Field Botanists Of Ontario

Newsletter

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Red Mulberry (*Morus rubra* L.), photos supplied by Kevin Burgess.

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FIELD BOTANISTS of ONTARIO

FIELD BOTANISTS OF ONTARIO NEWSLETTER

Published quarterly by the FBO; ISSN: 1180-1417.

The FBO is a non-profit organization founded in 1984 for those interested in botany and conservation in the province of Ontario.

The **deadline** for submissions for **Volume 13(2) - Summer 2000** is **June 14th, 2000**.

Standard source for scientific names of vascular plants:

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario Plant List. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, Ontario. Forest Research Information Paper No. 123, 550 pp + appendices.

Erratum:

Richard Aaron spotted an error in his list of mushrooms given at the end of David Orsini's account of the Bronte Creek field trip [Volume 12(4)]. The mushroom *Lycoperdon applanatum* does not exist! Richard suspects the species in question may have been *Ganoderma applanatum*, a very common polypore.

Editor's Note:

If the phrase "University of Guelph" seems to keep popping up in this issue, there is a reason. It is mainly through Carole Ann's last minute arm-twisting of University of Guelph graduate students and alumni that we were able to find enough content to get this newsletter out on time.

It was paramount that we 'rushed' this issue. At least one of the field trips planned for 2000 (Mt. Washington, NH) requires participants to sign up by April 9th in order to guarantee accommodations. Hopefully we've been able to spot all the typos and other editorial errors. Despite being a rush job, the quality of the content of this newsletter is excellent. Thanks to Carole Ann, Graham Buck, Kevin Burgess, and Peter Kelly for their excellent last minute efforts. Thanks to our other contributors too. Hopefully, other university biology/botany students, departments, and alumni will get a little jealous of the U. of G. and send us their own articles.

Ed Morris

Features:

1999 Botanical Highlights

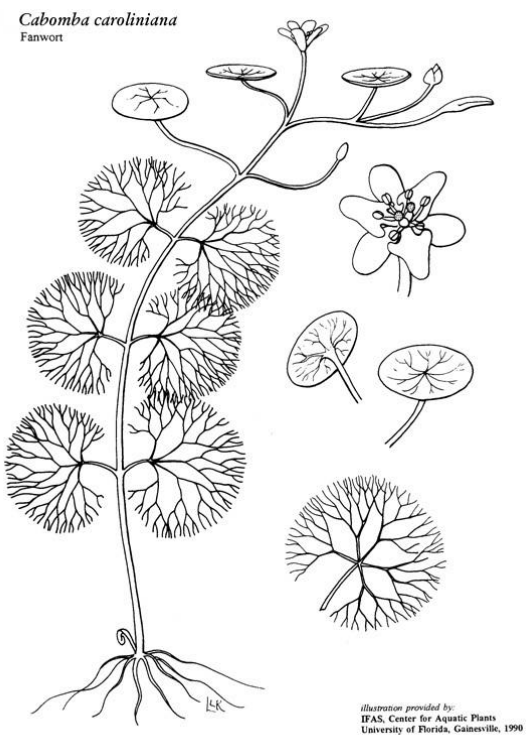
by M.J. Oldham[†]

In 1999 we are not aware of any native vascular plant additions to the provincial flora, although there have been several rediscoveries and exciting finds of rare species. While conducting Ecological Land Classification (ELC) fieldwork along the Thames River in Middlesex County, Todd Farrell of MNR in London, rediscovered Hairy Woodmint (*Blephilia hirsuta* (Pursh) Benth.; G4? S1) in Ontario. The only previous Ontario specimen record is from the 1950s near the Ausable River, and despite several searches it has not been refound there. Todd's discovery was from a rich floodplain woods within a provincially significant Area of Natural and Scientific Interest (ANSI).

Another exciting rediscovery was made by Karen Cedar who found Tall Green Milkweed (*Asclepias hirtella* (Pennell) Woodson; G5 S1) at Ojibway Prairie Provincial Nature Reserve. This species has not been seen in the province since 1983 when 3 plants were seen at a different location within the Ojibway Prairie Provincial Nature Reserve. At Lighthouse Point Provincial Nature Reserve on Pelee Island, Mike Oldham rediscovered Scarlet Ammannia (*Ammannia robusta* Heer & Regel; G5 S1). It was last seen at Lighthouse Point in 1988. Low Lake Erie water levels in 1999 provided abundant habitat for this species of mudflats.

The province's second record of the globally rare Virginia Mallow (*Sida hermaphrodita* (L.) Rusby; G2 S1) was found in Niagara Regional Municipality by Ken Ursic. The previous Ontario record is from Taquanyah Conservation Area in Haldimand-Norfolk Regional Municipality. Also in Niagara R.M., Helen Macdonald of the Niagara Falls Nature Club confirmed the presence of the nationally Threatened White Wood Aster (*Aster divaricatus* L.; G5 S1) at Short Hills Provincial Park and at Niagara Shores, and Mary Gartshore discovered a new population at Marcy Woods, Point Abino.

In Peterborough County, Don Sutherland and Mike Oldham found the introduced aquatic species Fanwort



Fanwort (*Cabomba caroliniana* A. Gray), reprinted from the Center for Aquatic and Invasive Plants, University of Florida. http://aquat1.ifas.uf1.edu

(*Cabomba caroliniana* A. Gray; G5 SE1) to be locally common in Kasshabog Lake. This plant was first found here about a decade ago by Rosita Ben-Oliel, but it appears to have spread and increased in abundance since then[1]. A search of nearby lakes in the Kawartha Lakes area did not reveal any additional infestations of this common aquarium plant. Because Fanwort is an aggressive aquatic weed in other parts of North America, NHIC staff collaborated with other OMNR biologists and the Ontario Federation of Anglers and Hunters to put out a press release and fact sheet about the potential threat to our native biota of this and other invasive exotic aquatic species

Another interesting and presumably adventive discovery was made by George Bryant and Helen Juhola who found Seaside Plantain (*Plantago maritima* L.; G5 S4) growing along Hwy. 17 in Lake Superior Provincial Park. Although this halophytic (salt-loving) species has a circumpolar global distribution, in Ontario it was

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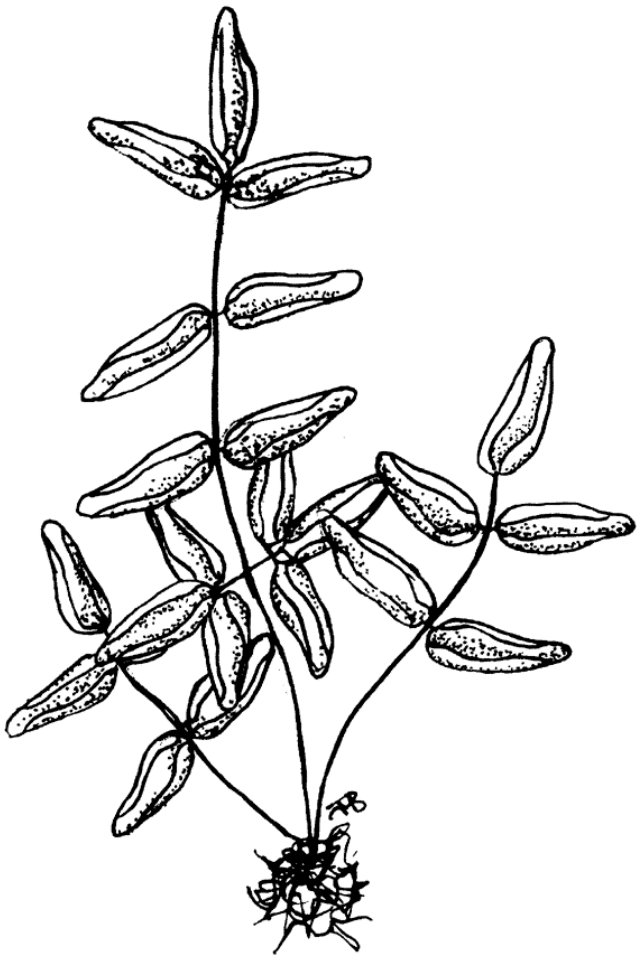
[1] *In the summer of 1999, I received reports of considerable increases in aquatic macrophyte populations from across the province. In particular, Eurasian Milfoil (*Myriophyllum spicatum *L.) populations appear to have increased. Some have speculated that this increase may be connected to abnormally low water levels in lakes and rivers. Will this trend continue in 2000? -Ed*

previously known only from the shores of Hudson and James Bays, and is apparently not known anywhere else in the Great Lakes basin. Not realizing the significance of their find, George and Helen did not collect a voucher specimen, however Steve Newmaster of the Ontario Forest Research Institute was able to relocate the population and collect voucher material. A number of other coastal halophytes have spread inland along major highways which are salted in winter.

The Plants of Cruickston Park Farm.

by Graham Buck

Cruickston Park Farm (Cruickston) is located along the south-west edge of the Grand River between the city of Cambridge and the village of Blair. The village of Blair is the oldest inland community in Ontario with a settlement date of 1802. A farm at the Cruickston property began shortly after that and the original log house stands on the property today. Another structure of historical significance is a slit barn, a rare structure today. The 17 500 square foot mansion, known today as Langdon Hall, was built in 1858. It was not until late 1968 that the property was transferred to the University of Guelph for research.



Smooth Cliff-brake (*Pellaea glabella* Mett. ex Kuhn), drawing by Jane Bowles.

The use of the farm for research is at its most active as I write this article, yet the farm is for sale and the University of Guelph is looking for 9 - 10 million dollars from the 900 hectare property. The proceeds would be used for research at the main campus, and possibly at the Elora and Arkell experimental farms. The selling of the property is a difficult issue for the university because many alumni and faculty are critical of the land sale. One organization, the Nature Conservancy of Canada, has risen above all the bickering and has been working hard to secure the natural areas of Cruickston.

The farm has an especially variable and interesting terrain, with parts of it still retaining some of its former woodland character. A few of the habitats found at Cruickston are: heavily wooded forest, a swamp and pond complex, two hedgerows, a stream within a wooded valley, a flood plain, limestone cliff and terrace. The natural area receiving the most publicity is the 45-acre hardwood forest, which Doug Larson discovered has old growth characteristics. This forest is described as an old growth remnant because of its small size, historical logging of pine, and removal of dead elms. The over-story is composed of Maple, Beech, Red Oak and White Oak. One of the Red Oaks in this forest has a circumference at breast height of 11 feet (≈3.4 m). The forest is just large enough for birds such as the Scarlet Tanager to breed. Plants of interest in this forest include:

Cardamine bulbosa (Schreb. ex Muhl.) B.S.P.
Spring Cress

Carex laevivaginata (Kükenth.) Mack.
Smooth-sheathed Sedge

Carya glabra (Miller) Sweet
Pignut Hickory

Cypripredium calceolus L.
var. *parviflora* (Salisb.) Hultén
Small Yellow Lady's Slipper

Lindera benzoin(L.) Blume
Spice Bush

Phytolacca americana L.
Pokeweed

The rare Blue-spotted Salamander (*Ambystoma*

laterale) is found in this part of Cruickston too. It requires mature woodlots as the adults use passages created by large tree roots to survive most of the year.

The other natural area receiving a lot of attention is the limestone cliff. This formation is unique to the Region of Waterloo, and there are many unique plants growing there:

Asplenium trichomanes L.
Maidenhair Spleenwort

Geum lacinatum Murray
Rough Avens

Pellaea glabella Mett. ex Kuhn
Smooth Cliffbrake

Penstemon hirsutus (L.) Willd.
Hairy Beardtongue

Polypodium virginianum L.
Rock Polypody

Malus coronaria (L.) Miller
Native Flowering Crab

Saururus cernuus L.
Lizard's Tail

Staphylea trifolia L.
Bladdernut

Zanthoxylum americanum Miller
Prickly Ash

Zygadenus elegans Pursh
White Camass

There are several wetland complexes in Cruickston. A swamp and pond complex has Baltimore Checkerspot butterflies (*Euphydryas phaeton*) breeding on the Turtlehead (*Chelone glabra* L.), and orchids like Spotted Coralroot (*Corallorhiza maculata* (Raf.) Raf.) and Green Adder's-mouth Orchid (*Malaxis unifolia* Michx). Along the Grand River, including the base of the limestone cliffs, a rich flood plain dominated by tall grasses, docks (*Rumex* spp.), raspberries (*Rubus* spp.), speedwells (*Veronica* spp.), and bedstraws (*Galium* spp.) are found. Unique plants include:

Erigenia bulbosa (Michx.) Nutt.
Harbinger of Spring

Adlumia fungosa (Aiton) Greene ex B.S.P.
Allegheny Vine

Celtis occidentalis L.
Hackberry

Zigadenus elegans Pursh
White Camas

Other interesting plants of Cruickston, some of them historical, include:

Asplenium rhizophyllum L.
Walking Fern

Campanula americana L.
Tall Bellfower

Carex jamesii Schwein.
Grass Sedge

Euonymus atropurpurea Jacq.
Burning Bush

Galearis spectabalis (L.) Raf.
Showy Orchis

Panax quinquefolius L.
Ginseng

Platanthera grandiflora (Bigelow) Lindl.
Purple Fringeless Orchis

Sanicula canadensis L. *var. grandis* Fern.
Long-styled Canadian Snakeroot

The rare Queen Snake (*Regina septemvittata*) has been caught in the area across the river, and is suspected to be at Cruickston.

Despite the flourishing of numerous plant species, 20 reptiles and amphibians, 119 birds which breed or pass through the area, and 20 different mammals, Cruickston

Lizard's Tail (*Saururus cernuus* L.), photo by Mimi Kamp.

is special because of its proximity to Cambridge and Kitchener-Waterloo. George Francis described green spaces in areas of intense urban and agriculture land uses as "patches of green." Stew Hilts refers to them as "islands of green." Cruickston is certainly special because it is an island. It is rare to have this much land under one ownership in southern Ontario. It represents a critical piece in the preservation of the history of Waterloo County, both natural and human. It represents a magnificent opportunity to educate the people of Cambridge about the value of green spaces. Let's all hope and help the Nature Conservancy in its quest to purchase Cruickston Park Farm.

Resources

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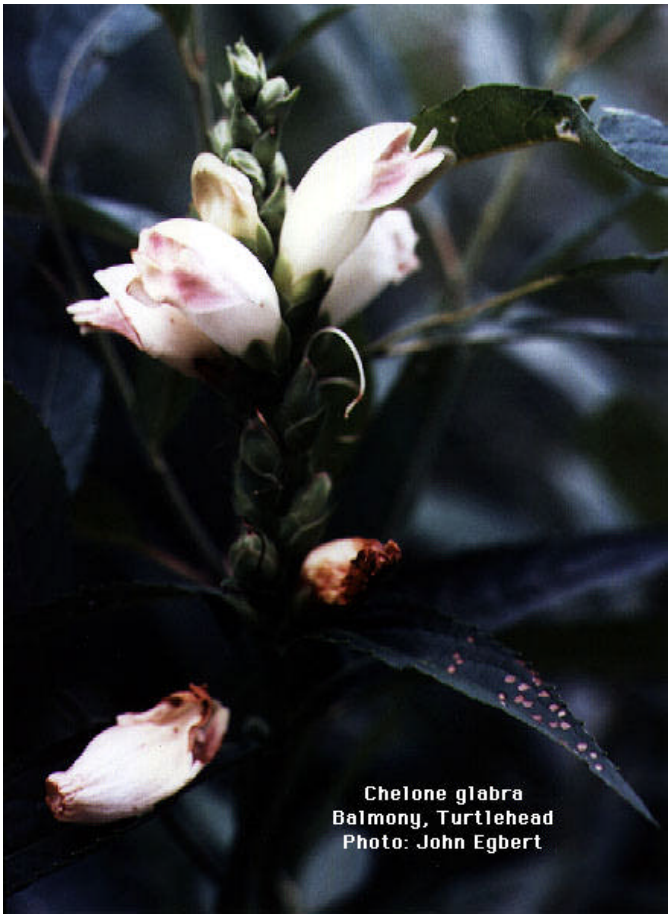

Turtlehead (*Chelone glabra* L.), photo by John Egbert.

Hybridization in endangered populations of Red Mulberry (*Morus rubra* L.) in Southern Ontario.

Kevin Burgess†

A plant that is recently receiving much conservation attention, and is suspected of being under pressure from hybridization with a more abundant introduced species, is Red Mulberry (G5 S2). *Morus rubra* L., Moraceae, is a wind pollinated understory tree species that grows typically to 15 m, but occasionally reaches into the canopy of deciduous forests. This monoecious/dioecious tree species flowers at leaf emergence in the early spring and sets multiple fruit (ovoid compressed achenes) in the late summer. Although it is suspected that small mammals may play an important role in seed dispersal, birds are the most significant foragers of these deep red fleshy fruit. *Morus* consists of approximately 12 species native to the temperate and sub-tropical regions of the Northern Hemisphere.

Native to North America, Red Mulberry is found from Florida to Texas, and north to Vermont, Southern Ontario, and South Dakota. In Canada, it is restricted to the Carolinian zone of southern Ontario. Growing in moist forested habitats such as floodplains, bottomlands, sand spits, and slopes along the southern portion of the Niagara Escarpment, Red Mulberry is currently found in only six confirmed locations in Canada in which populations contain five or more trees. The six critical populations of Red Mulberry in Southern Ontario occur in two key regions, along the Lake Erie shoreline (in Essex and Kent Counties) and between the Niagara

Leaf morphology of *Morus* species in Ontario. The left leaf is typical of *M. alba*, the right is a normal *M. rubra*. The centre leaf is hypothesized to be a hybrid of the two species.

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Escarpment and Lake Ontario shoreline. Historical records indicate that the abundance and distribution of Red Mulberry have been reduced substantially in the last century.

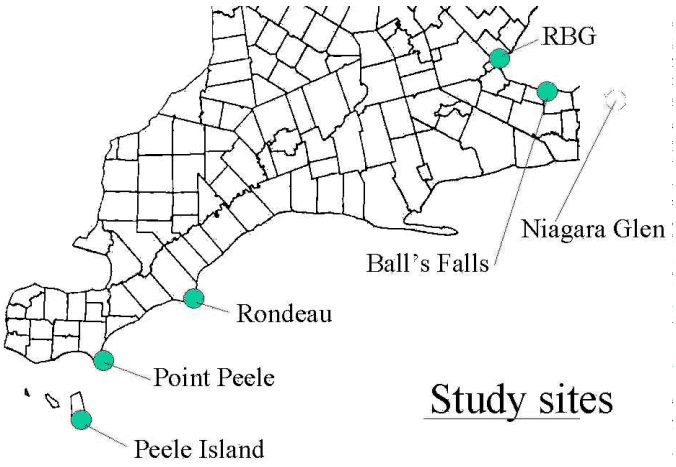
Because of its low numbers, Red Mulberry is likely the most endangered tree species in Canada. It has been recognized as "endangered" in Canada by the Committee on the Status of Endangered Wildlife in Canada, and listed as "threatened" or "rare" in three northern states of the U.S. Efforts to conserve the species has received strong support from land managers and naturalists. A recovery plan has recently been developed for Red Mulberry, and is likely the first plan for any plant listed as threatened or endangered in Canada. The recovery plan outlines the research needs and management action for the conservation of Red Mulberry. Specifically, this plan identifies two immediate threats to Red Mulberry populations: loss of habitat through urbanization and agricultural practices, and hybridization with the non-native White Mulberry (*Morus alba* L.). Introduced into North America in the early 1800s, White Mulberry was grown for its leaves as a staple for the silk worm industry, for its production of edible fruit, or for its ornamental characteristics. White Mulberry has since escaped cultivation and become established throughout the range of Red Mulberry. Flowering at the same time as the Red Mulberry, the White Mulberry is considered a threat to populations of Red Mulberry throughout its entire range.

The hypothesis that *M. alba* freely hybridizes with *M. rubra* is based on observations of individuals with leaf morphology that is intermediate between the two species, however their parentage is yet to be assessed using genetic methods. The recovery plan calls for two actions to address the risk of hybridization in Red Mulberry populations. First, it identifies the need to use genetic evidence to confirm the hypothesis that hybridization is occurring, and to quantify the extent and nature of the hybridization. Secondly, it suggests culling White Mulberry in core Red Mulberry populations as a major recovery action. This action is based on a second hypothesis: hybridization is occurring through gene dispersal on a local scale. There is no scientific data to confirm the role of hybridization in Red Mulberry populations, or the effectiveness of culling White Mulberry to reduce hybridization rates.

The goal of my research at the University of Guelph is to investigate hybridization and its consequences for rare plant populations and the structure of contact zones with more abundant species. To address that goal, I am examining the effects of hybridization on endangered populations of Red Mulberry using molecular and morphological markers.

By examining the genetic and demographic attributes of the Red Mulberry-White Mulberry hybrid zone, it is possible to identify the evolutionary processes that influence its structure. My thesis research involves a combination of theoretical and empirical approaches. Theoretical models, plus existing hybridization theory are being used to determine the critical parameters necessary for predicting the fate of small populations that experience hybridization, and to explore the range of outcomes that are plausible. Empirical studies and a literature review are being used to quantify the mechanisms acting on hybrid zones, assess their relative importance for small populations, and determine the likelihood of species extinction.

This research will contribute not only to an understanding of the consequences of hybridization in rare species and its consequences for biodiversity, but also to the conservation of Red Mulberry populations in

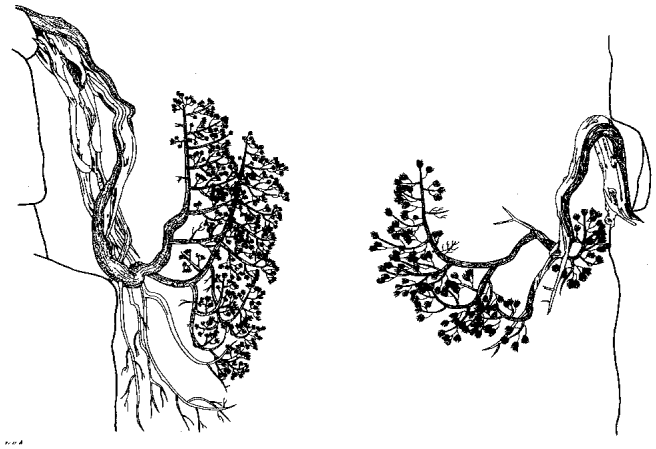


Southern Ontario. This research will yield insights of direct benefit to Ontario's National and Provincial Parks, the National Recovery Plan established for this species, as well as the scientific community. Research is funded by the University of Guelph, the World Wildlife Fund, the Canadian Forestry Service, and the Canadian Wildlife Service.

The Niagara Escarpment Ancient Tree Atlas Project; the Hunt for Ontario's Oldest Trees.

by Pete Kelly[†]

The Niagara Escarpment Ancient Tree Atlas Project began in 1998 with three principal goals. The first goal is to locate the oldest trees growing on individual sections of Niagara Escarpment cliff-face. The second goal is to produce a document which will be given to landowners to help them gain a better understanding of the nature of the cliff-face forest on their properties. The final goal is to determine the environmental variables and specific site factors which lead to extreme age in trees on cliffs. Data is collected in two stages. In the first stage, the cliff face is examined from the talus and potential old tree candidates are marked for future reference. In the second stage, we return to the site, descend to the tree and use an increment borer to collect core samples for age determination. A portable GPS unit is used to determine the precise coordinates of the tree and each tree is sketched and photographed where possible. Data collected at each tree location include: tree species, rock stability, cliff height, cliff aspect, human disturbance, soil depth, tree position relative to cliff height and talus canopy height, and evidence of rock fall, fire, or fauna. This data will help landowners make educated decisions related to conservation issues on their properties along the Niagara Escarpment.



Line drawings of individual ancient Eastern White Cedar (*Thuja occidentalis* L.) by Pete Kelly.

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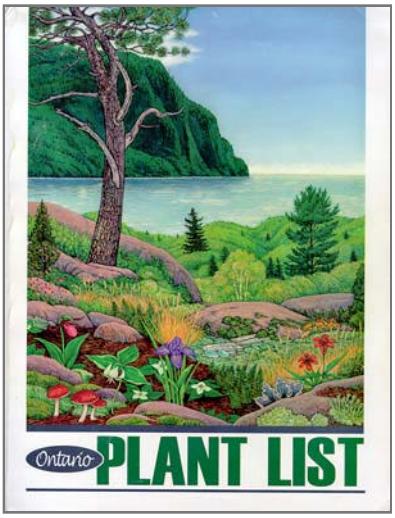
Review:

Ontario Plant List.

by Edward R. Morris

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray, and M.J. Oldham. 1998. Ontario Plant List. Ontario Ministry of Natural Resources. Ontario Forest Research Institute, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123, 550 pp + appendices.



Invariably, one's first reaction to seeing the recently published Ontario Plant List (OPL) is, "It's huge!" At about the size of a metropolitan phone book, this reference belongs on a bookshelf or a desk, not it your pack sack. I suppose the size could have been greatly reduced by reducing the size of the text. Those of you who avoid using sources like Gleason and Cronquist (1990) because of the tiny print will appreciate the medium-sized (size 10?) print used in the OPL.

The OPL is actually available in two forms: as a printed version and as a digital database. Since the former is most relevant to the FBO membership, I will focus my attention on reviewing only the printed version.

The OPL begins with a 23 page introduction which covers "Ontario's Landscapes and Plantscapes," "Rare Plants in Ontario," and "How to Use this Book." Reading these introductory chapters isn't absolutely necessary, but I strongly recommend it.

The plant list is divided into five major plant groups,

including Lichens[1] and Bryophytes which were not included in Morton and Venn (1990). Free-living fungi and algae do not appear in the current version of the OPL, but future versions of the OPL may include these as well. Each section begins with a short introductory paragraph and a description of 'life-form codes' relevant to that group. Life-form codes are used to quickly describe the habit (size/shape) and habitat preference of a species. A table follows which summarizes the number of species within each Genus and Family. In the case of Angiosperms (Magnoliophyta), there are several parts to the introductory section, including: woody plants, herbs, grasses, sedges and rushes.

Looking at the actual plant list, one can quickly see the OPL's roots as a digital database. Using database jargon, eight or nine taxa 'records' (ie: one species, subspecies, or variety per record) appear on each printed page. Each record has a standardized layout of 18 'fields' containing such information as current scientific name, scientific synonyms, English common names, a French common name, GRANK, SRANK, COSEWIC status, and more. For the most part, the information given of each field obvious (current scientific name, English common name), but one will have to read the introduction to the OPL in order to make sense of some of the more cryptic fields, including: life form code, weed control act status, Bayer code, and others. Fortunately, understanding the contents of these fields is not crucial for most readers.

One particular feature of the OPL which I have unconsciously adopted are "Vegetation Alpha Codes." These are seven-letter codes that can be used as a short-hand version of a scientific name. For example: the scientific name *Lysimachia terrestris* can be written as HLYSter. The 'H' represents 'herbaceous,' the 'LYS' are the first three letters of the genus, and 'ter' are the first three letters of the specific epithet. Granted, these codes are not likely to be of much interest to amateur botanists, but they should be adopted by professional botanists. When conducting a vegetation monitoring survey for a client last summer, I found myself using these 'short hand' codes useful as I made field notes. When the time came to make an official record of the data, there was never any ambiguity in my field notes with respect to the identity of the taxon I had observed. Later, when it came time to perform a statistical analysis of the data I had collected, I ran into a limitation of many statistical software packages: names given to columns of data cannot contain more than 8 characters. This vegetation alpha code system worked perfectly with that limitation of the statistical analysis software. I wonder if similar alpha codes can be used for other groups, such as insects or vertebrates.

That being said, Tyler Smith of the Royal Botanical Gardens has reported to me that the vegetation alpha codes used in the OPL are similar to, but not the same as vegetation alpha codes as the OMNR's Ecological Land Classification (ELC) system for Southern Ontario. Botanists who attempt to link information between the two systems could find the inconsistencies frustrating.

Clearly the OPL contains a great deal more information than Morton and Venn's earlier checklist. At first glance, the latter contains only current scientific names and synonyms, occasionally referenced to Literature Cited. However, the free style used by Morton and Venn allowed them to include an unlimited number of scientific synonyms for each plant taxon. The fixed format of the OPL's database structure limits the number of synonyms that can be listed to four. At first I didn't believe this was an important limitation, and for most users I suspect this is true. However, after trying to track down the current scientific name for a certain plant, I realized that the thorough coverage of scientific synonyms in Morton and Venn can sometimes be a true time-saver.

The OPL does contain a Literature Cited section, but it is unfortunate that linking specific taxa to the Literature Cited (as in Morton and Venn) was not done in the OPL. When a 'new' current scientific name is adopted by the authors of a checklist or plant list, it greatly enhances their credibility and satisfies the curiosity of the readers to see who is responsible for the change.

The convention used in most floras and checklists is to flag alien species with an asterisk (*). In the OPL, one must look to the SRANK code to determine if a species is alien to Ontario: S is used for native species, SE is used for aliens. It would have been handy if the asterisk convention had been followed in the OPL, but I suspect that the reason for its omission was related to

[1] Note for novices: Lichens are not 'plants,' but actually symbiotic associations between algae and fungi, yet they are named as though they are a single entity.

some technical limitations of the computer database software used to create, sort, and store the OPL.

There are four indices in the back of the OPL, each separated by a sheet of green paper so that the appropriate index can be accessed more easily. They are "Family-Genus Index," "Genus-Species Index," "English Common Name Index," and "French Common Name Index." As you might expect, users of the OPL spend a fair amount of time navigating through the indices. Although I found the green dividing papers helpful, it might be useful if all pages within each index was printed on coloured paper, and a different colour was used for each index. For my purposes, the Family-Genus Index is the fastest to use because it's very concise. When I'm not sure about which family a species belongs, I revert to the Genus-Species Index.

One final criticism that can be applied to both the OPL and publications from the University of Waterloo Biology Series (such as Morton and Venn): the bindings on these books do not stand up well under heavy use. When ordering any book from the University of Waterloo Biology Series, I request ring binding. For the Ontario Plant List, you may wish to check with local print shops to see if they can rebind it. Because of its size, the OPL may be too big to rebind as a single unit. Binding it as two smaller volumes may be a worthwhile alternative.

The OPL is clearly a invaluable reference item for any professional botanist. Many amateurs should also consider adding this to their bookshelf. Lichens and bryophytes are too often overlooked by amateur and even professional botanists, and their inclusion in the OPL should help to bring awareness of these plants into the mainstream. Owners of Morton and Venn's checklist will appreciate all the additional information and features included in the OPL. However, don't expect used copies of Morton and Venn's checklist to start circulating, as its more moderate size, complete list of synonyms, and annotated bibliography make it well worth keeping.

Acknowledgements

Thanks to Tyler Smith of the Royal Botanical Gardens for his valuable input. Thanks also to Mike Oldham for supplying the review copy of the OPL.

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Morton, J.K. and J.M. Venn. 1990. A checklist of the flora of Ontario: vascular plants. Univ. of Waterloo Biol. Ser. No. 34, Waterloo, ON. 218 pp.

Letters:

Is American Beech threatened?

In 1998, brochure in hand, I walked up Goodenow Mountain in the Adirondacks. At post G, said the brochure, I would find "white fluff on the trunks" of beech trees (*Fagus grandifolia* Ehrh.). It went on, "This is the residue of an insect which carries a fungus that gradually kills the American beech. Since the late 1960's, beech bark disease has killed thousands of trees in the Adirondacks." But at post G there was not white fluff, just a very dead tree. However, in 1999 I found quantities of "white fluff" on American beech in conservation areas near Orangeville and Milton. What is known of this in Ontario?

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Alan,

The organisms in question may be the beech scale (*Cryptococcus fagi*) and fungus *Nectria coccinea* var. *faginata*. The following information was extracted from Crosby and Jones (1952).

Death of beech trees from the combination of insect and fungus attack was first noticed in the early 1930s. The insect was introduced in Nova Scotia from Europe around 1890. The fungus was not known in North America until 1929, when it was found in the Maritime Provinces and Maine.

The first sign of attack by the beech scale, as indicated in your description, are minute, white woolly dots on the bark, usually near the tree base. As the

infestation increases, they may eventually assemble into solid patches of scale. Heavy infestations may completely whiten the trunk and lower side of branches. The 'white wool' is a wax secretion of the scale insect.

Infestations of these insects weaken the tree through their feeding on tissue of the outer bark. Heavy infestations can cause small ruptures to appear in the bark, and it is through these ruptures that the fungus is able infect the internal living tissue of the tree. The first outward signs of the fungus appear on the bark as clusters of pinhead-sized, red fruiting bodies. Contrary to your brochure, the insects may not play a large role in actually carrying the disease from tree to tree. Spread of this fungus from tree to tree is most probably due to wind borne spores, although birds and insects may play a minor role.

A few natural control factors are known. The scale insects do not survive cold weather (-35°C). The peculiarly named Twice-stabbed Lady Beetle (*Chilocorus stigma*) feeds upon the insect, and was observed to be quite effective in combination with a severe winter. The fungus *Gonatorrhodiella highlei* is parasitic on the beech *Nectria*, and is commonly associated with older colonies. According to Crosby and Jones (1952), these natural control factors don't appear to effectively influence the spread of beech scale and *Nectria*.

Trees which grow on steep slopes have been observed to be most susceptible to beech scale and *Nectria*. Woodlot managers were advised to lower the density of beech in their woodlots, remove the most mature specimens, and/or create openings in the canopy so that the forest microclimate would be less favourable to the insect and fungus.

I spoke with Gord Howse of the Great Lakes Forestry Research Centre (Natural Resources Canada) in Sault Ste. Marie. He confirmed that the scale insect has been known in Ontario since the early 1980s, but it was only last summer that half a dozen occurrences of the *Nectria* fungus were observed. He mentioned that some observations were made near Guelph, and the Belleville area appeared to be a relative 'hot spot.' In the year 2000, Natural Resources Canada staff will be tracking *Nectria* fungus occurrences. However, because most of Ontario has a drier climate than Atlantic Canada, Mr. Howse did not believe the fungus would become as much of a pest. Furthermore, the experience in the United States has been that some beech trees appear resistant to the fungus, while other individuals have been able to survive severe infestations (Houston and O'Brien 1983).

Fruiting bodies of *Nectria coccinea* var. *faginata* on American Beech (*Fagus grandifolia* Ehrh.).

Thanks to Gerard Courtin (Biology Department, Laurentian University) for recognizing this possible diagnosis of your observations. Thanks also to Mr. Howse for taking my call and giving me up-to-date information.

Ed Morris

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Notices:

Nature Conservancy of Canada launches campaign to save Clear Creek Forest.

March 7, 2000

Over 3000 people have signed in support of The Nature Conservancy of Canada's effort to protect Clear Creek Forest, one of Chatham-Kent's few remaining large forests. This grassroots enthusiasm - coming together in just two and a half months - has helped to give the green light to NCC to enter into a year-long $1.5 million campaign.

NCC plans to unveil a more detailed fund raising strategy in early spring and continue awareness building for Carolinian Old Growth from Toronto to Windsor. For Clear Creek Forest, this makes a lot of sense, since many birders and outdoor enthusiasts travel from throughout Ontario to the Rondeau region.

Nature Conservancy of Canada Press release

The FBO had a surplus recently. In the most recent executive meeting of the FBO executive, a motion was carried to donate $2000 towards the Clear Creek Forest campaign. Some additional money remains, and other specific campaigns were considered, but it was decided that a bit of fact finding would be necessary before cutting cheques for them. Look for an update in the next FBO Newsletter.

-Ed

FBO Website up and running: http://www.trentu.ca/fbo/

Kellie Bonnici, a Trent University student in her final year, joined the FBO executive last fall and took on the portfolio of "webmaster." She quickly began developing the site, and now most of the "under construction" signs are gone. You can visit the site at http://www.trentu.ca/fbo/

There are some very useful features on the site: if one knows of someone who would like to join the FBO, one can download membership applications; if one loses one's field trip application, or has a friend who would like to attend an FBO trip, one may download field trip registration calendars and forms; and if one wants to find other botany and conservation sites on the web, one can visit the links section. Of course, these are just some of the ideas that we have for the site. It will continue to evolve based on your suggestions and needs.

-Ed

Publication Notice:

Larson, D.W., U. Matthes, and P.E. Kelly. 1999. **Cliff Ecology: Pattern and Process in Cliff Ecosystems.** Cambridge University Press, Port Chester, NY. pp. 360.

Cliffs are present in virtually every country on earth. The lack of scientific interest in cliffs to date is in striking contrast to the commonness of cliffs around the world and to the attraction cliffs have had for humans throughout history. Cliffs provide unique habitat, rarely investigated from an ecological viewpoint. This book aims to destroy the impression of cliffs as geological structures devoid of life, by reviewing information about the geology, geomorphology, microclimate, flora, and fauna of both sea and inland cliffs. For the first time, evidence is presented to suggest that cliffs worldwide many represent an invaluable type of ecosystem, consisting of some of the least disturbed habitats on earth and contributing more to the biodiversity of a region than their surface coverage would indicate.

Copies may be ordered from Order Department, Cambridge University Press, 110 Midland Avenue, Port Chester, NY 10573-4930. Price prior to April 30th, 2000 is $US 55.96. Afterwards, the price rises to $US 69.95. Note that a special order form may be necessary to obtain the special introductory rate. Send a self-addressed stamped envelope to the authors (Botany Department, University of Guelph) or FBO Newsletter editor for the coupon.