



Generalist–specialist continuum in soil oribatid mites (Acari): evidence from stable isotopes*

JING-ZHONG LU, JOHANNA E. NOSKE, MARK MARAUN, INA SCHAEFER & STEFAN SCHEU

Johann-Friedrich-Blumenbach Institute of Zoology and Anthropology, University of Göttingen Office -1.338, Untere Karspüle 2, D-37073 Göttingen, Germany; [✉ jlu@gwdg.de](mailto:jlu@gwdg.de); [🌐 https://orcid.org/0000-0002-4051-8993](https://orcid.org/0000-0002-4051-8993)

*In: Zhang, Z.-Q., Fan, Q.-H., Heath, A.C.G. & Minor, M.A. (Eds) (2022) *Acarological Frontiers: Proceedings of the XVI International Congress of Acarology (1–5 Dec. 2022, Auckland, New Zealand)*. Magnolia Press, Auckland, 328 pp.

Not all individuals are the same. How this applies to soil-living creatures received little attention. Within-species variability determines the niche differentiation of coexisting species. To better understand trophic generalism, we analyzed the stable isotope ratio of $^{15}\text{N}/^{14}\text{N}$ in 28 species of oribatid mites, covering parthenogenetic and sexual species, and species of different trophic guilds and sizes. Trophic niche widths in oribatid species ranged from ~0.5 to 3 trophic levels ($\delta^{15}\text{N}$ values of 1.6 to 11.1 ‰), suggesting oribatid mites to form a continuum of trophic specialists and generalists. Linking the degree of trophic generalism to functional traits in oribatid species indicated that trophic niche widths are similar between sexual and parthenogenetic species. This suggests that parthenogenetic species at least in part remain ecologically plastic. Trophic niche widths in predators/scavengers are higher than in decomposers reflecting a higher degree of trophic generalism in predators. Further, narrower trophic niche widths in larger species indicated that they are more specialized and less variable in their trophic ecology. Overall, our findings suggest that intraspecific niche variation can be high, particularly for small and high trophic-level species in oribatid mites. Our results highlight that within-species variability in trophic niches needs to be considered for understanding species co-existence and their functioning in soil food webs.

Keywords: trophic niche width, feeding ecology, temperate forest, soil microarthropods