

Tragen mikroklimatische Veränderungen zum Verschwinden von Kreuzotter-Populationen im Landkreis Fulda (Hessen) bei?

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Can microclimate changes be partly responsible for the disappearance of adder populations in the county of Fulda (Hesse)?

In this study microclimate data were obtained from 13 known basking spots of the common adder (*Vipera berus*) from May to October 2017 in the county of Fulda. The 13 plots were searched for adders and the microclimate characteristics (air- and soil-temperature, air humidity) were correlated with the presence/absence of the species. The results show significantly higher temperatures in late summer and autumn at the seven sites with no recent adder records (absence of the species) and these areas had lower air humidity. The temperature of the soil was significantly lower at the six sites with recent adder records (presence of the species). Furthermore, I compared an adder habitat in a conifer forest in the north of Fulda (ca. 440 m altitude) to a humid meadow as adder habitat in the Rhön Mountains (ca. 780 m altitude). The site in the Rhön Mountains was significantly cooler but had higher maximum temperatures and a wider range of air humidity levels (higher maxima and lower minima). There is evidence that the microclimate towards the end of the year is very important for the common adder, especially for pregnant females who give birth in late summer. The humidity of the environment is essential for the cold-adapted species because of its high evaporation rate via skin. During pregnancy the females lose even more water because of intensive basking and the development of the embryo. If the water loss is too high in times of global warming with extreme and hotter summers and the adders cannot find suitable habitats, the microclimate can be partly responsible for the extinction of local populations. In further conservation measures one should focus on the creation and protection of microhabitat elements which support a warm and humid microclimate.

Key words: Adder, *Vipera berus*, disappearance, microclimate.

Zusammenfassung

In dieser Arbeit wurden mikroklimatische Eigenschaften von 13 bekannten Liegeplätzen der Kreuzotter (*Vipera berus*) im Landkreis Fulda von Mai bis Oktober 2017 untersucht. Die 13 Plots wurden nach Kreuzottern abgesucht und die mikroklimatischen Daten (Luft- und Bodentemperatur sowie Luftfeuchtigkeit) mit der aktuellen Präsenz/Absenz der Art korreliert. Die Ergebnisse zeigen, dass die sieben negativen Plots (Absenz der Art) gerade im Spätsommer und Herbst signifikant wärmer waren und dass die Luftfeuchtigkeit in diesen Gebieten zum Teil signifikant niedriger war. Zudem waren die Bodentemperaturen im Spätsommer und Herbst auf den sechs positiven Plots (Präsenz der Art) signifikant geringer. Es konnte außerdem ein aktueller Lebensraum in einem Wald nördlich Fulda (ca. 440 m NN) mit dem Lebensraum auf einer feuchten Wiese im Laubwald in der Rhön (ca. 780 m NN) verglichen werden.