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A Further Case of Foetal Development of Oviducal Eggs in a South African Blind Snake, *Afrotyphlops bibronii* (A. Smith) (Serpentes: Typhlopidae)

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ABSTRACT

The development of full-term embryos within unlaid eggs retained in utero in the Typhlopid species *Afrotyphlops bibronii* (A. Smith, 1846) (formerly *Typhlops bibronii*) has previously been reported by Erasmus and Branch (1983) and subsequently in popular books. A further observation of fully developed embryos in the unlaid eggs of *Afrotyphlops bibronii* is reported. Some of the literature relating to Typhlopid reproduction is briefly reviewed. While some Typhlopid snakes are known to have short incubation times indicating foetal development in the unlaid eggs, the presence of full term juveniles in oviducal eggs of Typhlopids has only been reported in *A. bibronii* as mentioned above and in *T. diardi* Schlegel, 1839 (now *Argyrophis diardii*) as was first reported by Wall (1918).

KEYWORDS:

*Afrotyphlops***,** unlaid eggs, full-term embryos, egg retention.

INTRODUCTION

The writer received an obviously gravid female *Afrotyphlops bibronii* shortly after it had been collected in the Johannesburg area, Gauteng, in the early 1970s. As it was desired to observe details of egg laying and incubation the snake was maintained alive in separate confinement. After a few weeks it was noted that, while no attempt had been made to lay its eggs, the animal was obviously in some distress. The eggs had visibly massed into the posterior abdomen immediately anterior to the vent, causing congestion and swelling. A lubricant was applied to the cloaca in the hope that this might facilitate egg laying but was not effective. Since the snake was already in poor condition, the animal was euthanised and the eggs removed surgically. A ventral incision revealed that the oviduct had ruptured posteriorly allowing eggs to escape into the abdominal cavity and obstruct the passage of the other eggs. Six eggs were removed.

OBSERVATIONS

Five of the eggs had measurements of 25 - 31 mm length and 8 mm diameter, the other egg, apparently infertile, while also 8 mm in diameter, was only 12 mm long. Contrary to what had been expected after referring to FitzSimons (1962) the five fertile eggs were found to contain well-developed foetuses (Fig. 1). All the foetuses were dead and there were signs that resorption was beginning to take place. A foetus removed from one of the eggs measured approximately 85 mm in length after having been preserved, another which was not completely removed from the egg had a measured diameter of 3 mm and appeared to be the largest overall (see Fig. 1, example on left).

DISCUSSION

The eggshells were relatively well-developed though not as thick as is normally the case observed in oviparous snakes nor as membranous as seen in ovoviviparous snakes such as *Hemachatus* and *Bitis* or as described by Erasmus & Branch (1983). It seems likely

that this species lays partly incubated eggs as is the case reported by FitzSimons (1962) for *Afrotyphlops schlegelii schlegelii* (Bianconi, 1849). FitzSimons also mentioned that both oviparity and viviparity are known in typhlopids but did not specify any other species. His description of *A. bibronii* did not indicate any variation from normal oviparity in this species. The only other typhlopid species that the writer has yet found to be mentioned in the literature as being live-bearing is the South Asian *Argyrophis diardii* (formerly *Typhlops diardi*) by Schmidt & Inger (1957). Cogger (1975) reports that Australian Typhlopids are oviparous while Taylor (1965) discussing Typhlopids generally states that "so far as is known all forms now recognised are typically oviparous." It is interesting to note that *A. diardii* was one of the Thai species included in the paper from which the above statement was extracted. Pitman (1974) mentions only oviparity in several Ugandan species as do Broadley & Cock (1975) for Zimbabwean species. Erasmus & Branch (1983) provide details of several other references to typhlopid reproduction.

Figure 1. Eggs and contents after preservation in alcohol.

There appears to be some variation in clutch size, egg measurements and the length of hatchlings. Erasmus & Branch (1883) reported two captive specimens laying 12 eggs and another laying 6 while a preserved specimen contained 8 eggs. They measured two eggs from the preserved female, one was 21 x 21 mm and the other 20 x 10 mm. FitzSimons (1962) stated that the species produces 5-8 creamy white eggs measuring 20-23 x 9-12 mm in a clutch (increased to 20-30 x 9-12 mm by Broadley (1983) while Bogert (1940) mentioned finding 5 eggs (averaging 9 x 23 mm) in a female. Branch (1988) gives "The female lays 5-12 thin-walled eggs in late summer (February). Embryos are well developed and the young (111-124 mm) hatch in 5-6 days." Branch (1998) increased the number of eggs to 5-14 and size range to 109-129 mm. Marais (2004) states "Oviparous, laying 2-14 thin-walled eggs (42-43 x 9,5-10 mm). these hatch within 5-6 days and the young measure 10-12,9 cm". Webb *et al* (2001) using museum specimens record 21 *A. bibronii* clutches giving a range of 2 to 13 eggs with a mean of

6.6 while a single *A. s schlegelii* contained 7 eggs. They state that all eggs were shelled indicating oviparity.

CONCLUSIONS

While this particular mode of reproduction has been called viviparity and egg retention these descriptions need clarification: this is not strictly lecithotrophic ovoviviparity (embryo nourished by the egg yolk) or matrotrophic viviparity (nourished by maternal placenta) where the female gives birth to living young. Neither is it egg retention in the sense of dystocia but instead it is a process in which the embryo develops within the egg while still in the oviduct (or uterine tube) and the egg then hatches after a period subsequent to being laid rather than immediately afterwards or simultaneously as in the case of ovoviviparity. In this particular case it seems that the animal concerned suffered accidental dystocia as well as having the eggs develop in the uterine tube as is apparently normal for this species.

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