



Unusual posture of a male northern viper *Vipera berus* – a more efficient way to bask?

Pozzi, Andrea; Limia Russel, Guillem

Herpetological Bulletin

DOI:
[10.33256/hb157.4243](https://doi.org/10.33256/hb157.4243)

Published: 01/10/2021

Publisher's PDF, also known as Version of record

[Cyswllt i'r cyhoeddiad / Link to publication](#)

Dyfyniad o'r fersiwn a gyhoeddwyd / Citation for published version (APA):
Pozzi, A., & Limia Russel, G. (2021). Unusual posture of a male northern viper *Vipera berus* – a more efficient way to bask? *Herpetological Bulletin*, 157, 42-43.
<https://doi.org/10.33256/hb157.4243>

Hawliau Cyffredinol / General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Unusual posture of a male northern viper *Vipera berus* – a more efficient way to bask?

ANDREA V. POZZI* & GUILLEM L. RUSSELL

Bangor University, Wales, UK

*Corresponding author e-mail: pozzi.andrea95@outlook.com

The northern viper (*Vipera berus*) is widely distributed across Europe, central and eastern Asia and, being exceptionally tolerant of cold climates, is even found north of the Arctic Circle (Andersson, 2003). This northerly distribution is made possible, at least in part, by an exceptional ability to thermoregulate achieved by adopting optimal postures to absorb energy directly from sunlight, to the extent that *V. berus* has been referred to as a “posturing heliotherm” (Spellerberg, 1976). Here, we described for the first time the unusual posture of a male *V. berus* observed in a sand dunes area in north Wales.

On the 2nd April 2021, while surveying for vipers in the sand dune systems along the coast of Rhosneigr, Wales, we observed a male *V. berus* moving uphill through the vegetation at about 5 m from the path where we were standing. The air temperature was between 8°-10° C and a moderate breeze was blowing (approx. 33 km/h). After five minutes from the initial encounter, the animal started wrapping itself around a patch of grass, while slowly turning on its back. At the end of this process, the dark ventral surface of the animal was exposed at almost 90° to the sun (Fig. 1). The observation started around 12:20 h and the behaviour was still observable at 13:56 h when we left the site. During this time, the individual kept this position while slowly moving, thus exposing different sections of the ventral surface.

There are several potential explanations for the observed behaviour. First, the rotation of the body could have resulted from neurological damage. This seems unlikely as the animal appeared in good health and was initially observed moving smoothly through the vegetation at a quite steep angle, without showing any locomotory impediments. Second, our close proximity to the animal might have provoked it to feign death (thanatosis). Such behaviour has been observed previously (Hodges, 2013) but has few similarities with that described here and given that we were a few meters from the specimen it seems unlikely that our presence would have triggered such a response. Finally, it may simply be a basking behaviour that takes advantage of the viper’s dark ventral colouration. According to the thermal melanism hypothesis, darker individuals living in cold climates would be able to increase their body temperature at a faster rate than light-coloured specimens (Trullas et al., 2007) and the thermal advantages proposed by this hypothesis have been supported in various studies on European vipers (Capula & Luiselli, 1994; Capula, Luiselli & Monney, 1995; Castella et al.,

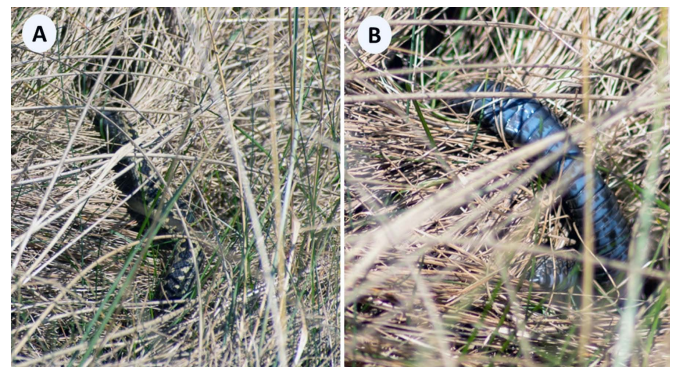


Figure 1. A male *Vipera berus* that rolled on to its back, so exposing its dark ventral surface to direct sun light – **A**. The male before it had rolled onto its back, **B**. The male on its back with ventral surface exposed to the sun

2013; Martínez-Freiría et al., 2020). Furthermore, a recent study has highlighted the overlooked adaptive role of the ventral colouration of vipers in heat transfer (Goldenberg et al., 2021). In this regard, our focal individual had, apart from its dark zig-zag stripe, a light dorsal background colouration, while its ventral scales were almost black. If this behaviour genuinely is basking then it would appear to be the first time that it has been described in any snake, although this behaviour has been suggested for a similar posture taken by a lizard species, the slow worm *Anguis fragilis* (Hails & Strine, 2016).

It seems likely that we have observed a previously unreported basking posture of *V. berus*; effectively a new posture for the posturing heliotherm (Spellerberg, 1976). Early spring represents a critical period for male northern vipers, during which basking efficiency is physiologically critical to both spermiogenesis and moulting that must be completed before mating can proceed (Nilson, 1980). Exposing its dark ventral surface to direct sunlight would have allowed this individual to warm up more rapidly, giving it a reproductive advantage over its conspecifics.

ACKNOWLEDGEMENTS

We thank Dr. James Hicks (Berkshire College of Agriculture, Maidenhead) and Dr. Wolfgang Wüster (Bangor University, Wales) for their help in reviewing and finalising the manuscript.

REFERENCES

- Andersson, S. (2003). Hibernation, habitat and seasonal activity in the adder, *Vipera berus*, north of the Arctic Circle in Sweden. *Amphibia-Reptilia* 24: 449-457.
- Capula, M. & Luiselli, L. (1994). Reproductive strategies in alpine adders, *Vipera berus*. The black females bear more often. *Acta Oecologica* (Montrouge) 15: 207-214.
- Capula, M., Luiselli, L. & Monney, J.C. (1995). Correlates of melanism in a population of adders (*Vipera berus*) from the Swiss Alps and comparisons with other alpine populations. *Amphibia-Reptilia* 16: 323-330.
- Castella, B., Golay, J., Monney, J.C., Golay, P., Mebert, K. & Dubey, S. (2013). Melanism, body condition and elevational distribution in the asp viper. *Journal of Zoology* 290: 273-280.
- Goldenberg, J., D'Alba, L., Bisschop, K., Vanthournout, B. & Shawkey, M.D. (2021). Substrate thermal properties influence ventral brightness evolution in ectotherms. *Communications Biology* 4: 1-10.
- Hails, E.L. & Strine, C.T. (2016). An "upside-down" juvenile slow-worm (*Anguis fragilis*): could this be a thermophilic behaviour? *The Herpetological Bulletin* 138: 42.
- Hodges, R. (2013). *Vipera berus* (common viper): feigning death. *The Herpetological Bulletin* 125: 25-26.
- Martínez-Freiría, F., Toyama, K.S., Freitas, I. & Kaliontzopoulou, A. (2020). Thermal melanism explains macroevolutionary variation of dorsal pigmentation in Eurasian vipers. *Scientific Reports* 10: 1-10.
- Nilson, G. (1980). Male reproductive cycle of the European adder, *Vipera berus*, and its relation to annual activity periods. *Copeia* 1980: 729-737.
- Spellerberg, I.F. (1976). Adaptations of reptiles to the cold. In *Morphology and Biology of Reptiles*, pp. 261-285. Bellairs A. d'A, & Cox C.B. (Eds.) Linnean Society Symposium Series 3. Academic Press, London.
- Trullas, S.C., van Wyk, J.H. & Spotila, J.R. (2007). Thermal melanism in ectotherms. *Journal of Thermal Biology* 32: 235-245.

Accepted: 7 June 2021