

## Oophagy in the Smooth snake (*Coronella austriaca*)

ENRICO LUNGHINI<sup>1,2,3\*</sup>, CLAUDIA CORTI<sup>3</sup> & TOMMASO CENCETTI<sup>4</sup>

<sup>1</sup> Universität Trier Fachbereich VI Raum- und Umweltwissenschaften Biogeographie, Campus I, Gebäude N Universitätsring 15, 54286 Trier, Germany

<sup>2</sup> Natural Oasis, Via di Galceti 141, 59100 Prato, Italy

<sup>3</sup> Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola", Via Romana 17, 50125 Firenze, Italy

<sup>4</sup> via Caracciolo 85, 50133 Firenze (Italy)

\*Corresponding author email: enrico.arti@gmail.com

The smooth snake (*Coronella austriaca*) is a small colubrid that is relatively widely distributed throughout most of Europe. Its distribution becomes less continuous eastward where the species reaches western Kazakhstan, the Caucasus, northern Asia Minor and northern Iran (Sindaco et al., 2006; Corti et al., 2010; Drobenkov, 2014). Across its range, *C. austriaca* can be found in different habitats types ranging from forests to open meadows depending on latitude and altitude (Santos et al., 2009; Luiselli & Razzetti, 2010).

This non-venomous snake is known to be an ambush predator that is able to detect prey by chemical cues (Amo et al., 2004; Pernetta et al., 2009). The diet of *C. austriaca* mainly consists of lizards, small snakes and mammals; however, invertebrates including small amphibians are also predated (Luiselli, 1996; Reading & Jofré, 2013). Typology of consumed prey changes depending on snake size: larger snakes tend to feed mostly on larger prey (e.g., small mammals) than smaller snakes, which usually prefer Lacertids (Reading & Jofré, 2013). In this paper we report the first observation of oophagy in *C. austriaca*.

In May 2015, we were searching for *C. austriaca* in southern Tuscany (Central Italy) in order to take high quality pictures of this snake. In the late afternoon, an individual was found under a rock in a dry bushy open area bordering an oak wood, at an altitude of 90 m a.s.l. The total length of the snake was 35.5 cm and therefore considered as sub-adult. Sex recognition of *C. austriaca* at this life stage is quite difficult (Najbar, 2006; Van Gelder et al., 1988). Some pictures were taken placing the animal in a white plastic box. Probably due to the stress of being handled, the snake regurgitated six eggs most likely that of *Podarcis* lizards (Fig. 1). Both *P. sicula* and *P. muralis*, inhabit the surrounding area but it was not possible to ascribe the eggs to either species.

Evidence of feeding on eggs, either from faeces or stomach contents, is absent in *C. austriaca* despite the numerous individuals analyzed in previous studies (Luiselli, 1996; Reading & Jofré, 2013) although oophagy for the congeneric *Coronella girondica* has been reported (Luiselli et al., 2001).



**Figure 1:** *C. austriaca* regurgitating six eggs of an unknown *Podarcis* lizard.

### ACKNOWLEDGEMENTS

The permit to handle protected species has been issued by the Italian Ministero dell'Ambiente e della Tutela del Territorio e del Mare: Prot. n. 1805/PNM, 04/02/2015. We thank B. Borri for having suggested us where to search for the species. We also thank the two anonymous reviewers for their suggestions.

### REFERENCES

Amo, L., López, P. & Martín, J. (2004). Chemosensory Recognition of its lizard prey by the ambush smooth snake, *Coronella austriaca*. *Journal of Herpetology* 38: 451-454.

- Drobenkov, S.M. (2014). Distribution, ecological traits and conservation of the smooth snake (*Coronella austriaca*) in Belarus. *Acta Biologica Universitatis Daugavpiliensis* 14: 21-27.
- Luiselli, L., Pleguezuelos, J.M., Capula, M. & Villafranca, C. (2001). Geographic variation in the diet composition of a secretive Mediterranean colubrid snake: *Coronella girondica* from Spain and Italy. *Italian Journal of Zoology* 68: 57-60.
- Luiselli, L. & Razzetti, E. (2010). *Coronella austriaca* Laurenti, 1768. In: Corti, C., Capula, M., Luiselli, L., Sindaco, R., Razzetti, E. (2010): *Fauna d'Italia*, vol. XLV, *Reptilia*. Calderini, Bologna, pp. 473-481.
- Luiselli, L., Capula, M. & Shine, R. (1996). Reproductive output, costs of reproduction, and ecology of the smooth snake, *Coronella austriaca*, in the eastern Italian Alps. *Oecologia* 106: 100-110.
- Najbar, B. (2006). The occurrence and the characteristics of *Coronella austriaca austriaca* (Laurenti, 1768) (Serpentes: Colubridae). *Acta Zoologica Cracoviensia* 49A: 33-40.
- Pernetta, A.P., Reading, C.J. & Allen, J.A. (2009). Chemo-reception and kin discrimination by neonate smooth snakes, *Coronella austriaca*. *Animal Behaviour* 77: 363-368.
- Reading, C. & Jofré, G. (2013). Diet composition changes correlated with body size in the Smooth snake, *Coronella austriaca*, inhabiting lowland heath in southern England. *Amphibia-Reptilia* 34: 463-470.
- Santos, X., Brito, J.C., Caro, J., Abril, A.J., Lorenzo, M., Sillero, N. & Pleguezuelos, J.M. (2009). Habitat suitability, threats and conservation of isolated populations of the smooth snake (*Coronella austriaca*) in the southern Iberian Peninsula. *Biological Conservation* 142: 344-352.
- Sindaco, R., Doria, G., Razzetti, E. & Bernini, F. (2006). Atlante degli Anfibi e dei Rettili d'Italia / *Atlas of Italian Amphibians and Reptiles*. Societas Herpetologica Italica, Edizioni Polistampa, Firenze: 526-529.
- Van Gelder, J.J., Olders, J.H.J., Mertens, L.A.J.M. & Kersten, H.L.M. (1988). Field Identification of the Sex of the Smooth Snake (*Coronella austriaca Laurenti*). *Journal of Herpetology* 22: 53-60.

Accepted: 3 September 2015