**The predictable sequence of adaptive radiation in subterranean amphipod: glass half empty or half full?**

Špela Borko, Ester Premate, Florian Altermatt, Ole Seehausen, Cene Fišer

Adaptive radiation (AR) is an evolutionary phenomenon in which an ancestral species colonizes adaptive zones, free of predators and rich in underexploited resources, and subsequently rapidly diversifies into many ecologically differentiated species. The initial high rates of speciation and diversification may slow down as ecological niches fill up. Theoretically, ecological diversification within AR unfolds predictably, with emerging species initially partitioning among habitats, while diversification in trophic niches within habitats continues longer. We tested this hypothesis using AR of the subterranean amphipod genus *Niphargus*. The genus radiated in southeastern Europe 20-15 Mya, in a series of regional ARs that assembled into one massive AR. Multiple ARs within a single lineage are an excellent model system to test the hypothesis of sequential diversification events. Using functional morphological traits as surrogates for habitat and trophic components of ecological niches, we analysed the sequence of diversification of niche traits over time. We performed analyses at two levels of AR: at the entire genus and on four speciose clades, respectively. Two of these clades diversified predominantly in karst areas with high habitat diversity, while the other two clades diversified in the interstitial with low habitat diversity. Genus-wide analysis indeed suggested that diversification of traits related to habitat concentrated earlier than diversification of traits related to trophic niche. However, at the clade level, sequential ecological diversification was only recovered in two karstic clades, but not in interstitial ones. We conclude that sequential ecological diversification is predictable but habitat-dependent.