snails). The study system were calcareous grasslands, a semi-natural grassland type developed through grazing and mowing, characterized by its exceptional diversity in both plants and invertebrates.

Our study comprised 14 small (< 1 ha) and 14 large (1.5 – 8 ha) fragments of calcareous grassland in Central Germany around the city of Göttingen along orthogonal gradients of landscape complexity and habitat connectivity. Each taxon was sampled on six plots per fragment (plants: relevés, leafhoppers and true bugs: sweep netting (20 sweeps per plot, three times in summer 2010), snails: soil samples and visual search for larger species).

We found that across taxa, species richness did not differ between large and small fragments. However, species-area accumulation curves showed that both overall and specialist species richness was much higher on several small fragments of calcareous grassland than on few large fragments. On average, 85 % of the overall species richness was recorded on all small fragments taken together (4.6 ha), whereas the two largest ones (15.1 ha) only accounted for 37 % of the species, which was not only found for overall species richness but also if specialist species were analysed separately. This could be due to distance decay effects, i.e. the greater geographic extent covered by many small fragments and the greater habitat heterogeneity it entails. However, community composition differed strongly between large and small fragments, and some of the rarest specialist species were only found on large fragments. The surrounding landscape did not show any consistent effects on species richness and community composition.

Our results show that both single large and many small fragments are needed to promote landscape-wide biodiversity across taxa. We therefore question the widespread focus on large fragments in biodiversity conservation only and call for a new diversified strategy.

Reference:

Rösch, V., Tscharntke, T., Scherber, C., & Batáry, P. (2015) Biodiversity conservation across taxa and landscapes requires many small as well as single large habitat fragments. – Oecologia, **179**: 209-222.

Phylogenetic relatedness of potential and known Auchenorrhyncha vectors of phytoplasmas: preliminary results.

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Phytoplasmas are phloem-limited plant pathogenic bacteria transmitted by insect vectors (leafhoppers, planthoppers and psyllids), and are responsible for hundreds of plant diseases worldwide (Bertaccini & al. 2014). Phytoplasma vectors are Hemiptera (Insecta) belonging to the suborders Cicadomorpha (leafhoppers) and Fulgoromorpha (planthoppers) and the family Psyllidae (psyllids) in the suborder Sternorrhyncha. In Cicadomorpha, the superfamily Membracoidea itself contains

the largest number of known vector species (Nielson 1979, Weintraub & Beanland 2006). Despite their economic importance, there are surprisingly many gaps in the knowledge on the phylogeny, taxonomy, life history and biology of leafhoppers and planthoppers. Previous authors advocated the use of phylogenetic analyses to make predictions concerning pest species (Dietrich 2013), because phylogenetic conservatism in certain behavioural traits, and consequent predictability of their expression, may elucidate the evolution of vectoring ability. However, phylogenetic relationships among lower taxa of Auchenorrhyncha remain largely unexplored.

This preliminary study reviews the state of the art of research on actual and potential vectors of phytoplasmas recorded until now, highlighting the phylogenetic relatedness among of species reported in the literature. About 200 leafhopper species were recorded as actual or potential vectors of phytoplasmas, and the vector competence has been properly demonstrated for about half of them. Competent vectors were recorded in 8 out of 19 subfamiles (Aphrodinae, Cicadellinae, Coelidiinae, Deltocephalinae, Eurymelinae, Iassinae, Megophthalminae, Typhlocybinae) of Cicadellidae, and about 80% of them are allocated in the subfamily Deltocephalinae. Thirteen tribes out of 36 described for Deltocephalinae shall comprise phytoplasma vectors, and those which including the largest number are Opsiini, Macrosteliini and Athysaniini.

Molecular and morphological studies are still ongoing with the aim of better defining the traits (genetic, ecological and morphological distinctness) associated with vector competence, and constructing detailed phylogenies of major groups of Auchenorrhycha vectors.

References

Bertaccini A., Duduk B., Paltrinieri S., Contaldo N. (2014): Phytoplasmas and Phytoplasma Diseases: A Severe Threat to Agriculture. – American Journal of Plant Sciences, **5:** 1763-1788.

Dietrich C.H. (2013) Overview of the phylogeny, taxonomy and diversity of the leafhopper (Hemiptera: Auchenorrhyncha: Cicadomorpha: Membracoidea: Cicadellidae) vectors of plant pathogens. – Proceedings of the 2013 International Symposium of Insect vectors and Insect-Borne Diseases: 47-70.

Nielson, M.W. (1979) Taxonomic relationships of leafhopper vectors of plant pathogens. – In: Maramorosch K & Harris K.F (eds): Leafhopper vector and plant disease agents. – Academic Press, New York: 3-27.

Weintraub, P.G. & Beanland L. (2006) Insect vectors of phytoplasmas. – Annual Review of Entomology, **51:** 91-111.

Hadrons and hoppers: inadvertent grassland conservation at CERN

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The name CERN (the European Organization for Nuclear Research) evokes high technology and cutting edge science; the LEP accelerator was hailed as the world's

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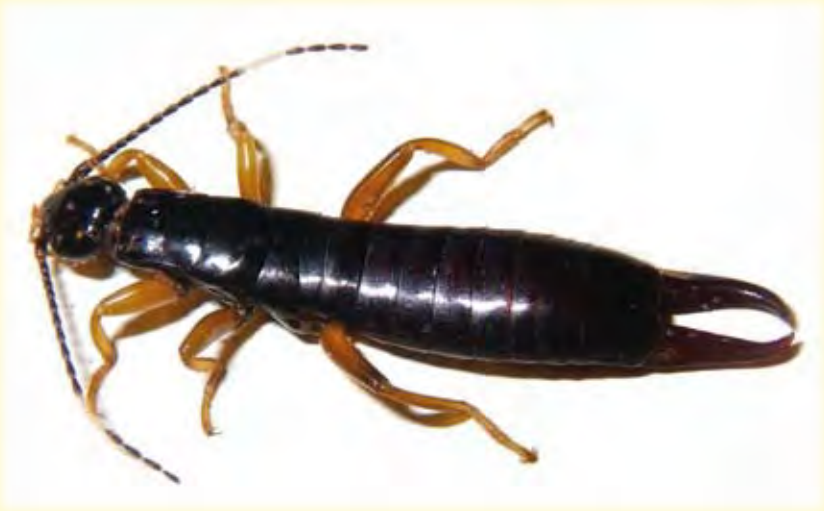

II. Insekten-Konferenz von DGaaE und DPG

Veränderung der Artenvielfalt, Monitoring und Maßnahmen für den Schutz von Insekten

10. 09. 2018 in Hohenheim