REPTILES & AMPHIBIANS

Axial Dicephaly in the False Coral Snake, *Oxyrhopus emberti* (Gonzales, Reichle, and Entiauspe-Neto 2020: Dispsadidae), Santa Cruz, Bolivia

Paola De la Quintana[1,2]

[1]Departamento de Ciéncias Biológicas, Universidad Estudual de Santa Cruz, Rodovia Jorge Amado, Km 16, Ilhéus, CEP 45662-900, Bahia, Brazil (paola.d.c.1186@gmail.com)
[2]Red de Investigadores en Herpetología-Bolivia, La Paz, Bolivia

Axial dicephalia or bicephaly has been reported in a large number of snakes from different families (Wallach 2007), with more than 1,280 cases reported among wild and captive animals (Wallach 2018). Most snakes with this characteristic are usually stillborn and others live for a few hours or days (Wallach 2007). Most of the reported cases have occurred in individuals born in captivity because they are constantly monitored, whereas reports in wild animals are scarce (Bárcenas-Ibarra et al. 2015).

The birth of dicephalic snakes is due to congenital malformations that occur during the embryonic stage, as can occur in several vertebrate groups (Vásquez-Cruz et al. 2020). Dicephalia may be the partial or total duplication of the skull and/or spine. Wallach (2007) proposed eleven possible causes of these malformations during embryonic development: (1) incomplete division of a single embryo, (2) partial fusion of two embryos, (3) abnormally low or high temperatures during incubation or gestation, (4) regeneration after injury, (5) anoxia during embryonic development, (6) toxic effect of metabolic secretions during prolonged stay in the oviduct, (7) inbreeding depression due to small population gene pools, backcrossing, designer and albino morphs, (8) hybridization, (9) environmental pollution, (10) chemical toxins, and (11) radiation exposure.

Specimen MNKR 4336, paratype of *Oxyrhopus emberti*, was reported in the description of the species with a small comment about the existence of a second head without giving more details about the individual (Gonzales et al. 2020). During a visit to the collection of the Museo de Historia Natural Noel Kempff Mercado, I examined this individual and here provide further description: A dicephalic male *Oxyrhopus emberti* with the following combination of characters (Figure 1A–E): total length measured from main head 291 mm, right/left head length from snout to fusion zone 11.82 mm/9.22 mm (4.06% and 3.16% of snout-vent length, respectively); head height right/left 4.29 mm/4.73 mm; width of the heads right/left 6.31 mm/6.11 mm; 201 ventrals plus three fusion zone preventrals; 88 paired subcaudals; tail length 65 mm (full tail); heads moderately short and distinct from the necks. Right head fully formed with distinguishable scales; supralabials 8/8, with 4–5 entering orbit; infralabials 9/9, with 1–1 in contact after mental scale. Left head moderately formed and the lower jaw almost indistinguishable; supralabials 8 (right side indistinguishable), with 4–5 entering orbit; with 4–4 in contact with first chin shields. Smooth dorsal scales, with 19-19-17 rows.

Until 2018, there were no documented records of dicephaly in the genus *Oxyrhopus* (Wallach 2018), and the record by Gonzales et al. (2020) was the second of dicephaly for Bolivia and the first for *Oxyrhopus*. This snake had been collected on 6 January 2004 at Pampagrande in the department of Santa Cruz (18.100000 S, 64.100000 W) and was deposited in the National Museum of Natural History Noel Kempff Mercado as MNKR 4336. The external morphology suggested that the heads were joined by a small neck, although no x-ray verifications were made. About 93% of somatodichotomies fall into the craniodichotomy or prodichotomy categories (hence the most common denomination of dicephalism), and, according to the classification of Smith and Pérez-Higareda (1987) and Wallach (2007), this snake would be nested within the prodichotomous group since the individual presented two complete heads, one with a differentiated neck and the other with a vestigial neck, and a single body and tail. Prodichotomous short-necked snakes can have their heads directed at any angle, and range from

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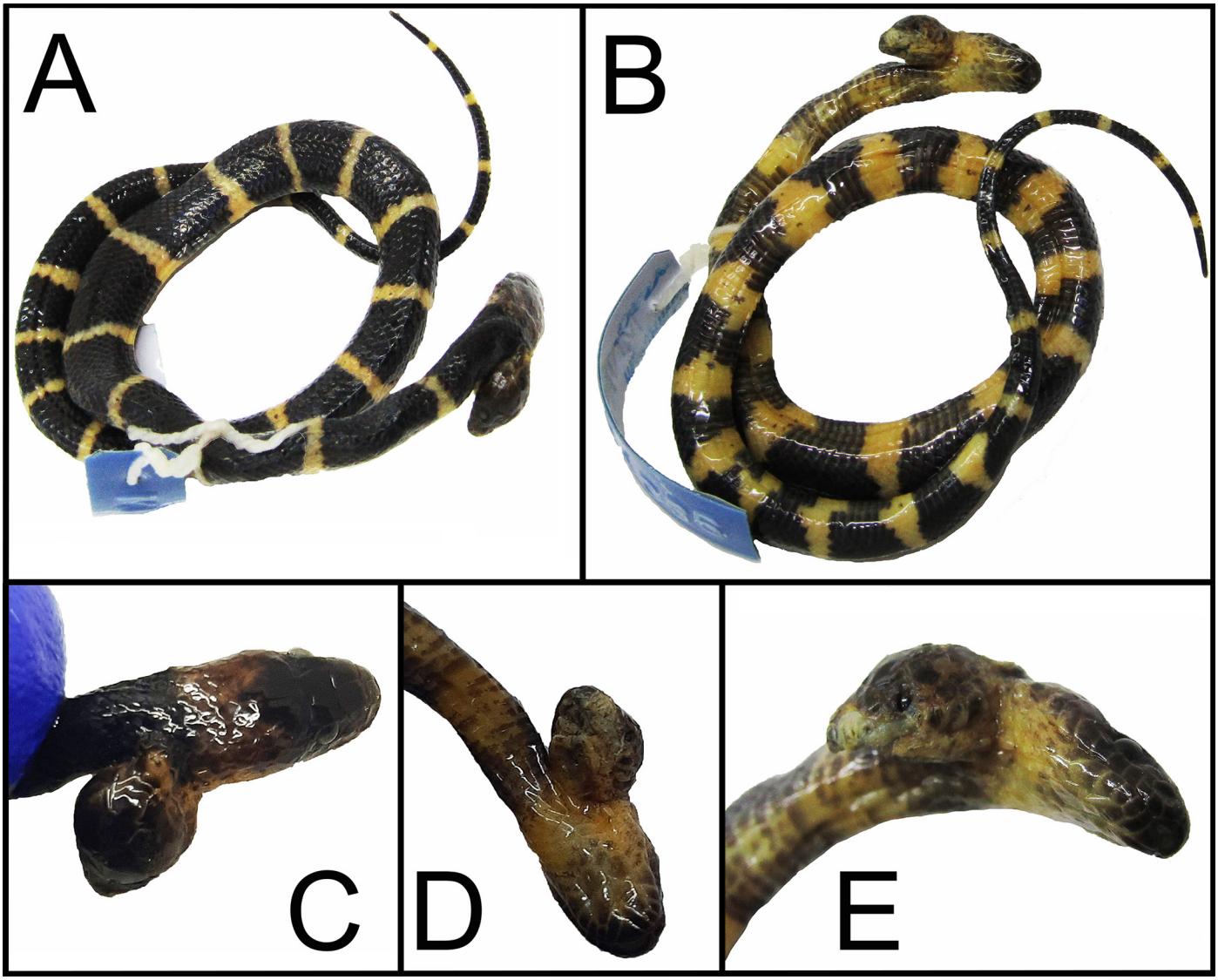

Figure 1. A dicephalic False Coral Snake (*Oxyrhopus emberti*): dorsal and ventral views of the snake (A–B), dorsal and ventral views of the heads (C–D), and heads joined laterally at the angle of the jaws (E). Photographs by Paola De la Quintana.

being mobile and parallel to being firmly fixed at close to 180° (Wallach 2018). In some cases, this results in an inability to swallow prey due to poor mouth formation or absent esophagi (Broadley 1975); so, if the malformation does not kill them, starvation will. This specimen did not have food in its stomach or intestines, although, as a newborn (total length was similar to that of other hatchling conspecifics with total lengths that varied between 272 and 334 mm), it likely never fed.

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