

A female Amazon water snake *Hydrops martii* with an exceptionally large number of secondary follicles

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The genus *Hydrops* Wagler, 1830, comprises three species of neotropical snakes widely distributed in South America (Wallach et al., 2014). Species in this genus are small to medium sized, aquatic, diurnal and oviparous (Cunha & Nascimento, 1978; Albuquerque, 2000; Scrocchi et al., 2005; Nunes, 2006; Fraga et al., 2014). *Hydrops martii* (Wagler in Spix, 1824) is widespread in the Amazon forest, being found in Brazil, Colombia, Ecuador, Guyana, Peru, and Venezuela (Nogueira et al., 2019). This species can be easily distinguished from the other congeners by its colour pattern (yellow body with black rings delimited by whitish spots arranged on each scale) and the presence of the 17 dorsal scale rows (versus 15 in *Hydrops caesurus* and *Hydrops triangularis*) (Fraga et al., 2014).

On 14 September 2019 we captured an individual of *Hydrops martii* (Fig. 1) at Mucajaí (2° 16'28.2" N, 60° 58'01.0" W), Roraima, Brazil, as a part of a field study. The snake was a large gravid female with a snout vent length (SVL) of 894 mm and tail length (TL) of 208 mm. The individual was captured (permit No. IBAMA 02001.004325/2015-71), euthanised with a 2 % lidocaine solution, fixed in a 10 % formaldehyde solution, stored in 70 % ethanol and is currently deposited at the Museu Nacional, Universidade Federal do Rio de Janeiro, under the number MNRJ 27503. This specimen at a total length of 1102 mm would appear to be large for the species and is second only to a specimen of total length 1219 mm reported by Albuquerque (2000). On dissecting our specimen we revealed 26 secondary follicles (18 in the right ovary and eight in the left ovary) (Fig. 2). The largest follicle measured 20.1 mm. This record of 26 follicles in a female represents the maximum number of secondary follicles published so far, which may be related to the female's size, since large females tend to have larger fecundity rates (Shine, 1977).

Albuquerque & Camargo (2004) assessed the reproductive biology of the genus *Hydrops* and found 31 gravid specimens with fecundity ranging from 7 to 23 "eggs". Later, Braz et al. (2016) re-examined 18 of these specimens and found no female with oviductal eggs, but only with enlarged ovarian follicles. So far, only a single specimen of *Hydrops martii* has been classified as gravid, containing 13 oviductal eggs (Braz et al., 2016). Although in some species the number of secondary follicles and the number of eggs/embryos



Figure 1. Female *Hydrops martii* (MNRJ 27503) from Mucajaí, Roraima, northern Brazil



Figure 2. Dissected female (MNRJ 27503) with 26 secondary follicles in the ovaries

is similar (Maschio et al., 2007), in others the number of secondary follicles produced by a female is higher than the number of eggs/embryos observed in the oviduct (Shine, 1977; Mesquita et al., 2013).

All species of *Hydrops* are considered to be oviparous but other Hydropsini genera may be either oviparous, viviparous

or in some species both (Nunes, 2006; Braz et al., 2016). Consequently, South American water snakes are considered to offer a suitable opportunity to study the evolution of viviparity. In that context, the reproduction of *Hydrops* still needs further research to include variations in clutch size, production of secondary follicles, and the relationship between female size and clutch sizes.

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