

## *Chionactis occipitalis*: hypomelanism

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The colouration patterns of wild animals are highly variable, and in rare instances, individuals may lack colour pigments—often termed albinism, leucism, or hypomelanism (for example, see Mira-Mendes, 2017). However, individuals with reduced pigmentation are extremely rare in nature due both to the infrequent occurrence of the mutations that give rise to the condition (Bechtel, 1995) and the decreased survival rates associated with the loss of pigment (Miyamoto, 2016). Here we report a case of hypomelanism in a wild shovel-nosed snake (*Chionactis occipitalis* Hallowell, 1854), a sand burrowing snake in the family Colubridae. Shovel-nosed snakes are small, slender-bodied snakes found in southwestern North America that exhibit a unique countersunk jaw morphology which helps them to “swim” through the soft sandy substrates associated with dune systems (Norris and Kavanau, 1966).

An adult male shovel-nosed snake with significant hypomelanistic traits was found near Kelso Dunes in the Mojave National Preserve in southeastern California (USA) on the night of May 24, 2017. The specimen had a snout-vent length of 275 mm and a body mass of 10 g. The colouration of the specimen was markedly lighter than previously reported for the species. The

characteristic dorsal saddle-patterns of the species, although lightly coloured, were still visible, and the eyes, despite being tinted red, appeared mostly dark in colour, indicating a significant loss of pigment but not complete albinism (Figure 1). The specimen was released at the site of capture after detailed records were taken.

Wild hypomelanistic individuals face a suite of ecological challenges, including increased damage from solar radiation (Brenner and Hearing, 2007), difficulty in avoiding predators (Childs, 1953), and visual impairment (Balkema and Dräger, 1991). However, because shovel-nosed snakes usually remain buried in the sand during the day and are active mainly at night, the negative consequences of hypomelanism may be limited. Damage from solar radiation is unlikely to be an issue, and many nocturnal predators are non-visual foragers. Although we do not have any direct evidence of visual impairment, the collected specimen displayed extreme aggression, especially when compared to the docile behaviour of most shovel-nosed snakes (personal observation), which could be a by-product of decreased visual acuity. The snake frequently struck and took a defensive posture in response to the slightest disturbance, and would even strike toward nearby rocks following a disturbance, seemingly incapable of discriminating between potentially dangerous predators and inanimate objects. Additionally, when disturbed the individual thrashed around and repeatedly changed its orientation as if unable to adequately discern the direction of the perceived threat. Given the diversity of potential predators at the locality where the specimen was found (*e.g.*, foxes, leopard lizards, larger predatory snakes, large scorpions, etc.), the increased aggression may be a strategy to intimidate a potential threat if the visual impairment hinders the specimen’s ability to either identify an optimal escape direction or the direction of the threat.

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**Figure 1.** A) A hypomelanistic *Chionactis occipitalis* found at Kelso Dunes in the Mojave National Preserve, CA (USA). B) A close-up of the head for identification purposes with key features labelled with arrows. Photos by Malachi D. Whitford.

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