



Intraguild predation between two predatory mites *Neoseiulus cucumeris* Oudemans (Phytoseiidae) and *Blattisocius dentriticus* Berlese (Blattisociidae)

XINYAO GU^{1,2}, KESHI ZHANG^{3,4} & ZHI-QIANG ZHANG^{3,4,*}

¹College of Animal Sciences, Guizhou University, Guiyang 550025, P. R. China.

²Institute of Entomology, Guizhou University, Guizhou Provincial Key Laboratory for Plant Pest Management of the Mountainous Region, the Scientific Observing and Experimental Station of Crop Pest in Guiyang, Ministry of Agriculture, P. R. China, Guiyang 550025, P. R. China.

³Manaaki Whenua – Landcare Research, 231 Morrin Road, Auckland, 1072, New Zealand

⁴School of Biological Sciences, University of Auckland, Auckland, 1072, New Zealand;

corresponding author: [✉ zhangz@landcareresearch.co.nz](mailto:zhangz@landcareresearch.co.nz); [ORCID: https://orcid.org/0000-0003-4172-0592](https://orcid.org/0000-0003-4172-0592)

*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.

Different species not only can compete with each other for food and space but also prey on competitors. Intraguild predation is where individuals prey on other competing species. Nevertheless, intraguild predation may cause adverse influence between biocontrol agents targeting the same pest. The generalist predator *Blattisocius dentriticus* recently invaded and excluded our culture of *Neoseiulus cucumeris*. Additionally, the presence of *B. dentriticus* females' cues has prolonged the development time and consumption of *N. cucumeris* males (Gu *et al.*, 2022). Therefore, the potential for intraguild predation between the two predatory mites, *N. cucumeris* and *B. dentriticus*, was investigated. Laboratory experiments were conducted using a no-choice test and a population test in the presence of their shared prey, *Tyrophagus putrescentiae* Schrank. Like other phytoseiid species, intraguild predation between *N. cucumeris* and *B. dentriticus* is mutual though they are asymmetric in size. *Blattisocius dentriticus* was larger than *N. cucumeris*, based on their dorsal shield lengths of the same sex and life stage, and superior than *N. cucumeris* in intraguild predation. In the no-choice test, *B. dentriticus* adults consumed *N. cucumeris* at all life stages, while *N. cucumeris* adults (i.e. females) preyed only on immature *B. dentriticus*. Body size was found to be a major factor affecting the direction of intraguild predation: intraguild predators were larger than intraguild prey they consumed. In the population experiment, *B. dentriticus* eliminated *N. cucumeris* despite the different starting populations of the two species. Our laboratory study suggests that *B. dentriticus* may adversely impact *N. cucumeris* through direct (i.e. intraguild predation) and indirect interactions.

Keywords: no-choice test, *Tyrophagus putrescentiae*, size, population, biocontrol agents

References

- Gu, X.Y., Zhang, K. & Zhang, Z.-Q. (2022) Non-consumptive effects of intraguild predator *Blattisocius dentriticus* (Berlese) on the development and prey consumption of *Neoseiulus cucumeris* (Oudemans). *Systematic and Applied Acarology* 27 (7), 1475–1482.
<https://doi.org/10.11158/saa.27.7.12>