

Flowers **Leaves** **Defense** **FUNGI** **Site** **BLOOM**
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 2022-08-06 5:29 PM Ver. From *Hardwoods Shrubs & Trees of the Maritimes, Northern New England & Quebec*. N. Whiston Earltown NS. norrisw@ns.sympatico.ca

Vertical Clusters (Inverted Cone)



red elderberry *Sambucus racemosa* creamy yellow
 vert.cl. 5 lobes pinnate, elliptical; undulate, sharp teeth; rank,
 glycoside repels insect > cyanide; **AMF** [open, disturb] **MAY**



staghorn sumac *Rhus typhina* yellow green tiny flower
 pinnate leaf, lance leaflets, hairy axis, toothed; **tannin**: anti
 fungi, epiphytes, slows decomposition, repels browsers &
 insects **Salt tolerant** **AMF** [forests sides, old farms] **JN-JUL**



meadowsweet *Spiraea latifolia* white or pink 5 petals
 oval lance, coarse th: **Methyl salicylate**: aerosol, anti-
 pathogen, warns of predators **Salicin (ASA)** antibiotic repels
 insects antifungal **immune stimulant** **AMF** disturbed **JL-AG**

Elongated Clusters



Chokecherry *Prunus virginiana* wh cyl. 6-12 cm 5
 petals egg-shape, thin, shiny, dark green, pointed, sharp fine
 teeth: **hydrocyanic acid**: See > **AMF** roadside **MAY-JUNE**



black cherry *Prunus serotina* white cylinder 15 cm, 5
 petals: **fragrant**; elliptical leaf, thick, glossy, fine sharp teeth,
hydrocyanic acid almond smell, leaves, bark & seeds
 poisonous to animals **hydrogen cyanide**; **Arbuscular**
mycorrhizal fungi **AMF** [thickets, dry woods] **JUNE**



mountain maple *Acer spicatum* yellow green, tiny,
 mostly upright, 7 – 15 cm; 3 lobe leaf, hairy under, wrinkled
 (deep veins), coarse rounded teeth; wilted leaf reduces red
 blood count; **Arbuscular mycorrhizal fungi** **AMF** [moist
 open woods] **JUNE**

Round Clusters



pin cherry / fire cherry / bird cherry *Prunus*
pennsylvanica white 5 petals lance broadly leaf, shiny, long
 pointed, tooth: **hydrocyanic acid**. See ^ toxic; **hydrogen**
cyanide: **AMF** [clearings, roadsides, burns] **MAY**



wild apple *Malus pumila* white - pink fragrant 5 petals
 elliptical or round leaf, rough, wavy, small teeth; [old farms,
 roadsides] **hydrogen cyanide**: See ^ **methyl acetate**: aerosol
 (volatile), toxic; **AMF** roadsides, old farms **MAY-JUNE**



American mountain ash *Sorbus americana* white 5
 petals pinnate compound lance leaflets, long-pointed, fine
 teeth: **cyanide compounds**: toxic; **hydrogen cyanide**;
parasorbic acid: anti-biotic, inhibits seed germination;
 toxic **AMF** [barrens, roadsides, burns +] **JUNE JULY**



eastern ninebark / common ninebark *Physocarpus*
opulifolius white 5 petals extended stamen 3-5 lobes,
 rounded teeth; **AMF** [towns, roadsides] **JUNE**



Labrador tea *Rhododendron groenlandicum* white 5
 petals reddish brownish green, elliptical, rugose, hairy
 revolute, untoothed; **gallic acid**; toxin, toxic when boiled;
tannin: antifungi, epiphytes, repels insects browsers, slows
 decomposition **Ericoid** [wet barrens, open forests] **JU- JULY**

Flat Clusters



hobblebush *Viburnum lantanoides* outer white 5 sterile
 lobes, inner small fertile blooms large heart-shape – egg shape
 leaf, heavily veined, tan buds, irregular teeth; **Arbuscular**
mycorrhizal fungi **AMF** [moist mixed woods] **MAY-JUNE**
NOTE: In blue are some of a plant's organic defense.
Aerosols & underground mycorrhizal fungal connections
 share ecosystem's warnings, the above defenses, stored
 water, nitrogen, carbon, & nutrients.

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red-osier dogwood *Cornus stolonifera* creamy white. 4 petals egg-shape leaf, opposite paired leaves, long curved veins smooth edge; **toxic AMF** [ditches, moist areas] **JUNE**



common elderberry / elder *Sambucus canadensis* white tiny 5 petal; **fragrant** pinnate leaf, elliptical leaflets, finely toothed; **glycosides**, insects repellent > becomes cyanide; **tannin**, **immune stimulating AMF** [old pastures, open woods, moist lowlands, along shores] **JULY-AUG**



Dewberry / dwarf raspberry *Rubus pubescens* white or pale pink 5 angled petals compound 3 or 5 leaflets, **doubled tooth**, **Arbuscular mycorrhizal fungi AMF** [damp places] **JUNE**



highbush cranberry / pembia / bush cranberry *Viburnum opulus*, *trilobum* out: creamy white 5 round petal large out; in: sm. fertile; 3 lobe leaf, variety of shapes, elongated pointed lobes, irregular teeth; **cover** for birds; **tannin**: anti fungi, epiphytes, insects, browser, slows decomposition; **viburnin**: (cramp bark); **antioxidant AMF** [damp soils, shores] **JUNE-JULY**



serviceberry / shadbush / Juneberry / Indian pear / Saskatoon *Amelanchier* white 5 long narrow petals oval to elliptical leaf; fine teeth; **resists** air pollution; **Salt tolerant AMF** [near moist areas, disturbed areas] **MAY-JUNE**



black chokeberry *Aronia melanocarpa* white 5 round petals elliptical leaf, **spoon-shape**, some abruptly taper, fine teeth; **Arbuscular mycorrhizal fungi AMF** [moist areas] **JUNE**



alternate-leaved dogwood *Cornus alternifolia* creamy white 4 petal **attracts** birds for its defense egg-shaped leaf, convex, deep long curved veins, **alternate**, top looks like a whorl, toothless often undulating edge, pointed tip: **toxic**; **resists air pollution**, **Arbuscular mycorrhizal fungi AMF** [moist forest, shores, borders, shade tolerant] **JUN-JULY**



hawthorn *Crataegus* white round 5 petal 7 + lobes, sharp irregular teeth; **early succession**, **thorns** cover; **rutin**, **vitexin AMF** [old fields, moist thickets, shores] **MAY-JUNE**



blackberry *Rubus canadensis* white 5 narrow petals, green sepals palmate, stem thorns, leaflets coarse tooth; **early succession**, **thorn** defense **Arbuscular mycorrhizal fungi AMF** [damp thickets, shorelines, roadsides.] **JUNE-JULY**



wild raisin / witherod / possumhaw / Appalachian tea *Viburnum nudum* var. *cassinoides* creamy white 5 lobes, elevated anthers elliptical leaf, opposite, thick, lighter green vein, toothed, tipped: **cyanide compound**: resists disease & insects, **toxic**; **pioneer AMF** [moist habitats, beside streams, almost anywhere] **JUNE-JULY**



glossy / smooth buckthorn *Frangula alnus* pale yellow-green 5 petals in axils; elliptical leaf, shiny dark green, **smooth edge**; **emodin**: anti insect, herbivore and pathogen; **allelopathic AMF** [roadsides, trailside] **MY-JUNE**
References: Biology Dictionary on line about Diazotroph Seen 2020; Blouin 2012; Boland 2012; Dwelley 1980; Little (Audubon) 1980; MacKinnon 2009; Nutrient Co.; Petrides (Peterson) 1988; Schneider 2002; Simard 2021; Tully 2022; Viereck 1986; Wessels 2019; Whiston 2019; Wojtech 2011



rugosa rose / seaside rose / wrinkled rose *Rosa rugosa* pink 5 petals large, bristly stalked, singular; **fragrant**; pinnate leaf, oval leaflets, shiny, rugose surface; **fruit high Vit. C**; **thorns** defense, **salt tolerant** **Arbuscular mycorrhizal fungi AMF** [roadsides, urban] **JUN - JULY**

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Fused / Pea-Like



Rhodora / Rhodora Azalea *Rhododendron canadense* rose-purple or white 5 fused petals elliptical blue-green, revolute, hairy under, blunt tipped, untoothed; **andromedotoxins**; poisonous; **Ericoid fungi** [peat soils, moist thickets, old pasture] **MAY-JUNE**



black locust *Robinia pseudoacacia* white, pea blossom pinnate leaf, oval leaflets, stalked, rounded both ends, untoothed; **ic acid**; **methyl acetate**: aerosol (volatile), **drought survival** toxic; harbors **Rhizobia Nitrogen fixer** in root nodules **AMF** [roadsides, planted,] **JUNE-JULY**

Lobed / Funnel / Bell / Urn



fly honeysuckle *Lonicera xylosteum* whitish yellowish, 5 petals, funnel-shaped elliptical, gray green – yellow green, paired, untoothed; **Arbuscular mycorrhizal fungi AMF** [damp mixed or deciduous woods] **APRIL-MAY**



Norway maple *Acer platanoides* yellow-green 5 lobes 5 lobe leaf; u sinus, milky sap at leaf base, a few sharply pointed ends; **invasive**: prolific seeds **Arbuscular mycorrhizal fungi AMF** [towns, urban roadsides] **MAY**



striped maple / moose maple *Acer pensylvanicum* yellow-green, 5 petals, bell-shaped 3 lobe leaf, opposite, very large, heart base, pointed tips, fine teeth; **high protein**; **Arbuscular mycorrhizal fungi AMF** [open, moist hardwoods] **MAY**



black huckleberry / high-bush huckleberry *Gaylussacia baccata* red to coral pink, 5 lobes urn-shaped elliptical, sticky, untoothed, pointed tip urn-shaped; **Ericoid fungi** [wet or dry woods, bogs, shores] **JUNE**



northern bush honeysuckle *Diervilla lonicera* pale yellow, funnel shape, 5 petals, lowest petal larger deeper yellow, protruding stamen elliptical, opposite, toothed, pointed tip, **Arbuscular mycorrhizal fungi AMF** [dry, open, dry, rocky soil, roadsides, field edges] **JUNE-JULY**

Scrawny Petals



beaked hazelnut *Corylus cornuta* f pink protruding scrawny styles m yellow green catkins > husk with **tannin**; anti fungi, epiphytes, repels insects, browser, slows decomposition, egg-shaped leaf, may have heart shape base, rugose, abruptly taper, veins to longest of double teeth; **EMF** [rocky slopes, forest edges, banks] **APRIL-MAY**



basswood / linden *Tilia americana* green to yellow 5 petals, nodding; **fragrant**; asymmetrical leaf, slender tips, small sharp teeth; **mucilage**; **flavonoids**; **tannin**: anti fungi, epiphytes, insects, browser, slows decomposition. **Water storage EMF** [towns, rich woods, planted] **JULY**



witch-hazel *Hamamelis virginiana* yellow twisting thin 4 petals asymmetrical leaf, rough, prominent veins, undulating edge, rounded uneven teeth; **Salt tolerant AMF** [damp rich hardwood / mixed understory, roadside] **SEPT-NOV**

Tiny or No Petals



elm *Ulmus americana* reddish cluster f pistils m stamen asymmetrical oval leaf, point ends, rough surface, thick, deep veins to tth, double tth; **ulmic acid tannins** **Arbuscular mycorrhizal fungi AMF** [moist bottom lands, shores, planted, towns] **APRIL-MAY**



sugar maple / rock maple *Acer saccharum* yellow-gr. long hairy stalks no petals m f separate clusters; 5 lobe, thin, u-shaped sinus, mostly smooth edge; require calcium; **water storage & shares** (like other hardwoods) **Arbuscular mycorrhizal fungi AMF** [well-drained upland soils] **APRIL-JUNE**



white ash *Fraxinus americana* yellow – purplish, clustered, 0 petals pinnate leaf, oval leaflets, opposite short stalked, tipped, sparse fine teeth or no teeth **Betulin**: white anti-desiccating in winter, anti-cancer, antibiotic, antifungal, insects, & distasteful **Tannins** (**Arbuscular mycorrhizal fungi**) **AMF** deep well drain soils, hardwoods **MAY**



red maple *Acer rubrum* male yellow stalkless, female bright red with stalk flowers; 3-5 lobe leaf, sharp sinus, irregular teeth; **digallates**: antiviral, anticancer, but toxic **AMF** [swamp, riverside, moist valley] **MAY**



Manitoba maple / box elder / ash leaf maple *Acer negundo* m. yellow green 5 lobe f long stalk, red brown stamin; pinnate leaf, oval lobed leaflet, point, irregular teeth; **invasive AMF** [shores, planted] **MAY**

Catkins Loose



northern red oak *Quercus rubra* m ylw grn hanging catkins, f spikes 7 lobe, yellow or red ribs, shallow wide sinuses, pointed tips **gallic acid**; **tannins**; **Quercitrin**: antioxidant, immunostimulant; **terpene** attract insect repel predator, **resin**: neutral insect, **Salt tolerant** (**Ectomycorrhizae Fungi**) **EMF** well-drained sites **MY-JU**

Catkins Hairy or Bumpy Beady



trembling aspen *Populus tremuloides* m gray, hairy egg-shape, fine tooth, tipped, **Salicin (ASA)**: repels insect; antibiotic, antifungal, immunostimulant, **tetrochrysin**; **chrysin**: antiviral **populin**: antifungal, repels insects; **EMF /AMF** pioneer, old pastures, clearcuts, burns **AP-MY**



large toothed aspen *Populus grandidentata* m. gray brown hairy; egg-shape, course tooth See **trembling aspen** above **EMF** or **AMF** burns, disturbed dry woods **APR-MAY**



sweet fern *Comptonia peregrina* m green brown, long arching, f small burr-like, red > brn, long, narrow, hairy, often revolute, surface resin, large teeth or notches; **Frankia Nitrogen fixer** in modified root branches; Cluster roots to **take-up phosphorus** [sandy, open barrens, roadsides] **MAY**



speckled alder *Alnus incana* burgundy brown to yellow brown m catkins; egg-shaped leaf, rough, wrinkled, pleated, >10 pairs deep straight sunken veins, doubled tooth insect and disease free; **pioneer**: **stops erosion**; **Betulin**: winter anti-desiccating, resists bacteria, fungi, insects, distasteful to animals; **Frankias nitrogen fixer** in modified root branches; uses **Ectomycorrhizae Fungi** **EMF** or **AMF** [old pastures, moist areas] **MR-MAY**



gray birch *Betula populifolia* m green brn long hang, f erect triangular leaf, lustrous, flat base, tapering tip, coarse teeth; **Betulin**: white winter anti-desiccating, resists bacteria, fungi, insects, distasteful to animals; **methyl salicylate**: receives; **Nit. fixer** in older birch litter; Tuber fungi's **Bacillus Nitrogen fixings (Ectomycorrhizae Fungi)** **EMF** [sterile soil, old fields, burns, clearcuts] **APRIL-MAY**



yellow birch *Betula alleghaniensis* m brown yellow hang, f erect; heart-shaped base, oval, broken twigs wintergreen smell, double tooth **methyl salicylate**: aerosol, anti-pathogen, recruits help, warns of predators; **Betulin**; **Nitrogen fixers** See^ **EMF** rich, shores, near swamp **MA-JU**



bayberry / wax-myrtle / candleberry *Morella pensylvanica* m sm grn, f grn nubs; ellip. Shiny fragrant; **Salt tolerant Frankia Nitrogen fixer** in modified root branches; **AMF** [sandy & headlands,] **JUNE**



willow *Salix* Pussies > catkins m yellow pollen various leaf types, fine teeth **Salicin ASA**: antibiotic, antifungal, repels insects (aroma), **immunostimulant tannin**: anti (fungi, epiphytes, insects, browser) decomposes slowly, keeps old bark, **pioneer**: **stops erosion**; **EMF** or **AMF** [wet thickets, shores, banks, roadsides, old wet or dry abandoned fields] **APRIL-MAY**