

Behavioural interactions between barred grass snake *Natrix helvetica* and northern viper *Vipera berus*

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This note documents behavioural interactions between barred grass snakes (*Natrix helvetica*) and northern vipers or adders (*Vipera berus*) observed during the spring breeding season in 2020. Observations were made from 9th to 16th April in a small clearing, amongst heather and gorse, a typical early spring basking site at this location in Norfolk, England.

During the first two days three male and two or three female vipers were present, mostly basking communally. Some courtship and brief spells of combat were observed and during the latter one of the males appeared to establish dominance.

On 11th April, over a period of approximately ten minutes, three grass snakes arrived and mingled with the vipers. Two of the grass snakes engaged in intertwining their tails, indicating that at least one was male and one female and that their relatively synchronous arrival was due to a mating pursuit. Three interspecific behaviours were also observed. A male viper followed alongside a moving grass snake (Fig. 1). At least one male grass snake initiated courtship behaviour with a female viper (Fig. 2). Male vipers behaved aggressively towards grass snakes, raising their foreparts (rising, both without and with contact, as described by Andr  n (1986)), in the initial stages of combat (Figs. 3 and 4).

Both grass snakes and vipers were present the following day and showed further interspecific mating and combat behaviour. No further interspecific interactions were observed after this. Weather was unfavourable to activity



Figure 1. Male viper tracking the movement of a grass snake



Figure 2. Grass snakes and vipers at a communal basking site. The grass snake on the left is initiating courtship with a female viper.



Figure 3. A male viper behaving aggressively towards a grass snake, raising its foreparts (rising without contact)

from 13th to 14th April. On 15th April two male and two female vipers were observed but only a single grass snake and by the 16th April only a single, courting pair of vipers remained.

The close proximity of snakes in this mixed species aggregation seems likely to have prompted these unusual interspecific interactions. It is difficult to determine the specific cues involved. Male vipers have been prompted to attempt combat with model snakes, or even a stick moved to replicate another male, but both visual stimuli and female pheromones could have been involved (Kelleway, 1982). Similarly, both visual and vomeronasal cues may have prompted the current observations. As the snakes were in physical contact, pheromones may have been transferred between species, provoking interspecific interactions.



Figure 4. A male viper in contact with a grass snake, raising its foreparts in the early stages of combat (rising with contact)

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