.7-35.1%, pelvic fin anterior margin 17.5-17.8% and ventral tail fold 32.6-33.9% of the disk width. The pre-orbital length is 103.0-104.7% and the width between the first gill slits is 11.9-12.1% of the interorbital length. The eyeball length is 39.4-40.1%, spiracle length 42.4-42.8% and distance between the fifth pair of gill slits 14.3-15.1% of the interorbital width. The snout angle is 115-125°. The mouth is slightly arched, the skin flap on the upper jaws has 24 oral papillae. There are five elongated papillae, on the mouth floor three central and a single papilla on each side. Total tooth rows contain 36-38 in the upper and lower jaws, each. The pelvic span is 31.7-35.1%, pelvic fin anterior margin 17.5-17.8%, and ventral tail fold 32.6-33.9%, all of the disk width.

The dorsal surface is beige along the margin of the pectoral fin and toward the snout. The pelvic fins are also beige. It is slightly darker between the eyes, and along the center of the body and the length of the tail. Irregularly shaped, gray to slate blue blotches, some interconnected, bordered by a thin dark flint gray margin, that spreads along the central part of the back from between the eyes to just before the beginning of the tail. The caudal sting is beige and the belly off-white to beige. The ventral surface is uniformly whitish to beige with a gray to slightly brownish margin at the tip of the snout.

DISCUSSION

Dasyatis chrysonota is closely related to *D. pastinaca* (Linnaeus, 1758) and, therefore, the two are often confused and misidentified. According to COWLEY & COMPAGNO (1993), these species can be distinguished by the ratio between the disk length and disk width and by the snout to vent length/disk width, which is smaller in *D. pastinaca*. In addition, the species differ in coloration: the dorsal surface of *D. pastinaca* is grayish-green to olive brown. *D. chrysonota* was reported for the first time in the Mediterranean in the Gulf of Gabès (southern Tunisia) by MAURIN & BONNET (1970) as *D. pastinaca* var. *marmorata*. This occurrence was confirmed under the same taxon by QUIGNARD & CAPAPÉ (1971). Referring probably to earlier taxonomical papers (see COWLEY & COMPAGNO, 1993) such as FREDJ & MAURIN (1987) and CAPAPÉ & DESOUTTER (1990), QUIGNARD & TOMASINI (2000) considered *D. chrysonota* = (*D. marmorata*) a valid species and included it among the chondrichthyan fishes of the Mediterranean Sea and the eastern tropical Atlantic.

Several papers provide information on the ecology (CAPAPÉ, 1989), food and feeding habits (CAPAPÉ & ZAOUALI, 1992) and reproductive

biology of *D. chrysonota* (*D. marmorata*). CAPAPÉ (1989) suggested that in southern Tunisian waters, *D. chrysonota* undergoes competitive pressure from related dasyatid species. Consequently, it inhabits restricted areas in the Gulf of Gabès, entering a closed hyperhaline lagoon, the Bahiret el Biban (CAPAPÉ & ZAOUALI, 1992, 1993, 1995).

CAPAPÉ & ZAOUALI (1993, 1995) estimated that disk width (DW) at birth is 108-115 mm and that sizes at sexual maturity for males and females are close to 300 mm and 320 mm DW, respectively. The two specimens from Israel are 171 and 230 mm DW and their sizes, especially with regard to the first specimen, indicate that they were born in Israeli waters.

In the eastern tropical Atlantic, *D. chrysonota* is widely distributed from southern Morocco to South Africa (COWLEY & COMPAGNO, 1993). This pattern of zoological distribution, whereby a species is found in the Mediterranean only along the southern coasts and in the Levant, is known in other species, e.g., *Encheylcore anatin*a, *Arius parkii* and *Acanthurus monroviae* (see GOLANI *et al*., 2002). It is possible that *D. chrysonota* is generally rare or that many cases of this species have been confused with *D. pastinaca*.

With the addition of *Dasyatis chrysonota* to the Levantine ichthyofauna it seems appropriate to present a key to the family in the region and the entire Mediterranean

Key to Dasyatidae species in the Mediterranean

1a. Tail shorter than disk width; membranous fold on the posterior ventral surface of tail reaching its tip ..... *Taeniura grabata*

1b. Tail longer than disk width; if membranous fold present, it does not reach tip of tail 2

2a. Tail more than 2.5 times longer than disk width 3

2b. Tail length less than 2.5 times in disk width 4

3a. Pointed snout; upper surface light-brown with numerous dark brown spots .....*Himantura uarnak*

3b. Round snout; upper surface uniformly violet to brownish-blue .....*Dasyatis violacea*

4a. Tail length more than twice disk width .....*Dasyatis centroura*

4b. Tail length less than twice disk width 5

5a. Three papillae on the mouth floor; upper surface without blotches or spots ..... *Dasyatis tortonesei*

5b. Five papillae on the mouth floor; upper surface with blotches and spots 6

6a. Disk length more than 80% and snout-to-vent length more than 70% of disk width .....*Dasyatis chrysonota*

6b. Disk length less than 80% and snout-to-vent length less than 70% of disk width ..... *Dasyatis pastinaca*

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Prvi podaci o pronalsku žutulje, *Dasyatis chrysonota* (Smith, 1828) (Chondrichthyes: Dasyatidae), u izraelskom priobalju (istočni Mediteran)

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SAŽETAK

Dva primjerka žutulje, *Dasyatis chrysonota (*SMITH, 1828*),* su ulovljena na mediteranskoj obali Izraela kao prvi zabilježeni nalaz na Levantu. Ova vrsta je poznata u tuniskom zaljevu Gabès. U ovom radu je razmatrana rasprostranjenost ove zapadno-atlantske vrste.

Ključne riječi: Chondrichthyes, Dasyatidae, *Dasyatis chrysonota*, Mediteran, južni Tunis, izraelska obala