
A Non-Flushing Stomach Wash Technique for Large Lizards

JESÚS ANTONIO RIVAS¹
CESAR RAMÓN MOLINA²

and

TITO MANUEL ÁVILA²

*Universidad Central de Venezuela, Instituto de Zoología Trópic,
Caracas, Venezuela*

*Present addresses: [1] Department of Ecology and Evolutionary Biology,
University of Tennessee, Knoxville, Tennessee 37996-0900, USA; and*

*[2] Fundación Museo de Ciencias, Centro de Apoyo Adolfo Erus,
Calle El Comercio, Las Acacias, Venezuela*

Stomach flushing has been proved useful in the study of lizard diets, but techniques have varied from one study to another (Henle 1989a; James 1990; Legler and Sullivan 1979; Shine 1986). We carried out a study of food habits in green iguanas (*Iguana iguana*) at Hato Masaguaral (a cattle ranch), Guárico, Venezuela (8°34'N, 67°35'W), and present the technique we used to recover stomach contents without killing or injuring the animals.

An iguana's mouth may be opened by gently pulling down the lower jaw, and then kept open by insertion of a metal ring (25 mm diameter, covered with several layers of masking tape to avoid damage to the teeth). Clear plastic tubes (8–15 mm diameter, depending upon animal size), with ends sanded to avoid cutting the stomach wall, may then be lubricated with vegetable oil and, while holding the animal's head in a vertical position, gently introduced through the ring into the throat. The tube is inserted past the initial resistance of the throat and until further resistance is met (a distance of about 60% snout-vent length), and then the tube is slowly backed out a distance of 1–2 cm, depending upon the size of the animal. The tube is then filled with water until the water level rises above the height of the mouth. The water in the tube is

then mixed with the stomach contents by gently massaging the belly; contents are removed by inverting the animal, retracting the tube an additional 2–3 cm (estimated distance from the hind wall of the stomach to the distal end of the sternum), and applying gentle pressure from the rear to the front of the stomach. The stomach contents are then collected in a plastic container; food becoming lodged in the mouth or pharynx is easily removed with forceps. This procedure is repeated 3–6 times for each animal and is stopped when the expelled water contains no plant items.

To test the efficiency of this procedure, one yearling and 13 hatchling iguanas were sacrificed, and the remaining stomach contents were analyzed after the procedure had been used. An average of 83.2% of all stomach contents (range 32–100 %) was recovered, and all species present in the stomach were detected in 13 of 14 cases. We did not consider it necessary to sacrifice larger animals to test the efficiency of the method.

Using this technique, we have been able to recover remains of 125 species of plants (Molina 1991; Rivas 1990). Stomach washing was performed on 365 iguanas ranging in size from hatchling (70 mm SVL, 12 g) to adult (up to 450 mm SVL, 4500 g). No animals died during the treatment although, in early attempts, some animals appeared weak after the maneuver. Many iguanas previously “stomach-washed” were recaptured in subsequent years and showed no ill effects.

This method provides a safe and easy way to study the dietary habits of large lizards. Because water is poured into the tube, no water pressure is applied to the animal gut, and no pump or syringe is needed. Although we used this method only for green iguanas, we believe it could be used with other lizards of comparable size; it was also used successfully with hatchling spectacled caiman (*Caiman crocodilus*) (Escalona, pers. comm.).

Acknowledgments.—We thank Thomás Blohm for the use of his ranch facilities, and the Wildlife Conservation Society (WCS) for financial support. Carlos Coronel allowed us to sacrifice some iguanas at his ranch. Gustavo Hernandez provided useful comments on the application of the technique. P. T. Andreadis, G. M. Burghardt, D. Truett, A. S. Rand, J. Thorbjarnarson, and A. E. Echternacht also provided useful comments and editorial suggestions.

LITERATURE CITED

- HENLE, K. 1989. Ecological segregation in a subterranean reptile assemblage in arid Australia. *Amphibia-Reptilia* 10:277–295.
- JAMES, C. D. 1990. A refinement of the stomach-flushing technique for small scincid lizards. *Herpetol. Rev.* 21:87–88.
- LEGLER, J. M., AND L. J. SULLIVAN. 1979. The application of stomach-flushing to lizards and anurans. *Herpetologica*. 35:107–110.
- MOLINA, C. R. 1991. Dieta de la iguana verde (*Iguana iguana*) en los Llanos Centrales de Venezuela durante la estación lluviosa. Unpublished thesis. Universidad Central de Venezuela. 82 pp.
- RIVAS, J. A. 1990. Dieta de la iguana verde (*Iguana iguana*) en los Llanos Centrales de Venezuela durante la estación seca. Unpublished thesis. Universidad Central de Venezuela. 65 pp.
- SHINE, R. 1986. Food, habits, habitats and reproductive biology of four sympatric species of varanid lizards in tropical Australia. *Herpetologica* 42:346–360.