

**ANILIUS SCYTALE (Red pipesnake):**

**REPRODUCTION.** The Red pipesnake inhabits northern South America from southern and eastern Venezuela, Guyana, Suriname, and French Guiana through the Amazon Basin of Colombia, Ecuador, Peru, Bolivia, and Brazil (McDiarmid *et al.*, 1999; Uetz, 1995–2005). It is a viviparous snake with fossorial habits that feeds mainly on elongate fossorial and aquatic vertebrates (Martins & Oliveira 1999), and which escapes from predators either by fleeing (flight category, Seigel & Fitch, 1984) or by using some form of active defense (stand-and-fight; Seigel & Fitch, 1984).

Life history data on Ecuadorian populations of this species are scarce or unpublished. The only reproductive data available for *Anilius* in Ecuador is that reported by Duellman (1978), who states: ‘one female collected in June with small ovarian eggs’. Cunha & Nascimento (1981) reported on seven females from Brasil (520–945 mm total length [TTL]) collected between March and November with ovarian eggs (3–37 eggs/female), two females collected in March and July with eight and ten developing embryos each one; and, seven other females (530–841 mm TTL) collected between February and July with developed embryos (5–8 embryos/female, 184–218 mm TTL). Among these, one female (841 mm TTL) had twelve embryos with a mean TTL of  $203.9 \pm 2.1$  SE mm (194–214 mm TTL, mode = 210 mm), and another (680 mm TTL) had nine embryos with a mean TTL of  $196.0 \pm 2.3$  SE mm (185–205 mm TTL, mode = 201 mm). Cunha & Nascimento (1981) stated that *A. scytale* appeared not to have a defined breeding season, independent from the rainy or dry season, and suggested a gestation period of four to six months. In the Iquitos region (Peru), Dixon & Soini (1986) reported on one female (1184 mm TTL) that gave birth to six young in February 1972; a smaller female that gave birth to four young in January 1966; and a very young specimen taken in early March. Martins & Oliveira (1999) reported on one female (598 mm snout-vent length [SVL], 24 mm tail length [TL]) that gave birth to eight young

(154–163 mm TTL) in October; another (898 mm SVL, 29 mm TL, 181 g) that gave birth to 15 young (206–234 mm TTL; combined mass of all 15 young = 52 g; relative clutch mass [RCM] = total offspring mass/female total mass = 0.29); a female (424 mm SVL, 17 mm TL) with seven fully developed embryos (157 – 173 mm TTL) in October; and, a female (898 mm SVL, 29 mm TL) with five developing embryos.

On 26<sup>th</sup> January 1999, a female *A. scytale* was collected in the Centro Mashient, province of Morona-Santiago, Ecuador. The specimen (FHGO 2355) was maintained in captivity and gave birth to 18 living and 8 stillborn young on 6<sup>th</sup> February 1999 (FHGO 2356-64, 2373-74, 2378, 2380, 2387-88, 2390-91, 2393-95, 2397, 2403, 2440). The female had a TTL of 1027 mm, and a mass of 155.7 g when collected. The 18 young had a mean TTL of  $213.7 \pm 2.5$  SE mm (190–230 mm TTL, mode 218 mm), and mean mass of  $2.8 \pm 0.1$  SE mm (2.2–3.3 g, mode=2.8 g). Four of the stillborn snakes had a mean TTL of  $212.5 \pm 3.1$  SE mm (206–221 mm TTL) and mean mass of  $2.7 \pm 0.1$  SE mm (2.4–2.9 g). Total litter mass was c. 70 g, RCM = 0.45. The 18 young snakes remained alive for between 53 to 69 days and died of unknown causes.

Additional data presented herein indicate that *A. scytale* litter size varies from 4 to 18 young, with an SVL range of 154–234 mm). Reproductive females had a mean SVL of  $718.5 \pm 54.2$  SE mm (424–1142 mm, n = 15), and relative clutch mass values range from 0.29–0.45. Notwithstanding the small sample size, RCM and SVL range in this species appears to be relatively high compared with other viviparous snakes (e.g. Seigel & Fitch, 1984; Seigel *et al.*, 1986). Also, although a decrease in RCM is often associated with increasing body size in viviparous snakes (Seigel *et al.*, 1986), *A. scytale* shows a different trend. However, this could be explained by the species’ fossorial habits, supporting Iverson’s hypothesis (in Seigel *et al.*, 1986) regarding the secretiveness of fossorial species permitting higher RCM. Species with burrowing habits are generally less

exposed to visual predators and the reproductive cost to females is thus likely to be relatively minor in comparison with species that occur primarily above ground, supporting Seigel *et al.*'s hypothesis (1986) regarding the ecological explanations for RCM and SVL relationships. Ovarian eggs, developing embryos and young have been reported from January to July, and in October and November, suggesting continual reproduction (Seigel & Ford, 1987) and supporting Martins & Oliveira's hypothesis (1999).

#### ACKNOWLEDGMENTS

I am grateful to Jean-Marc Touzet and Ana María Velasco for granting access to the specimens deposited at the FHGO, to Dwain Holmes for donating the pregnant specimen of *Anilius scytale*. To Anita Peñaherrera, Gabriel Touzet, Margarita Brandt, Andrés León, and Tomi Sugahara for laboratory assistance. To Roy McDiarmid and to the Savanna River Ecology Laboratory for sharing literature. My gratitude to Maria Elena Heredia and Laura Heredia for financial and moral support. Universidad San Francisco de Quito provided institutional support.

#### REFERENCES

- Cunha, O. R. da, & Nascimento, F. P. do. (1981). Ofídios da Amazônia: XIII – Observações sobre a viviparidade em ofídios do Pará e Maranhão (Ophidia: Anilidae, Boidae, Colubridae e Viperidae). *Bol. Mus. Para. Emilio Goeldi* **109**, 1-20.
- Dixon, J. R. & Soini, P. (1986). *The Reptiles of the Upper Amazon Basin, Iquitos Region, Peru*. Milwaukee: Milwaukee Pub. Mus. Press. 154 pp.
- Duellman, W. E. (1978). The biology of an equatorial Herpetofauna in Amazonian Ecuador. *Univ. Kansas Mus. Nat. Hist. Misc. Publ., Kansas* **65**, 1-352.
- Martins, M. & Oliveira, M. E. (1999). Natural history of the snakes in forests of the Manaus

region, Central Amazonia, Brazil. *Herpetological Nat. Hist.* **6** (2), 78-150.

- McDiarmid, R. W. Campbell, J. A. & Touré, T. (1999). *Snake species of the World: A taxonomic and geographic reference*. Vol.1. Washington, D.C.: The Herpetologist's League. 511 pp.
- Seigel, R. A. & Fitch, H. S. (1984). Ecological patterns of relative clutch mass in snakes. *Oecologia* **61**, 293-301.
- Seigel, R.A. & Ford, N.B. (1987). Reproductive ecology. In *Snakes: Ecology and Evolutionary Biology*, pp. 210-252. Siegel, R.A. Collins, J.T. & Novak, S.S. (Eds.). New York: Macmillan Publ. Co.
- Seigel, R. A. Fitch, H. S. & Ford, N. B. (1986). Variation in relative clutch mass in snakes among and within species. *Herpetologica* **42**(2), 179-185.
- Uetz, P. (1995-2005). The EMBL Reptile Database. Online. EMBL Heidelberg: <<http://www.reptile-database.org>> [Accessed on December 2004].

DIEGO F. CISNEROS-HEREDIA

College of Biological and Environmental Sciences, Universidad San Francisco de Quito, Ave. Interoceánica y calle Diego de Robles, Campus Cumbayá, Edif. Maxwell. Casilla Postal 17-12-841, Quito, Ecuador. E-mail: [diegofrancisco\\_cisneros@yahoo.com](mailto:diegofrancisco_cisneros@yahoo.com)