

## Biting among male Steppe Vipers *Vipera renardi* (CHRISTOPH, 1861)

In several snake species males engage in violent fights during the mating season in order to attain mating success. These ritualized combats are primarily aiming towards displaying power, and only rarely involve biting (SHINE 1993). Combats occur in several snake families including *Viperidae* (records reviewed by SHINE 1978; CARPENTER 1986; SHINE 1994). SHINE (1994) reported biting to occur more often in non-venomous (especially pythons) than in venomous taxa, where, particularly among viperids, it seems to be employed only as a means of last resort. Thus, biting has been recorded only occasionally in three species of *Viperidae*: *Agkistrodon contortrix* (LINNAEUS, 1766), *Bitis gabonica* (DUMÉRIL, BIBRON & DUMÉRIL, 1854), and *Crotalus cerastes* HALLOWELL, 1854 (SHINE 1994).

Biting was reported to be absent among European *Viperidae* (e.g., VOLSØE 1944; KELLEWAY 1982; KELLEWAY & BRAIN 1982; MADSEN et al. 1993; MADSEN & SHINE 1994). Contradictory behavior to that was mentioned by REUSS (1924; 1925), and an interesting example of absence of biting can be found in SCHWEIGER's (1992) work. The author reports on field herpetologists who induce combat in *Vipera ammodytes* (LINNAEUS, 1758) by rapidly moving their hand in front of the snakes without being bitten. One case of biting was observed in *Vipera renardi* (CHRISTOPH, 1861) by UDVARI (2001). His two captive males showed intense movements two weeks after hibernation, which at the beginning of the sloughing switched into violent fights and involved several bites from both individuals as well, but without any visible effect. The larger male attained mating success.

In the Budapest Zoo we observed two similar cases in *V. renardi* of the Zoo's Steppe Viper Captive Breeding Program. The first observation was made in spring 2002. Two males (#001 - six years old, #002 - six years old) and one female (#005 - six years old) were placed into mating terraria. The individuals were kept separately after hibernation until their first moult. The males differed in body condition: #002 weighing 144 g while #001 only 88 g. Shortly after

they were placed together, the males started the combat. Two bites were observed, one from each individual, and interestingly the larger one bit first. The winner was the larger male and it guarded the female for several days, thus the smaller individual was unable to copulate.

The same scenario was observed in 2005, too. The snakes were kept in the same way as previously described. Three males (#003 - nine years old, #008 - four years old, #009 - four years old) and three females (#004 - nine years old, #005 - four years old, #007 - four years old) were placed together. Male #008 was inactive during the entire period. Specimens #003 and #009 showed intensive movements, and later violent fights. Five well-directed bites were observed during the first day, all from the biggest male (#003). The small male #009 tried to bite back, but without success. All the bites involved the fangs and penetrated the skin, four on the head and neck region and one on the midbody, but did not have any visible effect, other than droplets of blood in the spot of injury on the head of the individual.

The general model of male-male combat in *V. renardi* is most probably similar to the one observed in *V. berus*. Usually males of similar body condition (weight and length status) engage into fights which are won in the majority of cases by the larger individual (e.g., ANDRÉN 1986; MADSEN et al. 1993). Similarity was observed in our examples and by UDVARI (2001). When two snakes of different length meet, the smaller one generally flees without trying to engage into a fight (MADSEN et al. 1993).

The observed biting attacks may be either an inherent problem of captivity, as captive snakes sometimes exhibit deviant behaviors such as increased aggression (STEMMLER 1967), cannibalism (BOLKAY 1923; pers. obs.) or homosexuality (pers. obs.); or may occur under natural conditions as well. In years or populations with highly male biased operational sex ratio biting could be used by males in order to outrival competitors. However, field observations on this snake are scarce and do not include reports on intraspecific biting so far.

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### Predation of *Pelobates fuscus* (LAURENTI, 1768) by the Kingfisher *Alcedo atthis* (LINNAEUS, 1758)

The Kingfisher *Alcedo atthis* (LINNAEUS, 1758) is known to prey on young frogs of the genus *Rana* (CRAMP 1985) and occasionally on amphibian larvae (GÉROUDET 1998), but the latter author does neither indicate species nor genus of the amphibians concerned. NÖLLERT (1990) lists 25 species of bird (however not the Kingfisher) known to consume the Common

Spadefoot *Pelobates fuscus* (LAURENTI, 1768) and mentions that *Pelobates* is the second most common amphibian genus after *Rana* in the prey of birds in Europe. Here we report our observation of a Kingfisher predating on a *Pelobates fuscus* larva.

On August 20, 2004, we witnessed a kingfisher diving in a pond where a little more than a hundred Spadefoot larvae (about 7 cm long) had been counted before. The Kingfisher was seen with a big tadpole in his bill after a dive from a low perch. The pond is located near a forest edge in the county of Geiswasser, in Haut-Rhin (Alsace, France). It is 27 m long, six m wide, and bordered by trees. Amphibians in this pond were surveyed in the course of a LIFE (L'instrument financier pour l'environnement) program aiming toward restoring lotic habitats along the Rhine floodplain, and *P. fuscus* tadpoles have been clearly identified.

The tadpoles of *P. fuscus*, which can grow as big as 80-100 mm in length, graze the water surface in an almost vertical position (NÖLLERT 1990). Therefore, they can constitute a favorite prey for Kingfishers, which prefer to catch easily visible prey that stays near the water surface (CRAMP 1985). The feeding on *Pelobates* tadpoles should nonetheless be classified as occasional for the Kingfisher, which prefers to feed on fishes caught along running water (CRAMP 1985) although it also uses small lentic habitats such as ponds for fishing (GÉROUDET 1998). *Pelobates fuscus* is the most declining amphibian in France (DUBOIS 1998; EGGERT & GUYÉTANT 2002), and the number of sites housing it is quite small. The Common Spadefoot occurs in less than five ponds in the north of Haut-Rhin, where our observation was made.

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