

## Scavenging in the genus *Natrix*

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**Abstract.** Scavenging is reported as an unusual behaviour of snakes. However, it is likely more common than is supposed. Here I report the use of dead newts as prey source by water snakes of the genus *Natrix* at a dam in north-western Spain. Juveniles and adults viperine snakes (*Natrix maura*), and also an adult grass snake (*Natrix natrix*) were found feeding on newt carcasses.

**Keywords.** Scavenging, *Natrix*, Spain.

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Scavenging in wild snakes has been widely ignored or is barely known, even though there are many references describing this behaviour (see references in DeVault and Krochmal, 2002). From older reports (Cowles, 1946) to the most recent ones (Platt and Rainwater, 2011; Lillywhite and Brischoux, 2011) the number of species observed scavenging has increased, involving pitvipers (Lillywhite et al., 2008) and piscivorous species more frequently than other species (DeVault and Krochmal, 2002).

The use of carrion as a food resource could be difficult to evaluate using traditional methods, as stomach contents analysis, unless prey items present signs of decomposition or contain fly larvae. Most of the references originates from accidental observations, some from road-killed preys (Mora, 1999; Phelps, 2006; Ventura, 2012). It has been also related with cannibalistic behaviour in some cases (Lillywhite, 1982).

During the monitoring of a mass-mortality of amphibians in a small reservoir close to Pontevedra (42.29° N, 8.36° W Spain), I have observed several scavenging events by water snakes (genus *Natrix*). The first one was detected on April 26<sup>th</sup> 2011 (Ayres, 2012); a juvenile viperine snake (*Natrix maura*) was detected while trying to ingest a dead individual of Bosca's newt (*Lissotriton boscai*). On May 23<sup>th</sup> and 30<sup>th</sup> 2011 four *N. maura* individuals were found dead without symptoms of predation or illness, three juveniles and one adult, all of them had ingested dead *L. boscai* with symptoms of decomposition.

On May 2<sup>nd</sup> a grass snake (*Natrix natrix*) was detected on the shore of the reservoir lake, over dried aquatic vegetation. The snake was actively searching under the vegetation by tongue flicking and quick head movements. A couple of minutes later the head of



Fig. 1. Adult grass snake with a dead newt in its mouth.

the *N. natrix* disappeared under the vegetation, and subsequently reappeared with a dead newt in its mouth (Fig. 1).

This behaviour is consistent with previous findings of Sazima and Strüssman (1990) and DeValt and Krochmal (2002). These authors suggest that carrion consumption could be influenced by behavioural processes. Species that use chemical cues to find their prey and semi-aquatic or aquatic species scavenge more frequently than species that used visual cues. Sazima and Strüssmann (1990) suggested that carrion aggregation by water currents increases the probability of detection, also influenced by chemical gradients that give more directional information in water.

Importance of chemical cues in the behaviour of scavenging has been studied in detail on the brown tree snake (*Boiga irregularis*) by Shivik and Clark (1997) and Shivik (1998, 1999). These authors demonstrated that *B. irregularis* is able to find carrion using only chemical cues, but the brown tree snake needs a combination of chemical and visual cues to capture live prey.

Consumption of carrion was described for *N. natrix* by Poschadel and Kirschey (2002). Scavenging was not described for *N. maura*, although Hailey and Davies (1986) reported that exploratory activities and cruising could be used to find dead preys. But recent findings (Ayres, 2012) confirm that both species can use carrion as a food resource. Even more, juvenile viperine snakes have been observed to feed on canned sardines used as bait (Ayres, pers. obs.).

As a conclusion, it seems that scavenging behaviour in snakes is more common than it was supposed previously, just often overlooked or simply not observed. Some species

use carrion consumption as an adaptation to a specific habitat (i.e., insular isolation; Lillywhite et al., 2002, 2008). Carrion consumption by Florida cottonmouths (*Agkistrodon piscivorus conanti*) living in Seahorse Key has been studied in detail. This snake population depends mostly on fish that are dropped or regurgitated by colonial wading birds that nest on the island (Lillywhite et al., 2002, 2008). These authors also suggested that it could be part of an “island syndrome” which implies behavioral and physiological modifications as a response to resource limitations on islands.

Other species could use carrion as an opportunistic food resource, like the described episode. The absence of more reports could be due to the inconspicuous life of many snake species, including rarely seen feeding behaviour.

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