

Climate change effects on ecology and pest status of noxious species

As growth and mortality of ectothermic organisms are strongly dependent on the surrounding temperature, global climate change will cause a series of gradual ecological changes. Insects are particularly likely to show various responses to both rising temperatures and more unpredictable weather, as this will affect also their activity periods and activity levels, reproductive performance and hence to a great extent impact on their distributional range, population dynamics and status as related to human activities.

In herbivores, differential responses of insects and their host plants may disturb interactions through changes in synchrony and nutritional quality. In anthropogenic ecosystems, e.g. agricultural, horticultural and silvicultural crops, the changes may alter the status of native pests and in addition lead to both immigration and introduction of new pests, hereby eliciting a need for development of new pest management strategies.

The PhD project will focus on the direct effects of different seasonal climate regimes on the mortality, phenology, reproduction and development of native and/or invasive noxious insects and their natural enemies. The work will further include indirect effects of climate change addressing questions related to herbivore-host plant synchrony, effect of extended growth period, and the impact of insect pests on crops. Hereby, the project will seek to provide basic biological and ecological knowledge required for development of future management strategies.

The project may explore indirect effects of climate change mediated through interactions between plants, noxious insects and their natural enemies, including studies of temperature-dependent predation and synchrony, and examine adaptation of natural enemies to invasive species and the effect of enemy diversity on ecosystem vulnerability to invasion by noxious species.

Depending on the appointee's interest and educational background the research may focus on noxious insect species on annual crops and/or perennial plants and relate to agricultural or urbanized ecosystems. The appointee will be part of a research team within Applied entomology, working on the ecology and trophic interactions of pests and beneficials in anthropogenic systems.

Contact: Professor Peter Esbjerg (pe@life.ku.dk) and Associate professor Susanne Harding (suha@life.ku.dk), Department of Agriculture and Ecology, University of Copenhagen.