Researchers decode birch tree genome sequence for the first time

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Richard Buggs collecting Dwarf Birch sample.

(Phys.org)—Scientists from Queen Mary, University of London have sequenced the genetic code of a birch tree for the first time, which could help protect British birch populations.

The genome, which is around 450 million letters, will help researchers understand the genetic basis of traits such as disease resistance and growth shape.

There are over sixty species of birch trees around the world, with huge ecological and commercial importance. They are an essential part of the

Boreal forest located around the North Pole, which is the world's largest land-based ecosystem. The team sequenced the genome of a dwarf birch tree from Scotland, a species that is nationally scarce in Britain but common further north in Europe.

Lead researcher Dr Richard Buggs, from Queen Mary's School of Biological and Chemical Sciences said: "Dwarf birch is an excellent model for birch genomics, as its small size makes it easy to grow and experiment with, and it has a smaller genome than some other birch species. This genome sequence is a valuable resource for scientists studying birch trees around the world."

The threat of an American pest is currently hanging over British birch populations. The bronze birch borer - a type of beetle - is a common and serious threat to birch trees in North America. British birch species show unusually low resistance to the pest, unlike their American counterparts, and if the pest were to come into the UK then it could cause widespread devastation.

Alan Watson Featherstone, executive director of Trees for Life, a charity that conserves dwarf birch near Loch Ness, said: "This is a tremendous breakthrough. Together with our woodland restoration work at Dundreggan, where we have one of the greatest concentrations of dwarf birch in Scotland, it will do much to benefit the conservation of this important species."

Queen Mary, alongside conservationists Trees for Life, and Highland Birchwoods are partnering to supervise a PhD student, James Borrell, who is surveying the genetic diversity of dwarf birch populations in Scotland.

James said: "This newly sequenced genome will be a hugely valuable tool in our effort to conserve this species. We are building on this to survey

the genomic diversity of dwarf birch trees in Britain to inform management strategies."

The research was carried out jointly with the University of Edinburgh and funded by the Natural Environment Research Council (NERC). It is published in the journal *Molecular Ecology* (Tuesday 20 November).

More information: onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-294X

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