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Male combat and early reproductive activity in Iberian *Vipera aspis*

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RESUMEN: Se describe la observación de un combate entre dos machos de víbora áspid *Vipera aspis* en el Sistema Ibérico riojano (España), siendo la primera vez que se documenta este comportamiento en la península ibérica. Además, se pone de manifiesto lo temprano de la observación, finales de febrero, para una localidad situada por encima de los 1000 msnm.

The asp viper *Vipera aspis* is an European viper (Fam. Viperidae) of Mediterranean affinity (Freitas *et al.*, 2020), widely distributed across France, Switzerland, SW Germany, Monaco, Italy, NW Slovenia, Andorra and Spain (Sillero *et al.*, 2014). The subspecies, *V. a. zinnikeri*, occurs in the North-East of Iberia (Martínez-Freiría, 2014). Its southwestern range limit is located in the Iberian System, between the provinces of Burgos, Soria

and La Rioja (Martínez-Freiría, 2021). In the latter region, the species is relatively widespread and ranges from montane habitats, over 2000 masl, to 550 masl in the Western parts of the Ebro valley (Zaldívar-Ezquerro, 2013).

Ritual male-male combat during courtship is a common behavior in many snake species worldwide (Carpenter, 1986; Senter *et al.*, 2014). This behavior and its adaptive impli-

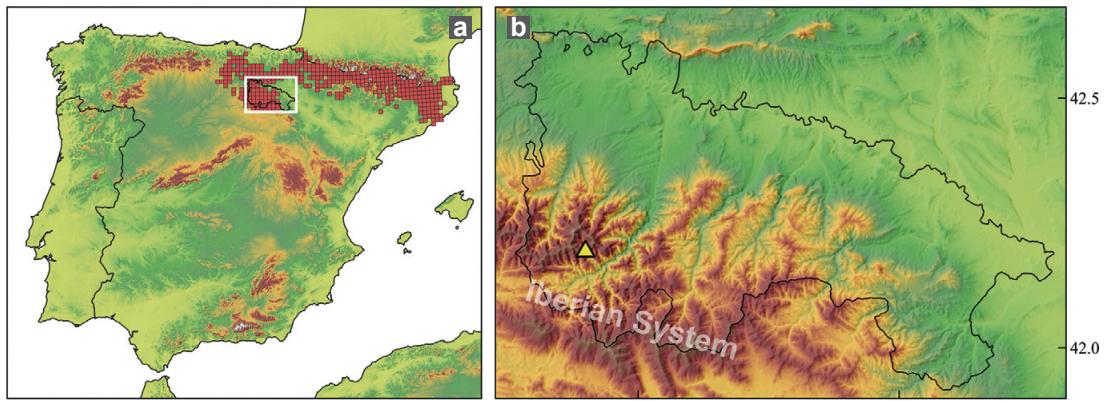


Figure 1: a) Distribution of *Vipera aspis* in Spain (data retrieved from <https://siare.herpetologica.es/>) and location of La Rioja province. b) Observation site in La Rioja.

Figura 1: a) Distribución de *Vipera aspis* en España (datos obtenidos de <https://siare.herpetologica.es/>) y ubicación de La Rioja. b) Localidad de la observación, en La Rioja.

cations have been well studied in the adder *Vipera berus* (Andrén, 1986; Madsen *et al.*, 1992). In the case of *Vipera aspis*, the behavior is known to occur in several European countries and has been registered in the literature since long ago (Carpenter, 1986; Duguy, 1958; Saint Girons, 1952). However, to our knowledge no studies have documented male-male combat in any of the three viper species living in the Iberian Peninsula.

On February 27th 2021, around 1:00 pm in the valley of the Calamantío river, La Rioja (UTM 1x1: 30T WM0472; 1164 masl.; Figure 1) we observed a combat between two individuals of *Vipera aspis* (Figure 2; video: www.herpetologica.org/BAHE/videos/ms1088_Vipera_aspis_combat_video.3gp). The sky was clear and temperature was around 10° C. The two vipers, likely males because of the contrasted dorsal coloration (Martínez-Freiría, 2014), were coiling up their bodies and raising their heads in an attempt of pushing the opponent down. The behavior lasted for about 5 minutes until they noticed our presence, stopped the combat and hid in the rocky substrate. The observation

occurred in a valley dominated by rocky outcrops among which *Quercus pyrenaica* forms a young and scattered forest accompanied by several shrubs such as *Cytisus* spp.

The behavior displayed was very similar to that described in detail for *Vipera berus* in Northern Europe (Andrén, 1986). In addition, the observation is interesting in terms of phenology. *Vipera aspis* can mate twice per year, in spring and autumn, and the spring mating period occurs in Iberia during April (Martínez-Freiría, 2021). Our observation, despite occurring over 1000 masl., was over one month earlier (27th February). Since the phenology of this species is climate-driven (Rugiero *et al.*, 2013), these kind of early observations can be due to ongoing climate warming and could be expected to become more frequent in the future, with unknown consequences on the long term survival of the species' populations (Le Galliard *et al.*, 2012; Wu, 2016).

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Figure 2: Video frames showing the male-male combat behavior.

Figura 2: Fotogramas de video mostrando el comportamiento de combate entre machos.

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