
NATURAL HISTORY NOTES

Natural History Notes features articles of shorter length documenting original observations of amphibians and reptiles mostly in the field. Articles should be concise and may consist of as little as two or three paragraphs, although ideally will be between 500 and 700 words. Preferred contributions should represent an observation made of a free-living animal with little human intrusion, and describe a specific aspect of natural history. Information based on a captive observation should be declared as such in the text and the precise geographical origin of the specimen stated. With few exceptions, an individual 'Note' should concern only one species, and authors are requested to choose a keyword or short phrase which best describes the nature of their observation (e.g. Diet, Reproduction). The use of photographs is encouraged, but should replace words rather than embellish them. Contributions are accepted

on the premise that they represent a previously unreported observation, and may be edited prior to acceptance. Standard format for this section is as follows:

SCIENTIFIC NAME (Common Name): **KEYWORD**. Text (there are no constraints on how information is presented but the date, time, and locality – with full map co-ordinates if possible – must be included, as should precise details on the nature of the observation with some discussion of its significance, and references to pertinent literature). If the information relates to a preserved specimen, its catalogue number and place of deposition should also be given. **REFERENCES**. Then leave a line space and close with name and address details in full.

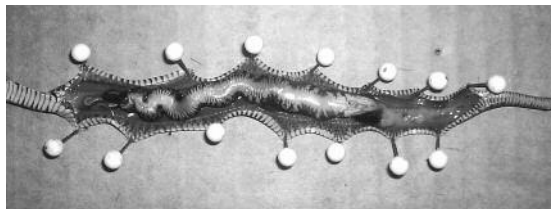
LIOPHIS MILIARIS (Common water snake): CANNIBALISM. *Liophis miliaris* is a medium size, semiaquatic and diurnal-nocturnal colubrid snake (Marques *et al.*, 2001) usually associated with moist environments (Dixon, 1980). It is a species widely distributed in South America, from the Guianas to northeastern Argentina, being common in southeastern Brazil (Gans, 1964; Dixon, 1983). Its diet is based on anurans, fishes and eventually lizards (Amaral, 1933; Lema *et al.*, 1983; Vitt, 1983; Michaud & Dixon, 1989; Machado *et al.*, 1998; Marques & Souza, 1993). This note reports an incident of cannibalism in *L. miliaris* involving two individuals of a litter kept in captivity.

On 12th November 2005, an adult female *L. miliaris* with a snout-vent length (SVL) of 930 mm, tail length (TL) of 192 mm, and mass of 330 g, was collected in Itapeccerica da Serra (23°43'S, 46°50'W), São Paulo State. On 17th November 2005 it laid 31 eggs that were incubated in a container with moistened soil as substrate and a mean room temperature of 25°C. From 6th–8th February 2006, eighteen of the eggs hatched. All newborns were housed in the same plastic box (20 x 32 x 35 cm) with water ad libitum and cardboard as substrate. On 31st March 2006, while cleaning the cage, we noted the lack of one individual and that one female (IB 74409, SVL = 171 mm, TL = 41 mm and 2.54 g) showed several undulations in its body, typical of snakes that have previously been observed to exhibit ophiophagy (Jackson *et al.*, 2004). This female was euthanised and

dissection revealed that it had ingested another conspecific female (IB 74410, SVL = 135 mm, TL = 41mm and 1.28 g) (Figure 1). The prey was swallowed headfirst, length ratio (LR = prey total length/predator SVL) was 1.03 and weight ratio (WR = prey mass/predator mass) was 0.50. It was fitted in the predator stomach, compressed in several waves such that its total length had decreased ca. 2.28 times (= 77 mm), and with no digestive activity apparent, had evidently been swallowed recently. It was not possible to determine whether or not the prey was alive or dead at the moment of ingestion.

The predator/prey size ratio of 1.03 is high for *L. miliaris* considering its natural prey (anurans and fishes). We used total length for prey and SVL for predator because the SVL of the predator is the useful space into which the entire length of the prey has to fit (cf. Jackson *et al.*, 2004). There are few data published to compare with ours, but the length

Figure 1. Hatchling female *L. miliaris* (IB 74409, SVL = 171 mm, TL = 41 mm and 2.54 g) with conspecific as prey (IB 74410, SVL = 135 mm, TL = 41mm and 1.28 g); prey mass/predator mass = 0.50.



ratio obtained here is lower than the LR found by Jackson *et al.* (2004) in observations of ophiophagy in *Lampropeltis getula californiae*. Young snakes usually feed on large prey, a fact explained by the lower availability of adequately sized prey in nature, and there are reported occurrence of young snakes having died from trying to eat prey above their ingestion capacity due to evaluation error (see Sazima, 1990). *Liophis miliaris* appears to be habitat specialist and food generalist (Dixon, 1983). Although it is known that this species feeds on anurans and fishes, it occasionally preys on lizards, increasing its prey spectrum and thus demonstrating its opportunistic habits (Michaud & Dixon, 1989; Machado *et al.*, 1998). In a review of published data on the diet of *L. miliaris*, we could find no mention of snakes as a recorded food item for this species (Amaral, 1933; Lema *et al.*, 1983; Vitt, 1983; Michaud & Dixon, 1989; Marques & Souza, 1993). The incident described here therefore leads us to speculate that *L. miliaris* probably feeds on snakes also in nature. However, cannibalism among newborn snakes kept in captivity seems to be a relatively frequent behaviour even in species that do not include snakes in the diet (e.g. Hoge & Federsoni, 1981; Lema *et al.*, 1983; Cardoso Júnior *et al.*, 1990). Furthermore, the litter had never been fed and the individual concerned may therefore have been hungry. Nevertheless, this was the only incident of cannibalism that occurred in the litter. Further research about the diet of *L. miliaris* should elucidate the possibility of ophiophagy in nature.

ACKNOWLEDGEMENTS

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***CROTALUS DURISSUS TERRIFICUS*
(Rattlesnake): A CASE OF XANTHISM.**

Colouration and pattern are very important to snakes, providing such advantages as camouflage, mimetism or warning. It is alleged that most species of snakes that present albinism or other anomalies are nocturnal (Sazima & Di-Bernardo, 1991). This supposition may be explained by selection against albinism in diurnal snakes, because the loss of protective colouration can make the animal more exposed and vulnerable to predation.

Chromatic anomalies in snakes are rare, and in Brazil, cases of albinism, melanism, erithrism, among others, have been reported in only a few species of the Boidae, Colubridae and Viperidae families (Amaral, 1927a,b; Amaral, 1932; Amaral, 1934; Hoge, 1952; Hoge & Belluomini, 1957/58; Andrade & Abe, 1998; Duarte *et al.*, 2005). However, some cases of xanthism are known: one concerning a specimen of *Epicrates cenchria* (Hoge & Belluomini, 1957/58) and another in *Sibynomorphus turgidus* (Amaral, 1933/34). Xanthism is defined as a pigmentary anomaly of genetic origin, in which there is lack of melanin and predominance of yellow pigments <www.ophidia.org.ve>.

Snakes of the genus *Crotalus* are terrestrial ambush predators; their most salient characteristic is the presence of a rattle in the tip of the tail. In Brazil there is only a single species, *Crotalus durissus*, which has a large distribution within savannah (*cerrado*), arid regions (*caatinga*) and open areas (Melgarejo, 2003). There are a few reported cases of albinism in this species (Amaral, 1927a; Amaral, 1932; Amaral, 1934; Duarte *et al.*, 2005) and also melanism (Silva *et al.*, 1999). This note reports a case of xanthism in a specimen of *Crotalus durissus terrificus*. The snake, a young female (500 mm in snout vent length, 35 mm in tail length, and 100g), was collected in Lindóia – SP (22°31'S; 46°39'W) in July 2005, with two other individuals of a similar size, but with normal colour patterns. This individual is yellow throughout the entire body, including the head, with lighter stains in the post-ocular region. The characteristic dorsal markings are dark yellow, bordered with scales of lighter yellow. The nape marking is also dark yellow, bordered by light yellow scales, and the gular region is light

Figure 1. *Crotalus durissus terrificus* with xanthism. Female (500 mm in snout vent length, 35 mm in tail length, 100 g).



yellow. The venter is yellowish and its eyes are a silvery colour (Fig. 1). The snake is currently maintained as a captive in the Herpetology Laboratory at Instituto Butantan, São Paulo, Brazil.

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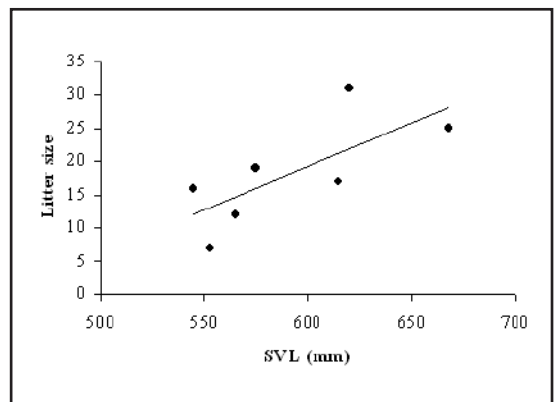
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HELICOPS LEOPARDINUS (Water snake):

REPRODUCTION. *Helicops leopardinus* is an aquatic and viviparous snake (Lira-da-Silva *et al.* 1994), distributed from the Guianas to Argentina (Peters & Orejas-Miranda, 1986). It is widespread in Brazil, and one of the most common species in the Pantanal region (Strüssmann & Sazima, 1993). Data on reproduction of this species are scarce. Lira-da-Silva *et al.* (1994) and Freitas (1999) recorded litters ($n = 4$) of seven to 15 newborns for *H. leopardinus* from Bahia, northeast Brazil. Here we present a new record of a litter, as well as provided additional information on the fecundity of the species.

One female *H. leopardinus* collected in the city of Lageado (09°45'S, 48°12'W), Tocantins, northern Brazil, was brought to Instituto Butantan on 21st January 2001. The female (IB 66413; 620 mm in snout-vent length (SVL), 145 mm in tail length (TL), and a mass of 145 g after parturition) gave birth to 31 newborns (21 alive and 10 dead but fully developed) on 8th February 2001. The live newborns averaged 118 mm in SVL (range = 100–135 mm), 39 mm in TL (range = 35–45 mm), and 1.8 g (range = 1.4–2.4 g). The relative clutch mass (RCM; total clutch mass/body mass of mother after parturition; see Shine, 1980) was 0.39. The RCM calculated following Seigel & Fitch (1984) (total clutch mass/body mass of mother + clutch mass) was 0.28.

Figure 1. Relationship between the litter size (including oviductal embryos) and the female's body size in *Helicops leopardinus*. $r_{\text{Spearman}} = 0.82$, $n = 7$, $p = 0.02$.



IB	Region	Co-ordinates	Female SVL (mm)	Litter size
22667	–	–	553	07
20024	Fortaleza, Ceará	03°43'S, 38°32'W	668	25
2646*	Bahia	–	575	19
24534*	Batovi, Mato Grosso	15°51'S, 53°30'W	615	17
44051*	Campo Grande, Mato Grosso do Sul	20°26'S, 54°38'W	545	16
45883*	Campo Grande, Mato Grosso do Sul	20°26'S, 54°38'W	565	12
66413	Lageado, Tocantins	09°45'S, 48°12'W	620	31

Table 1. Summary of data on litter and female's body size for *Helicops leopardinus*. * = oviductal embryos. All preserved individuals were from the Herpetological Collection of the Instituto Butantan (IB).

Additional litters of six preserved specimens presented seven to 25 newborns or oviductal embryos (Table 1). The average litter size in *H. leopardinus* including oviductal embryos is 18 (range = 7–31), and is positively correlated with the female body size ($r_{\text{Spearman}} = 0.82, n = 7, p = 0.02$; Figure 1). This correlation is a common trend encountered in various snake species (Shine, 1994). Moreover, *H. leopardinus* produce litters of similar size to other congeneric species, particularly *H. infrataeniatus* (Aguiar & Di-Bernardo, 2005) and *H. modestus* (RRS, unpubl. data). The RCM value reported for *Helicops leopardinus* is high but similar to the maximal values reported for other unrelated viviparous and aquatic snakes (e.g. some natricines of the genus *Nerodia* and *Regina*; see Seigel & Fitch, 1984).

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