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## A description of an excrescence in a captive-bred specimen of *Pituophis catenifer sayi* (Serpentes, Colubridae)

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The bullsnake, *Pituophis catenifer sayi* (Schlegel 1837), has a natural distribution that extends from southern Canada, down south through parts of central USA and northern Mexico (Conant and Collins, 1991). Even though these snakes can attain a total length of ca. 2.5 m (Conant and Collins, 1991), and may have an aggressive disposition (Lazaroff, Rosen and Lowe, 2006), they are occasionally kept as pets (Fitzgerald et al., 2004; UNEP-WCMC, 2009). Herein we describe an abnormal outgrowth in a captive-bred *P. c. sayi* specimen.

A five-year old heteroalbino male and a three-year old heteroalbino female *P. c. sayi* were paired, and on July 4, 2012, after a gestation period of ca. two months, the female produced a clutch of 13 eggs. The eggs had an average weight of ca. 66 g, and were incubated at 26°C, which is an acceptable incubation temperature for most snakes (Schmidt, 1995). On September 12, 2012, after an incubation period of 68 days, all the eggs hatched. An excrescence (Fig. 1) was noted on one of the female hatchlings. From the day it hatched, the snake has been housed in a cage (length = 35 cm; width = 24 cm; height = 14 cm), with paper towels as a substrate, and

containing a water bowl, a rock, and a shelter, filled with damp *Sphagnum* moss. The hot spot of the cage has a temperature of ca. 28 to 30°C during the day, while that of the cool spot is ca. 23 to 24°C. At night the cage is allowed to cool to room temperature (ca. 22°C). The



**Figure 1.** A lateral (top) and ventral (bottom) view of the *Pituophis catenifer sayi* specimen, showing the excrescence (photographed by Anna Piriou).

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**Figure 2.** A shed skin of the *Pituophis catenifer sayi* specimen. Note that the skin of the excrescence is attached to, and shed along with, the rest of the snake's skin; this illustrates that moulting takes place without complications (photographed by Anna Piriou).

relative humidity in the cage is maintained at ca. 50 to 60%. The snake first sloughed on September 23, 2012, and the following day it took its first meal, consisting of two baby mice. Since then the snake has readily fed and continues to grow. The excrescence grows along with the snake and does not seem to cause any discomfort during movement or moulting (Fig. 2). A radiographical examination of the excrescence revealed that vertebrae seven to 13 appear to be fused, or at least affected (Fig. 3). Vertebrae eight to 10 also appear to have an ossified structure to the left lateral side, and some of the ribs are poorly aligned. The excrescence is, apparently, superficial; it does not communicate with the cervical vertebral column; and is located more posteriorly along the trunk of the body.

The deformity reported herein does not resemble any of those described and/or illustrated in Bellairs (1981), Frye (1991) or Mader (1999), so we can only speculate as to the cause of this deformity. Since even in boas and pythons (Boidae), which have hind limb rudiments, there is no morphological evidence of forelimb development (Cohn and Tickle, 1999; Graham and McGonnell, 1999), it is highly unlikely that the described excrescence is the remnants of a partly developed forelimb bud. Although the excrescence may be an elaborate skin tag, a more likely explanation for this condition is that during embryonic development, the snake underwent axial bifurcation. Wallach (2007) stated that in axial bifurcation in snakes, in the fusion zone, the vertebrae

are compressed anteroposteriorly but enlarged laterally. Vertebrae eight to 10 of this specimen appear to fit this description. It is also worth noting that inbreeding depression from designer morphs and albinos, as in the case of the parents of the affected snake, have been suggested as a causal factor of axial bifurcation in snakes (Wallach, 2007). Therefore, it is probable that this case is an example of axial bifurcation. We further postulate that one of the twins died and was partly reabsorbed, with the remains forming a "parasitic" outgrowth.



**Figure 3.** A radiograph of the lateral (top) and dorsal (bottom) sides of the *Pituophis catenifer sayi* specimen and excrescence (photographed by Dr. Julien Goin [© ONIRIS - Ecole Nationale Vétérinaire, Agroalimentaire et de l'Alimentation Nantes-Atlantique - Service d'imagerie]).

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## References

- Bellairs, A. d'A. (1981): Congenital and developmental diseases. In: Diseases of the Reptilia. pp. 469-485. Cooper, J.E., Jackson, O.F. eds., Academic Press (Inc.), London.
- Cohn, M.J., Tickle, C. (1999): Developmental basis of limblessness and axial patterning in snakes. *Nature* **399**: 474-479.
- Conant, R., Collins, J.T. (1991): The Peterson Field Guide Series: A field Guide to Reptiles and Amphibians. Eastern and Central North America. 3<sup>rd</sup> edition. Houghton Mifflin Company, Boston. 616 pp.
- Fitzgerald, L.A., Painter, C.W., Reuter, A., Hoover, C. (2004): Collection, trade, and regulation of reptiles and amphibians of the Chihuahuan Desert Ecoregion. TRAFFIC North America, World Wildlife Fund, Washington D.C. 75 pp.
- Frye, F.L. (1991): Biomedical and Surgical Aspects of Captive Reptile Husbandry. 2<sup>nd</sup> edition. Krieger Publishing Company, Malabar. 637 pp.
- Graham, A., McGonnell, I. (1999): Development evolution: this side of paradise. *Current Biology* **9**: R630-R632.
- Lazaroff, D.W., Rosen, P.C., Lowe, C.H. Jr. (2006): Amphibians, Reptiles, and Their Habitats at Sabino Canyon. The University of Arizona Press, Tucson. 158 pp.
- Mader, D. (1999): Perinatology of pet reptiles. In: Reptile Medicine and Surgery. pp. 203-211. Mader D.R. ed., Saunders, Philadelphia.
- Schmidt, D. (1995): Breeding and Keeping Snakes. New Jersey, T.F.H. Publications. 192 pp.
- UNEP-WCMC (2009): Review of non-CITES reptiles that are known or likely to be in international trade. A report to the European Commission. UNEPWCMC, Cambridge. 86 pp.
- Wallach, V. (2007): Axial bifurcation and duplication in snakes. Part I. A synopsis of authentic and anecdotal cases. *Bulletin of the Maryland Herpetological Society* **43**: 57-95.