Ophiophagy and cannibalism in *Vipera latastei* Boscá, 1878 (Reptilia, Viperidae)

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THE normal or occasional diet of many snake species includes other snakes. Species such as the King Cobra (*Ophiophagus hannah*) from southeastern Asia or the Mussurana (*Clelia clelia*) from the Amazon rainforest are reported to be largely ophiophagic (Gasc, 1994). Some North American crotalids, members of the genera *Crotalus* and *Sistrurus*, primarily prey on endotherms; however newborns of both genera may prey on other snakes (Mushinsky, 1987). In Europe, there are no truly ophiophagic snakes, but some species such as the Montpellier snake (*Malpolon monspessulanus*), the Western whip snake (*Coluber viridiflavus*) or the European smooth snake (*Coronella austriaca*) also attack and prey on other snakes, including vipers (Bellairs, 1975; Gasc, 1994). About 20 species of snakes are reported to be cannibalistic (Polis & Myers, 1985).

With the exception of species adapted to eat other snakes, ophiophagy is considered an aberrant behaviour released by an inappropriate stimulus (Fox, 1975). Although this phenomenon has been observed in the wild, it typically occurs under captive conditions. For instance, it occurs in boids, when two specimens share a terrarium and select the same prey. One of them, usually the smaller, can be swallowed after the prey by the larger snake (Gasc, 1994). It also occurs after long periods of fasting, when a snake is stimulated by a prey situated within its striking range, regardless of whether or not the prey is another snake or a conspecific (Bruno & Maugeri, 1990).

In this note, ophiophagy and cannibalism is reported in wild and in captive conditions for Lataste's Viper (*Vipera latastei* Boscá, 1878). *Vipera latastei* is a small viviparous Mediterranean snake, distributed throughout most of the Iberian Peninsula, except for a narrow strip in the north, and in North Africa from Morocco to Tunisia (Pleguezuelos & Santos, 2002). It is an ambush predator with a similar diet pattern to the rest of European vipers, with the exception of *V. ursinii* (Bea & Braña, 1988; Bea *et al*., 1992; Brito, 2004). Its diet before sexual maturation consists mostly of ectothermic prey such as reptiles of the family Lacertidae, and endothermic prey such as small mammals of the Soricidae and Rodentia groups after sexual maturation (Saint-Girons, 1980; Bea *et al*., 1992; Brito, 2004). Less frequently, it also feeds on invertebrates of the Mollusca, Myriapoda and Coleoptera groups (Bea & Braña, 1988; Brito, 2004), and other vertebrates such as amphibians, birds and mustelid mammals (López Jurado & Caballero, 1981; Bea & Braña, 1988; Brito, 2004). To our knowledge (Valverde, 1967; López Jurado & Caballero, 1981; Bea & Braña, 1988; Bea *et al*., 1992; Brito, 2004), snakes have never been reported in the diet of *V. latastei*.

Two observations of ophiophagy in *Vipera latastei* from Sedano valley (latitude 42º43'13''N and longitude 3º45'03''W), north-western Burgos, north of Spain, are detailed. The first observation occurred in September 2004 when several pregnant females were kept in glass terrariums (54 x 30 x 30 cm) during the last 20 days of gestation for reproductive experiments. On 1st September an adult male of 400 mm snout-vent length (SVL) was introduced in a terrarium with a pregnant 525 mm SVL female. After a 5-day period without observing interactions between the two specimens, the male disappeared and five newborns were found in the terrarium. The palpation of the female allowed the clear identification of the male inside the stomach of the female. After the male was eaten, the female gave birth to two newborns more. The pregnant female weighted 180 g, the total weight of the offspring (including embryonic tissues) was 74 g, the male weighted 66 g and the post-partum female with the male in the stomach weighted 171 g. The second observation was made on 27th April 2005 during a field survey. A juvenile of *V. latastei* with an SVL of 167 mm was captured and a few minutes latter disgorged a juvenile 168 mm SVL *Coronella austriaca*.

Although both observations increase the current knowledge about the foraging ecology of *V. latastei*, the nature of such observations is radically different. The first observation was made under captive conditions and could be the result of an aberrant behaviour due to the conditions of captivity. Only *V. ammodytes* is reported to be cannibalistic in the field (Beskov & Dushkov, 1981; Mario Schweiger, pers. comm.). Whereas studies in semi-wild conditions (large open terrariums) confirm the lack of intraspecific intolerance when two specimens are placed in contact (Bellairs, 1975), in captive conditions (small closed terrariums) snake keepers have to be careful when placing vipers together as they should eliminate smells by washing the terrariums (Mario Schweiger, pers. comm.). Although social behaviour and intraspecific chemical recognition were studied in many snake species (Ford & Burghardt, 1993), including European vipers (Andrén, 1976, 1982), nothing is known about

territory marking by smell and interspecific recognition by smell under captive conditions. In the field, both sexes of *V. latastei* can only be found together during the hibernation and mating seasons. During the rest of the annual cycle, vipers are solitary animals, with pregnant females and males selecting different habitat types during the gestation period (authors, pers. obs.). This habitat segregation could avoid the occurrence of cannibalistic behaviours. Pregnant females of *V. latastei* usually do not feed during the final stages of gestation due to physical constraints in the abdominal cavity caused by the developing offspring (Bea *et al*., 1992). Thus, post-partum females are largely emaciated and finding food is a crucial step for survival (Madsen & Shine, 1992). The presence of the smaller male in a small terrarium at the moment after parturition might have released an inappropriate stimulus, leading to predation by the female.

The second observation was made under natural conditions and should reflect local variation in the diet composition of this viper. In the Sedano valley, *C. austriaca* is very abundant and it shares similar habitats to *V. latastei*, and thus could be a potential prey species for this viper. *Vipera latastei* occurs in a wide range of environments, from sea level to mountain areas, in sub-humid, humid and semi-arid Mediterranean climates (Pleguezuelos & Santos, 2002) and should exhibit local variation in diet composition according to prey availability.

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