

Ireland's high frontier

epiphytes in plantation forests

Linda Coote, George Smith and Daniel Kelly explain that trees are not the only plants to grow in our forests.



Hypotrachyna revoluta: © Stuart Dunlop.

Forest occupies only approximately 10% of the land area of Ireland, giving us one of the lowest forest covers in Europe. Almost all these forests are recent plantations of exotic conifer species, of which more than half are Sitka spruce plantations. The Government aims to increase the area under forest substantially in the next two decades. Until recently, there was little information about whether these plantations could provide suitable habitats for species normally found in native woodlands or whether they are in fact ecological deserts, as is popularly believed. The BIOFOREST project (<http://bioforest.ucc.ie>) was set up in 2001 to fill this information gap, and over the last five years, communities of birds, hoverflies (syrphids), spiders and plants have been studied in over one hundred plantation forests across Ireland.

As part of the research on the plant communities of these forests, we studied the epiphytes growing on conifers.

Epiphytes are plants that grow on other plants; they get their name from the Greek: *epi*, 'upon' and *phyton*, 'plant'. Epiphytes are different from parasites because they get their water and nutrients from the air and not from their



Tree climbing: Photograph George Smith.

host plants; they are sometimes known as 'air plants'. While tropical forest trees can support a diverse range of orchids, bromeliads (related to pineapples) and other flowering plants, in Ireland the main groups of epiphytes are mosses, liverworts and lichens. Epiphytes are good indicators of the environment they grow in and are particularly sensitive to air pollution. They can provide food for forest animals and their chemical compounds are used in dyes, perfumes and antibiotics. Knowledge of epiphyte communities in Ireland is limited, and no previous studies of them have been done in plantation forests. Because epiphytes can be found at any height in a tree, studying them can pose a problem. We overcame this by climbing the trees using a rope, harness and climbing spurs/spikes. We climbed 40 trees in 28 Sitka spruce and Japanese larch plantations, in the east and southwest of Ireland, and recorded the epiphyte species occurring on both the trunks and branches.



Plagiothecium laetum:
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We found that the trees supported a reasonably diverse range of moss, liverwort and lichen species, with ninety different species recorded. There were no differences between spruce and larch in the number of moss and liverwort species they supported on average, but more lichen species were found on larch trees. Two relatively rare moss species were found on Sitka spruce: *Daltonia splachnoides* and *Plagiothecium laetum*. The latter had only been recorded twice before in Ireland.

Trees in the southwest of the country supported more epiphyte species, most likely due to the more humid climate of this region; humidity is particularly important to epiphytes which get all their water from the air. Mosses were most abundant at the bases of the trees while lichens mostly occurred higher in the trees. Our data gave some support to the traditional advice for finding your way in the forest, as there was greater moss cover on the north sides of the trees in larch plantations; however, in spruce plantations there was no difference between the north and south sides. These non-native conifer plantations lacked a number of epiphyte species normally found in semi-natural woodland in Ireland and are not likely to develop an epiphyte flora as rich as in native woodland. However, some older larch plantations (>60 years) were found to support some of the lichen species found on pine in native Scottish pinewoods. Scots pine was once native to Ireland, but is believed to have become extinct here around 100AD (ongoing research at Trinity College hopes to shed more light on this). Studies of epiphytes in plantations of other tree species would add greatly to our understanding of the value of plantations as habitat for this diverse and fascinating group of plants.

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