

Vipera berus (northern viper): Morphometrics of feeding on a common field vole

DAVID BULL

34 Gatcombe, Netley Abbey, Southampton, Hampshire, SO31 5PX, U.K.
Author Email: bull77@btinternet.com

The diet of *Vipera berus* typically consists of small rodents, lizards and amphibians (Prestit, 1971; Anders, 1991), although birds may also be eaten (Meyer & Monney, 2004; Sweeting, 2011). *V. berus* tackling sizeable prey has been shown in a photo of a male starting to ingest a merlin chick (*Falco columbarius*) (Frazer, 1983); however actual records of the mass of undigested prey relative to snake mass in free ranging *V. berus* have not been commonly reported. The discovery during regular field work of a dead, recently fed, sub-adult female *V. berus* provided an opportunity to record details of prey type and size relative to the predator. The snake was found in a bracken (*Pteridium aquilinum*) and gorse (*Ulex europaeas*) riverine woodland ecotone on August 30th 2015 at Black Knowl in the New Forest, southern England. Length (± 1 mm) was measured with a tape measure, head length from rostral to the posterior edge of the rear-most supralabial scale with a micrometer (± 0.1 mm) and weight with a Pesola spring balance (± 2 g). Total body length was 402mm and snout-vent length (SVL) was 355mm. Head length was 17.4mm. A sizeable elongate bulge was visible mid-way between the head and vent indicating that it had recently fed (Fig. 1). Examination of the snake revealed head trauma, a mid-body puncture close to the spine and tissue damage to the upper left and right flanks of the body. The body was in good condition and exhibited no signs of decomposition or maggots. Opening of the stomach revealed an adult male bank vole (*Microtus agrestis*) (Fig. 2). The prey had been swallowed head first. The head of the vole exhibited minor digestion of soft tissue causing the posterior part of the zygomatic arch of the skull to protrude through the fur. Fur was also detached from the mid body section of the right flank. The prey was otherwise intact. The total mass of adder and prey was 54g. The prey mass was 26g and the snake mass with prey removed was 28g. The maximum girth of the prey was 70mm around the shoulders. Girth around the hips was 65mm and the snout to vent length was 105mm. The adder had therefore consumed a meal equivalent to 92.8% of its body weight and 29.6% of its snout-vent length.

The relationship between maximum mass of ingested prey items and snake SVL for *V. berus* was investigated experimentally by Forsman & Lindell (1993) using adders with SVLs of 400 to 650mm; rather larger than the sub-adult reported here. They determined the relationship



Figure 1. Body of a sub-adult female *V. berus* showing elongate food bulge and tissue damage at five localities on the upper flanks.

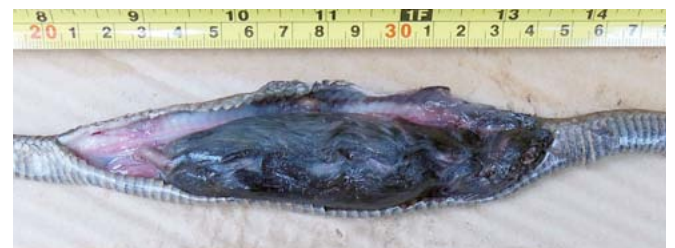


Figure 2. Stomach contents of a sub-adult female *V. berus* showing an almost undigested field vole (*M. agrestis*).

$y=0.15x-35$, where y is prey mass and x is snake SVL. This implies a maximum prey mass of 18.25g for the adder in this study which is 29.8% less than observed here. This would be consistent with an ontogenetic shift in the maximum size of prey taken by *V. berus*, however more data would be required to test this hypothesis.

The cause of death is unclear. Carcasses of grass snakes (*Natrix natrix*) have been found at this site with most of the flesh and organs removed and the ribs severed close to the spinal column, but the head and tail are left untouched. These remains are characteristic of buzzard (*Buteo buteo*) kills (Dave Bird, pers. Comm.). Buzzards are common at this site, however no predation of adders by any bird has been witnessed in the many years of recording at this site and no adder carcasses exhibiting characteristics of predation by buzzards have been found. The two other significant avian predators of British snakes, pheasant (*Phasianus colchicus*) and crows (*Corvus corvus*) are rare at this site.

REFERENCES

- Anders, F. (1991). Variation in sexual size dimorphism and maximum body size among adder populations: effects of prey size. *Journal of Animal Ecology* 60: 253-267.
- Forsman, A. & Lindell, L. E. (1993). The advantage of a big head: swallowing performance in adders, *Vipera berus*. *Functional Ecology* 7: 183-189.
- Frazer, D. (1983). *Amphibians and Reptiles in Britain*. London: Harper Collins, 256pp.
- Meyer, A., & Monney, J. C. (2004). Die Kreuzotter, *Vipera berus* (Linnaeus, 1758) in der Schweiz. In, Joger, U. & Wollesen, R. (Eds.). *Distribution, Ecology and Conservation of the adder (Vipera berus [LINNAEUS, 1758])*. *Mertensiella* 15, Supplement zu SALAMANDRA, 144-155.
- Prestt, I. (1971). An ecological study of the viper *Vipera berus* in southern Britain. *Journal of Zoology (London)* 164: 373-418.
- Sweeting, T. (2011). *Vipera berus* (ADDER): Feeding. *Herpetological Bulletin* 116: 31.

Accepted: 13 January 2016