

## Red wood ants as geochemical and tectonic indicators

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Recent research in tectonically active areas demonstrated a strong correlation of geochemical anomalies such as CO<sub>2</sub>, Helium and Radon [1] and the spatial distribution of red wood ant nests (RWA; *Formica* spp.) [2]. Statistical techniques were applied to a well-based dataset of 10,000 RWA nests and correlated with known tectonic structures and new geochemical findings in two study areas (Black Forest and Bodanrück, SW Germany).

It could be clearly shown that the spatial distribution of RWA nests is strongly correlated with geochemical anomalies. Furthermore, RWA nests directly reflect the recent main tectonic fault directions and their accompanying conjugated shear systems (e.g. dominant Riedel shears in dextral strike-slip mode in WNW-ESE) in hierarchical succession. Additionally, re-activated shear systems from former geological epochs modified by multiple overprinting due to changes of the main stress field [3] could be identified. These new findings complement and confirm the close correlation between RWA nests and gas-permeable tectonically active fault structures.

Inferring the occurrence of active faults using RWA nests as bioindicators for geochemical anomalies and active tectonics is of considerable advantage where tectonic fault systems cannot be identified due to vegetation cover, lack of information on the active tectonic regime, or if a required resolution cannot be achieved by technical means.

[1] Berberich & Schreiber (2013), *Animals*, **3**, 475-498. [2] Berberich *et al.* (2014). *Mitt. Dtsch. Ges. allg. angew. Ent.* **19**,45-50. [3] Schwarz (2012) *Z. dt. Ges. Geowiss.* **163/4**, 411-446.