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Sparks beneath the sea? First record of a lined colour morph in the sea snakes

A recent study by Parmar & Kaiser (2024) linked unusual morphs in Russell’s Vipers and Wolfsnakes to the spark/spark genotype mutation. We report a similar aberrant pattern for the first time in a sea snake observed in India (Bharuch District, Gujarat). During a marine reptile survey on January 26, 2019, near Aliabet, Bharuch District, in the Gulf of Khambhat (21.5958°N, 72.4408°E), fishermen caught 24 Annulated Sea Snakes (*Hydrophis cyanocinctus*) and one Little Filesnake (*Acrochordus granulatus*). One sea snake had an unusual pattern, differing from all other sea snakes (Fig. 1). This individual measured 1030 mm in SVL with a tail length of 110 mm.

A unique pattern. The abnormal snake was examined, photographed, and released at the bycatch site. We identified the snake as *Hydrophis cyanocinctus* based on a comparison of its morphometrics, scalation, and head pattern with the descriptions given by Whitaker & Captain (2008), Ganesh *et al.* (2019), and Parmar (2019): 35-40-36 dorsal scale rows, taken behind the head, at midbody, and just anterior to the cloaca, respectively; 312 ventrals, 55 subcaudals; six supralabials (SL) on both sides of the head, with SL4 in contact with the eye, SL4 partially divided dorso-ventrally, SL2 in contact with the prefrontal on both sides; 1/1 preocular, 1/2 postoculars on the left and right sides (L/R), respectively; 1L/2R anterior temporals; with a series of small scales bordering the mouth beginning at SL3; a series of scales along the infralabials beginning after the second infralabial; internasals elongated, nostrils positioned posteriorly on the internasals and located near the prefrontal at the top of the snout.

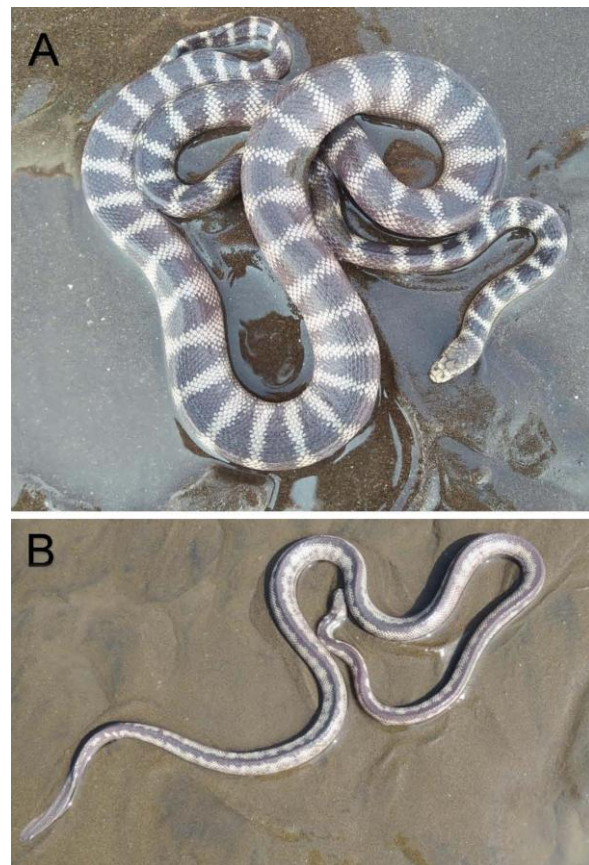


Figure 1. *Hydrophis cyanocinctus* (A) typical banded morph and (B) abnormal morph, potentially of the *spark/specter* mutation; © Photos: D.S. Parmar, M.H. Patel.

Whitaker & Captain (2008) reported 7 or 8 supralabials for this species, while the snake with the aberrant pattern had only six, the lowest count recorded. Whereas the head colour and pattern were typical for this individual, a relatively wide vertebral line (4–10+ scales wide) began immediately after the fifth vertebral scale, just behind the scale row where the parietals meet. The line was brownish on the anterior body, extending to the midbody, where it transitioned to dark grey and extended onto the

tail without borders. The sides of the body were cream-coloured. The tail itself was dark grey, with the longitudinal line gradually darkening to nearly black near the vent. Laterally, the line had some indistinct dark triangular projections. The stripe was four to seven scales wide except at the level of the dark projections, when it widened to 10 or more scales. No abnormalities were observed in the ventral pattern. To the best of our knowledge, this body pattern, unlike the typical banded phenotype, has never been documented in this species.

Sparks colour mutation. Wolf & Werner (1994) studied striped/non-striped polymorphism in snakes and found the striped pattern mainly in Colubridae, suggesting it aids in escape and camouflage. However, they did not report stripes in sea snakes, making the present study's findings extremely rare. Among sea snakes, *Hydrophis platurus* (Linnaeus, 1766) is known to exhibit diverse colour patterns. Parmar (2018) documented an aberrant, yellow and light brown unlined morph of *Hydrophis platurus* from Surat District, Gujarat—an area adjacent to Bharuch. This morph differed from the unpublished black and yellow variants reported from Gujarat and appeared to represent an intermediate form between the black-and-yellow and yellow morphs described in the published works of Bessesen & Galbreath (2017) and Solórzano & Mahmood (2024). Solórzano & Mahmood (2024) reported several colour variants, including the lined morph, attributing these differences mainly to geography. They noted predominantly yellow populations in Golfo Dulce and bicoloured ones in oceanic regions. Dao *et al.* (2023) linked genotype to colour patterns in ball pythons, and Parmar & Kaiser (2024) extended this to Russell's vipers (*Daboia russelii*) and wolf snakes (*Lycodon aulicus*) using their pattern recognition. Similarly, our unusual sea snake morph showed differences from the spark/spark genotype. Its dark, distinctive longitudinal stripe contrasts with the spark/specter colour mutation pattern in ball pythons, Russell's Vipers, and Wolf Snakes, which features a light vertebral line bordered by dark lateral colour. Our sea snake shows the inverse of this, as in the image of a spark/specter photo negative. According to the adult size of our specimen, it seems that its distinct colouration allowed that snake to become an adult and does not seem to attract more predators.

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M.H. Patel¹ & D.S. Parmar²

¹ Veer Narmad South Gujarat University, Surat, Gujarat, India

² Herpetology Section, Museum Koenig, Leibniz Institute for the Analysis of Biodiversity Change, Adenauerallee, Bonn, Germany
E-mail: ophiophagus_hannah10@yahoo.com