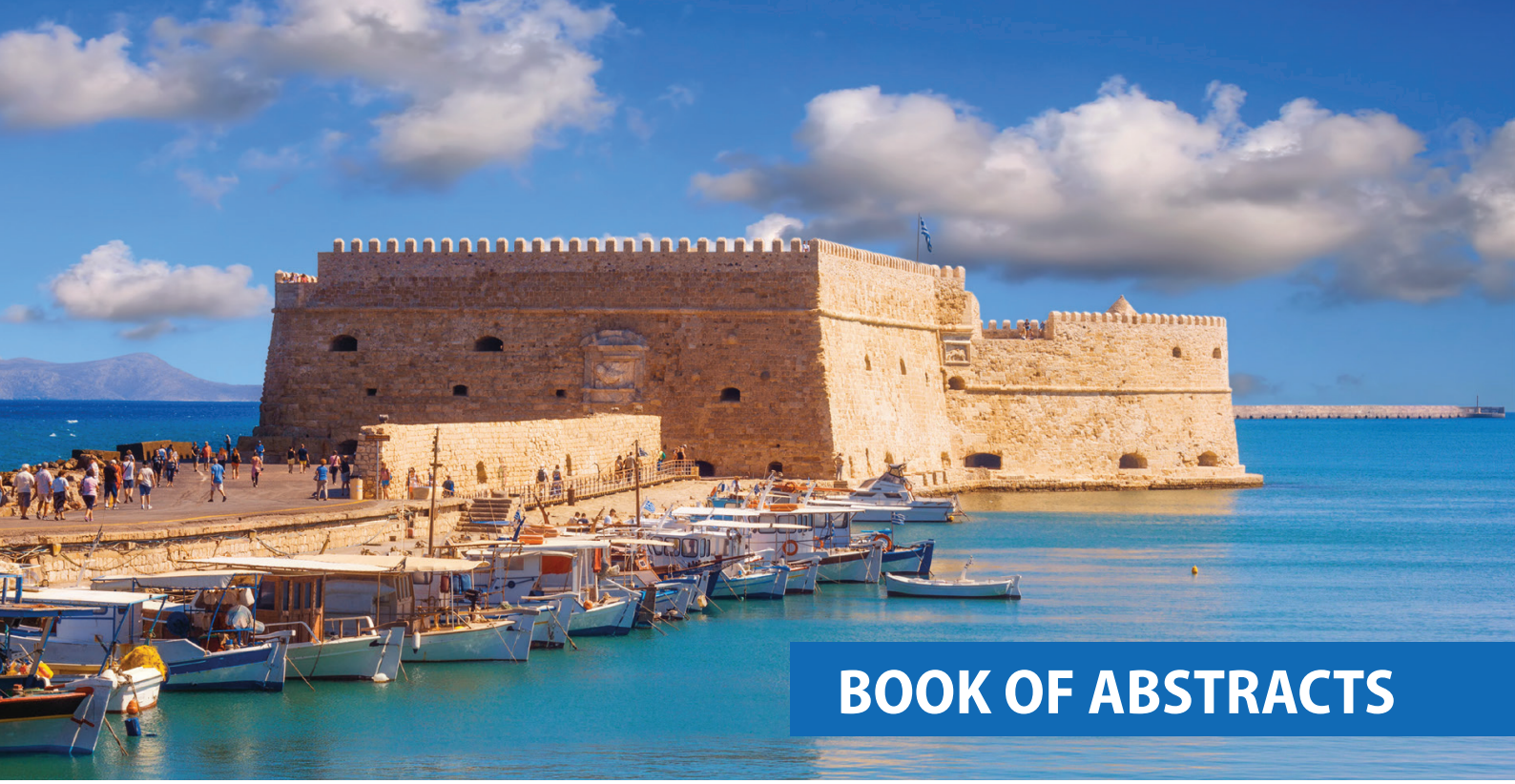

# BOOK OF ABSTRACTS

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## OC293. Drivers and Repercussions of UK Insect Declines (DRUID): Artificial Neural Networks predict species distributions for a wide range of insect taxa

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We show how an artificial neural network (ANN), given some novel specific developments, can capture the relationship between species response traits and environmental drivers to predict the probability of occurrence and therefore individual species distributions. Using our ANN architecture, we present community-wide occupancy predictions at the species level for the whole of the UK from both strategic monitoring networks and a citizen science data platform. Within our analyses we consider morphological (wing indices etc), physiological (voltinism) and ecological (number of host plants and type etc) traits as well as proportions of different landcover types, weather (temperature, rain, wind etc) and environmental (altitude, slops, aspect etc) covariates. The model is trained with long term data for butterflies (UK Butterfly Monitoring Scheme), moths (Rothamsted Insect Survey) and citizen science carabid, dragonfly & damselfly, grasshopper & cricket data from the National Biodiversity Network (NBN). Species-specific, UK-wide maps will be presented for these communities. Our approach explains the abiotic filtering behind our predictions, through the identification of the key environmental drivers of species niches, as well as the trait-mediation at the core of our model. We demonstrate that we can build on the high predictive performances of ANNs, while retaining the explainability that is key to species distribution models. For example, we highlight significant effects of wind exposure on flying insect communities, but also the importance of temperature and habitat, particularly broad-leaved woodland and arable land, across some taxa studied.

**Keywords:** Orthoptera, Odonata, Lepidoptera, Carabidae, NE/V00686X/1

## OC294. Diversity of insects associated to systemic integration of millet and shrubs (*Faidherbia albida* and *Guiera senegalensis)* in Niakhar area Senegal

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Insects are an important part of ecosystems. They contribute to the dispersal and exploitation of organic matter as well as in the production of ecosystem services. This study deals with the diversity of insects in farms where millet is associated with fertile woody plants (*Faidherbia albida* and *Guiera senegalensis*). Carried out in September 2021 and January 2022 in two stations (Sanghaie and Sob), its objective was to analyze the composition and functional role of captured insects. Sampling was done using six barber traps placed at 0.5m and 20m from six pairs of *Faidherbia albida* (pruned/not pruned) and six others that have Guiera residues or litter inputs. After 48 hours of trap expositions, 49 insect species (7 orders, 18 families) were recorded. The Shannon H' diversity, Pielou evenness, and Jaccard similarity indices show that the catches in Sob-Faidherbia and Sanghaie-Guiera stations are quite close, equitable and

more diversified than that of Sanghaie-Faidherbia. Five beneficials (*Scarites senegalensis, Crematogaster sp., Camponotus maculatus*, *Pimelia senegalensis* and *Heterogamodes sp*.), two polyphagous species (*Monomorium areniphilum*, *Zophosis trilineata*), a phytophagous species (*Carpophilus hemipterus*) and a decomposer (*Musca domestica*) were constantly observed. Hymenopteran (Formicidae) are prédominant under pruned *Faidherbia albida* with significatif effects of sites, seasons and their interactions (respective p-value of 2*10-16 and 0.0036). Coleopteran (Scarabaeidae and Tenebrionidae) were predominant in rainy season (82%) in plots amended with *Guiera senegalensis*. Pruning *Faidherbia albida* and use of *Guiera senegalensis* in crop amendments increase insect diversity and could contribute to natural pest regulation and seed dispersal in agroforestry systems.

Keyword: diversity, insects, millet, *Faidherbia albida, Guiera senegalensis,* Senegal

## OC295. EU LIFE Programme funding direct action to protect Europe's threatened insects

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The European Union protects more than 27,000 natural areas of special European importance. The network, known as Natura 2000, is set up to safeguard Europe's most valuable and threatened species and habitats. Since 1992 the EU has provided co-funding, through the LIFE Programme, to support direct action aimed at the protection and restoration of Europe's threatened habitats and species; and halting and reversing biodiversity loss. The decline of insect diversity and abundance across the world is well documented in the scientific literature (Sánchez-Bayo and Wyckhuys, 2019) and evidence of similar trends have been reported in Europe (Seibold et al. 20196 and Hallmann et al. 2017). The losses, and the potential impact on ecosystem services, are becoming better understood leading to responses such as the EU Pollinators Initiative. The LIFE Programme has played a part in seeking to address these declines and has supported over 220 projects across Europe which benefit threatened invertebrate species listed in the EU Habitats Directive (HD) and/or European Red Lists. However, of the insect species listed in the HD, less than half have been targeted for conservation action by LIFE projects, and few projects focus on European Red Lists species. There is therefore a recognition of the under-representation of actions for insects in LIFE projects in general, as well as a bias towards the same insect species (Neemo, 2020). The contributions of the LIFE Programme to the conservation of endangered insects as well as the opportunities that the programme currently offers must be more widely disseminated.

Keywords: funding, conservation action, biodiversity loss, pollinators, insects