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RESEARCH NOTE

First record of total albinism in southern stingray *Dasyatis americana*

Primer reporte de albinismo total en la raya *Dasyatis americana*

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Abstract. This paper describes the first record of total albinism in the southern stingray *Dasyatis americana*. The disc width of the albino sub adult female specimen was 640 mm and the total weight was 9,850 g. It was captured in the coast of Tabasco, southeastern Mexico.

Key words: Albinism, *Dasyatis americana*, elasmobranchs, Tabasco, southeast Mexico

INTRODUCTION

Albinism is a genetically inherited condition in which the pigment protein melanin is either absent or nonfunctional (Reum 2008). Individuals with total albinism exhibit total absence of melanin involving the entire body; on the other hand, partial albinism (or leucism) is phenotypically characterized by absence of melanin in part of the body or reduction of melanin in the entire body or a part of it (Lutz 2001). Albinism appears to be more common in bony fishes than in elasmobranchs, in which it has been reported in at least 26 shark and 15 ray species (Table 1).

The southern stingray *Dasyatis americana* (Hildebrand & Schroeder, 1928) is a coastal marine and estuarine species with a wide distribution in the Western Atlantic (McEachran & Fechhelm 1998). Its geographic distribution is from New Jersey to Florida in the United States, throughout the Gulf of Mexico, Bahamas, and the Greater and Lesser Antilles, and bordering the northern coast of South America to southeastern Brazil (McEachran & Fechhelm 1998). In the western Campeche Bank, in southern Gulf of Mexico, *D. americana* is the most frequently landed among elasmobranch species, with mean landings of 1,400 tons per year in the state of Campeche, Mexico (Ramírez-Mosqueda *et al.* 2012).

This paper describes the first report of total albinism in southern stingray *D. americana* in southeastern Mexico.

MATERIALS AND METHODS

An albino subadult female *Dasyatis americana* was found during a sampling conducted on January 25, 2014 to estimate distribution sizes and yields of different species caught by commercial small scale fisheries in San Pedro,

Tabasco, in the Southern Gulf of Mexico (18°39'32.35" N, 92°28'13.45"W). The specimen was caught on a bottom-long line with circle hooks at a depth between 18 and 25 m on sandy substrate. According to information provided by the fishermen, other species were included in the same catch, such as *Bagre marinus*, *Ariopsis felis*, and *Rhizoprionodon terranova*. The specimen was collected and transported to the laboratory where it was identified using the criteria described by Hoese & Moore (1998). The disc width of the fresh specimen was measured with a metric tape and total weight (g) with electronic portable digital weight scale. The specimen was deposited in the Ichthyology Collection of the Colegio de la Frontera (ECOSUR) under catalog number ECOSC 7561.

RESULTS AND DISCUSSION

The albino southern stingray *Dasyatis americana* measures 640 mm in disc width and its total weight is 9,850 g. This specimen size corresponds to a sub adult stingray (Ramírez-Mosqueda *et al.* 2012). The entire stingray was completely white in color and devoid of any pigmentation (Fig. 1a). In pigmented specimens of *D. americana* the top of the body normally varies between olive brown and green in adults, dark grey in juveniles, whilst the underside is predominantly white (Fig. 1b).

Already 41 species of elasmobranchs have been reported with albinism (Clark 2002, Ishihara *et al.* 2001, Sandoval-Castillo *et al.* 2006, Ben-Sousii 2007, Hoare 2009, Escobar-Sanchez *et al.* 2014).

Schwartz & Safrit (1977) reported an albino specimen of *D. americana* from the coast of North Carolina, USA. This specimen was not a total albino because certain parts of the body had coloration. Until now, no record of total albino

Table 1. Albinism reports in elasmobranchs. (1): in Clark (2002); (2): in Ishihara *et al.* (2001); (3): in Sandoval-Castillo (2006); (4): in Ben-Souissi (2007); (5): in Escobar-Sanchez *et al.* (2014) / Reportes de albinismo en elasmobranchios. (1): en Clark (2002); (2): en Ishihara *et al.* (2001); (3): en Sandoval-Castillo (2006); (4): en Ben-Souissi (2007); (5): en Escobar-Sanchez *et al.* (2014)

Record	Family	Species	Albinism	Capture site	Reference
1	Hexanchidae	<i>Notorynchus cepedianus</i>	partial	California	Herald (1953)(1)
2	Cetorhinidae	<i>Cetorhinus maximus</i>	?	Norway	Froiland (1975)(1)
3	Ginglymostomatidae	<i>Nebrius concolor</i>	total	Japan	Taniuchi & Yanagisawa (1987)(1)
4	Stegostomatidae	<i>Stegostoma fasciatum</i>	total	Indian Ocean	Nakaya (1973)(1)
5	Lamnidae	<i>Carcharodon carcharias</i>	partial	?	Smale & Heemstra (1997)(1)
6		<i>Lamna nasus</i>	total		Froiland 1975(1)
7	Triakidae	<i>Mustelus californicus</i>	total	Monterey Bay	Herald <i>et al.</i> (1960)(1), Talent (1973)(1), Cohen (1973)(1)
8		<i>Mustelus schmittii</i>	total	Brazil	Ferreira Teixeira & Goes de Araújo (2002)(1)
9		<i>Triakis semifasciata</i>	total	California	Follett (1976)(1)
10		<i>Hemitriakis japonica</i>	partial	Japan	Furuta (1985)(2)
11	Hemiscyllidae	<i>Chiloscyllium plagiosum</i>	total	USA	Clark 2002 (1)
12		<i>Galeorhinus galeus</i>	total	Channel	Deynat (2003)(4)
13	Carcharhinidae	<i>Carcharhinus amboinensis</i>	partial	Australia	McKay & Beinssen (1987-1988)(1)
14		<i>Carcharhinus elanopterus</i>	total	India	Manojkumar (2011)
15		<i>Carcharhinus isodon</i>	partial	Alabama, USA	Jones <i>et al.</i> (2006)
16		<i>Carcharhinus plumbeus</i>	partial	Gulf of Gabès, Tunisia	Saïdi <i>et al.</i> 2006
17		<i>Carcharhinus obscurus</i>	total	Gulf of California	Bejarano-Álvarez & Galván-Magaña (2013)
18		<i>Galeocerdo cuvier</i>	total	Baja California sur, Mexico Gulf of Mexico	Rider <i>et al.</i> 2002, (3) Sandoval-Castillo <i>et al.</i> 2006 (4)
19		<i>Scoliodon laticaudus</i>	partial	Arabian Sea	Veena <i>et al.</i> 2011
20	Sphyrnidae	<i>Sphyrna lewini</i>	total	Georgia	McKenzie (1970)(1)
21	Orectolobidae	<i>Orectolobus japonicus</i>	total	Japan	Iwamasa & Okano 1980(3)
22	Squalidae	<i>Squalus acanthias</i>	partial	Georgia	Froiland (1975)(2), Coad & Gilhen (2002)(3)
23		<i>Squalus megalops</i>	total	?	Sanda & De Maddalena (2003)(4)
24	Squatinae	<i>Squatina californica</i>	partial	Gulf of California	Escobar-Sanchez <i>et al.</i> (2014)(5)
25	Somniosidae	<i>Centroscyrmus coelolepis</i>	partial	NE Atlantic	Deynat (2003)(3)
26	Dalatiidae	<i>Dalatias licha</i>	partial	Italy	Bottaro <i>et al.</i> (2005)(4)
27	Rhinobatidae	<i>Rhinobatos halavi</i>	total	Tunisia	Ben-Souissi <i>et al.</i> (2007)
28	Rajidae	<i>Raja clavata</i>	partial/total	Scotland	Traquair (1893)(1) Ball <i>et al.</i> (2013)
29		<i>Raja montagui</i>	total	North Sea and English Channel	Ball <i>et al.</i> 2013
30		<i>Raja brachyura</i>	total	North Sea and English Channel	Ball <i>et al.</i> 2013
31		<i>Raja naevus</i>	partial	Scotland	Wilson 1951(2)
32		<i>Dipturus batis</i>	partial	Scotland	Wilson 1951(2)
33		<i>Dasyatis americana</i>	partial	North Carolina, USA	Schwartz & Safrir Jr.(1977)(1)
34		<i>Dasyatis pastinaca</i>	partial	Tunisia	Capapé & Pantoustier (1975)(1)
35		<i>Okamejei kenojei</i>	partial	West Pacific	Ishihara <i>et al.</i> (2001)(3)
36	Rhinopterae	<i>Rhinoptera bonasus</i>	partial	Maryland Chesapeake Bay	Schwartz (1959)(1) and Joseph (1961)(3)
37		<i>Zanobatus schoenleinii</i>	partial	Senegal	Diatta <i>et al.</i> 2013
38	Myliobatidae	<i>Myliobatis californica</i>	total	California	Jesus-Roldan (1990)(3)
39	Torpedinidae	<i>Torpedo torpedo</i>	total	Tunisia	Ben Brahim <i>et al.</i> (1998)(3)
40	Mobulidae	<i>Manta birostris</i>	partial	West Pacific	Ishihara <i>et al.</i> 2001(2), Marshall <i>et al.</i> (2009)
41	Narcinidae	<i>Narcine entemedor</i>	total	Baja California Sur, Mexico	Sandoval-Castillo <i>et al.</i> 2006

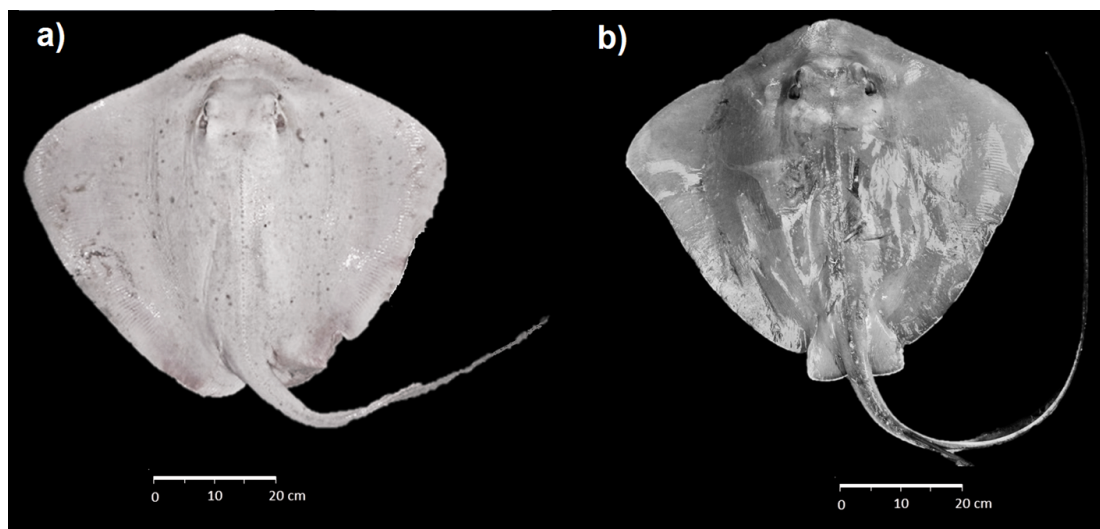


Figure 1. Dorsal view of the southern stingray *Dasyatis americana*. a) albino and b) normal. (Photo by A.T. Wakida-Kusunoki). Photographs were taken to fresh specimens / Vista dorsal de la raya sureña *Dasyatis americana*. a) albino y b) normal. (Fotografía de A.T. Wakida-Kusunoki). Fotografías tomadas de un espécimen en estado fresco

southern stingray has been reported. On Mexican Gulf coast, albinism has been reported only in catfish *Bagre marinus* (Wakida-Kusunoki & Amador del Angel 2013).

The occurrence of albinism in fishes might be caused by three factors: random genetic alterations, contamination effects, or genetic alteration due to small population size (Evangelista-Leal *et al.* 2013). The coastal zone of Tabasco and Campeche is impacted by oil extraction and discharge of rivers. The main sources of heavy metals in the area include mineral deposits, chronic natural oil seep (natural sources) rivers and municipal discharges and oil (anthropogenic sources) (Ponce-Velez *et al.* 2006). Recent studies indicate that the concentrations of heavy metals in sediment south of the Gulf of Mexico are in the range reported for other coastal regions of the Gulf of Arabia, Jordan, Kuwait and England (Ponce-Velez *et al.* 2006). Also, reports of heavy metal concentrations in muscle tissue of organisms such as fish and crustaceans are below thresholds of international standards (Vázquez *et al.* 2008).

The fishing pressure on *Dasyatis americana* of this region has been high. Its mean landings are 1,964 tons per year in the state of Campeche and Tabasco (CONAPESCA 2012)¹. The lack of fishery management measures in bottom long line fishery might have caused a decline in the abundance of this species. The small effective population size might have favored inbreeding and increased the homozygosity in the albinism gene (Sanabria *et al.* 2010).

The lack of coloration in albinos has been suggested to increase susceptibility to predation or render them less attractive for reproduction (Sandoval-Castillo *et al.* 2006); higher susceptibility to disease and poor vision may decrease the viability of albinos. This is the second report of albinism in fishes from the southeastern Gulf of Mexico. Both reports are species subject to commercial fishing with a high number of individuals being captured for decades with no previous record of albinism. This, then, is a rare event still undetected in most wild fish species, at least regarding adult individuals.

Although the albinism events recorded might be the result of random events, the fact remains that human factors such as pollution and excessive fishing pressure might be involved, thereby warranting a thorough investigation of these aspects in the region.

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¹CONAPESCA. 2012. Anuarios Estadísticos de Pesca. Comisión Nacional de Pesca, México. <http://www.conapescasagarpa.gob.mx/wb/cona/anuario_2012_zip>

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