

# Eat until bursting: an unusual feeding attempt by a European Asp, *Vipera aspis* (Linnaeus, 1758), on a Western Green Lizard, *Lacerta bilineata* Daudin, 1802, in Calabria (Southern Italy)

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Feeding habits represent a key element of snake ecology, with foraging modes (ambush vs. active foraging) often being correlated with a range of morphological, physiological, and behavioural traits (Glaudias et al., 2019). In particular, many snakes can ingest large prey, which may exceed their own body mass (Gavira and Andrade, 2013; Gavira et al., 2015; Siers et al., 2018). Some species ingest meals weighing 20–60% of their own body mass, or even more (Greene, 1983; Secor and Diamond, 1998). The digestion of large prey is metabolically and aerobically costly, and the fast increase in mass and alteration of the body form of a snake caused by a large prey bolus may precipitate behavioural changes. Moreover, taking large prey increases predation risk for snakes (Nielsen et al., 2011) and they must complete digestion before the prey begins to putrefy inside their gut due to bacterial action (Pough et al., 2003; Gavira et al., 2015).

Field observations, even anecdotal ones, on these aspects are quite rare and, above all, there are few observations of snakes, which, following the ingestion of too large prey, have died due to laceration of their intestine. In this note we report an unusual feeding attempt by a European Asp, *Vipera aspis* (Linnaeus, 1758), on a Western Green Lizard, *Lacerta bilineata* Daudin, 1802.

*Vipera aspis* is a venomous viper species found in southwestern Europe. The species grows to an average total length of 60–65 cm, and the diet of adult vipers

generally consists of small mammals (in particular rodents and shrews) and, to a lower proportion, of amphibians, lizards, or small birds (Luiselli and Agrimi, 1991; Saviozzi and Zuffi, 1997; Kowalewski and Profus, 2007). These observed differences in diet composition are likely correlated with the availability of potential prey.

The observation we report herein was made on 21 October 2019 during a monitoring activity in the “Foce del Fiume Crati” Nature Reserve in Calabria, southern Italy (39.7130°N, 16.5102°E). The sighting took place in an area characterized by the presence of lowland temperate wet forest vegetation, the so-called flood-plain forest, a relic of ancient forests that covered large areas of this territory and today relegated to small areas of the Reserve. The area is characterized by high herpetological biodiversity, as is the whole of northern Calabria (Bonacci et al., 2008; Leonetti et al., 2020).

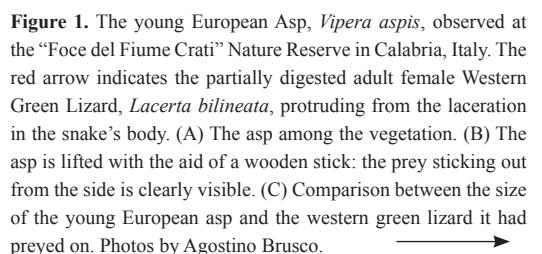
During the monitoring activities, a young European asp was observed in the forested area. It was immediately realized that part of a previously swallowed prey protruded from a laceration in the left side of the animal. Despite the laceration, the viper appeared to move and behave normally. The viper was captured to see if medical assistance could be provided, and during the capture process the prey completely emerged from the laceration. It was a partially digested adult female western green lizard, decidedly large when compared to the viper (Fig. 1). The European asp was released and continued to move and behave normally, disappearing,

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**Figure 1.** The young European Asp, *Vipera aspis*, observed at the “Foce del Fiume Crati” Nature Reserve in Calabria, Italy. The red arrow indicates the partially digested adult female Western Green Lizard, *Lacerta bilineata*, protruding from the laceration in the snake’s body. (A) The asp among the vegetation. (B) The asp is lifted with the aid of a wooden stick: the prey sticking out from the side is clearly visible. (C) Comparison between the size of the young European asp and the western green lizard it had preyed on. Photos by Agostino Brusco. 



after a while, in the vegetation. The viper was probably unable to survive due to the laceration affecting the skin, muscle mass, and intestines. We do not know how the viper received the laceration. As it did not have other wounds on the body, predatory attack can likely be excluded as a cause of the wound. Instead, it is conceivable that the laceration was generated by the considerable size of the prey compared to the predator. Based on the body measurements we recorded for the snake (snout–vent length 33 cm, weight 14 g) and the lizard (15 cm, 17.5 g), we can determine a prey/predator weight ratio (WR) of approximately 1.25.

Greene (1983) suggested that the maximum limits of WR for viperid snakes could occasionally exceed values of 1.0. Vipers can ingest prey substantially larger than themselves, suggesting that the upper prey size for vipers might be set by their capacity for transporting an item after swallowing rather than by their ability to subdue and engulf it. The WR we calculated for our observation is higher than the value suggested by Greene (1983) for vipers, so the viper we observed may have ingested too large a prey item. However, it is also possible that the viper ingested the lizard when it was still alive, which might explain the laceration. While this is conjecture, it would be very interesting since viperids usually kill prey before ingesting it. No published information is currently available reporting the ingestion of live prey in viperids. Our observation is certainly unusual and opens up space for discussion.

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