

Field Botany



Floristics at RBG

The natural lands at RBG have a wide diversity of habitats and contain plants associated with both the Carolinian and Great Lakes-St. Lawrence vegetation zones. Some of the Gardens' most significant upland communities include excellent examples of Carolinian tallgrass woodlands, Niagara Escarpment cliffs and talus slopes, and mature northern sugar maple forests. Twenty percent of plant species native to Canada are found on RBG property, including several species designated as endangered, threatened or rare.

Since the early 1950s, dozens of person-years have been invested in the botanical exploration of the RBG properties. Over 12, 000 specimen records from RBG's natural lands are maintained in the RBG Herbarium ("HAM"). The first checklist of spontaneous vascular flora was published in 1969 (Pringle, 1969). In 2003 an update was published (Smith, 2003).

Plant Conservation

In collaboration with conservation staff, the science department monitors and protects several endangered species on RBG property. Active recovery efforts are in place for populations of American columbo (*Frasera caroliniensis*), wood poppy (*Stylophorum diphyllum*) and butternut (*Juglans cinerea*). Our natural lands contain the primary Canadian populations of two critically endangered species: bashful bulrush

(*Trichophorum planifolium*) and red mulberry (*Morus rubra*).

Trichophorum planifolium (Few-flowered Club-rush)

RBG's natural lands are home to the last known population of *Trichophorum planifolium* in Canada. Extensive field work has revealed eight different sites found on both shores of Cootes Paradise. In order to ensure survival, RBG is a part of the *Trichophorum planifolium* Recovery Team. Field monitoring of the extant populations has been conducted for the past decade. Over the last two years, the RBG team has initiated a propagation project. One of the major issues with conserving this charismatic sedge is that very little is known about its ecology. This propagation project allows us to not only aid in the conservation of *Trichophorum* but also to learn about the way it grows and reproduces. Seeds have been collected from the wild population and planted under various conditions. Our goal is to develop a strong propagation program to preserve the genetic material. It is our hope that these projects will be successful in preserving *Trichophorum planifolium* for future generations.

Red mulberry (*Morus rubra*)

The rich escarpment talus slopes of the Gardens' Rock Chapel and Berry Tract nature sanctuaries support a strong population of this critically endangered tree. Extensive fieldwork over several seasons has allowed RBG staff to map the location of each tree, to assess its health, and to delineate the habitat communities that support these individuals. Together with researchers at the University of Guelph, scientists are attempting to assess the risk imposed by the non-native white mulberry (*Morus alba*). This common tree has the potential to hybridize with red mulberry, a process that could swamp the genetic uniqueness of the native species. In partnership with the Auxiliary and Dr. Kevin Burgess, we are investigating the genetics of our mulberry plants. This work will aid our understanding of hybridization and provide insight on the morphological characteristics that are distinct to red mulberry trees.

Phenology

The field of study which examines the timing of recurring biological events is called phenology. Flowering time, leaf-out time and the changing colour of leaves in fall are all important annual events for plants. The dates of these yearly phenomena are largely controlled by climate, with plants shifting their timing in response to environmental conditions. While weather fluctuations are natural, human-caused climate change is becoming an increasingly important source of variation in temperature and precipitation. Since flowering time can be very sensitive to temperature, phenological shifts are an early indicator of the biological effects of climate change.

Phenology at RBG In the science department, we monitor a list of horticultural and wild species for their first bloom dates. Each spring, we survey both the natural lands and garden areas and record the dates when plant species are flowering. This work continues through the summer. We can then compare dates over years and between sites. Long-term data sets of bloom dates allow researchers to look for correlations

between climatological factors and flowering times.

On your next visit to our gardens, be sure to check out the phenology garden, under construction beside RBG centre. Citizen scientists can also participate in phenology research through Canada's [PlantWatch](#) program, which monitors designated species for bloom and leaf-out dates across the country. If you are interested in learning more about phenology, the [PlantWatch](#) website and the [National Phenology Network](#) are two great resources.