Soils – the last frontier

Olaf Schmidt and Aidan Keith explain why soils are the final frontier in Irish biodiversity research

Soils are among the most biodiverse ecosystems on earth. The diversity of soil organisms is tremendous; 1g of soil can contain between 5,000 and 10,000 species of micro-organisms! Ecosystem services provided by soils (such as nutrient cycling, waste degradation, pest and disease suppression, carbon storage) depend on the activity of these diverse organisms. However, our knowledge of these organisms is extremely limited.

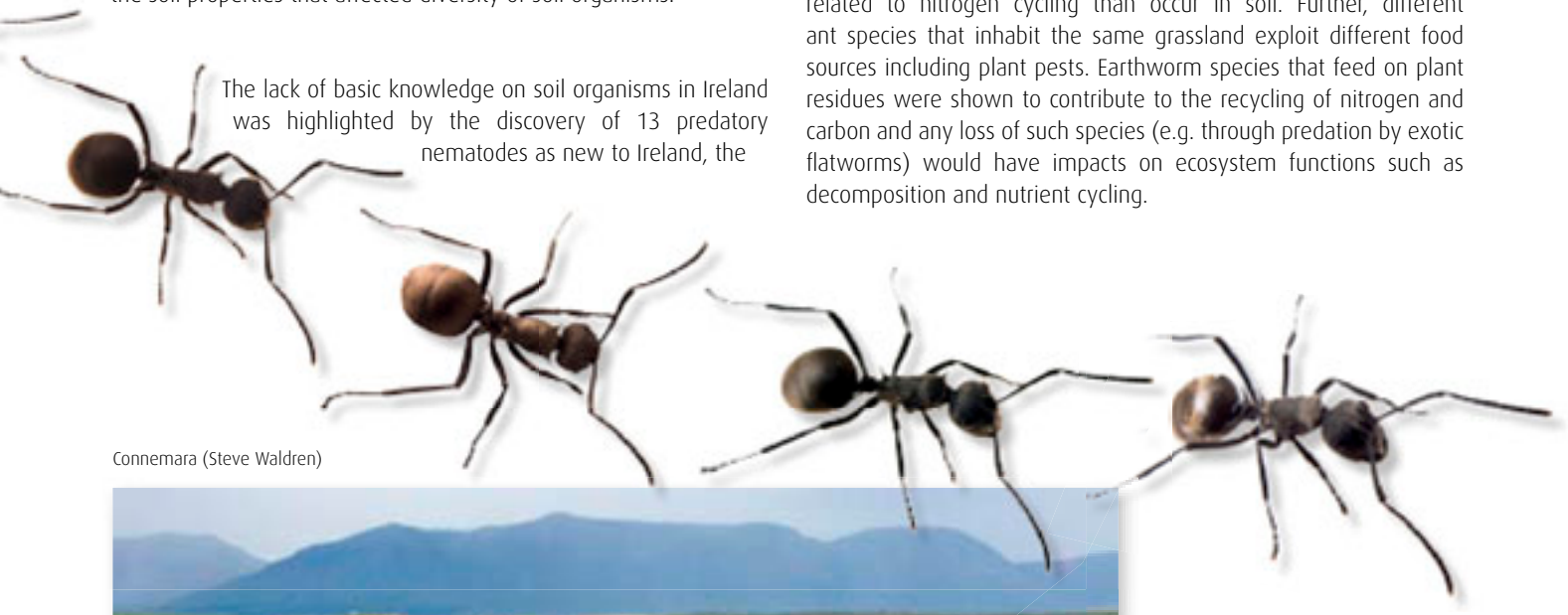
The primary objective of the CréBeo project was to increase scientific knowledge of soil biodiversity in Ireland. Some of the main findings were that soil type had limited effect on biodiversity. Rather it was the soil properties that affected diversity of soil organisms.

Irish farming is dependent on healthy soils (Olaf Schmidt)

1g of soil can contain can contain between 5,000 and 10,000 species of micro-organisms. Photo of Irish soil arthropods (Aidan Keith).

The lack of basic knowledge on soil organisms in Ireland was highlighted by the discovery of 13 predatory nematodes as new to Ireland, the first record of an earthworm endemic to southern France as well as a mite species potentially new to science.

Interestingly, grassland ants were shown to alter the properties of soil and to harbour different micro-organisms and functional genes related to nitrogen cycling than occur in soil. Further, different ant species that inhabit the same grassland exploit different food sources including plant pests. Earthworm species that feed on plant residues were shown to contribute to the recycling of nitrogen and carbon and any loss of such species (e.g. through predation by exotic flatworms) would have impacts on ecosystem functions such as decomposition and nutrient cycling.



Connemara (Steve Waldren)

The main recommendations of the project were

1) to revise the land-use and soil-type classification;

2) that the establishment of soil biological monitoring in Ireland is extremely important; and

3) a tiered structure of core and specific indicators should be used.

This project was funded by EPA STRIVE and further details can be accessed on the EPA website and at **www.ucd.ie/crebeo/**