

# *Betula dahurica*: A Special Birch Tree

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In the United Kingdom, *Betula dahurica* has a reputation for not making a well-shaped tree, as it often suffers repeated dieback and poor growth because of late spring frosts and inadequate summer heat. One specimen in the Arnold Arboretum (overhanging the road on Bussey Hill) shows the typical “witches’ broom” growths caused by such repeated dieback, but most trees of *B. dahurica* in the Arboretum have made good specimens. Particularly noteworthy is a tree of Japanese origin (accession 1015-80-A) just off Conifer Path near the bamboo collection. Dahurian birch is noted for its peeling, papery bark (similar to river birch, *B. nigra*) and this specimen has particularly attractive shaggy curls that have a redder color on their inner surface than some other Arboretum specimens. The color of the inner surface contrasts nicely with the creamy white of the outer surface of the curls and the unpeeled sections of bark on the branches.

*Betula dahurica* is native to China, Japan, Korea, eastern Mongolia, and far eastern Russia. Accession 1015-80-A is of special interest since *B. dahurica* is endangered in Japan, being known primarily from a small population near Nobeyama in Nagano Prefecture in the central part of the main island of Honshu (where this accession was collected). There is another small population in the northern island of Hokkaido and one on Iturup in the Kurile Islands, which were Japanese before being occupied by Russia at the end of World War II. Of genetic interest, these offshore island populations are hexaploid (6 times the base number for birches of  $x=14$ ) with a chromosome number of  $2n=84$ , whereas the extensive populations on the Asiatic mainland all appear to be octoploid with  $2n=112$ . This means that the island populations are unlikely to interbreed freely with the mainland populations, are genetically distinct, and, if they can be recognized by their appearance, should be named as a distinct species.

Three cuttings from the tree in the Arboretum have been rooted and are now growing in the nursery. The only other known trees from the Nobeyama provenance in cultivation are a single tree at Dawyck, a satellite garden of

the Royal Botanic Garden Edinburgh in southern Scotland, and six trees at Ness Gardens, the University of Liverpool Botanic Gardens near Chester in northwest England. Trees from this provenance grow far better in the United Kingdom than any from continental Asia, presumably because of the greater similarity of our climate to the maritime climate of Japan.

Since the Nobeyama trees are genetically distinct and rare in the wild, they are clearly of conservation significance and efforts should be made to have breeding populations for seed production in cultivation. Most species of birch are self-incompatible (self-sterile), so at least two different seedling trees are needed for seed production. Fortunately we have this at Ness and, despite the large number of other birch species in the surrounding garden, seedlings from the cultivated trees seem to be mostly coming true (i.e., are not hybrids with other species).

Accession 1015-80-A is producing some viable seeds, so it will be interesting to sow this and see what the seedlings are. If the parent tree is totally self-incompatible then all the seedlings will be hybrids. No known hybrids of *B. dahurica* have ever been reported, and certainly no hybrids of the Nobeyama provenance, so, if we can identify what the other parent(s) might have been, it will tell us what other species *B. dahurica* can hybridize with. Any such hybrids could be of horticultural interest since *B. dahurica* may be resistant to bronze birch borer. Alternatively, accession 1015-80-A could have a limited degree of self-compatibility (resulting in a low percentage of viable seeds) and at least some of the seedlings could be the result of self-fertilization. This could result in some dwarf or other abnormal growth forms as a result of inbreeding depression—this is the probable mode of origin of many dwarf conifers. No doubt this species, and the Japanese provenance in particular, will continue to be studied, conserved, and propagated at the Arnold Arboretum, Ness Gardens, and other botanical institutions.

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