
Poster Session 2 – Response to Human Induced Changes

104 Diet shift by livestock grazing shape the gut microbiota composition and co-occurrence networks in a local rodent species

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Gut microbes play key roles in maintaining physiological functions and health of their hosts. However, most studies on gut microbes are conducted in model systems under laboratory conditions. The response of gut microbiota to diet changes under field conditions has rarely been investigated. In this study, we utilize field and laboratory studies to test whether sheep grazing induces a diet shift and thus alters the gut microbiota of a small rodent species living in grassland. First, using a field enclosure experiment, we found that enclosures subjected to grazing were mostly dominated by *Cleistogenes squarrosa* (an unfavorable plant species for both sheep and voles), and that voles in grazing enclosures harbored gut communities with distinct microbial taxonomic composition and co-occurrence networks compared to those in control enclosures. Specifically, voles in grazing enclosures exhibited significantly lower abundances of *Firmicutes*, increased abundance of *Bacteroidetes*, and significant lower measurements of alpha diversity. PICRUSt analysis suggests a low mineral absorption capacity of the gut microbiome of voles from grazed enclosures. The microbiota from voles in the grazing enclosures had a smaller but more complex network with more positive interactions. We verified our findings using laboratory experiments where voles were exclusively fed either *Cleistogenes squarrosa*, *Stipa krylovii* or *Leymus chinensis*. We observed similar changes in the gut microbiome, confirming that the effects of sheep grazing on the gut microbiota of Brandt's voles were related to grazing-induced diet shifts. Our results provided evidence for a contribution of grazing-induced diet shift in changes of gut microbiota in Brandt's vole, which in turn may explain the negative interaction between large domestic herbivore and small rodents in the field.

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Jens Jacob, Jana Eccard (Editors)

6th International Conference of Rodent
Biology and Management
and
16th Rodens et Spatium

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