



# Biting during Male-Male Combat in the European Adder (*Vipera berus*)

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The European Adder, *Vipera berus* (Linnaeus 1758), is native to much of Eurasia, where it inhabits heathlands, moorlands, grasslands, coastal dunes, and woodland edges (Speybroeck et al. 2016). Its longitudinal distribution extends from Western Europe east through Russia to the Korean Peninsula and its latitudinal distribution from the Balkan Peninsula north to the Arctic Circle in northern Scandinavia (Speybroeck et al. 2016; Uetz et al. 2025).

Male-male combat in this species is a well-documented behavior that typically occurs during the early mating season when males compete for access to receptive females (Andrén 1986; Duvall et al. 1993). These contests involve ritualized and largely non-injurious physical interactions, primarily through the use of upright “body bridging” and pushing behavior to force the opponent to the ground (Andrén 1986; Kelleway 1982; Senter 2022). Victory in these bouts is often associated with larger body size, and longer, more intense contests tend to occur between males of similar sizes (Madsen 1988; Madsen et al. 1993). *Vipera berus* is one of the few species of snakes that engage in ritualistic combat in which males are typically smaller than females, possibly due to stronger

selective pressures on female fecundity than on male-male competition (Madsen 1988; Shine 1994).

On a clear, sunny day (ambient temperature ~15 °C) at 1044 h on 6 April 2025, while surveying herpetofauna in the North York Moors (UK), I observed two male *V. berus* emerge from dense heather vegetation close to the base of a young tree sapling and engage in typical ritualized male-male combat for approximately 30 sec. Unlike most documented interactions of this kind, both males were observed biting each other (Fig. 1). Combat continued for another 40–50 sec before one of the individuals “won” the bout and chased the “loser” 1–2 m away. Both individuals had recently shed, indicated by their bright, silver coloration, and appeared to be of similar length. The entire interaction lasted ~70–90 sec and included multiple upright entanglements and the one instance of biting behavior. Pairs of males (possibly including one or both individuals in the encounter described herein) engaged in combat five times at this site on 6–7 April 2025; no other instances of biting were observed.

Shaw (1948) described male combat in snakes as involving “no attempts to bite,” and this remains the standard for



**Figure 1.** Two male European Adders (*Vipera berus*) of similar sizes engaged in ritualistic combat with mouths open after apparent mutual biting (left) and entwined around each other during typical male-male combat behavior (right) in the North York Moors, UK. Photograph by Edward Gilbert.

most venomous species. While biting is commonly observed in nonvenomous colubrids (Shine 1994), it is considered a “last resort” in viperids, recorded only sporadically in species such as *Agkistrodon contortrix*, *Bitis gabonica*, and *Crotalus cerastes* (Carpenter 1986; Shine 1994). In *V. berus*, biting during combat appears to be unusual, given that the behavior was characterized as “highly ritualized without biting” by Capula and Luiselli (1997). Although biting has been documented during courtship and copulation in *V. berus* (Krütgen 2023), it has not been recorded during combat (Senter et al. 2014; Senter 2022).

Biting during male-male combat could reflect demographic or ecological stressors, such as post-hibernation energy deficits, unusually high male densities, or encounters between particularly closely matched males. What we do not know is if this behavior is rare or underreported due to this species’ secretive nature and the brief nature of these interactions. Under what ecological, demographic, or independent conditions might ritualized combat escalate to biting in *V. berus*? Could biting in combat confer an advantage or does it carry maladaptive risks for a venomous species? Additional observations during the early mating season, ideally coupled with high-resolution video and close monitoring of free-living males, could begin to clarify the circumstances and significance of this apparently rare behavior.

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