

# Diet variations across remote populations of a widely distributed snake species, the Asp viper (*Vipera aspis aspis*, Linnaeus, 1758)

Florian Laurence<sup>1,\*</sup>, Xavier Bonnet<sup>2</sup>, Sylvain Ursenbacher<sup>3,4</sup>, Gaetan Guiller<sup>5</sup>, Gopal Billy<sup>2</sup>,  
Guy Naulleau<sup>†</sup>, Nicolas Vidal<sup>1</sup>

1 - Institut de Systématique, Evolution, Biodiversité (ISYEB), Muséum national d'Histoire naturelle, CNRS, SU, EPHE, UA, CP 30, 57 rue Cuvier, 75005 Paris, France

2 - Centre d'études biologiques de Chizé, UMR-7372, CNRS Université de La Rochelle, 405 Route de Prissé la Charrière, 79360 Villiers en Bois, France

3 - Section of Conservation Biology, Department of Environmental Sciences, University of Basel, St. Johanns-Vorstadt 10, 4056 Basel, Switzerland

4 - info fauna – CSCF and karch, University of Neuchâtel, Avenue Bellevaux 51, 2000 Neuchâtel, Switzerland

5 - Le Grand Momesson, 44130 Bouvron, France

\*Corresponding author; e-mail: florian.laurence37@gmail.com

†Guy Naulleau passed away in 2024.

ORCID iDs: Laurence: 0000-0002-5841-1326; Bonnet: 0000-0001-6150-8199;

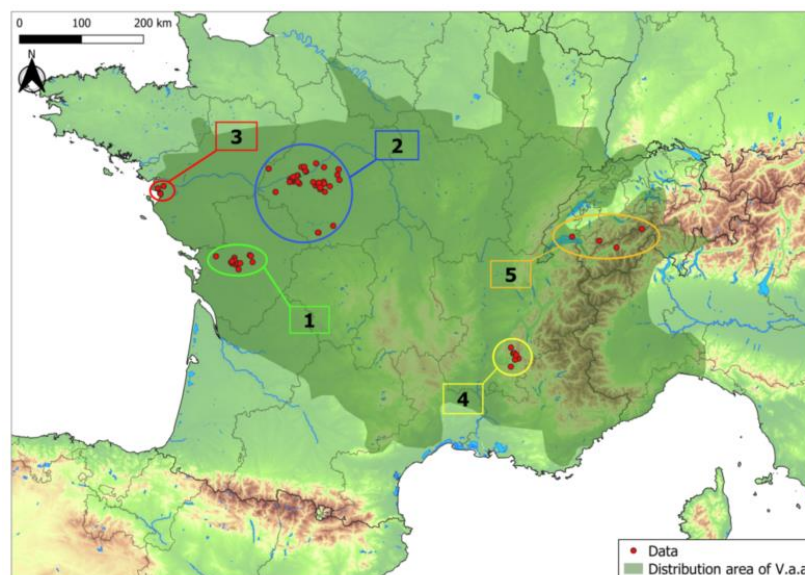
Ursenbacher: 0000-0001-5093-6403

Received 11 December 2023; final revision received 28 January 2024; accepted 4 March 2024;  
published online 25 March 2024

Associate Editor: Fernando Martínez-Freiría

**Abstract.** Documenting intra-specific diet variations among remote populations, thus across different habitats, is important to address evolutionary (e.g., phenotypic plasticity) and conservation issues (e.g., capacity to adapt to changing prey availability). We compared the diet of different populations of Asp vipers (*Vipera aspis aspis*; Linnaeus, 1758) living in contrasted habitats of France and Switzerland. We sampled 1680 individuals in five geographical areas, broadly encompassing the distribution range of the species (West to East and North to South): Group 1 = Western Central France; Group 2 = Central France; Group 3 = West France; Group 4 = South France, and Group 5 = Switzerland. We compared mean total body size (TL) of snakes and their diet. We found strong similarities among the groups with a predominance of micromammals in the diet. In mountainous area (Group 5), however, snakes included a substantial number of reptiles and fed occasionally on amphibians and birds. The diet varied ontogenetically (juveniles often consuming lizards, adults heavily feeding on mammals) and sexually (females tending to feed more extensively on mammals). Overall, our results suggest that Asp vipers maintain a diet largely based on micromammals (mostly voles), at least across their continental distribution range.

**Keywords:** European viper, feeding ecology, ontogenetic shift, prey type.



**Figure 1.** Study areas and associated group numbers. The background shows the topography and water bodies (mainly rivers) of the study area, coupled with administrative areas at a scale corresponding to regions. Country boundaries are also shown. V.a.a distribution: *Vipera aspis aspis* distribution.