Ecology, physiology and behaviour

European small mammals in the agricultural landscape: an overview

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Many small mammals are keystone species in European agricultural landscapes. They are an integral part of terrestrial food webs, affecting predator species by bottom-up trophic processes through fluctuating prey availability. Burrowing small mammals, as ecosystem engineers, can alter soil structure and nutrient fluxes and provide habitat structures for other animals in their tunnel systems. As seed dispersers and predators, they shape plant recruitment in many habitats. Despite these key contributions, there is a pervasive dialectic in the perception of rodents in the public eye as well as the scientific literature. They are the most diverse and abundant mammalian order and multiannual, high-density fluctuations of widespread, generalist species like common vole (*Microtus arvalis*) can lead to high damage to crops and significant monetary losses in agriculture.

Intensively managed agricultural habitats are often characterized by reduced overall biodiversity and a homogenized vertebrate community that primarily include small mammals with high resilience to human disturbance. From the regional species pool, generalist species would utilize agricultural areas allowing them to succeed in the agricultural landscape, while others cannot. The degree of tolerance to agricultural practice depends on a multitude of factors including but not limited to niche or diet breadth, number of offspring, nest placement (i.e., below- or aboveground) or dispersal strategies in relation to landscape composition. Different degrees of tolerance impact community composition, population dynamics and long-term presence in a particular area. Specific traits determine if species will avoid or benefit from agricultural landscapes in the long term.

So far, the focus of small mammal research in agricultural settings has mainly been on only a few species, typically the most prominent pest species in agricultural production. However, large-scale assessments of community level changes are still scarce for small mammals. Therefore, we propose to bring together experts in the field of small mammal research from all over Europe to collect expertise of regional small mammal communities. In a combined analysis, our aim is to identify universal species traits to describe the degree of species' avoidance, tolerance or dependence on agricultural land.