

And now it is over to you, I've been sent some lovely contributions this month.

Starting with Cedric, labelling and practical conservation volunteer. Cedric has been researching 'Witches Broom' and has kindly written up a piece for our newsletter.

Witch's broom

I seem to have always been aware of witch's broom on birches, generally caused by the fungus *Taphrina betulina*,



But, on a walk by Louisa Lake, I spotted these interesting ones on a couple of Douglas fir, *Pseudotsuga menziesii*:





The small larches at the bottom of the sunken track come from a witch's broom on a larch near the Gruffalo:

Dan said that one of the delights of propagating brooms is that you are then able to name your own cultivar, there are a few examples of these around the Pinetum. It also seems that people can become obsessed by hunting for brooms, and as the genetic mutations are more common at high altitude, perhaps due to greater solar radiation, people can spend a large part of their lives in the mountains hunting for brooms, some have found and named over a thousand!

Two examples of cultivars grown from brooms, in the dwarf conifers enclosure, are a Serbian spruce, *Picea omorika* 'Kay Phillips', which was off a broom in the plots, and a Dragon spruce, *Picea asperata* 'Jeff Phillips', this came from a broom long gone from spruce triangle or as it is now known section 17.



N.B. There seem to be several ways to spell witch's broom, including witches' broom and witch'es-broom

1 - <https://conifersociety.org/conifers/articles/what-witches-broom/>

I asked Dan about them and found that there was a really fascinating world I hadn't noticed before, and once you look for them you realise there are witch's brooms all over the place.

Normally in plants, especially evident in trees, the leading shoot will produce an auxin, a plant hormone, which will slow the growth of the secondary and tertiary shoots to prevent them from overgrowing it. Interference in this mechanism by mutations or cytokinins (a phytohormone) induced by fungi, insects, nematodes, phytoplasmas, viruses or other outside agencies can cause plants to develop into witches' brooms. ¹

In conifers it is in members of the *Pinaceae* that brooms are generally found, rather than the soft foliaged conifers, like the *Cupressaceae*, and it is those caused by genetic mutations that are of real interest, as they can often be propagated and used as the source of dwarf cultivar conifers. To stay true to type the brooms are propagated by grafting onto a rootstock, those around the Pinetum have often been propagated by Lime Cross nurseries, who specialize in this type of propagation. Dan has found that if you try growing from seeds, from cones on witch's broom, about 50% stay small and similar to the broom and the rest grow to the same size of those on the parent tree.

Around the Pinetum there are several examples of the original tree and the propagated broom, for instance the Japanese black pine, *Pinus thunbergii*, by the zigzags, opposite the visitor's centre, comes from the parent in section 19.

