

FUNCTIONALBIO

Functional biodiversity in forests: diversity of soil decomposers and predatory and parasitic arthropods

PROJECT TEAM

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COMPLETION DATE

September 2010

OBJECTIVES

Work Group 1:

- to compile a literature review of previously conducted biodiversity studies that relate to this project.
- to select the forest sites in Ireland where field sampling will be conducted in collaboration with groups from UCC and TCD.



Porobelba spinosa - a species of mite found in the canopy of oak. Species from this genus have not previously been found in Ireland. The shed exuviae (skins) of the animal remain attached and can be seen in the photograph.

Work Group 2:

- to compile a macrofungal basidiomycete and ascomycete inventory of selected woodland sites encompassing the following functional groups: ectomycorrhizal fungi, saprotrophs, pathogenic wood-decay fungi.
- to obtain information on the abundance of fruiting bodies of edible forest fungi in the selected woodland sites.
- to relate fungal diversity to site and management factors such as native/non native broadleaf vs plantation conifer canopy, conifer/broadleaf mixtures, second rotation vs first rotation plantation, stand age, soil type, herb layer vegetation.
- to relate the efficiency of fungal biodiversity indicators to other biodiversity indicators in Irish forests.

Work Group 3:

- to assess additional aspects of biodiversity (Hemiptera, parasitic Hymenoptera, nematodes and soil microarthropods) in forests that have not been covered by the BIOFOREST project (2001-2006).
- to assess the below-ground biodiversity of forests in detail
- to provide inventories of the biodiversity in the habitats studied.
- to develop methodologies to assess biodiversity in forests.
- to draw up recommendations to enhance biodiversity in plantation forests.

PROGRESS

The literature review is ongoing. Lists of mite species recorded from forests have been compiled and reviews of the Collembola, Hemiptera, parasitic Hymenoptera and nematodes are ongoing.

Five sites have been selected in each of the following general areas (Wicklow/Kildare, Laois/Offaly, Clare/Galway, Sligo/Roscommon

and Cork/Kerry). In each of these areas first and second rotation Sitka spruce, Scots pine, ash and oak are being selected. Nine of these sites were selected during 2007 and further potential sites will be visited.

Each site was visited a number of times during the autumn and all fungal species observed fruiting collected, enumerated (fruiting body counts where applicable, especially of edible species), and identified to species where possible. Digital photographs have been taken of most of the larger species, and voucher specimens of unidentified and critical species have been retained for confirmation by experts. Preliminary information on environmental factors such as substrate and vegetation were gathered.

The project achieved all of the objectives set out for autumn 2007, i.e. to commence compilation of a macrofungal basidiomycete and ascomycete inventory of the selected woodland sites, and data on abundance and environmental variables.

ACTIVITIES PLANNED

Sampling of sheathing mycorrhizas (primarily ectomycorrhizas) on roots of tree species will commence in late spring 2008. Sampling of ectomycorrhizas will involve collection of root samples from selected trees by soil coring. Ectomycorrhizal (EM) types will be extracted from soil cores and characterised on their morphology using the morphotyping protocols of Agerer (1991). Samples of characterised mycorrhizas will be preserved at -80°C for identification using DNA methods.

Commencing in September 2008, the sites first sampled in autumn will be re-sampled for functional groups of macrofungi.

The limited number of samples taken during 2007 have been sorted and are currently being identified. Due to poor weather conditions, this programme is behind schedule and will require increased activity during summer 2008. However, the samples collected have already provided interesting material which will provide useful baseline information and further experience with the identification of these animals.

Tree climbing was carried out at nine sites. This has proved successful and a number of species new to Ireland have already been identified.

Soil microarthropods sampled at nine sites were sorted and are currently being identified. Further sampling will be required at each of these sites.

These activities will contribute to the provision of inventories of the biodiversity in the habitats studied.

The experience gained with sampling and the selection of taxa to examine have already provided indications of the methods of sampling and taxa which could be used in the assessment of biodiversity in forests.

Further activities for 2008 will include the completion of the lists of the species of mites occurring in the samples collected by climbers, of springtails occurring in samples of all kind already collected, of parasitic hymenoptera and spiders from the limited number of fog samples collected during summer 2007; as well as final site selection and completion of soil and canopy sampling.



◀ Preparing to fog the canopy.