



# First record of a leucistic *Narcine bancrofti* (Elasmobranchii, Narcinidae) from the northern Gulf of Mexico

by

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**Résumé.** – Premier signalement d'une *Narcine bancrofti* leucistique (Elasmobranchii, Narcinidae) au nord du golfe du Mexique.

La présente étude rapporte le premier signalement d'un cas de leucisme chez une espèce de Narcine, *Narcine bancrofti* (Griffith & Smith, 1834). Cette raie leucique, un mâle immature, a été capturée avec 21 congénères présentant la coloration normale de l'espèce. Dix-neuf de ces animaux, y compris la raie leucique, ont été conservés pour un examen plus approfondi. Douze mesures morphométriques ont été réalisées sur chacune d'entre-elles et rapportées à la longueur totale afin d'identifier si des anomalies morphologiques supplémentaires étaient présentes. Dans chaque cas, la raie leucique présentait des proportions relatives similaires à celles des spécimens de coloration normale.

**Key words.** – Narcinidae - *Narcine bancrofti* - Gulf of Mexico - Leucism - First record.

Albinism refers to a complex of genetic disorders affecting the production of the pigment melanin, resulting in a lack of pigmentation in both the skin and iris (Clark, 2002). Albinism is controlled by several different genes (Summers, 2009) and in many cases results from reduced activity of tyrosinase (Reis *et al.*, 2013). Leucism, on the other hand, is controlled by a single recessive allele (Owen and Skimmings, 1992) and has primarily been used in reference to herpetological examinations (Veena *et al.*, 2011). Generally, leucism results in either the complete or partial lack of pigmentation of the skin, while the pigmentation of the iris presents as normal for the species (Bechtel, 1995). As melanin production is similar among amphibians, reptiles, and fishes, and many ichthyological descriptions of so called "partial albinism" resemble those in herpetological literature, the term leucism seems appropriate for fishes as well (Clark, 2002; Veena *et al.*, 2011).

Although rare, albinism and leucism have been reported for several elasmobranch species, with detailed reviews of the subject provided by Nakaya (1973), Clark (2002), and Sandoval-Castillo *et al.* (2006). In most instances the albino individual appears morphologically similar to other conspecifics (e.g. Nakaya, 1973; Talent, 1973; Clark, 2002; Reis *et al.*, 2013). However, in rare instances the albinism is associated with additional, morphological abnormalities (e.g. Taniuchi and Yanagisawa, 1987; Saïdi *et al.*, 2006; Escobar-Sánchez *et al.*, 2014). It was the purpose of this note to report the capture of a single leucistic lesser electric ray, *Narcine bancrofti* (Griffith & Smith, 1834), in the northwestern Gulf of Mexico and to compare morphometrics taken from the leucistic individual with 18 conspecifics captured at the same location to determine if additional abnormalities were associated with the leucism.

On 13 June 2014, 22 *Narcine bancrofti* were captured east of Port Aransas, TX (27.782°N, 097.038°W; Fig. 1), in approximately 13 m of water, during a trawl event on the annual National Marine Fisheries Service (NMFS) Southeast Area Monitoring and Assessment Program (SEAMAP) bottom trawl survey in the northern Gulf of Mexico (GOM).

Nineteen of these 22 individuals were retained for further investigation. Of those retained, nine were male, ranging in size from 145 to 323 mm total length (TL). Three of the males were immature (145-234 mm TL), with the remainder (n = 6) being



Figure 1. - Capture location (black circle) of *Narcine bancrofti* examined in this study.



Figure 2. - Leucistic *Narcine bancrofti* surrounded by conspecifics presenting normal pigmentation.

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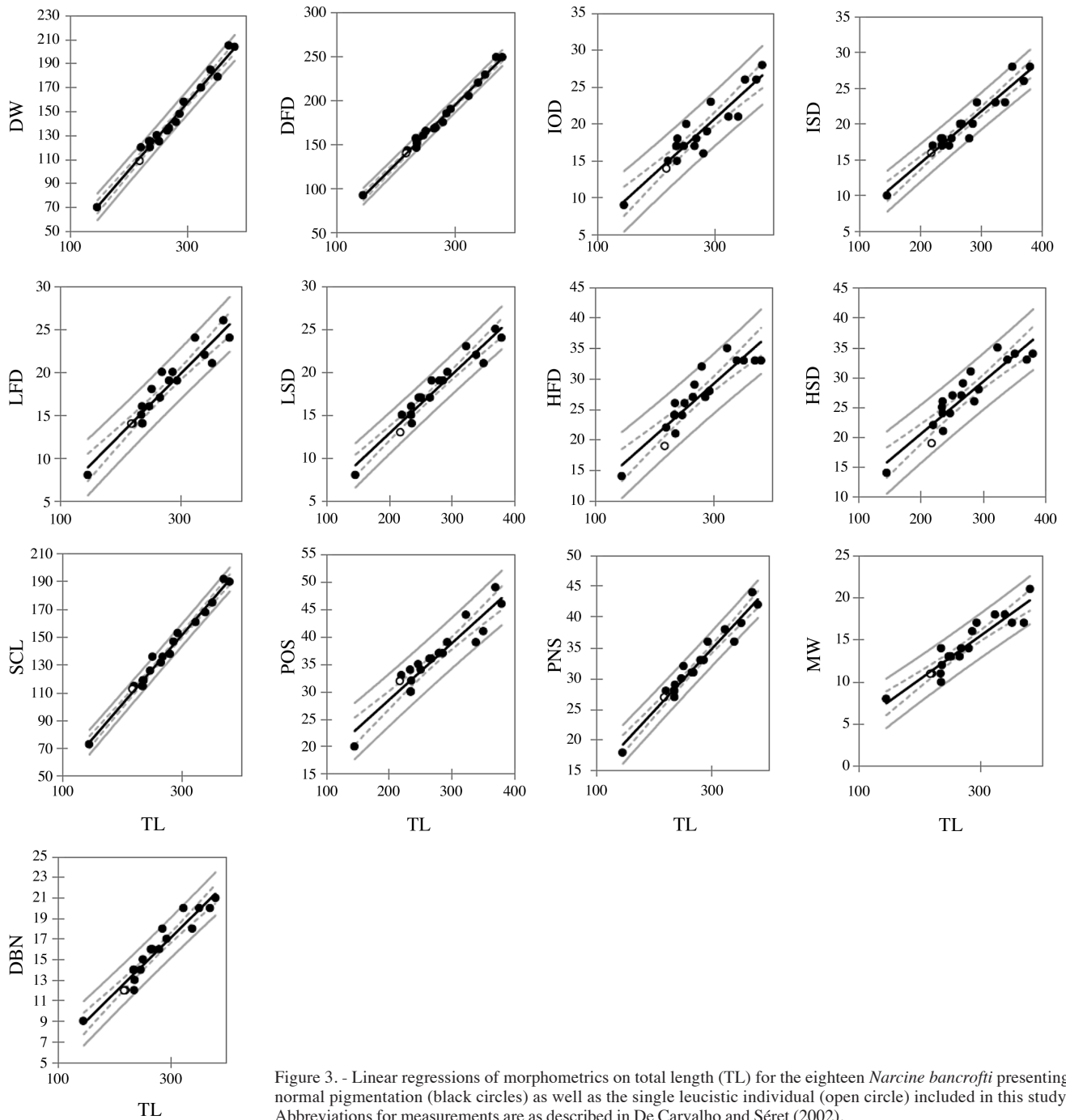


Figure 3. - Linear regressions of morphometrics on total length (TL) for the eighteen *Narcine bancrofti* presenting normal pigmentation (black circles) as well as the single leucistic individual (open circle) included in this study. Abbreviations for measurements are as described in De Carvalho and Séret (2002).

mature (235-323 mm TL). Maturity status for males was based on clasper calcification, rotation and rhipidion opening (Clark and von Schmidt, 1965). The remaining 10 individuals were female, ranging from 220 to 380 mm TL. Five of the females were immature (220-293 mm TL) and five were mature (286-380 mm TL). All mature females, except one, were gravid with four to nine embryos present. All embryos were in the early stages of development and measured approximately 25 mm TL. The single mature female in which no embryos were found had yolk in the right uterus, but none in the left. A single individual, recorded as immature, possessed a

developing right ovary and widening of the uteri, from posterior to anterior.

All of the specimens examined presented normal pigmentation for this species with the exception of a single individual (Fig. 2). This specimen exhibited pigmentation consistent with descriptions of leucism, lacking pigmentation on the body but presenting normal pigmentation of the iris (Bechtel, 1995). The individual was an immature male measuring 217 mm TL and 109 mm disc width (DW). Other than pigmentation, the leucistic individual appeared normal.

In an effort to determine if additional abnormalities were present in the leucistic individual, a suite of twelve morphometrics, in addition to TL and DW, were measured to the nearest mm on all 19 retained individuals. The measurements were taken as described in De Carvalho and Séret (2002). After examination, all specimens were deposited in the ichthyological museum at the University of Southern Mississippi's Gulf Coast Research Laboratory (normally pigmented rays, GCRL 36549; leucistic ray, GCRL 36550). Each measure was regressed on TL to determine if the leucistic individual followed the same trend as those presenting normal pigmentation. In all cases, the leucistic ray exhibited similar relative proportions to the non-leucistic individuals (Fig. 3).

Since 1972, 608 *Narcine bancrofti* have been captured in 186 of the 18,725 (~1.0%) tows conducted during both summer and fall NMFS SEAMAP bottom trawl surveys in the GOM. To our knowledge, this is the first record of leucism reported for *Narcine bancrofti*. It has been speculated that albinism and leucism may put individuals at a disadvantage, owing to the fact that they lack the camouflage afforded their normally pigmented conspecifics and they may be less attractive to potential mates (Sandoval-Castillo et al., 2006). However, records of mature (Taniuchi and Yanagisawa, 1987; Sandoval-Castillo et al., 2006), and in one case gravid, (Joseph, 1961) albinistic or leucistic individuals may indicate that the lack of pigmentation does not alone impose a significant disadvantage to either survival or reproduction (Sandoval-Castillo et al., 2006). *Narcine bancrofti* have been noted for burying themselves in the sand, with only small portions of the body exposed (Coles, 1910). This behavior could have contributed to the survival of the leucistic individual noted in the current study, as the lack of pigmentation is not as disadvantageous when sufficiently covered.

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