

Report of molluscivory in *Atractus carrioni* PARKER, 1930

Atractus carrioni PARKER, 1930 is a neotropical snake endemic to the Loja Valley, southern Andes of Ecuador (SAVAGE 1960). The genus *Atractus* comprises fossorial and semifossorial snakes which primarily prey upon earthworms, although arthropod larvae, adult insects, acari, plant matter and snake scales have also been found in their digestive tracts (DUELLMAN 1978; HOOGMOED 1980; CUNHA & NASCIMENTO 1983; PEREZ-SANTOS & MORENO 1990; MARTINS & OLIVEIRA 1999; CISNEROS-HEREDIA unpublished). Since our knowledge on the ecology of most species of the genus is very poor information on the diet of *A. carrioni* and the first report of molluscivory for the genus are provided here.

Two adult male *A. carrioni* (deposited at the Fundación Herpetológica G. Orcés, FHGO) were collected 5 km east of the city of Loja, Loja Province (ca. 79°09'W, 03°59'S, 2300 m a.s.l.) on 01 May 1993 by J.-M. TOUZET. Analysis of their digestive tracts revealed the presence of terrestrial slugs (Mollusca, Pulmonata). Specimen FHGO 652 (snout-vent length [SVL] = 315 mm, tail length [TaL] = 45 mm) contained four slugs in the stomach and one partially digested in the intestine, and specimen FHGO 650 (SVL = 325 mm, TaL = 50 mm) had two slugs in the stomach. The mean length of all seven slugs was 7.8 mm (range 6.5-9.5 mm), mean width was 3.3 mm (2.5-4.5 mm).

The genus *Atractus* is part of a clade of small semifossorial xenodontine snakes that feed on soft-bodied invertebrates ("goo-eaters"). This clade is divided into a lumbricophagous subclade that includes *Atractus* along with *Adelphicos*, *Chapinophis*, *Chersodromus*, *Geophis*, *Ninia*, and

Omodiphas; and a molluscivorous subclade of *Dipsas*, *Sibon*, and *Sibynomorphus* (CADLE & GREENE 1993; CAMPBELL & SMITH 1998; FERNANDES 1995; KÖHLER et al. 2001). Species of the molluscivorous subclade have particular morphological adaptations for eating snails and slugs (PETERS 1960). *Atractus carrioni* does not seem to have any adaptation for slug predation, and predation upon unshelled mollusks is interpreted as opportunistic, and probably occurs in other lumbricophagous species especially when slugs are an abundant resource like in the habitat of *A. carrioni*. This opportunistic pattern is also seen in molluscivorous species, e.g. a specimen of *Dipsas elegans* BOULENGER, 1896 (*oreas* complex) collected at the Cumbaya Valley (next to the city of Quito, 2350 m a.s.l.) in 28 April 2004 regurgitated an earthworm 60 mm long.

ACKNOWLEDGMENTS: I am grateful to Jean-Marc TOUZET (Fundación Herpetológica G. Orcés) for the opportunity to study his specimens of *Atractus* and to Carlos MONTUFAR (Universidad San Francisco de Quito) for donating the specimen of *Dipsas elegans*; to Daniel PROAÑO, Ma. Olga BORJA and Pablo RIERA (Universidad San Francisco de Quito) for laboratory assistance; to Jonathan CAMPBELL, Walter SCHARGEL (The University of Texas at Arlington), and Gunther KÖHLER (Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. M.) 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: CADLE, J. E. & GREENE, H. W. (1993): Phylogenetic patterns, biogeography and the ecological structure of Neotropical snake assemblages; pp. 281-293. In: RICKLEFS, R. E. & SCHLUTER, D.: Species diversity in ecological communities: historical and geographical perspectives. Univ. Chicago Press, Chicago. CAMPBELL, J. A. & SMITH, E. N. (1998): A new genus and species of Colubrid snake from the Sierra de las Minas of Guatemala.- *Herpetologica*, Johnson City; 54(2): 207-220. CUNHA, O. R. DA & NASCIMENTO, F. P. DO. (1983): Ofidios da Amazônia XX.- As espécies de *Atractus* WAGLER, 1828, na Amazônia Oriental e Maranhão. (Ophidia, Colubridae).- *Boletim do Museu Paraense Emílio Goeldi*, Belem; (123): 1-38. DUELLMAN, W. E. (1978): The biology of an Equatorial herpetofauna in Amazonian Ecuador.- *Miscellaneous Publication*, University of Kansas, Museum of Natural History, Lawrence; (65): 1-352. FERNANDES, R. (1995): Phylogeny of the dipsadine snakes. Unpubl. PhD Diss, University of Texas at Arlington; pp. 115. HOOGMOED, M. S. (1980): Revision of the genus *Atractus* in Surinam, with the resurrection of two species (Colubridae: Reptilia). Notes on the Herpetofauna of Surinam VII.- *Zoologische Verhandlungen*, Leiden; (175): 1-47. KÖHLER, G. & WILSON, L. D. & MCCRANIE, J. R. (2001): A new genus and species of colubrid snake from the Sierra de Omoa of north-

western Honduras.- *Senckenbergiana biologica*, Frankfurt am Main; 81(1/2): 269-276. MARTINS, M. & OLIVEIRA, E. (1999): Natural history of snakes in forests of the Manaus Region, Central Amazonia, Brazil.- *Herpetological Natural History*, Phoenix; 6 (2):78-150. PEREZ-SANTOS, C. & MORENO, A. (1990): Anotaciones biométricas y alimenticias de la serpiente neotropical *Atractus badius* (BOIE, 1827) (Serpentes, Colubridae) de la Colección del Museo Nacional de Ciencias Naturales de Madrid.- *Revista Española de Herpetología*, Madrid; 4: 9-15. PETERS, J. A. (1960): The snakes of the subfamily Dipsadinae.- *Miscellaneous Publications, Museum of Zoology, Univ. of Michigan*, Ann Arbor; (114): 1-224. SAVAGE, J. (1960): A revision of the Ecuadorian snakes of the colubrid genus *Atractus*.- *Miscellaneous Publications, Museum of Zoology, Univ. of Michigan*, Ann Arbor; (112): 1-86.

KEY WORDS: Reptilia, Squamata, Serpentes, Colubridae, *Atractus carrioni*, diet, molluscivory, Ecuador

SUBMITTED: February 02, 2005

AUTHOR: 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 <diegofrancisco_cisneros@yahoo.com>.