

Grass endophytes in diet protect sibling voles from least weasel predation

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Plant-associated micro-organisms may affect the regulation of terrestrial food webs. One potential but largely ignored group of such symbionts are systemic and asymptomatic *Neotyphodium* fungal endophytes of Pooidae grasses. These endophytes are often considered to form mutualistic associations with their hosts via increased resistance to herbivores. The effects of endophytes may potentially cascade through predator – prey interactions to higher trophic levels, but this has been rarely explored. In this study, we first examined how feeding on *Neotyphodium* endophyte infected (E+) or endophyte free (E-) meadow ryegrass (*Scherodonus pratensis*) affects body mass and reproduction of sibling voles (*Microtus levis*), and then whether diet mediates the vulnerability of voles to least weasel (*Mustela nivalis nivalis*) predation. Because least weasels are known to be visual and olfactory hunters, we then examined whether endophytes influence vole mobility or whether least weasels are able to distinguish olfactory cues of voles fed on E+ from those fed on E- diets. The performance and reproduction of voles maintained on the E+ and E- diets did not differ. However, least weasels preferentially preyed on voles fed with E- grass. Although voles fed on E+ grass exhibited lower mobility than voles fed on E- grass, the difference in mobility was unrelated to the prey preference of least weasels. We neither found evidence for least weasels being able to distinguish between odours of voles fed on the two grass types. Our study is the first to demonstrate that plant-

associated microbial symbionts such as endophytes can indirectly affect the strength of trophic interactions in vertebrate communities.