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Case of leucism in the spadenose shark, *Scoliodon laticaudus* (Müller and Henle, 1838) from Mangalore, Karnataka

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ABSTRACT

The present paper reports the first case of leucism in the spadenose shark, *Scoliodon laticaudus* from India. This report is based on the study of a single specimen of *S. laticaudus* caught by a commercial trawler off Mangalore coast. Photographs were taken and measurements recorded using vernier calipers. Partial reduction in pigmentation and no other morphometric differences were seen between the specimen studied and other normal spadenose sharks. Conclusion of leucism in the specimen was done based on the partial lack of integumentary pigments and normal eye colour.

Keywords: Leucism, Mangalore, Partial albinism, *Scoliodon laticaudus*, Spadenose shark.

Albinism is a hereditary lack of pigmentation caused by an enzyme deficiency involving the metabolism of melanin during prenatal development and may involve the entire body or a part of the body (Boncinelli, 1998). A new term leucism, has been introduced to animal biology to describe reptiles and amphibians with abnormal skin pigmentation and normal eye colour (Bechtel, 1995) and recently it has also been used in ichthyology (Steven, 2002). The term leucism, more prominently used within the herpetological discipline, is suggested as a more apt description for previously reported color aberrations in elasmobranchs and hence it is felt apt to use this term for partial albinism observed in the present study. The present communication reports the first record of leucism (partial albinism) in a specimen of *Scoliodon laticaudus* (Müller and Henle, 1838) from Mangalore, south-west coast of India along with details of comparative account of this specimen with other normal specimens of the same species.

A specimen of spadenose shark (*S. laticaudus*) was landed in a commercial trawler operating in the 0 - 60 m deep fishing grounds, off Mangalore (Arabian Sea) in November 2006. The specimen was collected and brought to the laboratory where it was identified using FAO identification sheets (Fischer and Bianchi, 1984). The morphometric characteristics of the specimen were noted using vernier calipers. Body measurements were made according to Compagno (1984). All the measurements were taken after fixation in formalin. The characteristics of normal specimens of the same sex and equivalent length, caught within the same area were also

collected for comparative analysis. In order to quantify the albino surface, the specimen was photographed and four pictures (dorsal, ventral, left and right sides) of the fish were used and the white patches were quantified using the same.

The landed specimen of *S. laticaudus* was a male, measuring 50 cm in total length and weighing 430 g. The morphometric measurements noted are given in Table 1. It had white patches, clearly visible on the dorsal side from tip of snout to the caudal fin tip (Fig. 1a-d). On the lateral sides, only some parts near the head region and caudal end had white markings (Fig. 1b). The first and second dorsal fins showed slight discoloration on anterior ends whereas the pectoral, pelvic and anal fins did not have any change in colour. There was no discoloration on the entire ventral side (Fig. 1c). The eyes showed normal retinal pigmentation (Fig. 1e). Denticles were present which confirmed that the observed white patches were not caused due to denticles being removed during the trawl process. Hence, it was concluded that the specimen was a partial albino.

The normal body colouration of spadenose shark is bronze grey above and white below. The fins sometimes are darker than the body with no other conspicuous markings. Other than partial albinism, this shark appeared normal in all other respects when compared to other normally pigmented specimens of the same species and of same sex caught along the same region.

Leucism has been commonly reported in teleosts worldwide (Follet and Dempster, 1976; Dingerkus *et al.*,

Table 1. Morphometric characteristics of the albino shark, *Scoliodon laticaudus* landed at Mangalore

Morphometric characters	Albino shark
Wt (g)	430
TL (mm)	500
SL (mm)	383
FL (mm)	423
Head length (mm)	115
Snout length (mm)	43.6
Eye diameter (mm)	7.9
Post-orbital length (mm)	62.2
Inter-orbital length (mm)	38.7
Inter narial length (mm)	34.4
Pectoral fin length (mm)	50.1
Dorsal I fin length (mm)	56.4
Dorsal II fin length (mm)	23.0
Ventral fin length (mm)	24.1
Anal fin length (mm)	22.1
Pectoral fin base length (mm)	29.9
Dorsal I fin base length (mm)	45.6
Dorsal II fin base length (mm)	13.3
Ventral fin base length (mm)	24.9
Anal fin base length (mm)	36.2
Clasper length (mm)	56.9
Caudal peduncle length (mm)	21.0
Upper caudal fin length (mm)	117.0
Lower caudal fin length (mm)	44.3
Gill slit I length (mm)	18.7
Gill slit V length (mm)	13.1
Body depth before 1 st dorsal (mm)	59.9
Head depth (mm)	45.8
Sex	Male
Maturity	Mature
Date of collection	15.11.06
Place	Mangalore

1991; Béarez, 2002) and also occurs among Chondrichtheans. In fact, partial or total albinism has been described in different species of cartilaginous fishes, both in rays (Traquair, 1893; Schwartz, 1959; Joseph, 1961; Nakaya, 1973; Schwartz and Safrin, 1977; Jesus-Roldand, 1990; Brahim *et al.*, 1998) and in sharks *Sphyrna lewini* (McKenzie, 1970); *Mustelus californicus* (Talent, 1973); *Mustelus californicus* (Cohen, 1973); *Stegostoma varium* (= *fasciatum*) (Nakaya, 1973); *Triakis semifasciata* (Follett, 1976); *Nebrius concolor* (Taniuchi and Yanagisawa, 1987); *Carcharhinus amboinensis* (McKay and Beinssen, 1987:1988); *Carcharodon carcharias* (Smale and Heemstra, 1997); *Mustelus schimitti* (Teixeira and

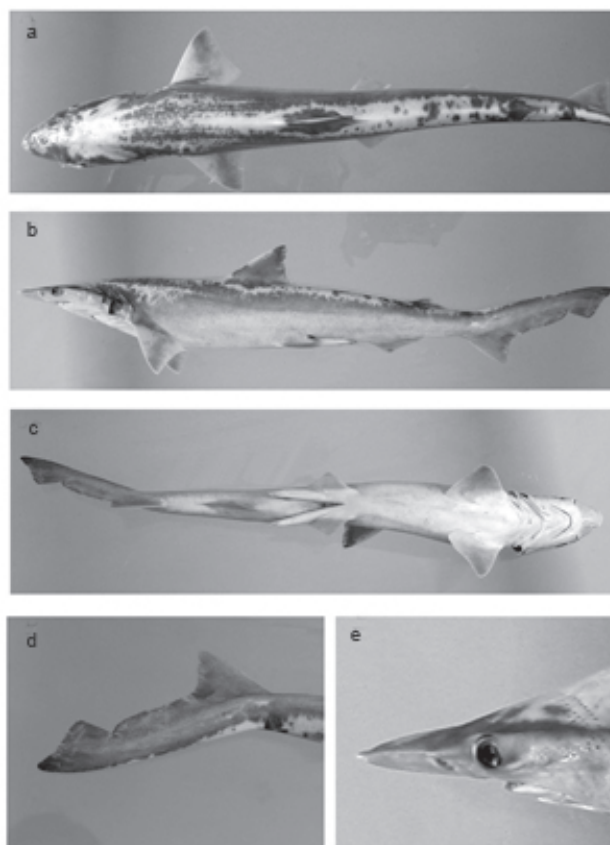


Fig. 1. Leucism in *Scoliodon laticaudus*; a. Partial lack of pigmentation seen in dorsal view; b. Partial lack of pigmentation seen in lateral view; c. Ventral view showing no discoloration; d. Discolouration in tail region; e. Eye showing normal pigmentation

Araújo, 2002); *Chiloscyllium plagiosum* (Steven, 2002); Leopard shark (Alistair, 2002); *Centroscymnus coelolepis* (Deynat, 2003); *Heterodontus portusjacksonii* (Clarke, 2004); Brier shark (McGrouther, 2004); *Dalatias licha* (Bottaro *et al.*, 2005); *Notorhynchus cepedianus*, *Nebrius ferigineus*, *Cetorhinus maximus* and *Galeocerdo cuvier* (Reef Quest Centre for Shark Research, 2006).

From the Indian waters, complete albinism has been reported in a cat fish *Arius caelatus* (Valenciennes) by Pillai and Somvanshi (1979) and by Das *et al.* (2006) and in sharks by Gopalan (1971).

It is learnt from the Reef Quest Centre for Shark Research (2006) that relative darkness or lightness of a given shark species may vary enormously among individuals. Dusky smoothhound (*Mustelus canis*) can gradually change their color after moving from one habitat to another and blacktip shark (*Carcharhinus limbatus*) may temporarily lose virtually all their pigmentation during “whitings”, which may be due to blooms of shelled protozoans called “coccolithophores” (Reef Quest Centre for Shark research,

2006). But true albinos seem to be very rare among sharks. Snow white colour makes them highly visible to both prey and predators, so it is unlikely they would survive long (Reef Quest Centre for Shark research, 2006).

Another possible reason for the low frequency of this alteration could be simply based on the relatively small presence of the cartilaginous fish in nature (Bottaro *et al.*, 2005). In fact, chondrichtheans are top predators and so they are normally present with low values of abundance (Bonfil, 1994); furthermore they are characterised as having slow growth, being longlived, maturing at a late age and having low fecundity, resulting in low rates of population increase (Camhi *et al.*, 1998).

This is the first report of leucism described in *Scoliodon laticaudus* from India. We prefer to define it as a case of leucism due to the colour irregularity, partial depigmentation of the body surface and normal retinal pigmentation.

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