

DNA profile of British ash trees could make them at less risk from 'dieback,' ecologist claims

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(Phys.org)—An ecologist who has examined research into the genetic lineage of populations of native British ash trees claims that significant differences in their DNA could make the majority less at risk from ash dieback than being currently predicted.

Dr Graham Rowe, a molecular ecologist at the University of Derby, has revisited research into the [DNA variation](#) of [ash trees](#) across Europe, and claims that the genetic make-up of the majority of British ash trees is significantly different to those currently being decimated by fungal disease 'dieback' (*Chalara fraxinea*) across Denmark and northern Europe.

Dr Graham Rowe said: "Patterns of [genetic variation](#) in many species of [plants and animals](#) across Europe were strongly influenced by the last Ice Age, around 20,000 years ago.

"As the Scandinavian ice sheet melted, flora and fauna re-colonised northern Europe, including Great Britain, by a number of different routes from glacial refuges in south west and south east Europe, and beyond."

"When looking at the genetic make-up of ash trees across Europe in papers published in 2004 and 2006, the majority of native British ash trees have a similar [genetic makeup](#) to those found in Spain and Portugal, indicating a south west re-colonisation route.

"In contrast, the DNA of ash populations from northern central Europe, including those from Denmark, indicate a re-colonisation from a glacial refuge somewhere in south east Europe."

The different genetic make-up of the majority of British trees to those currently being decimated across Northern Europe, he claims, could alter the affect the disease has on British trees.

"Current evidence suggests that the majority of native British trees are of a different genetic origin which may be less susceptible to the disease.

"From the research I revisited, it looks like ash populations along the eastern [coastal counties](#) of England - populations currently being affected by dieback in the UK - might be of the same genetic stock as those from Denmark. This should come as no great surprise, as many species re-colonised the British Isles by two different routes, including the natterjack toad."

As these ash trees seem to share their genetic lineage with the trees of

Northern Europe it may be why they are being similarly affected by the disease.

"We cannot know for sure what affect ash dieback may have on native British ash trees going forward, but the south-western European lineage of the majority of the British trees may make them less susceptible to this terrible disease."

More information: Heuertz, Myriam et al. (2004) Chloroplast DNA variation and postglacial re-colonisation of common ash (*Fraxinus excelsior*) in Europe, *Molecular Ecology*, Volume 13, 3437 - 3452.

Heuertz, Myriam et al. (2004) Nuclear microsatellites reveals contrasting patterns of genetic structure between western and southeastern European populations of the common ash (*Fraxinus excelsior*), *Evolution*, Volume 58, 976 - 988.

Heuertz, Myriam et al. (2006) Chloroplast DNA phylogeography of European ashes, *Fraxinus* sp. (Oleaceae): roles of hybridization and life history traits, published in *Molecular Ecology*, Volume 15, 2131-2140.

Graham Rowe co-authored the first textbook on Molecular Ecology:

Beebe, T.J.C. and Rowe, G. (2008) *Introduction to Molecular Ecology*. Oxford University Press. Second edition.

Provided by University of Derby

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