

Elapomorphus quinquelineatus (five-lined burrowing snake): Feeding on squamate eggs.

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Certain snakes are known to feed upon squamate eggs, and specialised species of snakes can have morphological and behavioural traits associated with this food habit (Scanlon & Shine, 1988; Queiroz & Rodrigues-Robles, 2006). For example, the Taiwan snake (*Oligodon formosus*) uses enlarged blade-like rear maxillary teeth to make repeated slashes in the leathery egg shell, allowing the snake to insert its head and swallow the yolk (Coleman et al., 1993). The American Scarlet snake (*Cemophora coccinea*), another egg-eater specialist, possesses enlarged posterior maxillary teeth that pierce large eggs. A combination of vigorous chewing and depressing of the snake's body expel most of the egg's contents (Palmer et al., 1970). These two snakes, and the African colubrid of the genus *Prosymna*, another squamate egg-eater, also swallow the whole egg (Broadley, 1979). Among Neotropical dipsadid snakes, at least *Drepanoides anomalus* (Pseudoboini) and some species of *Lystrophis* (Xenodontini) may be squamate egg-eater specialists. However, some none egg-eater specialist dipsadids occasionally use this food item (see Greene & Jaksic, 1992; Gaiarsa et al., 2013). Here we report an additional possible case of egg eating among neotropical dipsadid. This is the first time egg eating has been reported for an Elapomorphini snake, which accepted snake eggs in captivity.

An adult female *Elapomorphus quinquelineatus* (SVL = 580 mm, tail = 60 mm, diameter at the middle body = 10.6 mm, head width = 10.3 mm, mass = 32 g) was collected on 10 July 2013 in the municipality of São Paulo (23°32' S, 46°37' W) and housed in a 54 x 37 x 15 cm terrarium with a corrugated paperboard substrate. The snake always accepted young snakes as food, but refused mice (*Mus musculus*) and small lizards (*Hemidactylus mabouia*). On 4 November 2013 at 8:35 hrs, this snake laid two eggs with normal appearance (aspect and coloration). Approximately 20 minutes after the eggs were laid, the snake ingested one of the eggs. The other egg was not removed from the terrarium, and after approximately 12 hours the snake ingested it. The swallowing time ranged from four to almost seven minutes. After this, eggs of the three dipsadid snakes (n = 4, Table 1) were placed in the terrarium on different days at a minimum interval of three days. Two *Sibynomorphus mikanii* eggs with a diameter of <10 mm (and therefore smaller than the snake's diameter) were ingested, but we did not observe

the snake swallowing them. A large *Liophis miliaris* egg (diameter ≈ 15 mm) was entirely ingested, and the snake took over 30 min to swallow it (Fig. 1, Table 1). In the last experiment with a larger *Oxyrhopus guibei* egg (diameter ≈ 8 mm), the snake tried grasping the egg numerous times but stopped after 4 hours. The snake died a few months later and its remains were deposited in the herpetological collection of the Instituto Butantan (IBSP 85164).

E. quinquelineatus belongs to the Elapomorphini that also includes two other genera (*Apostolepis* and *Phalotris*) and almost 40 species of rear fanged snakes that are widely distributed in South America (Ferrarezzi, 1993; SBH, 2014). These burrowing snakes seem to be very specialised predators, feeding upon elongated squamata (Savitzky, 1979). Factual data on the food habits of *Elapomorphini* are scarce in the literature, but dissection of preserved specimens has always revealed amphisbaenids and fossorial snakes in their guts (e.g. Zamprogno & Sazima, 1993; Bernarde & Macedo-Bernarde, 2006; Braz et al., 2013). Recent reports described amphisbaenians as prey of *E. quinquelineatus* (Hartmann, 2009; Caramaschi & Niemeyer, 2012; Duarte, 2012) confirming that this snake has a diet similar to other Elapomorphini. However, eggs are an unrecorded and unexpected food item for such snakes. The data in the present study was obtained from snakes in captivity, where they can eat food items that are not eaten in nature (pers. obs.). However, an egg is an inert item that is unlikely to be accepted by a snake if it is not recognised as food. Moreover, the snake refused to eat the mice and lizards. Thus, it is plausible that *E. quinquelineatus* could ingest a snake egg if it found one in nature. Among neotropical snakes, the Pseudoboini group may comprise the highest number of species that prey upon squamate eggs, including the highly specialised *Drepanoides anomalus* (Martins & Oliveira, 1998; Gaiarsa et al., 2013). Queiroz & Rodriguez-Robles (2006) verified that egg eating is especially likely to arise in snake species that already feed on animals that lay eggs. We expect that squamate egg eating is most common among Pseudoboini snakes because this group feeds predominantly on squamates (Gaiarsa et al., 2013). However, Elapomorphini snakes also fall within this prediction because they feed on fossorial squamates and they exploit a microhabitat where other squamates usually lay their eggs.



Figure 1. *E. quinquelineatus* (captive female) swallowing a large egg of the xenodontid snake *L. miliaris*.

Date	Species	Egg length / egg diameter (mm)	Egg mass (g)	Ingestion time
04/11/2013	<i>E. quinquelineatus</i>	-	-	6m 40s
04/11/2013	<i>E. quinquelineatus</i>	-	-	4m 14s
08/11/2013	<i>S. mikanii</i>	27.5 / 9	3.0	Not timed
11/11/2013	<i>S. mikanii</i>	28 / 8.6	3.3	Not timed
14/11/2013	<i>L. miliaris</i>	26 / 15.7	5.6	32m 26s
25/11/2013	<i>O. guibeii</i>	31.2 / 18	6.2	Not ingested

Table 1. Eggs of various snake species offered to a captive *E. quinquelineatus*, their dimensions and time taken for complete ingestion.

ACKNOWLEDGMENTS

We thank Angelica Gomes da Silva for laboratory assistance. This work was supported by FAPESP and CNPQ (fellowships to OAVM).

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