

Ecology, conservation and functioning of European salt marshes

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Terrestrial arthropods in salt marshes are composed by different taxa with various trophic habits and life history traits which all have in common to cope with unusual stressors for them, i.e. regular submergence by seawater and associated high salinities. How dominant groups of arthropods like spiders withstand prolonged immersion and osmotic shocks, and consequently what would be the impact of sea-level rise on this compartment, remains little understood nowadays. In this talk we will review works that have been done to evaluate such avoidance and resistance strategies, using e.g. field survey (along land-sea transects of increasing soil salinities), field (especially with different frequencies of flooding) and laboratory experiments. Field samplings and experiments along gradients of soil salinity and flooding frequency revealed the existence of several distribution ranges along the marsh, including specialist -halophilic- taxa, suggesting species are differentially filtered by one, or both, of these factors, or other co-varying factor (e.g. food availability / quality). Experiments in laboratory suggest that salinity mostly drives species survival, and thereby species distribution within and between habitats. Studies on the impact of salinity under controlled conditions revealed very contrasted responses among arthropod taxa, with an important dichotomy between osmo-conformers (e.g. springtails) and facultative osmo-regulators (such as spiders), the latter displaying better survival at low salinity level. Laboratory experiments on flooding effects also revealed the existence of original behaviors displayed by terrestrial arthropods before or during submersion. In the last parts, we will discuss the impact of the grass *Elymus athericus* on salt-marsh functioning (export of C, direct or indirect, to seawater), and see which management practices are best suited to promote the conservation and functioning of European salt marshes.