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FLORA
OF THE
PRAIRIE PROVINCES

by

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Part I

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FLORA
OF THE
PRAIRIE PROVINCES

A HANDBOOK
TO THE FLORA OF THE PROVINCES OF
MANITOBA, SASKATCHEWAN AND ALBERTA

by
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Part I
Pteroids, Ferns, Conifers and
Woody Dicopsids
Omnis vera cognitio

cognitione specierum innitiatur

Linné
We are pleased to present herewith in this condensed form a survey of the flora of Manitoba, Saskatchewan and Alberta as we know it. It is in a form which we hope will be especially adapted to use by the college student, yet remains convenient, in form and presentation, for use not only by the educated layman who my wish a key to the nature around him, but also by biologists, agrops, botanists and other naturalists who may have the need for a handy guide to the vegetation of our area.

ENGLISH POPULAR NAMES have been restricted to those that appear to be vernacular and they are underlined only if they are known to be vernacular in Canada. FRENCH POPULAR NAMES follow in (brackets) and are underlined only if known to be vernacular in North America.

NATIVE AND INTRODUCED plants are distinguished as follows: names underundulated represent plants native in our area; names in CAPITALS represent plants introduced in our area.


Two kinds of synonyms have been distinguished. True synonyms, such as Astragalus triphyllus Pursh in the synonymy of A. gilviflorus Sheldon, are followed by the correct author's name. Other synonyms, such as Astragalus hypoglossus AA. in the synonymy of A. danicus Hetz., represent names based on misidentification of specimens or misinterpretation of types; note that the author's name has therefore been replaced by the abbreviation AA. All synonyms are underlined and encased in (brackets).

The local DISTRIBUTION of each taxon is followed by its general distribution in an abbreviated form. The geographical sequence used conforms to the list of abbreviations below. Two geographical abbreviations are connected by a hyphen when a Canadian distribution is continuous across the intervening provinces or territories, while a comma separating geographical units indicates a discontinuous Canadian distribution. Thus Q-BC indicates that a plant is known to occur in Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

Conversely Q-Man, Alta-BC indicates a plant with a similar distribution, but lacking in Saskatchewan.
A distribution is enclosed in (brackets) if we have not checked it personally but are quoting other botanists. No brackets are used when we have been able to confirm the distribution given herewith. Partially confirmed distributions are accordingly given partially outside, partially inside brackets. Prior to 1963 our recording of verified distributions was unfortunately somewhat spotty, hence some of the confirmed distributions will fall short of our actual herbarium studies and annotations.

A brief review of 22 major families and other groups of plants occurs at the beginning of the Herbaceous Dicots. This review may be especially useful to the beginner. It may also serve as an outline for a practical course in Plant Classification at the elementary level.

Insofar as we have been able to check them, we have included in this text only such taxa as we have been able to recognize as discrete biological entities. All others have been relegated to synonymy, along with all minor morphological segregates that seemed of no particular significance. We have acted on the basis that first and foremost a species should be morphologically discontinuous from its closest relatives. And this discontinuity should be such as to be readily recognized by a good amateur or biologist (ecologist, forester, agron, etc.), given the usual equipment and a reasonable amount of previous experience or training. One should not need to send for a specialist for every other Carex or Crataegus. Taxonomy is not an esoteric science, but an everyday tool of biologists, amateurs and just plain interested and intellectually curious people. We consider that the classification of Vascular Plants should remain within reach of such people and that the species should be the natural unit of knowledge. May we hope that the result of our efforts does not fall too far short of our objective.

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Herbier Louis-Marie
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September 1966*

* A few additions and minor revisions have been incorporated to this text until late spring and summer 1967.
THANKS

Our field work in the Prairie Provinces covered 8 seasons from 1946 (with the National Museum) to 1960 (with the Department of Agriculture) and we have had an opportunity to examine or borrow a large proportion of the relevant material preserved in institutional collections. The general western collections at the Department of Agriculture (DAO) and at the National Museum (CAN) are rather complete and have been extensively reviewed. The general but less extensive collections at the Faculty of Agriculture at Laval (QFA) have also been reviewed nearly in full. Another extensive and important collection is preserved at the Gray Herbarium (HUH) but has been examined in part only. We have borrowed large blocks from some of the local herbaria, namely from the University of Saskatchewan (SASK), the University of Regina (REG), the Experimental Farm at Swift Current (SCS) and the Research Station at Saskatoon (SASKP). We have also leafed through part of the collections at the University of Alberta (ALTA), the University of Manitoba (WIN) and the Experimental Farm at Brandon. At one time or another we have received selected loans from a large number of institutions, including every one of the above. To all the institutions who have thus placed their facilities at our disposal, our most grateful thanks for their unfailing cooperation. We wish to extend similar thanks to the many colleagues who have helped us with information and suggestions and similarly to the numerous amateurs who have kept sending in a steady stream of information and of duplicates of their more important discoveries. Many of these amateurs have also published important papers and have thus made a major contribution of their own. Such as: A.J. Breitung (McKague, Cypress Hills, Waterton), Dr. G.H. Turner (Fort Saskatchewan), J.H. Hudson (Mortlach), and J.P. Bernard (Otterburne). The latter is now my assistant and deserves special thanks for his substantial contribution to the preparation of this text, collaborating on the preparation of the glossary, helping to check the distributions and, generally speaking, shouldering a large proportion of the tasks involved in preparing this manuscript for publication.
ABBREVIATIONS

AA. Authors, American Author.

sphalm. By mistake; abbreviation of the latin sphalmate.

m Meter, about 4 inches longer than a yard.

dm Decimeter; about 4 inches.

cm Centimeter; about 2/5 inch.

mm Millimeter; about 1/25 inch.

ssp. Subspecies

var. Variety

f. Form

cv. Cultivar

n North

s South

e East

w West

ne Northeast

nw Northwest

se Southeast

sw Southwest

c Central

Q Greenland

F Franklin District

K Keewatin District

Y Yukon

Mack Mackenzie District

Aka Alaska

L Labrador

NF Newfoundland

SPM Saint-Pierre & Miquelon

NS Nova Scotia

PEI Prince Edward Island

NB New Brunswick

Q Quebec

O Ontario

Man Manitoba

S Saskatchewan

Alta Alberta

BC British Columbia

US United States of America

CA Central America, (including Mexico and the West Indies)

SA South America

Eur Eurasia

Afr Africa

Oc Oceania

SEQUENCE OF FAMILIES AND GENERA

The sequences of FAMILIES is adapted from the Bull. Soc. Bot. Fr. 103: 490-505, 1956. And the sequence of GENERA within a family is adapted from Dalla Torre & Harms, Genera Siphonogamarum 1900-1907 for the Conifers and Flowering Plants, from E.B. Copeland, Genera Filicum 1947, for the Ferns.

At least as far as the families are concerned, the basic principle of the sequence is the following evolutionary hypothesis.

Evolution does not proceed by the creation or production of brand new structures -- evolution proceeds by fixation, modification, specialization, differentiation or reduction of preexisting structures. Structures which appear to be new, those which constitute a progress, those which give a species, or other taxon, a special advantage in the struggle for life, which enable a species to occupy a previously empty niche or to displace an earlier occupant, such structures are always evolved step by step from preexisting structures.

This evolution step by step, or microbatic (=little steps) evolution, is familiar to our generation by many well known instances such as the creation of new horticultural varieties or the appearance of new and resistant races of pests and diseases following the wide application of a chemical or biological controls.

In practice this evolutionary concept leads to the following observations in so far as the Vascular Plants are concerned.
1- Free structures are more primitive than fused structures.
2- Similar structures are more primitive than differentiated structures.
3- The type with numerous parts is more primitive than one with fewer parts or with parts fixed in number, which in turn is more primitive than the type without the same parts, provided this absence is the result of reduction.
4- Alternate or spiral parts is a more primitive condition than opposite or verticillate, as the latter seems to result from some internodes failing to develop.
5- Open venation is more primitive than reticulate venation.
6- Indefinite and indeterminate growth is more primitive than definite or determinate growth.
7- The terminal or solitary flower is more primitive than the inflorescence and the open inflorescence is more primitive than a closed inflorescence, such as a capitulum, cyathium, catkin, etc., which has come to function more or less as a single flower.
8- The free prothallium (alternation of generations) is a more primitive type than the type where the spores develop and produce a seed without leaving the mother-plant.
9- Dichotomous branching is more primitive than sympodial or monopodial or verticillate branching.
10- The type with scattered and similar sporophylls is more primitive than the type with sporophylls borne in a spike, or sexually differentiated, etc.
11- The type with the fronds all similar is more primitive than the type with the fronds differentiated into sterile and fertile ones.
12- Radial symmetry is generally more primitive than the dorsiventral or bilateral or zygomorphic type.
13- The perennial plant is more primitive than the biennial or the annual.
14- The woody plant is generally more primitive than its herbaceous relative.
15- The terrestrial and autonomous type is more primitive than its aquatic, or epiphytic, or saprophytic, or climbing, or parasitic, or symbiotic relative.

Finally, evolution tends to become irreversible as a type becomes further and further reduced, more and more specialized.

KEYS TO GENERA AND SPECIES

Keys are a modern feature of floras, but their development is a gradual one. In floras of two centuries ago there were no keys, but the species of a genus were often arranged in a graded sequence so that the successive diagnostic names could be used somewhat like an unindented key. Synoptical diagrams of the classification of a whole flora were often offered as a help to the user. Larger genera were often subdivided by means of subheadings. The latter were easy to locate in the text as they...
were usually quite symmetrical visually and may be further identified by use of various symbols such as asterisks, daggers, dashes, etc. As genera became larger, more elaborate system of subheadings were developed. And when these subheadings were brought together in a synoptic table at the beginning of a genus, a key was born. As keys were further developed, they tended to become dichotomous. And when ease in identification became the primary objective of a key, the natural key which gave a synoptic view of a genus tended to give way to the artificial key in which diagnostic characters are selected solely for their ease of use and efficiency in identification.

We have further developed and refined our keys along the lines of current trends. Our keys are purely artificial and built strictly as an aid to identification; more convenient characters are given the preference over more fundamental ones that might better illustrate the essential differences between taxa. Keys are strictly dichotomous and indented, with the pairs of indentations identified by the same letter in the margin. This is the type of structure which produces the easiest keys to use. The number of words and concepts used in each indentation has been kept low on purpose so that the reader may keep the contents of the first indentation clearly in mind while he reads the second indentation. Keys that are overloaded with ifs and whens or too many characters may be more accurate because they may take care of all the contingencies, but the gain in accuracy is all too often at the expense of comprehension.

Visual symmetry is a valuable feature of a good key; it enables the eye to discover quickly and follow easily a particular path of identification. The visual symmetry is here provided primarily by the use of indentations and identifying letters. This has freed us from the need for verbal symmetry and we have therefore eliminated some of the repetitiveness usually found in the second member of a pair of indentations. The resulting brevity will facilitate the task of the mind trying to grasp simultaneously the contents of a pair of indentations. We have also been able to emphasize the diagnostic differences in our keys at the expense of verbal symmetry. Further we have often emphasized the direction of the differences between two taxa or two groups of taxa; it is thus quite often possible to state in only one or two words the essential nature of the difference between two entities.

As we progressed in the preparation of this text we noticed that it was possible to grasp an overall view of a key as long as its terms were not too numerous. This has led us to try to subdivide each larger genus into groups of mostly 6-10 species each. When a large key is thus broken in smaller units, it is possible to retain a overall view of the key to a much larger number of species or genera.

For the sake of brevity the characters used in a key are most often not repeated in descriptions of species, genera and larger groups. Further brevity has been achieved quite often by merely stating how a particular taxon differs from a closely
related one, thus obviating the need to repeat such characters as they may have in common. While a standard sequence is generally followed in describing the successive parts of a plant, more important features are often stated first, especially if they have strong diagnostic value, and especially if these characters were not used in the key.
Plants with vascular tissues and, usually, recognizable root, stem and leaves.

a. Reproduction by spores borne on leaves or sporophylls.
   b. Sporangia borne dorsally on peltate sporophylls.
      Branches, leaves and sporophylls verticillate .............. Division 2. Equisophyta p. 14
bb. No peltate sporophylls. Branches, leaves and sporophylls usually alternate.
   c. Sporangia ventral, leaves usually small and simple ........ Division 1. Lycophyta p. 9
   cc. Sporangia dorsal or naked on specialized branches; leaves (*fronds*) usually large and variously divided.

Division 1. LYCOPHYTA
   Sporangia solitary and subaxillary on the ventral side of a bract or leaf (*sporophyll*).

a. Submerged tufted aquatics from a fleshy bilobed corm ................. Class 2. Isopsida p. 14
aa. Normally terrestrial herbs with clearly distinct stem (and branches) .............. Class 1. Lycopedia p. 9

Class 1. LYCOPSIDA
   Growing point terminal. Foliar appendages differentiated into leaves and sporophylls, the latter usually disposed into clearly recognizable spikes.

a. Spike cylindrical; spores very small and quite numerous ......................... 1. Lycopodiaceae
aa. Spike quadrangular, the sporophylls being disposed in 4 vertical rows; some of the spores much larger and only 4 to a sporangium .......
   ......................... 2. Selaginellaceae
Order 1. LYCOPODIALES

Single family

1. LYCOPODIACEAE (CLUB-MOSS FAMILY)

Sporangia, spores and prothallia not sexually differentiated. Sporangia and leaves without ligules.

1. LYCOPODIUM L.

Herbs dichotomously divided. Leaves small and simple, disposed on 1 ranks or more, persistent.

a. Bearing rings of bulblets. No spike ............ 1. L. Selago

aa. No bulblets. Sporophylls in a terminal spike.

b. No rhizome. Terminal spike barely differentiated from the foliage ............ 2. L. inundatum

bb. Elongated rhizomes present. Spikes strongly differentiated from the foliage.

c. Spike borne on a long peduncle.

d. Leaves in about 6 rows and with a long terminal seta .............. 4. L. clavatum

dd. Branchlets flattened; leaves partly adnate and in 4 rows ........ 5. L. complanatum

cc. Spikes sessile or nearly so.

e. Leaves in 6 or more rows, the free portion of each leaf 3 mm long or more.

f. Erect shoot with a strictly dichotomous branching; branches few .............. 3. L. annotinum

ff. Erect shoot with a distinct main stem; branches numerous .... 5. L. obscurum

ee. Leaves in 4-(5) rows, much adnate, the free portion not more than 3 mm long.

g. Leaves of the various rows quite similar ............. 6. L. sabinifolium

gg. Leaves strongly differentiated, those of the dorsal row trowel-shaped ............ 7. L. alpinum


The widely distributed var. Selago has the leaves \* 1 mm wide, or slightly more, and straight. Around the Pacific Ocean it grades into, and is largely replaced by, the more delicate var. Miyoshianum Makino with leaves \* 0.05 mm wide, \* incurved.
beyond the middle, and mostly spreading to descending. Reports of *L. porophillum* Lloyd & Und. from Western Canada by Rydberg 1932, Macoun 1890, and others are likely to be based on various forms of *L. Selago*. However, we have not yet met with any specimen so named from Alberta. See Boivin 1966. Reports by Macoun 1890 of *L. lucidulum* Mx. from Laggan and B.C. have not been traced yet but are held as highly dubious and likely to be based on variants of *L. Selago*.


Var. *acrifolium* is sporadic in its distribution and appears to be a morphological extreme with entire leaves. *F. pungens* appears to be an ecological variation and is geographically restricted to the same extent that its habitat is also restricted.


The setae are commonly deciduous around the 5th or 6th year. On the Pacific slope the typical variety is partly replaced by a var. *integerrimum* with setae deciduous the very first year. The latter has also been reported from Wisconsin, but we have not yet been able to confirm this report. *F. monostachyon* appears to be an ecological variant essentially comparable to the *F. pungens* of the previous species. Other variations based on the size and number of spikes per peduncle do not seem to be in any way significant.

5. *L. obscurum* L. (f. *exsertum* Vict., var. *dendroides* (Mx.) D.C. Eaton) — Ground-Spruce, Ground-Pine (Petite Prise) — Rhizome deeply buried. Erect shoots very branchy and looking like little trees, with a solitary or a few terminal sessile spic-
A barely distinct form of sunny places is often called var. dendroides, but a better name would seem to be f. exsertum as it hardly rates as a variety.

6. *L. sabinifolium* W. var. sitchense (Ruhr.) Fern. (L. sitchense Ruhr.) -- Ground-Fir -- Rhizome nearly superficial. Leaves partly adnate, this species being thus intermediate between the previous numbers with free leaves and the following ones strongly adnate. Sterile branches strongly ascending and flattened, but with those of the ventral and dorsal rows quite alike. Spike usually solitary, sessile. Acid soils from lake Hasbala westward. -- Aka, nS-BC, US, (Eur).

Our variety has dimorphic erect branches, the fertile ones being 2-3 times longer (exclusive of the sessile spike) than the sterile ones. The more eastern typical variety has subequal branches, but the spike is usually pedunculate. This morphological distinction is at variance with the usual treatment in current manuals and all specimens and reports of var. sabinifolium from Howard and elsewhere in our area have been revised accordingly. See Boivin 1966.


In some herbaria many specimens of *L. complanatum* have recently been revised to various hybrid combinations. We find these hybrids to be unconvincing on morphological ground and also because too many of them were collected way outside the range of one of the putative parents. Nearly all these so-called hybrids appear to fall within the normal range of variation of *L. complanatum* or its var. Habereri.
1967
Boivin, Flora of Prairie Provinces

Order 2. SELAGINELLALES

Single family

2. SELAGINELLACEAE (SPIKEMOSS FAMILY)

Like small Club-Mosses, but with the spores sexually differentiated, the megaspore larger and 4 together in a sporangium.

1. SELAGINELLA Beauvois


a. Leaves merely acute, not bristle-tipped ........

.................................................. 1. S. selaginoides

aa. Leaves bristle-tipped.

b. Glaucous, loosely tufted ............... 4. S. Wallacei

bb. Green, densely creeping.

c. Setae about 0.5 mm long ............ 2. S. rupestris

c. Setae 1.0 mm long or more ............. 3. S. densa


2. S. rupestris (L.) Spring -- Small perennial resembling a small Lycopodium. Sterile branches about 1 cm high; the fertile ones (2)-3-(4) cm high. Leaves small and closely imbricated, ending in a seta 1 mm long or less. Forms a loose carpet on rocks or in dry Pine woods. -- G, NS, NB-neAlta, US, Eur.

Reports from southwestern Manitoba proved to be based on S. densa.

3. S. densa Rydb. var. densa -- A prairie species quite similar to the preceding and often confused with it. Sterile branches about 4 mm high, the fertile ones 1.5-2.5 cm high. Terminal setae 1 mm long or more, forming conspicuous tufts at the end of branches. Sporophylls ciliate to the tip. Forming compact flabelliform carpets on dry ground. Very common prairie species, but usually hidden and inconspicuous. -- swMan- BC, US -- Var. scopulorum (Maxon) Tryon (var. Standleyi (Maxon) Tryon; S. scopulorum (Maxon) -- Sporophylls eciliate above the middle. Dry alpine habitats. -- (se Aka), swAlta-BC, US, (CA).

4. S. Wallacei Hier. -- Foliage somewhat glaucous. Similar to the previous two and often confused with them. Much larger and more loosely tufted and branched, the main shoots up to 10 cm long. Leaves and sporophylls minutely ciliate towards the apex, but eciliate or nearly so towards the base. Setae short, inconspicuous, less than 0.5 mm long. Dry, rocky mountain slopes: Waterton. -- swAlta-BC, US.

13 Selaginella
Class 2. ISOPSIDA
A single order, family and genus.

Order 3. ISOETALES -- 3. ISOETACEAE (QUILLWORT FAMILY)

1. ISOETES L.

Tufted aquatic from a bilobed corm. All leaves bear a ventral sporangium with a small ligule above the sporangium. Spores of two kinds, the female ones much larger and termed "megasporos".

a. Megaspores covered with spinulose projections about as high as the equatorial and commissural ridges...

------------------------ 1. I. echinospora

aa. Smaller and merely covered with tubercules which are about as high as wide and much lower than the ridges ------------------------ 2. I. Bolanderi

1. I. echinospora Durieu var. Braunii (Durieu) Eng. (S. muricata AA.) -- Leaves soft, filiform, arched, entire, up to 15 cm long, bulbous at base. The bulbous part is hollowed out and contains a sporangium. Megaspores spinulose, about 1/2 a millimeter across. A bottom dweller is shallow waters of lakes. -- G, K-Aka, L-SPM, NS-BC, US.

Northeastward it gives way to var. Savilei Boivin, a smaller plant with smaller megaspores, about 1/3 mm across, varying from 300 to 400 μ. Our American varieties form the ssp. muricata (Durieu) Löve & Löve, characterized by the presence of stomata. These will be made conspicuous by the action of iodine as the guard cells accumulate starch. Stomata are absent in ssp. echinospora.

2. I. Bolanderi Eng. var. Bolanderi -- Leaves often longer, up to 25 cm long. Megaspores merely tuberculate and smaller, about 1/3 mm across. Alpine lakes in Waterton. -- swAlta-(BC), US.

In the southwestern USA occurs a var. pygmea Clute much smaller, 2.5 cm high or less, and with megaspores almost smooth.

Division 2. EQUISOPHYTA
A single class, order, family and genus.

Class 3. EQUISOPSIDA -- Order 4. EQUISETALES
4. EQUISETACEAE (HORSETAIL FAMILY)

1. EQUISETUM L.

HORSETAIL
Herbs, easily coming apart at the nodes. Leaves verticillate, small and fused together into a sheath at each node. Branches verticillate and alternating with the leaves. Sporophylls peltate and verticillate in a terminal spike. Sporangia dorsal.

a. Stems all green and simple.

Isoetes
b. Stems wall paper-thin and easily crushed...
                        9. E. fluviatile

bb. Stem stiff with thick wall and smaller central cavity,
   c. Small plants; sheath with 3 teeth only
                        1. E. scirpoides
   cc. Larger; teeth much more numerous.
   d. Teeth persistent; stem up to 2.5 mm thick
                        3. E. variegatum
   dd. Teeth deciduous; stem usually much larger.
   e. Stems annual; sheath with a ring of brown dots
                        1. E. laevigatum
   ee. Stems biennial; sheath soon developing two black rings...
                        2. E. hyemale

aa. Stems branched, at least the sterile ones; fertile stems sometimes yellow and simple.
   f. Branches ramified; sheath two-toned, green at base, brown at top
                        7. E. sylvaticum
   ff. Branches normally simple; sheath green only.
   g. Lowermost internode on each branch longer than the corresponding sheath on the stem
                        5. E. arvense

66. Lowermost internode on each branch as long as or shorter than the corresponding sheath on the stem.
   h. Sheath of the branches 3-toothed
                        6. E. pratense
   hh. With (h)-5-(6) teeth.
      i. Stem-sheaths with 6-8 teeth
                        8. E. palustre
      ii. With 10-30 teeth
                        9. E. fluviatile

1. E. laevigatum Braun (E. hyemale L. var. intermedium
   A.A. Eaton; E. kansanum Schaffr.; E. intermedium (A.A. Eaton)
   Rydb.) -- (Prêle) -- About 1 mm high, often producing tufts of short stems. Stem simple, pale green, not overwintering. Sheath slightly constricted at base, about 2-3 times longer than wide at base and slightly flaring. Sporesis mostly in mid-summer. Open places, often hilly and sandy. -- Q-BC, US, (CA).

Quite easily recognized by its pale green colour and the ring on the sheath reduced to a row of brown dots. New shoots will produce a spike the very first year and sporesis takes place around the middle of summer. The stems do not persist but are regularly winter-killed. The base of an old stem will often generate a tuft of very thin stems which are usually sterile and may vary from straight to flexuous, thus resembling E. variegatum in habit. Yet these thin stems should be readily recognized by the unique type of sheath of E. laevigatum. The base of an old stem will sometimes persist into a second summer; it will then develop sets of rings that may somewhat resemble those of E. hyemale. Most of our personal collections of E. laevigatum will illustrate its usual dimorphism in stem size and shape.

In our field experience this species and the next two are
quite sharply distinct and never hybridize. However, in the herbarium, the distinction is not always so obvious and a fair proportion of specimens will seem to be more or less intermediate. These atypical specimens are variously treated as varieties or species or as interspecific hybrids. Mostly they will be found filed under one or the other of the following names or formulae.

E. hyemale × laevigatum = E. hyemale var. intermedium A.A. Eaton = E. Ferrissii Clute. We have examined quite a few specimens identified by Hauke to E. Ferrissii and we are not satisfied that they show morphological evidence for their hybrid status; nearly all specimens seemed to fall well within the normal range of variation of E. laevigatum and have been so revised. According to the map published, the range of E. Ferrissii extends a long way beyond the range of one of the putative parents, certainly not a feature to be normally expected in a hybrid.

E. laevigatum × variegatum = E. variegatum var. Nelsonii A.A. Eaton = E. Nelsonii (A.A. Eaton) Schaffner. Under those names one finds mostly small specimens of E. laevigatum. E. Nelsonii is treated as a hybrid by Hauke 1963 and, as in the case of E. Ferrissii, his distribution map shows E. Nelsonii extending well beyond the range of one of its putative parents. The morphological evidence of hybridity is not convincing.

E. hyemale × variegatum = E. hyemale var. Jesupii (A.A. Eaton) Vict. = E. trachyodon AA. Specimens filed under those names are usually small individuals of E. hyemale. These seem to be sporadic in the range of the species, being perhaps more frequent northward. As in the two cases previous, the morphological evidence for hybridity is not convincing.

2. E. hyemale L. var. affine (Eng.) A.A. Eaton (var. elatum (Eng.) A.A. Eaton, var. pseudohyemale (Farw.) Morton, var. robustum (A.Br.) A.A. Eaton, E. affine Eng.; E. praelatum Raf.) -- Scouring Rush (Prêle des tourneurs) -- Stem dark green, commonly 1 m high, simple, overwintering. Sheath cylindric, short, up to 1½ times as long as large, soon developing two black rings separated by a gray zone. Sporesis sometimes in the fall of the first year, most often in the spring of the second year. Humid and sandy places, most often on embankments. -- Mack-Aka, (NF), NS, NB-BC, US, (Eur)

The internodes are ridged longitudinally and in our american var. affine the ridges are created by a single row of minute and inconspicuous siliceous tubercules. In the eurasian var. hyemale the tubercules form a double row on the crest of each ridge. This difference is not always very clear, but is a valid one if the two varieties are treated as populations.

The stems of this species are very dark green and, like E. laevigatum, they are dimorphic although not in the same manner. First year stems are lighter in colour and usually sterile, but they may produce toward the middle of the summer a spike which will achieve sporesis in the fall. The second year the stems will have appreciably darkened and most of them will produce a spike which will mature before the end of spring. Generally the
stem will be frost-killed during the second winter, but an occasion it may survive for a third season and will then produce short fertile branches (_cf._ _polystachyum_ Prager). This branching and production of more than one spike may also appear during the second summer on stems that may have suffered during the first winter some frost damage affecting only the summit of the stem. Our collection no. 13611 from Pend-d'Oreille Lake in Idaho was meant to illustrate the stem dimorphism of this species.

Such individuals as may be more luxuriant, being taller and coarser, are often named var. _californicum_ Milde or var. _elatum_ or var. _robustum_. These forms are occasional in the range of the species and hardly deserve taxonomic rank, even if they seem to be somewhat more frequent southward.

3. _E. variegatum_ Schleicher -- Similar to the preceding, but generally smaller. Stems simple, annual, up to 1 dm high, up to 2.5 mm thick. Sheath with a single brown or black ring and persistent teeth. We were able to collect mostly in the range of the species and hardly deserve taxonomic rank, even if they seem to be somewhat more frequent southward.

4. _E. scirroides_ Mx. -- Smallest and forming a dark, dense, tangled carpet on the forest floor. Stems only 5-12 cm long, dark green, simple, flexuous and without a central cavity. Sheath with only 3 teeth. Mostly coniferous woods. -- G-Aka, L-NF, (SPM), NS, NB-BC, US, Eur.

As with the first two species, extreme forms have received names. Var. _alaskanum_ A.A. Eaton will designate the more vigorous plants while var. _anceps_ Milde, or better f. _anceps_ (Milde) Braun, will refer to those with more delicate stems.

5. _E. arvense_ L. (var. _boreale_ (Bong.) Led.) -- Horsetail (Queue de renard) -- Stems of two kinds, the fertile ones simple, very early, yellow and soon disappearing. The sterile ones appearing a little later, with simple solid branches. Sheaths of the branches with 3-4 lanceolate teeth 1 mm long or more. Everywhere, especially in wet places. -- G-Aka, L-SFM, NS-BC, US, Eur. Afr.

A most plastic species with scores of named forms and varieties. The most popular one is var. _boreale_ in which the branches are essentially trigonous while they are tetragonous in var. _arvense_. The first is mostly found in shaded places and the second occurs mainly in more sunny habitats. Apparently these varieties are only minor ecological forms.

6. _E. pratense_ Ehrh. -- Meadow-Horsetail -- Stems of two kinds, the fertile ones very rare, appearing in early summer, pale green, branched or soon branching. Sterile stems with simple branches spreading. Sheaths of the branches with 3 deltoid teeth less than 1 mm long. Dense woods near water. -- Mack-Aka, NF, NS, NB-BC, US, Eur.

7. _E. sylvaticum_ L. var. _multiramosum_ (Fern.) Wherry (var. _pauciramosum_ AA.) -- Bottle-Brush -- Branches flexuous and ramified. Stem finely pubescent. Shoots of two kinds, appearing at the same time, the fertile ones with the longest branches uppermost, the sterile ones with the longest branches lowermost. Sheaths of the stem with large russet teeth fused in 3 or 4 groups.
Sporesis in late spring. Woods, especially coniferous woods. --
G, K-Aka, L-SPM, NS-BC, US.

Typically var. multiramosum has smooth branches while the
eurasian var. sylvaticum is minutely glandular-scabrous along
the ridges of the branches. As pointed out by Fassett 1944 and
as we have been able to check in the field and in the herbarium,
the distinction is a statistical one and is valid only if the two
varieties are treated as populations on a continental scale. It
is not difficult to find in the range of one variety, especially
in the northern part of the range, a specimen that could pass as
typical of the other variety.

In Ungava and eastward one may find another variety, var.
pauciramosum Milde, with much reduced branching. Many authors do
not distinguish this entity, in which case the correct name for
var. multiramosum becomes var. pauciramosum because the latter
antedates the former by nearly a century. Hence all reports of
var. pauciramosum west and south of Ungava and Newfoundland should
be interpreted as applying to var. multiramosum.

8. E. palustre L. var. simplicissimum Braun -- Bog-Nut --
Sterile and fertile shoots rather alike and normally branched,
the branches rather coarse and nearly as thick as the stem. Low­
est branches internode very short, with a central cavity and with
sheath bearing (4)-5-(6) teeth. Shores of larger rivers. -- Mack­
Aka, L-NF, NS-BC, US.

The eurasian var. palustre bears branches with their middle
sheaths cut into teeth only (0.5)-0.8-1.2-(1.5) mm long. Our
american phase is weakly differentiated by a number of statisti­
cal differences of which the strongest is found in the length of
the teeth of the middle sheaths of the branches; these are (1.0)-
1.2-2.5-(3.0) mm long in american plants. The latter was first
distinguished as var. americanum Vict. 1927 but there are three
earlier names available of which var. simplicissimum Braun is the
earliest and correct name as pointed out by Boivin 1951.

9. E. fluviatilis L. (E. limosum L.) -- Pipes (Pipes) --
Stem with the largest central cavity and the thinnest walls, thus
very easily flattened. Very variable, simple to much branched.
Sterile stems long attenuate at tip, otherwise similar to the
fertile ones. Stem sheaths short, with numerous small and strongly
blackened teeth. Branches hollow. Wet spots and shallows. -- K­

Division 3. PTEROPHYTA

Reproducing by seeds or by spores borne in marginal or dor­
sal sporangia. Leaf (or frond) usually well developed and rather
large.

Sub-division 1. PTEROPHTINA

Herbs with rather large fronds which are usually much divi­
ded. Venation usually more or less dichotomous. Sporangia borne
on the back of fronds or at the margin of specialized shoots.
A single class.
Class 4. PTEROPSIDA
a. Frond dichotomously divided into a leafy branch and a fertile branch; sporangia not clustered in sori, but more or less scattered, rather large and individually noticeable and usually sessile.

Order 5. Ophioglossales
aa. Frond usually pinnately divided; sporangia small, submicroscopic, usually stipitate and aggregated in discrete sori

Order 5. OPHIOGLOSSALES
Sporangia marginal, scattered, often sessile or nearly so. Frond divided in such a way as to look like a stem with a terminal insporescence and a single cauline or basal leaf.

5. OPHIOGLOSSACEAE (ADDER'S TONGUE FAMILY)
A single genus with us.

1. BOTRYCHIUM Swartz
Fertile segment a terminal panicle. Sterile segment ± divided.

a. Sterile segment triangular, peduncled and inserted near the base of scape.
b. Sterile segment ternately compound... 1. B. multifidum
bb. Sterile segment simple to trifoliate ... II. B. simplex
aa. Sterile segment sessile to short-peduncled, inserted toward the middle or upper part of the stipe.
c. Sterile segment 1-4 dm wide ........ 7. B. virginianum
cc. Sterile segment smaller.
d. Sterile segment ± lanceolate.
e. Pinnae broadly flabelliform..... 2. B. Lunaria
ee. Pinnae ovate or obovate.
f. Pinnae obovate, entire ..... 4. B. simplex
ff. Pinnae ovate, pinnatifid ... 3. B. boreale
dd. Sterile segment not so elongate, deltoid to triangular-lanceolate.
g. Sterile blade ± deltoid..... 6. B. lanceolatum
gg. Sterile blade ± triangular, about twice as long as broad ................. 5. B. matricariifolium

1. B. multifidum (Gmelin) Rupr. var. multifidum -- Sterile segment 1 dm wide or less ± bipinnatifid, broadly deltoid, inserted near the base of the stipe. Last year’s blade often overwintering, the plant thus appearing bifoliate. Spores in late summer. Sandy sterile prairies. -- Mack, (L)-NF, NO-BC, US, Br. -- Var. Intermedium (D.C. Eaton) Farw. (B. silaifolium Presl; B. ternatum Sw. var. Intermedium D.C. Eaton) -- Larger and coarser. Blade up to 2.5 dm wide and ± tripinnatifid. -- (Aka), L-NF, NO, (NB)-Q-BC, US.
2. B. Lunaria (L.) Sw. -- Moonwort (Herbe à la lune) --

The lanceolate limb simply pinnate, the pinnae broadly flabelliform. Insertion near the middle of the stipe. Open to semi-open places on sandy soils or dry bogs. -- G, K-Aka, L-SPM, NS, Q-BC, US, (SA), (Oc).

More luxuriant specimens with slightly larger spores have been segregated variously as a form, variety or species (B. min-ganense Viet.). This uncommon extreme appears to be sporadic in its distribution and its taxonomic significance is not obvious. The last monographer of the group, Clausen 1938, reports it from all three of our provinces, but the Saskatchewan report actually originated from Boss Hill Creek in southwestern Manitoba.

3. B. boreale Midle var. obtusi lobum (Rupr.) Brown -- Much like the preceding, the limb somewhat larger, the pinnae ovate and pinnatifid. Grassy mountain slopes, below or above treeline. Often looking like a very lush B. Lunaria. -- Y-Aka, swAlta-BC, (US).

The eurasian var. boreale (including var. crassinervium (Rupr.) Christ.) has the sterile limb shorter and less deeply cut, the pinnae more clearly obovate or even flabelliform.

4. B. simplex E, Hitch. var. simplex -- Smallest and least divided. Up to 12 cm high. Limb 1-2 cm long, simple or trifoliate, inserted near the base. Sterile, open places: North Battleford -- NF, NS, MB-0, S, BC, US, (air) var. tenebrosum (A.A. Eaton) Clausen -- Limb more elongate and more divided into 3-7 obovate pinnae. Peduncle 1-3 cm long, inserted towards the middle. Often looking like an intermediate to B. Lunaria, but the pinnae not flabelliform. -- Aka, NB-0, S-Alta, US, (air).

A Macoun collection from Silver City (MTMG; DAO, photo) was originally cited by Burgess 1887 under B. matricariifolium. It was later revised to B. simplex by G.E. Davenport and cited accordingly by Macoun 1890. Upon examination, this collection proved to be made of immature specimens of B. Lunaria. This was the basis for all subsequent reports of B. simplex and B. matricariifolium for Alberta, but our own reports are based on more recent collections from Rich Valley (ALTA; DAO, photo) for B. simplex var. tenebrosum and Wilderness Park (DAO) for B. matricariifolium. The var. tenebrosum collection is not very uniform.

5. B. matricariifolium Braun (var. hesperium (Maxon & Clausen) Boivin; B. ramosum AA.) -- Middling in size and form. Sterile segment inserted above the middle, generally short pedunculate, bipinnatifid and triangular (that is about twice as long as large), the ultimate segments commonly obovate. Moist prairies and shores. -- (NF)-SPM, NS-BC, US, (air).

6. B. lanceolatum (Gmelin) Rupr. (var. angustisegmentum Pease & Moore) -- Much like the preceding, but the sterile segment larger, sessile and inserted near the base of the panicle. Limb deltoid (that is nearly as wide as long), its ultimate segments tending to lanceolate. Moist prairies. -- J, (Y-Aka), L-(NF)-SPM, NS-Q-(O), swswAlta-BC, US, (air).

Usually grows with B. matricariifolium and often giving the
impression (perhaps fully justified) of being only a later matur­
ing growth phase of *B. matricariifolium*. There is 2-3 weeks dif­
ference in the spores time of the two entities.

7. *B. virginianum* (L.) Sw. (var. *europaeum* Angström) —
Kafflesnake-Fern. — Largest and most divided, 2-5 dm high, the
stipe puberulent near the base. Sterile segment (1)-2-3-(4) dm
wide, sessile or nearly so, inserted near the middle, tripinnati-
tipartite to quadripinnatifid. Rich woods. — K-Mack, Aka, L-NF,
NS-BC, US, (SA), Eur — *F. anomalum* Cody — Lower segment partly
modified and bearing some sporangia along with the normal green
tissue. McKague. — 3o, S.

Plants of more sunny places have a smaller, less divided and
more leathery limb, along with slightly larger sporangia. These
are often segregated as var. *europaeum*, undoubtedly a mere eco-
logical form.

Order 6. FILICALES

Sporangia submicroscopic, generally stipitate and borne dor­
sally on normal or specialized fronds.

a. Sporangia disposed in a continuous manner
along the limbless divisions of the rachis,
not aggregated into sori ............... 6. Osmundaceae p. 21
aa. Sporangia disposed in clusters termed sori.

b. Frond looking like a 4-leaved
clover ......................... 11. Marsileaceae p. 31
bb. Frond looking more like a typical Fern.

c. Frond simple, pinnatipartite.

d. Frond compound, at least at base.

dd. Sori more or less removed from
the flat or revolute margin; limb
never divided into entire, discrete
and petiolulate leaflets.

e. Indusium lacking or attached
by a point only ............. 8. Aspidiaceae p. 24

ee. Indusium placed laterally
and attached by its whole
length.

f. Fronds evergreen, 1,5
dm long or less... 9. Aspleniaceae p. 30

ff. Fronds not evergreen,
much larger ............. 8. Athyrium p. 29

6. OSMUNDACEAE (FLOWERING FERN FAMILY)

Sporangia not aggregated in sori, but disposed continuously
along some branches of the rachis.

21 BOTRYCHIUM
1. OSMUNDA L.  
FLOWERING FERN

The fertile pinnae devoid of leafy tissue.

1. O. Claytoniana L. var. Claytoniana -- Interrupted Fern
-- A rather large frond, pinnate, the pinnae pinnatifid. Some
fronds are sterile, others are interrupted towards the middle
by 2 to 4 pairs of fertile pinnae. Wet and marshy places. -- L-
SPM, NS-seMan, US.

Younger fronds of var. Claytoniana exhibit a barely tinted
pubescence, merely light brown, while the hilly, var. vestita
(Wall.) Ylde has russet pubescence.

7. PTERIDACEAE  
(BRACKEN FAMILY)

The fertile fronds commonly made of distinct leaflets, more
or less entire and petiolulate. Sori marginal, protected by the
revolute margin of the limb, or by an indusium, or both. Indus-
ium, if present, often more or less continuous along the margin.
a. Leaflets strongly asymmetrical and bearing sori
along one edge only .......................... 5. Adiantum
aa. Bearing sori along both sides.

b. Frond 3-10 dm high ...................... 1. Pteridium
bb. Frond smaller, 2.5 dm high or less.
c. Stipe dark, brown to black.
d. Segments deeply dissected ....... 2. Cheilanthes
dd. Segments entire ..................... 3. Pellaea
cc. Stipe pale, green to pale green .... 4. Cryptogramma

1. PTERIDUM Gleditsch
Scales lacking. Fronds all alike, with deeply divided
segments and a continuous marginal sorus.

1. P. aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw.
(Pteris aquilina AA.) -- Bracken, Brake -- Large coarse fern
with a more or less deltoid limb, not tufted, but with a deeply
buried elongate rhizome. Limb tripinnatifid to tripinnate, gla-
brous or pubescent along the margin and the midrib below.
Light and sandy soils. -- NF-SPM, NS-(FEI-NB)-Q-(0)-seMan, swAlta-
US, (CA, Eur) -- Var. champlainense Boivin (var. pubescens AA.)
-- Similar but not deltoid and more pubescent. Limb rather
ovate and puberulent over the whole of the under surface. -- Q-
seMan, US -- Var. pubescens Underw. -- Larger and more pubescent.
Frong commonly 1 mm high or more, its growth protracted, the
growing tip remaining active a good part of the summer. Limb
ovate, pubescent on both surfaces more so below. Waterton. --

Our varieties belong to the largely boreal ssp. aquilinum
in which the ultimate segments are not wing-decurrent on the
lower side or are equally wing-decurrent on both sides. In the
mainly austral ssp. caudatum (L.) Bonaparte, the ultimate seg-
ments are decurrent on the lower side only, or at least more
strongly so on the lower than on the upper side.

OSMUNDA 22
2. CHEIANTHES Swartz
   LIP-FERN
   Margins revolute mostly towards the tips of the lobes of pinnules. Fronds not dimorphous.

1. C. Feel Moore -- A small tufted fern, extremely pubescent. Stipe woolly, brown. Limb ± tripinnate, gray-tomentose above, densely woolly below. Limestone cliffs: Rockies. -- swAlta-BC, US.

3. PELLAEA Link
   CLIFF-BRAKE
   Stipe dark colored. Fronds slightly dimorphic, the fertile ones with the margin of the limb continuously revolute all around the pinnule.

1. P. glabella Mett. var. simplex Butters (P. atropurpurea (L.) Link var. simplex (Butters) Morton; P. Sukodoriāna Butters) -- Rock-Brake -- Stipe brownish, black and shiny. Limb pinnately divided into discrete, petiolulate, entire leaflets. Rhizome and base of stipe densely scaly. Scales made of linear cells, these 1-15 times as long as wide. Cracks of calcareous rocks. -- swAlta-BC, (wUS) -- Var. gana (Rich) Cody (P. glabella Mett. var. occidentalis (E. Nelson) Butters) -- Usually smaller but the main characters detectable only with a strong hand-lens or binnocular with power about X20: scales with cells oblong-lanceolate and only 3-5 times as long as wide. Lower pinnae often trilobed or trifoliate. -- swMack, Mack-Alta, US.
   Reports of P. atropurpurea from northern Saskatchewan are based on specimens (BM, CAN, DA) which appear to be quite typical of var. nana as to pubescence of stipe and rachis, size and division of the frond, shape of cells of scales, etc.

4. CRYPTOGRAMMA Br.
   ROCK-BRAKE
   Stipe pale. Fronds strongly dimorphous, the fertile ones similar to Pellaea minus the dark stipe and rachis.

a. Fronds tufted and coriaceous ................. 1. C. crispa
   aa. Fronds spaced along the rhizome and very thin. 2. C. Stelleri

1. C. crispa (L.) Br. var. acrostichoides (Br.) C.B. Clarke -- Mountain-Parsley, Parsley-Fern -- Densely tufted and green, the fertile fronds twice larger and divided into entire, linear, petiolulate leaflets. Limb thickish, that of the fertile fronds strongly revolute. Crevices of dry precambrian and other acidic rocks. -- Mack-Aka, (L, Q)-0-BC, US, ( bur).
   The eurasian var. crispa has thinner fronds in a lighter green and the basal scales are mostly of a uniform brown colour; the latter are mostly with a paler central zone in our american variety. Reports of this species for Baffin Island are rated as improbable; those for Labrador and Quebec have yet to be verified or confirmed.

2. C. Stelleri (S.G. Gmelin) Prantl -- Similar but not tufted, the fronds arising singly from an elongate rhizome. Limb

The Porter Lake, Sask., reports are not substantiated by any specimen that we know of in Saskatchewan herbaria or elsewhere.

5. ADIAN'TUM L.

No indusium, but the edge of the leaflets is folded over in a very good imitation of an indusium, the sorus borne under the folded over portion. Revolute margin discontinuous, cut up into 3-6 segments per leaflet.

1. A. pedatum L. var. aleuticum Rupr. -- The frond cut in a most unusual manner. Petiole and rachises jet-black and shiny. Petiole bifurcate at summit; each primary branch is recurved and bears, on one side, 3-6 secondary branches, each of which is pinnately divided into numerous, petiolulate, asymmetrical leaflets. Damp woods and rocky subalpine slopes, rare. -- Aka, NF, Q, swAlta-BC, US, (Eur).

In the typical eastern phase the limb is spread out horizontally. In our variety the frond is somewhat reduced and its primary segments are divergent to nearly erect. This distinction cannot always be applied satisfactorily and at times appears to be merely ecological.

8. ASPIDIACEAE (SHIELD-FERN FAMILY)

Family rather polymorphic, of miscellaneous Fern types. Sori commonly round or roundish. Indusia absent or more often present; if present, nearly always attached by a single point. 

Athyrium is an atypical genus with the sori elongate and the indusia attached lengthwise.

a. Fronds strongly dimorphous, the fertile ones with the limb reduced to a mere envelope for the sori ........................................ 1. Onclea
aa. Fronds all alike or near similar with a normal limb well developed.

b. Not tufted, but the rhizome long stoloniferous, sori mostly devoid of indusia.

c. Lowest pinnae with a well developed petiole.

d. Indusium absent; limb essentially bipinnate ...................... 5. Carpogyynnia
dd. Indusia present; limb tripin nate to quadripin nati partite ............ 7. Cystopteris

cc. All pinnae sessile or practically ....
so ........................................ 6. Thelypteris

bb. Tufted.
e. Sori without indusia .................... 8. Athyrium

ee. Indusia present.

f. Sori elongate; indusia attached lengthwise ...................... 8. Athyrium
ff. Sori roundish; indusia attached by a point.
g. Indusium placed under the sorus. 2. Woodsia
gg. Indusium covering the sorus.
h. Indusium hoodlike and attached laterally .......... 7. Cystopteris
hh. Indusium flatish and attached in the center of the sorus.
i. Indusium peltate .... 3. Polystichum
ii. Indusium reniform-cordate, attached at the sinus .......... h. Dryopteris

1. ONOCLEA L.

Fronds strongly dimorphic, the fertile one much contracted, much less divided, strongly enveloping the sori, and brownish or blackish rather than green.

a. Frond oblanceolate .................. 1. O. Struthiopteris
aa. Deltoid and smaller .................. 2. O. sensibilis

1. O. Struthiopteris (L.) Hoffm. var. pensylvanica (W.)
Boivin (Matteuccia Struthiopteris (L.) Tod. var. pensylvanica (W.) Morton; Pteretis nodulosa (Mx.) Nieuw.) -- Fiddle-Heads-- Our largest fern, commonly 1 mm or more high. Frond pinnate, the pinnae pinnatifid. The fertile frond dark, much simpler and only half as long. Damp woods. -- Mack, Aka, (NF), NS-BC, US.
Scales from the base of the stipe are uniformly brown in our variety, but show a blackish-brown central band in the typical eurasian phase.

Often placed in a segrerate genus justified primarily by the simple type of nervation of this first species as constrained with the anastomosed nerves of the next. As shown by Boivin 1961, the type of nervation is merely a reflection of the degree of expansion of the ultimate segments.

2. O. sensibilis L. -- Limb rather triangular and nearly simple, pinnate at base, pinnatipartite above, the segments not cut but merely undulate at margin. Wet and marshy places, often on shores. -- L-SPK, NS-seMan, US, Birk.

2. WOODSIA Br.

Indusium neither covering nor protecting the sorus, but reduced to few laciniae more or less hidden under the sorus or seemingly mixed with the sporangia.

a. Stipe articulate, with a well defined abscission point.
b. Frond glabrous.
c. Stipe chaffy ......................... 2. W. alpina
cc. Not chaffy above the articulation .... 3. W. glabella
bb. Frond densely chaffy and pubescent below. 1. W. livensis

WOODSIA
aa. Stipe not articulate, the old fronds breaking off rather irregularly

1. W. ilvensis Br. -- Our chaffiest and most pubescent species. All parts of the frond abundantly covered with chaff and long hairs, especially so on the under surface of the limb. Hairs and chaff at first white, soon becoming rusty and quite conspicuous. Stipes articulate and breaking off in age at the articulation point, leaving behind a tuft of stubs of nearly equal length. Very common on dry non calcareous cliffs. -- G-Aka, L-NF, NS, NB-BC, Us, Eur.

2. W. alpina (Bolton) S.F. Gray -- Similar to the following, the stipe darker, bright brown, and chaffy below the limb. Pinnae slightly larger and slightly more divided. Shaded cliffs: Lake Todd. -- (G) (F) (K-Mack) Y-Aka, (L) NF, NS, (NB) Q-Man, (BC, US), Eur.

3. W. glabella Br. -- Limb narrow and up to 2 dm long, being composed of numerous small deltoid pinnae that are nearly all of the same size. Limb glabrous and not chaffy. Stipe pale green, glabrous, not chaffy except below the articulation. Shaded, moist, calcareous or dolomitic cliffs. -- G-Aka, L-NF, NS, NB-BC, US, Eur.

4. W. oregana D.C. Eaton var. oregana -- Fronds 1-2 cm long, densely tufted. Stipes not articulate, the old ones breaking off rather irregularly, leaving behind a cluster of very uneven stubs, some of them often half as long as the remaining fronds. Limb lanceolate, pinnate and neither pubescent nor glandular, nor chaffy. Or sometimes the stipe and the limb slightly glandular, especially towards the insertion point of the pinnae. All sorts of rocky cliffs. -- Q-O, nwS-BC, US -- E. cathcartiana (Rob.) Boivin -- Neither pubescent nor chaffy, but abundantly and finely glandular throughout: Boisé Coteau. -- Q-O, swS, BC, US -- Var. Lyallii (Hooker) Boivin (W. scopulina D.C. Eaton) -- Not chaffy, but abundantly pubescent and glandular throughout. -- Y-Aka), Q-O, nwS-swAlta, gBC, US -- Var. pannonica Boivin -- Stipe chaffy and also lightly pubescent and glandular. Limb usually neither pubescent nor glandular, but sparsely chaffy, especially dorsally. Amisk Lake. -- wS, ecS, US.

3. POLYSTICHIUM Roth

Evergreen fronds with round and peltate indusia.


4. DRYOPTERIS Ad. SHIELD FERN

Indusium reniform and attached from the bottom of the sinus.

a. Fronds marcescent, 3 dm long or less ........ 4. D. fragrans

WOODSIA
aa. Fronds longer.

b. Limb bipinnate ------------------- 1. D. austriaca

bb. The limb less divided, pinnate or bipinnatifid to bipinnatipartite.

c. Fronds dimorphous, pinnae up to 6 cm long ------------------- 3. D. cristata

c. Fronds all alike, larger, the main pinnae much longer ------------------- 2. D. Filix-Mas

1. D. austriaca (Jacq.) Weynare (var. dilatata (Hoffm.) Schinz & Thell., var. spinulosa (Müller) Fiori; D. dilatata (Hoffm.) Gray; D. spinulosa (Müller) Watt, var. americana (Fischer) Fern.; Aspidium spinulose (Müller) Sw., var. dilatatum (Hoffm.) Link, var. intermedium (Kuhl.) D.C. Eaton) -- Wood-Fern, Florist's Fern -- A large common wood fern with very much dissected fronds, used by florists as background foliage for bouquets. Up to 1 m high, the limb bipinnate and the pinnae pinnatifid to pinnatipartite. Fronds not dimorphous, but overwintering under the snow. Showy in moist woods. - C, K-(Mack-Y)-Aka, L-(SNP), NS-BC, US, Eur, (Afr).

Usually divided in a series of segregates variously treated as varieties or species. We derive no intellectual satisfaction from their recognition, there is too much arbitrariness in the identification of many specimens and the various phenotypes appear to be more or less sporadic in their occurrence, with most names used having European type localities.

2. D. Filix-Mas (L.) Schott -- Very scaly throughout and the scales mostly follicular, often present even in the sinuses of the marginal teeth. Similar to the following, but not dimorphous and larger; the main pinnae 7-15 cm long. Frond 9-10 dm long, the limb 12-30 cm wide and usually oblong-lanceolate. Mid summer. Wet woods and cliffs near lakes and rivers: Waterton. - C, NF, NS, Q-C, Alta-BC, US, Eur.

3. D. cristata (L.) Gray var. cristata (Aspidium cristatum (L.) Sw.) -- Fronds slightly dimorphous, the fertile ones slightly longer and narrower with the pinnae broader and ascending. Frond 5-6 dm high, the limb oblong-lanceolate to ovate-lanceolate. Indusia rather small, not fully covering the mature sori. Wet or boggy woods. - NF-(SNP), NS-BC, US, Eur.

Grades eastward into a var. Clintoniana (D.C. Eaton) Und., with somewhat larger and non dimorphic fronds.

4. D. fragrans (L.) Schott (var. remotiuscula Kom.; Aspidium fragrans (L.) Sw.) -- A conspicuous cliff species with a tuft of green fronds arising from a much larger tuft of pendulous dead darkened fronds. Limb discolor, dark green above, bluish to rusty below. Indusia longest, persistent and imbricate, covering the lower face of the limb almost entirely. Dry rocky and steep habitats. - C-Aka, L-(NF, NS, NB-W), US, Eur.

Larger plants from more southern and usually shaded cliffs are frequently distinguished as var. remotiuscula: probably little more than an ecological form.

27 DRYOPTERIS
5. **CARPOGYMNIA** Love & Love

Not tufted. Limb more or less ternately divided. Indusium absent.


Var. **pumila** (DC.) stat. n., *Polypodium Dryopteris* L. var. **pumilum** DC., Fl. Fr., ed. 3, 2: 565. 1815. This is a weak variety or possibly only an ecological form of shaded calcareous cliffs; intermediate specimens have been variously treated now as a form, now as interspecific hybrids.

6. **THELYPTERIS** Schmidel

Technically much like **Carpoxygnyia** long stoloniferous and not tufted. Indusia absent or present. Limb pilose along the nerves, often ciliate.

a. Limb pinnate, lanceolate ......................1. **T. palustris**

aa. Limb broadly triangular, nearly simple....2. **T. Phegopteris**

1. **T. palustris** Schott var. **pubescens** (Lawson) Fern. (Aspidium Thelypteris AA.; Dryopteris Thelypteris (L.) Gray var. **pubescens** (Lawson) Nakai) -- Marsh-Fern -- Slightly dimorphous, the fertile fronds appearing more open because of the revolute margin of the limb. Limb lanceolate, pinnate, the pinnae pinnatifid, more or less pilose, especially along the main nerves. Indusia present. Marshes. -- (NF)-SPM, NS-O-Man, US).


With only one known collection per province, we admit to being puzzled by this high degree of sporadism.

**CARPOGYMNIA** 28
7. CYSTOPTERIS Bernh., Fern-Bladder

Indusium hood-shaped, attached laterally and enveloping the sorus from the side. The indusium is early deciduous and this genus is thus not always easy to recognize.

a. Limb 2 lanceolate, longer than its stipe... 1. C. fragilis

aa. Limb 2 deltoid, much shorter than its stipe... 2. C. montana

1. C. fragilis (L.) Bernh. var. fragilis (Filix fragilis (L.) Gilin.) -- Our only common and widely distributed species in the prairie regions. Easily and often confused with other species. Highly variable and not readily defined. Limb thin and wilting rapidly, much dissected, glabrous. Fronds up to 1 dm long, but variable in size and many sizes often present in the same tuft. Limb pinnate, the pinnae pinnatifid and serrate. Wooded slopes. -- G-Aka, L-NF, NS, NB-SC, US, CA, Eur, (Afr). -- Var. Huteri (Hausman) Luerssen -- Prond and rachis finely glandular. Rockies. -- (swAlta).

Typically, the spores are covered by spinules readily distinguished with a good microscope. A sporadic form in which the spores are merely rugose has been distinguished as a species, but the rank of form would seem to be more realistic: f. Dickena (Sim) stat. n., C. Dickena Sim, Gard. Journ. 308. 1845.

2. C. montana (Lam.) Bernh. -- Rather similar to Carpogynia Dryopteris, but each nerve ending above into an elongate, white fovea. And more dissected, tripinnate, the ultimate segments coarsely lobed to pinnatifid. Slightly scaly-pubescent along the rachises. Damp calcareous habitats. -- G, Mack-Aka, L-NF, Q-O, Alta-SC, US, Eur.

Cystopteris bulbifera (L.) Bernh. has often been reported for south-eastern Manitoba, yet we have found no corresponding specimen in CAN, HUH, MTMG, etc. The only possible justification for its occurrence in our area might be a collection by M.W. Hutchinson without locality but bearing the note "Eastern Manitoba, 1944" (MFM; DAO, photo). This generalized distribution is likely to be a verbatim repeat of the entry for the species in the list of Lowe 1943, rather than a place of collection. And the specimen itself is presumably of unknown origin.

8. ATHYRIUM Roth

Sori obviously elongate. Indusia present, elongate, attached laterally and by their whole length. An atypical genus with mostly the technical characters of the Aspleniaceae. One atypical species lacks indusia.

a. Sori and indusia elongate or recurved... 1. A. Filix-femina

aa. Sori orbicular, indusia lacking... 2. A. distentifolium

1. A. Filix-femina (L.) Roth var. Filix-femina (var. Michauxii (Sprengel) Farw.; Asplenium Filix-femina (L.) Bernh.)--Lady-Fern (Fougère femelle) -- A rather large and much dissected
fern, quite similar to Dryopteris austriaca and readily confused with it when sterile. But the sori about twice as long as broad and the indusia lanceolate. Ultimate nerves not reaching the tip, but usually ending slightly to the side of it (excurrent into spinulose tips in Dryopteris austriaca). Limb bipinnate, the pinnule deeply lobed. Wet woods. -- G, L-NF-(SPM), NS-Man, US, Eur -- Var. sitchense Rupr. (var. cyclosorum (Rupr.) T. Moore) -- Mostly larger, usually 7-15 cm high. Indusia rather short, mostly suborbicular, or deltoid or reniform. -- Mack-Aka, wAlta-BC, (W/US).

The segregation of our plants as an American variety or species is not tenable on a morphological basis. And var. sitchense itself is a rather weak variety.

2. _A. distentifolium_ Tausch var. _americanum_ (Butters) Boivin (A. alpestru (Hoppe) Rylands var. _americanum_ Butters) -- Bippinnate to tripinnatifid frond with small, round, naked sori. Frond 3-6 dm high, ± obovate. Pinnules lanceolate, 1-2 cm long. Usually one of the marginal lobes is strongly recurved and partly covers the adjacent sorus. Wet cliffs and talus slopes at or below timberline: Waterton. -- (G, Aka, L)-NF, seq, Alta-BC, WUS.

Var. _americanum_ is based on a series of tendencies and not on a simple morphological discontinuity; its frond is usually narrower, the pinnules often more remote and the smaller sori usually show no trace of indusia.

9. _ASPLENIACEAE_ (Spleenwort Family)

Sori elongate. Indusia similarly elongate and attached laterally by their whole length.

1. _ASPLENIUM_ L.

Spleenwort

Evergreen ferns, the limb quite dissected.

1. _A. viride_ Hudson -- Small delicate fern, the fronds about 1 dm long, the limb linear, pinnate, the numerous small pinnules subopposite.

Stipe blackish below, with a few hair-like scales. Quite similar to _Woodsia glabella_, but the latter has the stipe pale green, articulate and coarsely scaly. Limestone cliffs. -- (G, swMack:-(Y)-Aka, NS, NB-O, swAlta-BC, (US), Eur.

10. _POLYPODIACEAE_ (Polyody Family)

Frond simple, the sori dorsal, rounded and without indusium.

_POLYPODIUM_ L.

Rhizome elongate, the fronds not tufted, coriaceous.

1. _P. virginianum_ L. var. _virginianum_ (L.) Eaton -- Polyody (Tripe de rocic) -- Frond simple but pinnatifid; lobes linear to oblong-lanceolate, not narrowed at base, finely serrate, obtuse or acute at tip. Sori rather coarse, in two parallel rows on the back of each lobe. Abrupt places, mostly acid and rocky.
sometimes forming a dense carpet over rocky outcrops. Precambrian regions. -- sMack-Aka, NF-SPM, NS-eBC, US. -- Var. columbiana Gilbert -- Pinnae slightly narrowed near the base, oblong lanceolate to obovate, more or less rounded at tip. Waterton. -- Alta-eBC.

11. MARSILEACEAE

Fronds dimorphous, the sterile one digitately divided, the fertile one tightly enroled into a pea-sized structure called sporocarp.

1. MARSILEA L.
Sterile fronds divided into 4 terminal leaflets.

1. M. mucronata Braun (M. vestita AA.) -- Looking just about like a four-leaved Clover. Stems elongate, creeping, rooting in the mud, with tufts of rusty hairs at the nodes. Sterile fronds in small fascicles at each node. Stipes inserted directly at the node and bearing only one sporocarp each. Muddy shores and shallow waters. -- S-BC, US.
Sub-division 2. GYMNOPHYTINA

Plants reproducing by seeds borne on the ventral face of open scales. A single class with us.

Class 5. PINOPSIDA


Order 7. CONIFERALES

a. Leaves alternate or in fascicles.
   b. Cone reduced to a single ovule; fruit a one-seeded berry ..................12. Taxaceae p. 32
   bb. Cone many-seeded and more or less woody ..........................13. Pinaceae p. 32
aa. Leaves opposite or verticillate ......14. Cupressaceae p. 36

12. TAXACEAE (YEW FAMILY)

Single genus

1. TAXUS L.

Much like a small Fir or Spruce in general appearance, but the cones reduced to two stamens or a single ovule. Fruit a fleshy one-seeded berry.

a. Trailing shrub; needle with a straight tip...1. T. canadensis
aa. Small tree; needle with tip bent backwards...2. T. brevifolia

1. T. canadensis Marsh. -- Ground-Spruce (Buis de sapin) --
Like a trailing Spruce on the forest floor. Central trunk lacking; branches trailing at base, ascending at tip. Needleless linear, 1-2 cm long, subpetiolate, more or less disposed in two ranks, flat, abruptly acuminate into a straight sharp tip. Berry red. Scattered in moist coniferous woods, rare: York Factory, Indian Bay.
-- NF-(SPM), NS-Man, US.

The York Factory record (CAN; DA'), photo) is a long way from the rest of the range and has never been confirmed. It is now considered questionable as to location; its specific identification has been repeatedly confirmed.

2. T. brevifolia Nutt, -- A tree, erect and with a good central trunk. Otherwise quite similar to the preceding and not readily distinguished in the herbarium except that the tip of each needle is deflexed backwards at an angle of about 30 degrees. Scattered in moist coniferous woods: Waterton -- (Aka), Alta-BC, US.

13. PINACEAE (PINE FAMILY)

Needles in fascicles or spirally arranged. Scales spirally arranged in the cone.

a. Needleless deciduous, alternate on the leading shoots, in tufts of 10-20 on the short side-shoots ................................. 2. Larix

TAXUS 32
aa. Needles persistent.
   b. Needles all in fascicles ..................... 1. Pinus
   bb. Needles all alternate.
      c. Needles obviously flattened
         d. Needles sessile ....................... 5. Abies
            dd. Needles neatly short-petioled ... 4. Pseudotsuga
      cc. Needles squarish ........................ 3. Picea
   1. PINUS L.

PINE

Needles all in fascicles, tightly wrapped together at the base. Scales of the cone rather thick-woody.

a. Needles in 5's.
   b. Needles very finely and remotely serrulate ..................... 1. P. Strobus
   bb. Needles entire.
      c. Cone purple ............................. 3. P. albicaulis
         cc. Cone green or almost entirely so ... 2. P. flexilis
   aa. Needles in 2's.
      d. Needles usually 10-15 cm long ............ 4. P. resinosa
         dd. Needles usually 3-5 cm ............. 5. P. divaricata

1. P. strobus L. -- White Pine (Pin blanc) -- A very tall tree, usually overtopping the forest. Needles in 5's, minutely and remotely denticulate, straight and soft, commonly 5 cm long. Young twigs tomentose. Cones commonly 8-10 cm long. Seeds with a long wing. Scattered in the forest or in dense stands in the dryer sites, especially over nearly bare rock. Southeast. -- NF, NS, SE Man, US -- Var. monticola (Douglas) Nutt. (P. monticola Douglas) -- Barely distinct. Cones usually longer, at least 10 cm long. Young twigs often less densely pubescent. Rockies. -- Alta-BC, US.

   In the field the Eastern and Western White Pine seem almost identical. In the herbarium they are indistinguishable in the absence of cones.

2. P. flexilis James -- Limber Pine -- Needles in 5's but entire, stiffer and falcate. A more middle size tree with the young twigs becoming glabrous. Cones essentially green, at least 8 cm long. Seeds nearly wingless. Usually as scattered trees among taller species on dry rocky slopes. -- sw Alta-BC, US.

3. P. albicaulis Eng. -- A small to depressed alpine or subalpine tree with a smooth bark much like that of Abies, Otherwise quite like P. flexilis. Cones purple and smaller, remaining closed. Open slopes and rocky ridges. Rockies. -- sw Alta-BC, US.

4. P. resinosa Aiton -- Red Pine (Pin Rouge) -- Needles very long and in 2's, somewhat stiff, usually 10-15 cm long, usually forming big tufts at the end of branches. Bark breaking up in large brownish plates. Cones 6 cm long. Dry light soils. Southeast. -- NF, NS, SE Man, US.

5. P. divaricata (Aiton) Dumont var. divaricata (P. Banksiana Lamb.) -- Jack Pine (Cypres) -- Needles shortest, stiff,
in 2's, falcate, mostly 3-5 cm long. Cones persistent, about
4 cm long, ascending, incurved, not spiny. A very common conifer
on well drained soils, especially on sand, often in pure forma-
tions. General north of the prairies. -- Mack, NS-Alta, US --
Var. latifolia (Eng.) Boivin (P. contorta Douglas var. latifolia
Eng.; P. Murrayana AA.) -- Lodgepole Pine (Cypres) -- Cones
straight, more or less reflexed, each scale with a strong dorsal
protuberance ending in a small pine. Western Alberta and Cypress
Hills. -- Mack-Aka, S-BC, US -- X Var. Musci Boivin -- A polymor-
phic population intermediate between var. latifolia and the type,
presumably of hybrid origin. Cones usually straight, variously
divergent and more or less spiny. From lakes Primrose and Hasba-
la westward across central Alberta. -- Mack, S-Alta.

Pinus divaricata (Aiton) Dumont -- Validated by a reference
to an earlier name validly published in the Hortus Kewensis. An-
tedated by one year P. Banksiana Lamb. in current use.

The report of Pinus ponderosa Douglas for Alberta is based
in part on R.G.H. Cormack, Carbondale River, near Lynn Creek Ca-
bin, about 10 miles from B.C. Border, rocky-sandy shore, July 22,
1955 (ALTA; DAO, photo). According to T.C. Brayshaw (verbatim)
who visited the spot recently, the original cluster of saplings
is now reduced to a single rapidly growing tree. This unique in-
dividual is some 40 miles from the nearest member of its species
and its habitat is unusual to say the least. Local tradition has
it that it was originally seeded in and there seems to be no rea-
son to doubt that this is in no way a spontaneous occurrence.
There is also at CAN a specimen labelled Dawson, Missouri River,
Alta, June 30, 1881. But the Missouri River is now entirely on
the U.S. side of the boundary.

2. LARIX Adanson          LARCH

Needles deciduous, pale green and turning yellow in the
fall. Branches of two kinds, the leading ones with numerous al-
ternate leaves, the lateral one stubby and ending in a tuft of
leaves. Cones erect, persistent.

a. Twigs tomentose, the tomentum persistent .... 2. L. Lyallii
aa. Twigs glabrous, or pubescent when young only.

b. Needles almost 1-2 cm long; scales
glabrous ................................ 1. L. laricina
bb. Needles about 3 cm; scales puberulent
dorsally ................................ 3. L. occidentalis

1. L. laricina (DuRoI) K. Koch -- Tamarack (Epinette rouge)
-- A bog species with pale green and very sparse foliage. Twigs
glabrous. Needles rounded above, keeled below. Cones 1.5 cm
long or less, at first pink or purple, maturing pale green to
straw-coloured. Bracts very short and hidden between the gla-

2. L. Lyallii Parl. -- A small tree with densely tomentose
branchlets, the tomentum persisting many years after the leaves
have fallen off. Branchlets 4 drooping. Leaves squarish, that

PINUS
is keeled above and below, with all four faces deeply concave. Cones 3-5 cm long, the very long bracts protruding between the scales, their tips reflexed. High alpine and forming small bluffs above the general timberline. Rockies. -- Alta-BC, (US).

3. L. occidentalis Nutt. -- A very tall tree with brittle branchlets, at first puberulent, soon glabrous. Leaves about 3 cm long, convex above, keeled below. Cones of middle size. Bracts with long tips protruding between the scales, the latter densely puberulent dorsally. Low montane on wetter soils. Crow's Nest and Kananaskis. -- Alta-BC, US.

3. PICEA Link SPRUCE

Trees with the cones pendent at maturity. Needles squarish, densely and spirally disposed on the branch. Leaves, when falling off, leaving behind strongly protuberent and decurrent stubs. Cones with small bracts hidden between the scales.

a. Cones lanceolate, 3-6 cm long; twigs glabrous to puberulent ........................................ 1. P. glauca

aa. Cones ovoid, 1.5-2.5 cm long; twigs puberulent ......................................................... 2. P. mariana


Var. albertiana is somewhat variable and essentially intermediate to the other two varieties. Often it gives the impression of being a hybrid population, but it ranges much beyond the area of overlap of the other two phenotypes.

Older trees will on occasion retain a smooth bark covered with resin-filled blisters reminiscent of Abies. This variation is fairly frequent within the range of var. albertiana and it has been named var. Porsildii.

2. P. mariana (Mill) BSP. -- Black Spruce (Epinette noire) -- A smaller tree with smaller and purple persistent cones. Twigs glandular puberulent. Needles about 1 cm long. Cones commonly persisting through the second season. A common species of poorer and wetter soils, especially in bogs. General north of the prairies. -- (K)-Mack-Aka, L-NF-(SPM), NS-BC, US.
A report of Picea rubra Dietr. by Johnstone 1939 is based on a collection, J. Jeffrey, Oxford House, Sept. 19, 1850 (B; DAO, photo), now revised to P. mariana.

4. PSEUDOTSUGA Carr.
Cones pendant at the tip of the branchlets. Needles flat, short-petioled. Scales very long, very conspicuous, trifid at tip.

1. P. Menziesii (Mirbel) Franco -- (P. taxifolia (Poiret) Britton) -- B.C. Fir, Douglas Fir (Pin Douglas, Pin de la Colombie) -- A giant tree westward, but of more reasonable size with us. Needles with a short but well defined petiole. Bracts about twice as long as the scales. Local at low altitudes in the Rockies, mostly on rocky or gravelly ground. -- swAlta-BC -- P. Alexidig Boivin -- Low, depressed and straggling. Alpine habitats at high altitude in Waterton--swAlta.

Rocky Mountain specimens will often exhibit shorter cones and leaves and may be distinguished as var. glauca (Beissner) Franco. However the range of morphological overlap with the typical variety is too wide and the distinction is not a practical one, unless one is willing to use the place of collection as a primary character for the majority of the specimens.

5. ABIES Miller
FIR
Cones erect, the scales deciduous and leaving behind the persistent, stiffly erect axis. Needles flat and sessile; when falling off leaving behind a smooth, round and non-protuberating scar.

1. A. balsamea (L.) Miller var. balsamea -- Balsam, Balsam-Fir (Sapin) -- Bark smooth, with numerous blisters containing a clear resin called balsam. Leaves flat, those of the lower branches usually forming a two-ranked spray and with few, if any, short lines of glaucous stomata above. Main branches commonly in verticils of about 6. Cones purple violet, turning blackish. Fresh woods. --sk, L-NF, NS-seBC, US-- Var. fallax (Eng.) Boivin (A. lasiocarpa (Hooker) Endl.) -- Needles more glaucous, those of the lower part of the foliage with 6-12 glaucous lines of stomata, of which 4-8 lines will run most of the length of the needle. Western Alberta. -- (swMack)- sy-Aka, wAlta-BC, US.

11. CUPRESSACEAE (CYPRESS FAMILY)
Evergreen trees, usually similar to the Pinaceae, but with the leaves and cone scales opposite or verticillate.

a. Trees; cone woody ........................................ 1. Thuja
aa. Low shrubs; fruit a bluish berry .................... 2. Juniperus

1. THUJA L.
ARBOR-VITAE
Cone with opposite woody scales. Trees with more or less flattened twigs of small, closely imbricated, adnate, scaly leaves.

PSEUDOTSUGA
1. *T. occidentalis* L. -- Cedar (Cèdre) -- A small tree. Foliage compact, of strongly flattened sprays. Leaves opposite, in 4 ranks, those of the dorsal rank with a well defined gland, brown or clear green. Cone small, about 1 cm long, of a few opposite woody scales. Wet places and limestone outcrops. Southeastern Manitoba. -- NS-Man, US.

2. *T. plicata* D. Don -- Cedar (Cèdre) -- A giant tree westward, much smaller with us. Closely resembling the preceding but the leading terminal shoots not flattened; all leaves more or less acute and the glands indistinct, being of the same color as the rest of the leaf. Moist woods. Rare and local in the Rockies. -- se Aka, Alta-BC, US.

2. **JUNIPERUS** L. **JUNIPER**

Cone maturing into a bluish berry. Depressed or creeping shrubs with opposite or verticillate leaves.

a. Leaves verticillate in 3's .................. 1. *J. communis*

aa. Leaves opposite.

b. Creeping shrub ............................. 2. *J. horizontalis*

bb. Small tree ................................. 3. *J. scopulorum*

1. *J. communis* L. var. *depressa* Pursh (var. *saxatilis* AA.; *J. sibirica* AA.) -- Ground Juniper (Genève, Buis) -- Needles verticillate in 3's. A low shrub, the branches decumbent, ascending at tip, forming round patches. Leaves 7-15 mm long, straight or incurved at base, strongly carinate, with a ventral glaucous band of stomata. Stomatal zone usually less than half as wide as the leaf. Leaf tips spinescent, with a mucro about 0.5 mm long. Local in sandy soil, dry woods or rocky slopes. -- K-Aka, L-NF-(SPM), NS-BC, US -- Var. *saxatilis* Pallas (var. montana Aiton) -- Branches more closely creeping. Needles smaller, 1-10 mm long, merely acute or short acuminate, the glaucous zone wider, usually at least half as wide as the leaf. Rocky places in alpine and subarctic habitats. -- G, K-Y-(Aka), L-NF-(SPM), NS-Pei, Q-nMan, swAlta-BC, US, Eur.

Some 8 or 10 collections from the upper Mackenzie basin were reported by Raup 1936 as var. *montana*. We have examined about half of these specimens and revised them all to var. *depressa*.

2. *J. horizontalis* Moench (Sabina *horizontalis* (Moench) Rydb.) -- Creeping Juniper (Savínier) -- A creeping shrub with small opposite leaves, usually forming a compact and elastic carpet. Green or glaucous. Leaves variable, 1-2-(6) mm long, closely imbricated, adnate to nearly free, more or less acute and ending in a slightly mucronulate tip. Eroded dunes and
hillsides, also on rocky exposures. -- K-Aka, (L)-NF-SPM, NS-BC, US.

2 X -- *J. fassettii* Boivin (*J. scopulorum* Sarg. var. *patens* Fassett) -- Hybrid of *J. horizontalis* × *scopulorum*. Commonly 1 mm high, a diffusely branched shrub, sometimes partly decumbent. Leaves acute to mucronulate. Local in the Rockies. -- swAlta-BC, US.

3. *J. scopulorum* Sarg. -- A small tree, commonly 2-3 m high, with a well defined central trunk. Otherwise barely distinguishable from *J. horizontalis*. Leaves acute at tip, rarely mucronulate. Hillsides, especially near watercourses. Rockies, rare. -- swAlta-BC, US.
Sub-division 3. ANGIOPHYTINA  FLOWERING PLANTS

Plants with flowers. Ovules borne in closed chambers formed of carpels.

a. Leaves with nervation commonly pinnate or reticulate. Flowers variable, commonly 5-merous, almost never 3-merous. Trees, shrubs or herbs, often with a taproot ..........6. Dicopsida

aa. Leaves with parallel nerves. Flowers commonly trimerous, often much reduced. Herbs without a taproot ............7. Monopsida part IV

Class 6. Dicopsida  DICOTS
Flowers commonly 5-merous, or 2-merous, or 4-merous, or the floral parts in variable number, sometimes much reduced in number, almost never 3-merous. Trees, shrubs or herbs, often with a taproot. Vascular tissues forming a cylinder around a central pith. Bark present, more or less developed.

a. Stem woody, perennial, increasing in diameter through a cambium located between the wood and the bark ........................................1. Lignidae

aa. Stem herbaceous, annual, or perennial, the bark poorly developed .............2. Herbidae part II

Sub-class 1. Lignidae  WOODY DICOTS
Plants perennial, commonly woody, the bark usually well developed. Sometimes herbaceous.

The Lignidae also include a variety of herbaceous groups. These are not included in the key below, but will be found in the key to the Herbidae.

a. Leaves and buds opposite or verticillate.

b. Leaves simple ......................... Group 1, p. 39

bc. Leaves compound ..................... Group 2, p. 41

aa. Leaves and buds alternate, or sometimes alternate on the leading shoot, but fasciculate on the short shoots.

c. Leaves compound ..................... Group 3, p. 41

cc. Leaves simple

d. Climbing vines ......................... Group 4, p. 42

dd. Not climbing

e. Leaves entire ......................... Group 5, p. 42

ee. Leaves denticulate to more or less deeply lobed .................. Group 6, p. 43

Group 1
Leaves opposite or verticillate, simple.

a. Small and only semi-woody shrubs, 3 dm high or less ........................................ Group 1-A

aa. Taller and obviously woody.

39 LIGNIDAE
Group 1-A
Small semi-shrubs with opposite or verticillate leaves.

a. Leaves opposite and crowded or strongly overlapping.
b. Peduncle bearing 3 bracts ... Diapensiaceae, p. 171
aa. Internodes well developed; leaves all or in part verticillate or subverticillate.
c. Leaves dentate .................. 41. Pyrolaceae, p. 165
c. Leaves entire.
d. Leaves mostly basal or near basal,
   the stem rather scabrous with a verticill of leafy bracts subtending
   the inflorescence ............... Ericameria, part II
dd. Stem leafy, no basal leaves.
   e. All leaves opposite or verticillate ............... 27. Cornaceae, p. 137
   ee. Leaves part alternate, part verticillate in whorls ... Ehretiaceae, p. 172

Group 1-B
Trees or shrubs with opposite and entire leaves. At least 3 dm high.

a. Densely stellate-pubescent, at least on the lower leaf surfaces .......... 49. Elaeagnaceae, p. 176
aa. Leaves glabrous or with a different pubescence.
b. Flowers and fruits geminate ............ Lonicera, p. 190
bb. Each flower its own peduncle.
   c. Flowers all or mostly in axillary clusters .................. Symporicarpos, p. 179
cc. Inflorescence terminal.
   d. Leaves strongly revolute or
      very small ............... 39. Ericaceae, p. 150
dd. Leaves flat, large.
   e. Inflorescence a compound
      corymb or panicle.
      f. Leaves nearly deltoid
         and more or less truncate
         or subcordate at base ... Syringa, p. 175
      ff. Narrower and cuneate to rounded at base ... 27. Cornaceae, p. 137
   ee. Inflorescence a bractless raceme .......... 26. Hydrangeaceae, p. 130

Group 1-C
Trees or shrubs with the leaves variously toothed or lobed.

a. Leaves palmately lobed.
1967 Boivin, Flora of Prairie Provinces

b. Petals white; fruit a berry ........ Viburnum, p. 128
bb. Petals inconspicuous, fruit a samara.

................. 59. Acrocarpaceae, p. 195

aa. Leaves dentate or serrulate.
c. Spinescent, the lateral branches ending
   in a sharp point ............... 38. Thymelaeaceae, p. 175
c. Not spinescent.
   d. Inflorescence a terminal raceme of
dd. Flowers ............... 59. Caprifoliaceae, p. 107

Group 2
Leaves compound, opposite or verticillate.

a. Shrub climbing by its twining petioles... Clematis, part II
aa. Not climbing.
b. Trees producing samaras.
c. Leaflets coarsely few-toothed....

............... 39. Acrocarpaceae, p. 195
cc. Leaflets finely serrate ..... 51. Oleaceae, p. 171
bb. Shrubs producing berries .... 59. Caprifoliaceae, p. 107

Group 3
Leaves alternate, compound.

a. Climbing vine with large digitate leaves ...

............... 52. Vitaceae, p. 177
aa. Not climbing.
b. Semi-woody and only 1-3 ft high; leaves
   more or less ternately divided.
c. Leaves alternate, pectinate ....... Lonicera, p. 177
cc. Leaflets in 3-5 leaflets.
   d. Leaflets entire or coarsely and
      irregularly few-toothed ......

............... 59. Anacardiaceae, p. 197
dd. Leaflets serrate or 3-toothed
   at apex ............... 15. Rosaceae, p. 15
bb. Taller and obviously woody;
e. Leaflets coarsely toothed, each
   tooth ending in a spine ........ Berberis, part II
ee. Leaflet margin not spiny.
f. Petiole without stipule ......

............... 59. Anacardiaceae, p. 197
gf. Petiole with a pair of free
   or partially adnate stipules.
c. Leaflet variously
   toothed ............... 15. Rosaceae, p. 15
gg. Leaflets entire.
h. Leaflets 5-7 ......... 14. Potentilla, p. 71
hh. Leaflets much more
   numerous ........ 16. Loganaceae, p. 71

111
Group 4
Climbers with simple alternate leaves.

a. Leaf peltate, pentagonal........ 65. Menispermaceae, part II
   aa. Not peltate.
      b. Climbing by twining stems.
         c. Leaves coriaceous, entire on the lower surface of leaves ..... 45. Celastraceae, p. 172
         cc. Leaves entire or lobed........ 93. Solanaceae, part III
      bb. Climbing by tendrils ............... 50. Vitaceae, p. 177

Group 5
Leaves alternate, simple and entire. Non-climbers.

a. Abundantly stellate-pubescent, especially on the lower surface of leaves ... 49. Elaeagnaceae, p. 176
   aa. Pubescence, if present, not stellate.
      b. Densely spiny-branched ............... Sarcobatus, part II
      bb. Not spiny.
         c. Semi-shrubby, with numerous herbaceous shoots from a woody base; nearly all leaves not developing any wintering bud.
         d. Creeping shrub with single terminal long peduncled flower .... Dryas, p. 66
         dd. Inflorescence more elaborate.
            e. Flowers in glomerules .............. 78. Chenopodiaceae, part II
            ee. Flowers in involucreted heads........................ Artemisia, part III
         cc. Shrubs or trees. Main leaves usually developing an axillary winter bud.
            f. Small lanate leaves 1.0-3.5 cm long .................... 29. Cistaceae, p. 139
            ff. Leaves larger.
               g. Leaves part alternate, part verticillate........ 44. Betulaceae, p. 172
               gg. Leaves all alternate or tufted .................... Group 5-A

Group 5-A
Remainder of group 5 with alternate or tufted leaves, neither very small nor stellate. Clearly woody shrubs or trees; not spiny.

a. Leaves persistent, coriaceous, often revolute.
   b. Ovary superior .......................... 39. Ericaceae, p. 130
   bb. Ovary inferior ........................ 40. Vacciniaceae, p. 165
   aa. Leaves deciduous.
      c. Bud covered by a single hooded scale.......... 17. Salicaceae, p. 105
      cc. Buds with 2 or more scales (or naked).

LIGUMIDAE
d. Leaves mostly tufted, with one large leaf and 2 or more very small ones in each tuft .............. Lycium, part III

dd. Leaves all or mostly alternate, not tufted.

c. Small stipules present, persisting all summer ............... Cotoneaster, p. 48
ee. No stipules.

f. Inflorescence a terminal corymb .............. 27. Cornaceae, p. 137
ff. Flowers axillary or racemose.

g. Flowers solitary or in bracted racemes ....
pe. Flowers in axillary cluster of 2-5 flowers.
h. Clusters borne on the new shoot, in the axil of a leaf ....

.................. 48. Rhamnaceae, p. 175
hh. Borne on the older and leafless wood, at last year's nodes...

.................. Rhododendron, p. 160

Group 6
Leaves alternate, simple, not entire. Non-climbers.

a. Leaves lobed to deeply dissected.
b. Leaf pectinately divided .............. Artemisia part III
bb. Cut into coarser lobes.
c. Leaf lyrate .............. 27. Fagaceae, p. 130
cc. Leaf palmately lobed.
d. Carpels free; flowers corymbose to solitary .............. 15. Rosaceae, p. 45
dd. Ovary compound; flowers racemose to solitary .......... 25. Grossulariaceae, p. 133

aa. Leaves merely toothed or serrate.
e. Variously spiny.
f. Leaf fascicles subtended by spines usually three-pronged ............... Berberis, part II
ff. Well armed with spinescent short lateral branches.

g. Leaves subopposite towards the end of the branches ........ 48. Rhamnaceae, p. 175
gg. Leaves alternate .............. 15. Rosaceae, p. 45
ee. Not spiny ................ Group 6-A

Group 6-A
remainder of group 6, spineless and the leaves merely serrate or dentate.
a. Low shrubs, less than 2 ft high.

b. Flower solitary on a long peduncle and conspicuously overtopping the foliage. **Dryas** p. 66

bb. Not solitary, or at least overtopped by the foliage.

c. Ovary inferior. **Vacciniaceae** p. 165

dc. Ovary superior.

d. Bud covered by a single scale. **Salix** p. 163

dd. Bud showing more than one scale.

e. Petals free; flowers in a terminal corymb. **Chima p. 168**

ee. Fused; inflorescence nearly always different. **Ericaceae** p. 183

aa. Taller shrubs and trees.

f. Leaves strongly asymmetrical at base.

g. Leaf with 3 conspicuous main nerves. **Tiliaceae** p. 151

gh. Leaf with a single main nerve. **Ulmaceae** p. 131

ff. Leaves not particularly asymmetrical at the base.

h. Flowers with showy petals, not in catkins.

i. Petals hooded. **Ceanothus** p. 176

ii. Petals flat. **Rosaceae** p. 155

hh. Flowers in catkins, lacking petals.

j. Inflorescence compound, a spike or raceme of catkins.

k. Leaves oblong or obovate, toothed near the top only. **Myricaceae** p. 123

kk. Leaves broader and more toothed. **Betulaceae** p. 121

jj. Catkins not in compound inflorescences.

l. Leaves all alternate, with a bud produced in each axil.

m. Leaves evenly and simply serrate or crenate.

............. **Salicaceae** p. 105

mm. Denticulation very uneven and more or less double.

............. **Corylaceae** p. 129

ll. Leaves alternate on the leading shoots, clustered on the short lateral shoots, the latter with a single terminal bud.

............. **Betulaceae** p. 124

Order 8. **ROSACEAE**

Flowers perfect and normally 5-merous. Sepals fused, but petals free. Carpels mostly free.

a. Flowers regular, carpels mostly numerous. **Rosaceae**

aa. Flowers papilionaceous, carpel solitary.

............. **Leguminosae** p. 71
Receptacle usually well developed, with the floral appendages peripheral. Flowers regular and conspicuous, with the stamens usually in multiples of 5. Carpels often very numerous, usually free. Stipules present, usually conspicuous.

We have been unable to substantiate any of the various reports of Sanguisorba canadensis L. in the interval between Quebec and British Columbia. No specimens at CO, DA, MT, NB, NY, W, WJ, etc.

a. Leaves simple, entire to lobed; plants woody to semi-shrubby ................................ Group A
ac. Leaves more deeply dissected.
  b. Leaves simple, deeply divided into linear lobes.
    bb. Leaves compound ........................... Group B

Group A

Leaves entire to lobed.

a. Flower solitary; at the end of a very long peduncle; petals and calyx lobes about 8 .......... 1a. Dryas, p. 66
aa. Petals and calyx lobes about 5; flowers usually more numerous.
    b. Low semi-herbaceous plants, less than 3 dm high ................................. 9. Rubus, p. 52
    bb. Taller shrubs or trees.
      c. Coarsely spiny.
        d. Spines leaf the first year ... 17. Frangus, p. 70
        dd. Spines leafless ............. 6. Crataegus, p. 51
      cc. Not spiny.
        e. Leaves lobed.
          f. Calyx stellate-pubescent...
              ................. 1. Physocarpus, p. 42
          ff. Calyx not stellate ........ 7. Rubus, p. 52
            ee. Leaves entire, serrate or toothed.
              e. Stipules lacking; fruit a group of dry follicles ........ 2. Spirea, p. 42
              ee. Stipules present; fruit clavate.
                b. Fruit superior; carpel solitary ............ 17. Frangus, p. 70
                bb. Ovary inferior; carpels 2-5.
                  i. Leaves entire... 5. Cotoneaster, p. 48
                  ii. Leaves serrate or dentate.
                    j. Flowers racemose ....... 7. Actinidia, p. 50
                    jj. Flowers 2-5 locular; inflorescences various ........ 6. Pyrus, p. 48
Leaves compound.

a. Calyx double, with an outer set of 5 lobes termed calycule and an inner ring of 5 broader lobes forming the calyx proper.

b. Fruit fleshy; stemless plant with trifoliolate leaves .................. 10. Fragaria, p. 54

bb. Fruit not fleshy; leaves various.

c. Style short and more or less deciduous, not elongating in fruit ...

cc. Style many times longer than the achene, strongly geniculate or plumose .................. 11. Potentilla, p. 55

aa. Calyx simple, of 5 lobes.

d. Stipules adnate to the petiole for most of their length; usually a very spiny shrub .................. 16. Rosa, p. 67

dd. Stipules free or nearly so.

e. Ovary (and fruit) with a ring of hooked prickles .................. 15. Agrimonia, p. 67

ee. No hooked prickles on fruit.

f. Herb with pinnate leaves .... 4. Sorbaria p. 47

ff. Shrubs or trees.

g. Shrubs, mostly with trifoliolate leaves ........... 9. Rubus, p. 52

gg. Small trees; leaves

pinnate ....................... 6. Pyrus, p. 48

Tribe 1. SPIREA

Fruit a group of follicles. Shrubs, sometimes only semi-shrubby.

1. PHYSOCARPUS Max.

Follicles dehiscing along both sutures. Shrubs with stellate pubescent calyces.

1. P. malacoides (Greene) Kuntze -- Shrub, 1-2 m high, with exfoliating bark. Leaves ovate to cordate, mostly 3-lobed and doubly serrate. Flowers white in a stellate-tomentose terminal corymb. Waterton. -- Alta-BC, US.

2. SPIRAEA L.

MEADOW-SWEET

Follicles dehiscing along ventral suture only. Leaves without stipules. Small shrubs.

a. Flowers in a narrow panicle .................. 1. S. alba

aa. Flowers in a corymb.

b. Flowers white .................. 2. S. betulifolia

bb. Flowers pink .................. 3. S. densiflora

There is a gradual transition from var. *alba* to var. *latifolia*. It is noteworthy that in eastern Saskatchewan and adjacent Montana some intermediates occur although typical var. *latifolia* is absent from the region.


Calyxes of var. *luciana* are glabrous or ciliolate on the outside. Var. *b. var. luciana* barely distinct from the east asian var. *b. betulifolia* of the latter having pubescent fruits and less ciliate leaves.

3. *S. densiflora* Matt. var. *splendens* (Bunemann) J.L. Hitchc. — Similar to the previous but the flowers pink in most northern forms. Leaves serrate to crenate. Calyx lanceolate triangular. (early summer) Subalpine meadows and swamp shores. Waterton. — S-Alta, US.

All the B.C. material examined is glabrous or merely ciliolate on the leaves and bracts and belongs to typical var. *densiflora*, while all the Waterton specimens were lightly puberulent in the manner of var. *splendens*, mainly in the inflorescence, on the twigs and on the lower face of the leaves.

3. LUKTICA Bongard

Foliage subulate, deliscent ventrally and partly also dorsally. Semishrub.


b. 3 BARKY, Braun

As in *Epigaea* but the leaves pinnate and stipulate.

The mention of Clearwater Lake, Sask., by Breitling 1957, was discussed by W. J. Cady, Can. Field-Nat. 76: 101-7, 1962. The site was revisited in 1960; no local evidence of this plant was detected as the local climate did not seem very propitious to its spread.

Tribe 2. POMAR

Ovary inferior; the fruit a pome. Shrubs or trees.

5. COTONEASTER

Such as in Trachelospermum, the fruit a small pome containing hard, bony, one-seeded carpels, but at flowering time each carpel contains 2 fertile ovules. Ours are non-spiny shrubs with entire leaves and black fruits.

a. Young shoots and lower surface of some leaves yellowish tomentose, becoming merely pubescent at maturity; .......... 1. C. acutifolia

aa. Tomentum white, darker, the leaves remaining tomentose below at maturity; ............... 2. C. melanocarpa

1. C. ACUTIFOLIA Du.R. -- (初步業) -- A shrub with leaves and branches two-ranked and his usual flat sprays. Leaves about 1-4 or less, ovate, dark green above, much paler below, entire, broadly acute at the base, leaves crowded below with a lighter yellow to white yellow tomentum which becomes much laxer at maturity. Short shoots with smaller leaves and a small spray of flowers. Stipules much to blackish and alternate to the petiole, persisting all summer. Fruit black, small, solitary, with 2 or 3 nutlets. (Early summer?) Cultivated and sometimes to die to spread into the wild. Known: Fort Barry, Pembina, Sherwood Park, Edmonton and Smoky Lake. -- 0-Alta, (Cal.)

2. C. MELANOCARPA Lodg. -- Quite similar, but the tomentum shorter, pure white, more persistent. A somewhat smaller shrub with the leaves yellowish green to rounded at tip and the fruit with 3-4 nutlets. (Early summer?) Less persistent after cultivation. Known: -- Yon, Cal.

6. PYRUS

Small trees or bushes with a small or large pome as a fruit. The carpels are included in the flesh and have cartilaginous walls; the usually contain two seeds or pips. Flowers white, in umbels or corymb.

a. Leaf simple .................................................. 1. P. Malus

aa. Leaf pinnate

b. Bush, in inflorescence with lower surface of leaflets more or less pubescent .......... 2. P. Auspasia

bb. Leaflets puberulous or nearly so below; buds glabrous to ciliate.

c. Leaflets ciliate only 1/4 to 1/3 of

COTONEASTER 43
their length; rusty pubescence on new shoots and in the inflorescence ... P. sitchensis cc. Leaflets serrate to near the base; pu-

cescence clear or white .............. 3. P. americana

1. P. MALUS L. (Malus punica Miller) -- Apple-Tree (Pommier, Pommier sauvage) -- A small tree commonly planted for its

fruit. Leaves broadly ovate, serrate, alternate on the leading shoots, tufted on the fragile short shoots. Flowers white to

pinkish in showy clusters on the short shoots. Fruit, the well known APPLE. Mid spring. Planted and very long persistant,

2. P. AUCUPARIA (L.) Gaertner (Sorbus Aucuparia L.) -- Row-

an-Tree, Mountain-Ash (Cormier, Sorbier)--A small tree planted

for its snowy flowers and persistant fruits which attract winter birds. Leaves part alternate, part clustered at the end of

shoots, pinnately divided into 9-17 oblong to lanceolate leaf-

lets, more or less villous-lanate below, especially along the midnerves, often nearly glabrous in age. Young twigs tomentose
to white-villosous. Inflorescence a wide corymb, white-villosous,
becoming nearly glabrous and pendant by mid summer. Late spring.
Planted and sometimes reseeding itself in nearby bush. -- Aka,

A european var. glabras Wimm. & Graebn. is glabrous or

nearly so and its leaflets are narrower and more acute, forming a transition to our P. americana.

3. P. americana (Marsh.) Bo. var. decora Sarg. (P. scopu-

lina (Greene) Longyear; Sorbus decora (Sarg.) Schneider; S. sco-
pulina Greene) -- Dogberry, Mountain-Ash (Maskouabina, Cormier)

-- A shrub or small tree with alternate pinnate leaves, quite similar to the preceding and easily confused with it. Much less
pubescent, only lightly villous and often quite glabrous. Outer
bud scales ciliate and usually glabrous or nearly so dorsally.
Young twigs lightly villous. Leaflets oblong to lanceolate. In-
florescence lightly villous, remaining erect at maturity. Early
summer. Widely scattered in regions of coniferous forests, in-
cluding the Cypress Hills. -- Aka, L-SW, NS, NS-BC.

Sorbus decora and S. scopulina are commonly treated as dif-

ferent species separated by a wide distributional gap and a more
tenuous morphological one. The distributional gap is non exis-
tant and the morphological one not convincing. Certainly the
leaflets of the average eastern specimen are not stubbier than
those of the western ones. And if label indications are to be
relied upon, the western shrub is 1-4 m high while the eastern
one is mostly 2-3 m high with the odd sheltered individual reaching
up to 6 m.

The more southern and eastern var. americana is commonly
taller, has more elongate and more acuminate leaflets and a small-
er pone.

Reports of Sorbus americana from Manitoba were based partly
on specimens since revised to var. decora, partly on a specimen
from "M.A.C.", that is "Manitoba Agricultural College" and presumably planted as a sometimes ornamental.

Our interpretation of the name Sorbus americana Marsh. is at variance with a discussion of its application by Jones 1953. We are not satisfied that Sorbus americana Marsh. "in montibus excel-sis carolinae" should be interpreted in the sense of the more northern S. decora which does not occur in the Carolinas. More satisfactory would be the equivalence of S. americana W. and S. americana Marsh., the latter being the only species known to occur in the mountains of Carolina. 

We are not satisfied that Sorbus americana with an unequivocal reference to S. americana W. and S. americana Marsh., the latter being the only species known to occur in the mountains of Carolina. 

The nomenclature adopted herewith is based on our contention that Sorbus americana remains the same nomenclatural entity from Marshall to Pursh, regardless of successive taxonomic accretions and slip applications.

1. P. sitchensis (Roemer) B. P. (P. occidentalis Watson; Sorbus occidentalis (Watson) Braune; S. sitchensis Roemer, var. Grayi (Wenzel) C. L. Hitchc.) -- Mountain-ash. -- Quite similar to the preceding, but lower and shrubby, 1-3 m high. Pubescence of the buds, young twigs and inflorescence partly or entirely rust-coloured. Leaflets oblong to lanceolate, entire in the lower 1/3 or so, often less numerous, normally 2 or 11 per leaf, rounded at tip. (Late spring?). Light woods: Rockies. -- Saka, Alta.-2, nsw.

Reaches as far north as Lake Bennett on the BC-Yukon boundary. There is no evidence that Dawson's collection from Lake Bennett comes from the Yukon side of the border. To include Yukon in the distribution of this species is not fully justified at this stage.

Specimens with less toothed leaflets, entire in the lower half, are often separated as P. occidentalis. The material examined showed neither morphological discontinuity nor geographical restriction for this phenotype.

7. AELMUS L. MED. "SASKATCHEWAN"

Fruit a saskatoon, that is a small dark blue pome with the five carpels divided by false cartilaginous partitions into a total of 10 locules, each containing a seed. 50% juice and like Pyrus except that the leaves are always simple. Ours have recurved inflorescences.

a. Pedicels short, mostly less than 1 cm. ..... 1. A. alnifolia

bb. Leaves glabrous or nearly so at flowering time, rounded or truncate at tip, mostly not mucronulate .................................. 2. A. carolinum

a. Longer, the lowest usually 1.5 cm or more.

b. Leaves flat at above at flowering time; obtuse or rounded at tip, mostly mucronulate .................................. 2. A. carolinum

bb. Leaves glabrous or nearly so at flowering time, rounded or truncate at tip, mostly not mucronulate .................................. 3. A. floridana
1. A. alnifolia Nutt. -- Saskatoon (Poiré, Saskatons, Bois de Fleche) -- A common colonial shrub, up to 3 m high, showy in spring, with its racemes of white flowers and its white or yellowish tomentose folded leaves. Leaves ovate or oblong, serrate, often squarrose, rounded or more often truncate at tip. Pedicels 2-10 mm long. Fruits 6-9 mm long. Sepals 2-3 mm long. Fruit dark bluish purple, edible, the well-known saskatoon. First half of spring. Around bluffs, along watercourses, in small draws, etc. General. -- Mack-Aka, sw Q-BC, US -- F. alba Nielsen -- Fruits whitish at maturity. -- S-Alta, (US).

2. A. humilis (Pursh) DC. (A. humilis Wiegh.) -- Indian-Pear (Petites Poires, Pierrier) -- Generally similar to the preceding, the pedicels a more uneven length, the lowest usually 15 mm or more. Leaves white floccose below at flowering time, mostly obtuse or rounded and mucronate at tip. Sepals 3-4 mm long. Petals 5-10 mm long. (Mid spring). Openings and margins of woods. Southeastern Manitoba. -- sec, NF, NS-Man, US.

The taxonomy of this genus is currently quite controversial and A. humilis is one of the more controversial species, being divided into as many as seven phenotypes: A. anabellae Wiegh., A. gaspensia (Wiegh.) Fern., & Weath., A. humilis Wiegh., A. turnerensis Wiegh., A. mucronata Nielsen, A. sanguinea (Pursh) DC., and A. aestivalis Mielser.

3. A. borreri Lindley -- Also generally similar, also with longer pedicels, the lower usually 15 mm long or more, but the leaves floccose or nearly so at flowering time, mostly broadly rounded or truncate at tip and often rather coarsely serrate. Sepals 3-5 mm long, petals 10-15 mm long. Mid spring to early summer. Mostly in river valleys and rather local. Cypress Hills, Rockies and Northern Alberta. -- sMack, (sAka), S-BC, US.

8. CRATAEGUS L.

Hawthorn

Shrubs with rather coarse woody spines. Fruit a middle size pome with 3-5 stone-hard pips, these being the mature carpels.

a. Spines 1.5-2.5 cm long; fruit dark blue or purple black

aa. Spines mostly more than 1.5 cm long; fruit scarlet.

b. Larger teeth rather coarse, acute and acuminate; no ventral cavities

bb. Teeth of the larger series low, obtuse, not acuminate; ventral cavities present

1. C. rotundifolia Moench (C. chrysocarpa Ashe; C. colombiana AA.) -- Hawthorn (Zenelles) -- A large shrub, with the biggest wood thorns. Up to 4 meters high and stoloniferous, forming quite impenetrable clumps with numerous thorns 7-6 cm long and usually falcate. Leaves doubly serrate, with a purple black gland at the end of each tooth. Flowers white in showy corymbs. Fruit scarlet, often pruinose, obovoid, about 1 cm long or slightly
longer. Stones flat on the faces. Mid-spring. Inside bluffs, along ravines and near watercourses. General. -- (IF), NS-Alta, US.

The comment under Amelanchier sanguinea applies equally well here. About 1,000 species of Crataegus have been described for North America and most known permutations of a limited number of morphological characteristics have been decorated with a binomial. Our concept of C. rotundifolia includes some 10-12 "species" of some other current florists. C. columbiae Howell may or may or not be a distinct species; we have not yet seen adequate material from the Columbia basin. However such material from our area as was identified C. columbiae did not appear to be essentially different from C. rotundifolia.

2. C. succulenta Link (var. occidentalis (Britton) Palmer) -- quite similar but the teeth not so sharp, those of the larger series much lower. Stones with well marked depressions on the two lateral faces. Mid-spring. Oak bluffs. -- (US-CA) - WA, OR, US.

We do not know the basis for the report of this species for southeastern Saskatchewan by Love 1959.

3. C. douglasii Lindley -- Black Hawthorn -- Also quite similar but the spines shorter and the fruit darker. Fruit dark purple or blackish, with a well marked neck below the ring of sepals. Leaf teeth with a brown gland at tip. Late spring. Boise Coteau and Rockies. -- (AK), wa, sws-BC, US.

Disjunct east of the Rockies and occurring in the general area of the Boise Coteau and also west of lake Superior. Reports from southern Manitoba and eastern Ontario proved to be based on other species.

1. punctata Jacq. has been reported for Manitoba by Scoggin 1957 and far southern Saskatchewan by Love 1959. The only Manitoba sheet (US) is dated Aug. 11, 1872, yet the specimen is only in flower, obviously the label data of this specimen is questionable. Further, the specimen itself is C. succulenta. We are not aware of the basis for the Saskatchewan report.

Tribe 3. RUBEAE:

Carpels numerous, free and fleshy. Shrub with short-lived stems.

P. NUCLEI.

Fruit raspberry-like, edible, thimble-shaped, made up of numerous small, fleshy, adhering carpels. Shrub usually sterile the first year (floricane), becoming wood and flowering the second year (floricane).

a. Leaf simple.
   b. Low, 1-3 dm high ....................... 1. R. Chamaemorus
   bb. Much taller ......................... 5. R. serratiflorus
aa. Leaf compound.
   c. Low, 1-3 dm high.
   d. Leaves with 5 leaflets ............. 4. R. pedatus
   dd. Leaves trifoliate.
1. R. langemannii L. -- Bake-Apple, Yellowberry (Jumonvié, Plaquenier) -- A low bog plant with large, palmately lobed leaves. Finishes, with the stems are or less buried in silt. Erect herbaceous shoots with 5 or 3 leaves and a simple white terminal flower. Floral parts in 4's, 5's, or 6's. Fruit at first reddish, maturing nearly white. First half of summer. Picea mariana bogs. -- B-Ak, L-SP, US-3, '63, Mr.

2. R. arcticus var. angustifolius (Mx.) Boivin (R. acaulis Mx.) -- Dewberry. Berry, Ground-Raspberries (Faire rouges) -- another bog plant, this one quite narrow except for the buried woody base. Stem erect, up to 1.5 dm high, with a few trifoliate leaves and a simple terminal flower, pink, to dark rose. Leaflets obtuse or rounded at the tip. Floral parts in 4's or 5's. Sepals 10.0 mm long. Petals 10-16 mm long. Late spring and early summer. Fruit erect, red. Res. -- B-Ak, L-SP, US-3, '63.

In var. stellatus (Sm.) Boivin occurring from Northern S.C. to Alaska, some of the leaves are simple, being trilobed to triplicate, and the flowers are larger.


4. R. pedatus var. brevissimus Nutt. -- Thimbleberry -- A large semi-shrub with maple-like leaves and large white flowers that dry yellow. Up to 2 m high. Leaves large, palmately lobed and serrate. Flowers 3-7 cm across, in small yellow corymbs. Fruit a finely pubescent, hemispherical, red raspberry. Early to mid summer. Forest openings: Cypress Hills and western Alberta. -- Ak, W0, Al-Alta, US, CA.

5. R. idaeanus L. var. acaulestissimus Regel & Tiling (var. canadensis Rich.) var. strigosus (Mx.; Max.; R. melanolasius Focke; R. strigosus Mx.) -- Raspberry (Franboisier, Flack) -- Semishrub
with the stem abundantly armed with weak acicules. Usually about 1 m high. Leaves of two kinds, those of the primocane mostly pinnate, those of the floricanne mostly trifoliate. Flowers white. The fruit is a red raspberry. First half of summer. Open and semi-open places in forested regions. --K-wa, L-NF-(SPM), NS-BC, US, (CA, eEur) -- F. tonsus (Fern.) Boivin -- Unarmed or nearly so. Local. -- (NF), O, S, (US) -- F. erythrochlamydeus Boivin -- Petals red. Also local: Elbourne -- Y, S.

American plants are glandular-stipitate in the inflorescence while the eurasian var. idaeus is eglandular and its armature tends to be of short and small prickles, especially in the inflorescence. The latter is cultivated for its fruits and has been reported as a casual escape in eastern Canada.

Young leaves are finely white-tomentose below. Typically this tomentum erodes gradually during the summer until in the later part of the season the older leaves will have turned green and nearly glabrous below. In a minority of specimens (var. paramoecaeus (Greene) Fern. or R. viburnifolius (Greene) Rydb.) the young leaves will quickly become green below and eventually glabrous before they are fully grown. This variation is generally distributed but appears to be relatively more frequent west of Saskatchewan than eastward.

Many authors will distinguish a var. canadensis with stems glabrous between the acicules from a var. strigosus with stems more or less finely tomentose. Both types are common and equally widespread; their taxonomic value is not obvious except perhaps as very minor phenotypes.

Tribe 4. POTENTILLEAE

Carpels numerous, free and dry (achenes). Nearly all herbs, most of them with a double calyx.

10. FRAGARIA L. STRAWBERRY

Fruit a strawberry, that is a fleshy fruit in which the fleshy part is the enlarged receptacle. The numerous dry and small achenes are scattered on top of the fleshy receptacle. Small herbs, stemless, with rosettes of trifoliate leaves and long superficial stolons that root at the nodes. Flowers in a corymb, borne on a scape.

a. Fruit with an even surface ...................... 1. F. vesca
aa. Fruit surface deeply pitted ............... 2. F. virginiana

1. F. vesca L. var. americana Porter -- Squaw-Berry, Sow-Teat-Strawberry (Fraisier à Vaches, Fraisier des bois) -- Fruit glabrous or nearly so. Surface of the receptacle nearly even and the achenes standing above the surface. Apical tooth of the leaflet about as large as its neighbours and slightly overtopping them. Calyx-lobes commonly reflexed at maturity. Strawberry usually conical. Late spring to mid-summer. Fresh soils, open or wooded. -- Mack, (NF), N3, NS-BC, US -- Var. griffia (Ryd.) C. L. Hitchc. (var. bracteata (Heller) Davis) -- Fruit as above, but the calyx rather like the next species, that is somewhat appres-
sed and enveloping the base of the fruit. -- wcAlta-BC, WIS.

2. F. virginiana Duch. (var. terrae-novae (Rydb.) Fern. &
   Wieg.; F. canadensis Mx.; F. glauca (Watson) Rydb.; F. pauciflo-
   rea Rydb.) -- Wild Strawberry (Fraisier des champs) -- Quite simi-
   lar to the preceding and only doubtfully distinguishable when
   in flower. Apical tooth of the leaflet only half as large as its
   neighbours. Surface of the ripe receptacle slightly hairy, deep-
   ly pitted, with each achene attached at the bottom of a pit and
   half or more buried into the flesh. Calyx-lobes normally more
   or less appressed around the base of the fruit. Strawberry com-
   monly globose and much sweeter than in the preceding. First
   half of summer. Dry woods. -- K-Mack-(Y)-Aka, L-(NF-SFM), NS-
   (PEI)-NB-S-(Alta)-BC, WIS.

11. POTENTILLA L. CINQUEFOIL

The basic type of the Potentilaceae with a double calyx
and numerous, dry, free achenes. Leaves compound, petals usu-
ally yellow and flowers 5-merous.

a. Shrub with entire leaves .................... 1. P. fruticosa
   aa. Herbaceous or rarely with a shrubby base.
   b. Stemless, flowers solitary on long
      scapes ........................................ 25. P. Anserina
   bb. Stem present.
      c. Calyx and corolla purple ............ 5. P. palustris
         cc. Calyx green or whitish-tomentose;
            petals cream to yellow.
      d. Leaves all or mostly pinnate.
         e. Leaflets serrate to lobed ........ Group 1
            ee. Leaflets dissected more than
                halfway to the midrib .......... Group 2
            dd. Leaves trifoliolate to digitate or
                subdigitate.
               f. Leaves trifoliolate ................. Group 3
             ff. Leaves with 5 or more leaflets,
                or some of the upper ones tri-
                foliate ............................. Group 4

Group 1

Leaves pinnate, the upper sometimes trifoliolate. Leaflets
serrate to lobed.

a. Leaflets green on both faces.
   b. Glandular; stem leaves 0-2.
      c. Tall, 3-8 dm high; the inflorescence
         compact .................................. 3. P. arguta
      cc. Less than 1 dm high, the inflorescence
         quite open.
         d. Leaflets glandular, serrate 4. P. glandulosa
         dd. Non-glandular and coarsely toothed
             to narrowly lobed ............... 4l. P. Drummondii
             bb. Non-glandular; with 4-7 stem leaves.... 11. P. paradoxa

55 POTENTILLA
Leaflets grayish to white-tomentose below.

a. Leaflets white-tomentose below .......... 12. P. Hippiana
b. Leaflets not tomentose, but grayish-pilose to hirsute below ............ 6. P. pensylvanica

Group 2

Leaves pinnate, the upper sometimes trifoliate. Leaflets pinnatifid to pinnatipartite.

a. Leaflets equally green on both faces ...... 10. P. plattensis
   aa. Pale green to white below.
   b. Pale green to grayish-pilose or glandular below .................. 6. P. pensylvanica
      bb. White-tomentose below.
         c. Pectinatipartite and the margin revolute.
            d. Upper stem leaves with stipules ovate, coarsely toothed to semi-pectinate .......... 7. P. bipinnatifida
               dd. Stipules linear to lanceolate, entire .................... 8. P. multifida
      cc. Not quite so deeply and so narrowly dissected, the margin revolute or not.
         e. Mid-summer flowering arctic and alpine species ...................... 18. P. nivea
         ee. Spring flowering prairie species.
            f. Early spring flowering; stems 1 dm long or less .......... 16. P. concinna
               ff. Late spring flowering; stems 1-2 dm long ............... 9. P. saximontana

Group 3

Leaves all or mostly trifoliate.

a. Leaflets cuneate, three-toothed at apex.
   b. Inflorescence very lax with obvious white petals ...................... 2. P. tridentata
      bb. Inflorescence congested; the yellow petals minute ................... 24. P. Sibbaldii
   aa. Leaflets broader, not cuneate and more than three-toothed.
      c. Leaflets densely and more or less whitish-tomentose below ..................... 18. P. nivea
         cc. Green below.
            d. Stem-leaf only one or none below the inflorescence .................. 19. P. flabellifolia
               dd. Stems quite leafy.
                  e. Petals broad, longer than the calyx tube .................. 22. P. norvegica
                     ee. Petals narrow and inconspicuous, being shorter than the calyx tube ...................... 23. P. rivalis
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Leaves digitate, the upper ones sometimes trifoliate.

a. Leaflets grayish to white-tomentose below.
   b. Stems quite leafy; petals only 2-5 mm long
      ................................................ 20. P. argentea
   bb. Stem leaves 0-3 below the inflorescence; flowers larger.
      c. Stems 1 dm long or less; flowering in early spring  .................... 16. P. concinna
      cc. Usually taller and summer-flowering.
         d. Leaflets 3-5; plants 2.5 dm high or less.
            e. Leaflets pinnatifid, with narrow lobes .......... 17. P. quinquefolia
               ea. Not so deeply divided; serrate to coarsely lobed .......... 13. P. nivea
               dd. Usually taller, the leaflets 5-9 per leaf ..................... 13. P. gracilis
      aa. Leaflets less densely pubescent, green below.
         f. Inflorescence a very leafy cyme; petals minute ............................. 23. P. rivalis
      ff. Open corymb leafy at base only; flowers large.
         g. Stem leaves 1-3 below the inflorescence.
            h. Leaflets coarsely toothed (or lobed) to the base ............. 13. P. gracilis
               hh. Leaflets coarsely toothed above, entire at least in the lower third .................... 15. P. diversifolia
            gg. Stem leaves 4 or more ...................... 21. P. recta


2. P. tridentata Aiton (Sibaldiopsis tridentata (Aiton) Rydb.) -- Tufted herb from a thin, woody rhizome, 1-2 dm high, with white flowers in a large open cyme. Leaves mostly basal, trifoliolate. Leaflets cuneate, 3-toothed at tip. All summer. Sandy Pine woods and precambrian outcrops. -- G, K-Mack, L-SPM, NS-Alta, US.

3. P. arguta Pursh var. arguta (Drymocallis agrimonicoides (Pursh) Rydb.; D. arguta (Pursh) Rydb.) -- Stem stiff, 3-8 dm high, abundantly covered, along with the petioles and inflorescence, with long glandular and viscid hairs. Leaves pinnate, the leaflets green, coarsely serrate. Inflorescence compact, of more or less cream-coloured flowers. First half of summer. Occasional in open places on better soils. -- Mack-Y, NB-BC, US --

POTENTILLA
Var. Convallaria (Rydb.) Th. Wolf -- Leaflets not only glandular, but also velvety pubescent on both faces, Rockies. -- Y-Aka, Alta-BC, US.

4. P. glandulosa Lindley var. intermedia (Rydb.) C.L. Hitchc. (ssp. pseudopraestris (Rydb.) Keck) -- Similar to the preceding and sometimes grading into var. Convallaria, but smaller, less leafy and the inflorescence open. Stems 1.0-2.5 dm high, with few or even no stem-leaves below the inflorescence. Pubescence glandular, usually also partly villous and non-glandular. Petals slightly longer than calyx lobes. First half of summer. Alpine slopes. Waterton. -- Alta-seBC, nwUS.

The more western var. glandulosa has smaller flowers, the petals no longer than the calyx lobes, and the pubescence usually uniformly glandular.

5. P. palustris (L.) Scop. (Comarum palustre L.) -- (Comaret) -- The petals purple and persistent; the calyx also purple, at least inside. Leaves pinnate with 5-(7) approximate leaflets. Leaflets glabrous to silky, lanceolate, 3-7 cm long, serrate, paler beneath. Early summer. Marshes and bogs. -- (G), K-Aka, L-SFtl, NS-BC, US, Eur -- Var. parvifolia (Raf.) Fern. & Long -- Leaflets smaller and broader, 1-3 cm long, ovate or obovate to narrowly obovate. Arctic and subarctic marshes. -- G, K-Aka, L-(NF, NS), Q-Man, BC, US.

6. P. pensylvanica L. var. pensylvanica (var. glabrata (Hooker) Watson, var. pectinata Lep.; P. glabra Rydb.; P. pectinata Raf.; P. platyloba Rydb.) -- Leaves pinnate, pale green to grayish pilose below. Tufted perennial, the stems 2-6 dm high, decumbent at base or erect. Stems and petioles light tomentose to strigose or stout pilose. Leaflets oblanceolate, lobed to pectinatipartite, glabrous or glandular to silky above, paler and usually glandular and grayish silky below. Early to mid summer. Hillsides, prairies and steppes. -- Mack-Aka, Q-BC, US, Eur -- Var. atrovirens (Rydb.) Th. Wolf (var. arida Boivin, var. strigosa AA.; P. strigosa AA.) -- Petioles hirsute, the pubescence ± spreading and the hairs up to 1-3 mm long. Steppes. -- (Y-Aka), Q-BC, US, CA, Eur -- Var. litoralis (Rydb.) Boivin (var. pectinata AA.; P. pectinata AA.) -- Leaflets approximate and rather few, usually 5-7, often giving the leaf a rather pentagonal outline. -- K-(Mack, L)-NP, NS, Q-Man-(nwS)-Alta, (US).

A rather variable and much divided type, gradually more variable westward. Many variations appear to be almost but not quite sympatric, hence of limited, if any, interest. At one time or another we have tried to recognize quite a few variants but we admit to much intellectual dissatisfaction with most of them. We are herewith recognizing only 3 types: the main var. pensylvanica, common in all sorts of grassy and open habitats, mainly on prairies; a var. atrovirens more coarsely and more stiffly pubescent, the common type on drier prairies and steppes, becoming quite local, yet widespread, outside the main area of steppes; a var. litoralis which occurs primarily along the east coast, but also inland especially around the larger bodies of water, and
sporadically westward across the northern part of the range as
far west as Alberta.

P. pectinata Raf. is illegitimate because it included when
published the earlier P. pensylvanica. The two are therefore
nomenclaturally synonymous and it is quite incorrect to apply
them to different taxa. Var. litoralis is the earliest name
available for what has been incorrectly called var. pectinata.

7. P. bipinnatifida Douglas (P. pensylvanica L. var. bi-
pinnatifida (Douglas) T. & G.) -- Leaflets narrowly pectina-
partite, white-tomentose below. Stem tomentose, 2-5 dm high.
Leaves pinnate, the basal ones with 5-7 leaflets, the cauline
with 3-5 leaflets, green and silky above. Lobes slightly revo-
lute at margin. Middle and upper leaves with 2 ovate stipules,
coarsely toothed to semi-pectinate, white-tomentose dorsally.
Calyx densely silky-tomentose dorsally. Bractlets about as long
as the calyx lobes. First half of summer. Dry prairies and
open Pine woods. -- Mack, wO-seBC, US.

Native in our area; introduced west of us at McBride, B.C.
Perhaps also introduced at Schreiber east of us. Reports from
still further east are probably incorrect.

8. P. multifida L. -- Similar. Stem strigose, 1-4 dm
high. Basal leaves with 7 leaflets, the stem leaves with 5-7.
Stipules of the stem leaves entire, linear to lanceolate, not
white below except in the inflorescence. Leaflets finely pecti-
nate, strongly revolute. Calyx silky dorsally. Bractlets smaller,
much shorter than the calyx lobes. First half of summer.
Open rocky places and bare gravels. -- K-Aka, Q-neBC, Eur.

9. P. saximontana Rydb. (P. Macounii Rydb.; P. rubripes
Rydb.) -- Tufted perennial, decumbent to loosely ascending, the
stems 1-2 dm long. Basal leaves pinnate, about 1 dm long. Leaf-
lets green above, whitish-tomentose below, the lobes oblong-
lanceolate. Flowers few. Late spring. Hillsides along the
southern border. -- swMan-seAlta, US.

Known from Dalny, Carievale, Pickthall and the Cypress Hills.

10. P. platensis Nutt. -- Very finely divided and equally
green on both faces. Stems spreading, 1-2 dm long, diffusely
branched. Basal leaves almost as long as the stems, pinnate,
with numerous leaflets, the main ones with 5-9 lobes. Late spring
and early summer. Alkaline soils. -- swMan-Alta, US.

More compact alpine forms have been called P. ovina J.M.
Macoun.

11. P. paradoxa Nutt. (P. Nicolletii (Watson) Sheldon) --
Leaflets of the upper pair long decurrent on the proximal side.
Biennial or short-lived perennial. Leaves pinnate with 5-11
leaflets, pubescent but not glandular, green on both faces, cre-
nate-serrate at margin. Flowers in a diffuse, cyme, numerous, small,
the petals about 3 mm long, about equalling the calyx lobes.
 Mostly early summer. Shores of lakes and large rivers. -- 0-seBC,
US, (CA).

12. P. Hippiana Lehm. var. Hippiana -- White-tomentose
throughout except on the upper surface of the leaflets which are
green and silky to grayish. Leaves pinnate, the leaflets deeply

POTENTILLA
Crenate-serrate. Calyx lobes silky dorsally, ending in a white hair tuft. Bractlets similar to the calyx lobes. Late spring to mid summer. Prairies and steppes. -- (NS), Q-BC, US -- Var. argyrea (Ryd.) Boivin (P. argyrea Rydb.) -- Leaflets nearly equally whitish-tomentose on both faces. Calyx as in var. Hippiana. Dry hills. -- s3-Alta, w. -- Var. filicula (Nutt.) Boivin (P. effusa Douglas) -- Leaves nearly equably whitish-tomentose on both faces. Calyx lobes ending in a brownish, glabrous mucro. Bractlets much smaller, green and lightly tomentose, also ending in a brownish, glabrous mucro. Dry and eroded hills. -- sMan-Alta, us.

Our three varieties are recognized primarily because they seem to have individualized ranges in our area. But we are not at all sure that they do represent biological units; they could be mere extremes of variation. From the specimens at hand, var. filicula seems to be the more common and more widespread variety south of us.

13. P. gracilis Douglas var. gracilis (var. filipes (Ryd.) Boivin, var. flavicans (Lehm.) C.L. Hitchc., var. Nuttallii (Lehm.) Shelton, var. peregrinus (Ryd.) C.L. Hitchc., var. pulcherrima (Lehm.) Fern., var. rufida Watson; P. camporum Rydb.; P. Hippiana Lehm. var. pulcherrima (Lehm.) Watson; P. juncunda Nelson; P. Nuttallii Lehm; P. pulcherrima Lehm.; P. rufida Nutt., [nom. illeg.]; P. viridescens Rydb.) -- Cinquefoil--Topped perennial 2-7 dm high. Basal leaves with 5-9 leaflets, all digitate or some of them subdigitate. Stem leaves mostly 2-3. Leaflets ± oblanceolate, serrate to pinnatifid, green and silky to white-tomentose below. Petals slightly longer than the calyx. Early to mid summer. A common prairie plant. -- Aka, PEI, Q-BC, US -- Var. flabelliformis (Lehm.) Nutt. (var. ctenophora (Ryd.) Boivin; P. flabelliformis Lehm.) -- Leaflets more deeply divided, pectinatipartite to pectinate. Moist prairies. -- Aka, (Q), Man-BC, US.

Native east to the Great Lakes. Probably introduced further east. Intermediate between the digitate and the pinnate series; subdigitate specimens are liable to be mistaken for P. Hippiana.

Fully as variable as the last species. Our earlier and more elaborate classificatory attempts proved unsatisfactory as one varietal range after another gradually filled out to the size of the collective range. However var. flabelliformis and the sympatric var. ctenophora still retain a somewhat restricted range and are therefore still maintained, but as a single taxon.

Var. pulcherrima is often used to designate the mostly larger plants with mostly subdigitate leaves and the leaflets mostly white below. It is sporadic throughout the range and does not seem to be well enough defined to warrant taxonomic recognition.

14. P. Drummondii Lehm. -- Leaves dimorphic, the stem leaves digitate, with 3-5 leaflets, the basal ones short pinnate, with 5-9 leaflets. Otherwise much like the next but tending to be taller and slightly more pubescent. Leaflets ciliate and glabrous or pilose dorsally. Stem and calyx ± pilose. Summer. Low alpine or subalpine meadows. -- Aka, swAlta-BC, US.

15. P. diversifolia Lehm. var. diversifolia (var. clauco-phylla (Lehm.) Watson; P. clauco-phylla Lehm.) -- Perennial 2-4
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dm high, tufted, with little pubescence. Leaves digitate, few, rather large. Leaflets broadly oblanceolate, entire and cuneate base, coarsely serrate above the middle, glabrous on both faces or slightly hirsute along the nerves below, paler beneath and often slightly glaucous. Early summer. Montane prairies. -- (Mack)-Y-Aka, swS-BC, US -- Var. perdissecta (Ryd.) C.L. Hitchc. (var. multisecta AA.) -- Intermediate to P. gracilis, the leaflets being deeply divided most of their length. Plants small, 1-2 dm high, and little pubescent as in var. diversifolia. -- sw Alta-(seBC, US).

Two Manitoba collections were listed by Bell 1861 as P. diversifolia and also later by Macoun 1883 as P. dissecta. More recently Scoggan 1957 has referred them to P. norvegica. We have examined the York Factory collection (QK; DAC, photo) and revised it to P. multifida.

17. P. concinna Rich. var. concinna (P. humifusa Nutt.) -- A small tufted perennial, quite conspicuous in early spring on dry eroded hillsides. Stems spreading, 1 dm long or less, barely overtopping the leaves. Basal leaves digitate, with 5 leaflets. Stem leaves much reduced. Leaflets obovate to cuneate, 1-3 cm long, coarsely serrate to pinnatifid, the lobes triangular to oblong, white-tomentose below. Early spring on rolling steppes. -- Man-Alta, US -- Var. dissecta (Watson) Boivin (var. divisa Rydb.) -- Leaves digitate or subdigitate, the leaflets more divided, pinnatifid to pinnatifid. Lobes ± lanceolate. -- swS-seAlta, (US).

In conformity with Rydberg's treatment of 1908 in the North American Flora, we presume that Watson's type material of var. dissecta is made up of two elements, one of which comes from Montana and belongs to var. dissecta as interpreted herewith. The other element comes from the headwaters of the Smoky River and belongs to the P. nivea group.

At the varietal rank, var. dissecta has priority over var. divisa.

17. P. quinquefolia Rydb. (P. Hookeriana AA.; P. nivea L. var. Hookeriana AA., var. pentaphylla Lehman.) -- A small tufted perennial, 1-3 dm high, with digitate leaves, all with 5 pinnate leaflets or some of them with only 3 leaflets, green above, white-tomentose below. Early summer. Dry hills and sandy Pine woods. -- Y, Man-SC, US.

Not always clearly distinct from the following.

18. P. nivea L. var. nivex (var. incisa Turcz., var. lapponica C. & S., var. macrophylla Ser., var. Chamaissonis (Hulten) Hilt., var. Hookeriana (Lehm.) Hilt.; P. Ladobouriana Fors.; P. uniflora Led.; P. Valhiana Lehman.) -- A low, densely tufted perennial, often forming cushions. Stems short, usually about 1 dm high, few flowered to single-flowered. Leaflets 3, rarely 5, green above, white-tomentose below, the pubescence otherwise quite variable in kind and density. Leaflet margin serrate to incised. Flowers relatively large and showy. Mid summer. Alpine and arctic or subarctic prairies. -- 3-Aka, (L-SP), Q, nMan-nwS-swAlta-BC, US, Eur -- Var. villosa (Pallas) Regel & Tiling (P. villosa
Pallas, var. parviflora C.L. Hitchc.) -- A coarse and densely villous extreme of the preceding. Leaflets thick, veiny and densely villous above, coarsely serrate, the tomentum often yellow-tinted below. Bractlets most often ovate, varying to lanceolate. Rocky outcrops in the mountains: Mt. Signal. -- Y-Aka, Alt-TN, (US, Eur) -- Var. pulchella (Br.) Durand (P. pulchella Br.; P. rubricaulis Lehm.) -- Coarser, the leaves trifoliolate or mostly short pinnate with 5 large leaflets which are coarsely and deeply few-lobed. Basal leaves with rather large brown stipules, often up to 2-5 cm long. Dry arctic gravels and sands. -- G-Mack-(Y-Aka), L-TN, nQ-nMan, (Eur).

Often subdivided into a series of some 12 microspecies or varieties. The morphological discontinuity is weak or nonexistent in all cases and the geographical segregation does not always conform to published distributions or maps. At least the above 3 varieties appear to be sufficiently distinct to warrant taxonomic recognition.

19. P. flabellifolia Hooker var. flabellifolia -- Perennial, very loosely tufted, about 2 dm high, green throughout and nearly glabrous or slightly puberulent. Leaves ternate, with usually only 1 stem leaf. Leaflets obovate, incised, glabrous to ciliate to lightly villous along the nerves. Petals around 1 cm long. All summer. Moist alpine meadows. -- (Alta)-BC, wUS -- Var. emarginata (Pursh) Boivin (P. emarginata Pursh; P. hyparctica Malte var. elatior (Abrom.) Fern.) -- More densely villous, the hairs forming white tufts at the end of the teeth. Usually smaller, about 1 dm high and more densely tufted. Often suggesting a green phase of P. nivea. -- G-K-(Mack-Y)-Aka, L, Q, swAlta-BC, (Eur).

20. P. ARGENTEA L. -- Perennial and often depressed, quite leafy and white-woolly throughout, except the upper face of the leaflets. Leaves digitate, ± incised. Flowers numerous and small in a diffuse cyme. Petals 2-5 cm long, not exceeding the calyx. All summer, Roadsides, footpaths and other trampled places. -- NF-SPM, NS-S, BC, US, Eur.


A rare extreme of variation, var. labradorica (Lehm.) Fern., with the stem glabrous or nearly so, is sporadic in North America.
It may possibly be somewhat more frequent in Ungava and Labrador.


We fail to detect any character of generic value between *Potentilla* and *Sibbaldia*. The latter, like the average *Potentilla*, has a calycitate calyx, yellow petals, stamens in variable number, usually 5 or a multiple of 5, and carpels similarly varying in number, mostly in multiples of 5. Key characters commonly used to separate *Sibbaldia* have been found to be quite unrealistic.

25. *E. anserina* L. var. *Anserina* (Argentina *Anserina* (L.) Rydb.) -- Silverweed (Argentine, Richette) -- Stemless and spreading by long superficial stolons rooting at the nodes. Leaves tailed, lyrate-pinnate, up to 3 dm long. Leaflets of two sizes, the larger 1 alternating with the smaller, green above, white tomentose below. Flower solitary on a long scape. Bractlets ± ovate and tomentose dorsally, often coarsely toothed. Late spring to mid summer. Open moist places. -- G, K-Aka, L-Scn, N-Aka, NS, Eur. -- *H. argentea* (Hayne) Hayek (*E. pratincola* Boivin; *Argentina argentea* Rydb.) -- Leaflets grayish or whitish tomentose above. -- (3), Mack-Y, (NF, No), Q-(C)-Man-BC, US, Eur. -- Var. *yukonensis* (Hultén) Boivin (*E. yukonensis* Hultén) -- Calyx with the bractlets usually entire, lanceolate, nearly glabrous and often slightly longer than the calyx lobes. Leaflets often broader, ± ovate, and more deeply incised. Shores of rivers and large lakes. -- Mack-Aka, Man-Alta, US -- Var. *greenlandica* Tratt. (F. egriii Worsn. var. *greenlandica* (Tratt.) Pol.) -- Much smaller and essentially glabrous except for the lower faces of the leaflets. Leaves usually shorter, mostly less than 1 dm long. Leaflets 1-2 cm long, the smaller ones very small and few or even lacking. Arctic and subarctic shores. -- G-Mack, L-Sc, N-Mack, N-Alta, N-Aka.

All these forms and varieties are linked by more or less nearer us intermediates.

12. CHAMOMILE Sunne

As in *Potentilla*, but the calyx simple, being devoid of bractlets. Stamens only 5.
1. **G. erecta** (L.) huds var. *peritiflora* (Hatt.) 3.1. Hitchc. (*G. lutatii* (T. & J.) Ricker) -- Biennial, glandular and more or less pubescent. Stem solitary, usually simple, 1-4 dm high. Basal leaves trinervate, the lobes linear-oblong, 1 mm wide or less. Stem leaves gradually smaller and less divided. Petals white, about 2.5 mm long. Mid-spring to mid-summer. Arid hillsides and rocky or sandy places. - SWY, San-SC, US.

Barely distinguishable from the Siberian var. erecta. The latter often has longer peduncles and the sepals are usually somewhat narrower.

13. **AVENS**

Like Potentilla, but the styles longer, persistent and elongating in fruit, becoming either plumose or hooked and catchy.

a. Stem leaves 1, opposite ............... 4. **G. trilobum**

aa. Leaves alternate.

b. Calyx lobes erect, generally purple tinged, petals yellow to purple, persistent ........ 3. **G. rivale**

bb. Lobes green, reflexed at anthesis, petals yellow, deciduous.

c. Upper stem-leaves not quite trifoliate, merely tripartite; lower internode of the mature style 1.5 cm long, finely glandular .................. 2. **G. pericinum**

do. Upper stem-leaves trifoliate; lower internode 5-6 cm long, not glandular .......................... 1. **G. aleppicum**


The American plants are often segregated as a New World variety or species under a name, *J. strictum*, which is an illegitimate name and preoccupied by the European *J. aleppicum*. A substitute name was prepared in 1919 and used extensively in herbarium sheets but was never actually published because the reputed distinctive characters proved to be too elusive.

All herbarium sheets contained a variety of *J. aleppicum* and *J. pericinum* sheets mistakenly as *J. macronyllum*. This is not due to the lack of distinctiveness between the three species, but most current floras emphasize a rather weak and inconsistent basal leaf difference, hence the current confusion.

Most obviously, in *J. macronyllum* the upper stem leaves are trilobal (typical) or trifid (var. *Kikutai Fan.*), and the leaves are squarrose (typ.) to broadly oblong-ovate (var. *s.*), in our
two prairie species for leaves are always trilobate (i.e.,) or divided almost to the base (pinnate) and the leaves much narrower. Taking into account this character and also leaf-shape, pubescence of the inflorescence, calyx and achene, etc., I. macropyllum has been reduced out of our area.

1. J. macropyllum f. pinnatum (J. pubescens A.) -- Hybrid of J. pinnatum, which is similar to J. pubescens but not readily distinguishable from it. Leaves somewhat broader and with more rounded teeth, as in J. aberration. Local: Bowdoin, Slope River. -- Alberta (A.).

The Ferntree report of J. pubescens A. for Alberta is apparently based on species 217, Bowdoin River, 1977 (J. A.), which is also the only known sheet of J. pubescens in our area. In Flora only the hybrid J. macropyllum f. pubescens f. pinnatum, one of its parents is absent from our area.

2. J. macropyllum A. var. intermedius (J. macropyllum A. var. intermedius (A.)) -- Named similar to the preceding, it is smaller, with smaller leaves, much smaller, and in a smaller head. Lower stem leaves not quite trilobate, nearly trilobate. Flowers, semi-open, 15-17 mm. long, 13-11 mm wide. Lower internode of the style 1-2 mm. long, 2-1 mm. wide, not obscure. Late spring and early summer. Not a prairie species any more. -- Alberta, 1987. -- Var. macropyllum var. pubescens B. -- Boivin -- flowers and slightly bigger, 15-17 mm. long, the lower internode about 2 mm. long. Lower stem leaves almost: less divided, with only 4-5 leaves. Boivin, Coteau. -- sec.

Var. intermedius var. n. Folia caulina stipulis 1-3 cm. longa, emarginata dentatis val intermediae superius intermissis. Folia caulina inferiora majora 1-7 cm. Oblonga et lobis unguem, 1-6 mm longis, 1-6 mm lat. Type: A. J. Breitung, Cypress Hills Park, wet meadow, occasional, July 8, 1961 (DA).

2X. J. pubescens B. -- Hybrid of J. pinnatum and var. intermedius var. intermedius. Upper stem leaves trilobate. Calyx lobes reflexed, 1-1.5 mm. purplish, dorsally, petals golden yellow, purplish-tinted, deciduous. Lower internode of the style 1-2 mm. long. Wet meadows in the Cypress Hills. -- sec.

Var. n. Folia caulina stipulis 1-3 cm. longis, dentatis val intermediae superius intermissis. Folia caulina inferiora majora 1-7 cm. Oblonga et lobis unguem, 1-6 mm longis, 1-6 mm lat. Type: A. J. Breitung, Cypress Hills Park, wet meadow, occasional, July 8, 1961 (DA).

3. J. pubescens B. -- Chocolate-root (Herbe a la tache) -- Large nodding flower, showy mainly because of the persistent dark reddish calyx. Erect perennial 40 cm. high. Leaves lyrate, the upper smaller to simple. Calyx lobes erect at anthesis, often becoming reflexed in fruit. Petals maroon, pale yellow with purple marking, emarginate, flatelliform, included. Lower style inter-

1. D. triflorum Pursh var. triflorum (Sieversia triflora (Pursh) Br.) -- Three Sisters, Old Man's Whiskers -- One of the common and showy spring flowers: 3 purple flowers nodding on long peduncles. Leaves pinnate, mostly basal. Stem leaves 2, opposite. Calyx purple, persistent. Petals 10-11 mm long, yellow and purple. Fruiting heads also very showy because of the persistent plumose styles elongating to 2.5-3.0 cm. Mid spring. Prairies. -- SMack, 0-BC, US -- F. pallida, Fassett -- Flowers yellowish or greenish. Cypress Hills. -- sec. (US) -- Var. ciliatum (Pursh) Fassett -- Petals shorter, usually included or nearly so. Upper style internode usually deciduous. Waterton. -- (Alta)-BC, US.

We are not yet fully convinced of the value of var. ciliatum.

1. DRYAS L.

Petals more than 5, usually about 6-16, and the calyx lobes about as numerous. Low semiwood with creeping woody stems forming carpets, large solitary terminal flowers and conspicuous fruiting heads because of the elongating plumose styles.

1. D. octopetala bb. Flowers white; leaves truncate to coriaceous

2. D. octopetala L. var. hoekeringii (Juz.) Breitung -- (Chêneau, Chênette) -- Forming small dense mats. Leaves oblanceolate, coarsely crenate, truncate to subcoriaceous at base, strongly rugose above, white-tomentose below with brown glands on the nerves as on the petioles. Calyx white-tomentose and black-hairy, the lobes lanceolate. Petals white. Mid summer. High alpine on rock outcrops. -- Mack-Aka, Alta-BC, nWSoS.

Leaves glabular and often black punctate on the upper face in our variety, while the more northern var. octopetala is glandular only on the lower face.

3. D. integrifolia Vahl (var. salvatica Hultén) -- Leaves entire, triangular-lanceolate, truncate at base, smooth above, white-tomentose below. Calyx sparingly tomentose, the lobes narrowly lanceolate. Petals white. First half of summer. Forming a dense carpet in arctic or alpine prairies. -- l-SoK, l-SP,
At lower altitudes, such as gravel flats of braided glacial outlets, this plant becomes naturally taller, the leaves larger and less revolute (= var. sylvatica). Undoubtedly an ecological form.

Tribe 5. POTERIEAE

Fruit structure as in the Rosaceae, but the pistils much reduced in number (less than 5) and maturing into achenes. Herbs.

15. AGRIMONY L.

1. A. striata Mx. -- Perennial herb with pinnate leaves of large leaflets alternating with very small ones. Flowers small, yellow, in an elongated spiciform raceme, with 3-cleft bracts. Fruit reflexed and deeply furrowed below the ring of bristles. Before mid-summer. Aspen groves. -- NF, NS-BC, Us.

Tribe 6. ROSACEAE

Receptacle very much enlarged with a bottle-shaped cavity lined by the numerous dry carpels. Styles free and more or less protruding through the mouth of the cavity. This inferior-like ovary matures into a fleshy pome-like fruit called a hip. Shrubs, nearly always very spiny.

16. ROSE L.

Flower a typical Rose, with 5 large, and mostly pink, free petals, borne on usually very spiny shrubs. The genus is characterized by its hips, as described above. There are two main types of spines; acicules are straight, thin and abruptly passing into a thin flat base; prickles are stronger and gradually thickened into a conical base.

a. Stems and branches uniformly covered throughout with acicules of very unequal size ........................................... 1. R. acicularis

aa. Gradually less spiny above.

b. Stem simple, flowering the first year, dying back to near the ground every year ...................................... 4. R. arkansana

bb. Sterile the first year, flowering on plants 2 year or older and 2 branched.

c. Branches and upper half of the stem unarmed. Stipules not glandular-ciliate ....................... 2. R. blanda

c. Acicules or prickles present on the branches.

d. Small, few-flowered, weakly
acicular, less than 5 dm high ........................................ 3. R. alcea
dd. Taller, at least some pairs of prickles present.
e. Mostly flowering the second year; prickles neither
flattened nor recurved ........... 5. R. woodsii
ee. Mostly flowering the third year; main axis with numerous
strongly flattened prickles;
branches mostly with recurved
infrastipular prickles ........... 6. R. terrens

1. R. acicularis Lindley var. macrostigma Crépin -- (Eglantier) -- A forest species densely and uniformly covered with
acicules on stem and branches. Mostly 1 m high. Acicules
straight, the longest 5-10 times longer than the smallest ones.
Stipules glandular-ciliate. Peduncles glabrous and unarmed.
Early summer. Common throughout in nearly all kinds of forests.
Range. -- (3).

The eurasian var. acicularis is reputed to differ from our
plant by its glandular peduncles.

2. R. blanda Aiton var. blanda -- (Rosier sauvage, Eglantier) -- Unarmed or nearly so on the branches and upper part of
the stem, but densely acicular below. Stipules not glandular-
ciliate, but entire or serrate, each tooth with a large red gland
at tip. Flowering from the second year. Early summer, the first
to flower. Edge of woods, mostly near large rivers. -- Mack, NB-
Man, US -- F. alba (Schuette) Fern. -- Flowers white. Otterburne
-- Man, (US).

Leaflets and stipules puberulent dorsally. In var. glabra
Crépin the herbage is entirely glabrous or nearly so. The latter
occurs mainly on the shores of the Great Lakes and of the larger
eastern rivers, but it has also been collected at Aigle on the
MacKenzie and may be expected to turn up eventually in the north-
ern part of our area.

In 1955 we could not find at NY any specimen which could be
tied to a report by Rydberg 1913, 1932 of R. subblanda Rydb.
(= R. blanda var. glabra) from Manitoba. This was not the only
case where a report by Rydberg could not be correlated with a
justifying specimen at NY.

3. R. alcea Greene -- Prairie Rose -- A small weak species
usually half hidden in the prairie vegetation. Stem rather thin,
1-5 dm high, branching little, with numerous weak acicules becoming
less dense above. Stipules glandular-ciliate. Flowers few,
often only one. Flowering for a few years, starting the second
one. First half of summer. Prairies and steppes, very common.
-- Nan-Alta, (Va).

4. R. argillacea Porter (var. suffulta (Greene) Cockerill; R. suffulta Greene) -- Prairie Rose -- Stem short, 1-5 dm, simple
and flowering the first summer, killed back by frost every winter.
Acicules abundant. Leaflets mostly 9. Flowers in a large terminal corymb, pink in bud, usually opening white. Last to flower: mid summer or a little earlier. Open places, mostly on sandy soil. -- Tex.-Ok. -- F. plana Lewis -- Flowers a little, Woodruff. -- (3).

There is some doubt as to the precise application of R. aridiflora and R. woodsii. Hence some authors prefer to use R. sylvestris F. and R. penduliflora respectively.

5. R. penduliflora Lindley (R. penduliflora Crepin; R. Macounii Greene) -- Prairie-rose -- Well armed with both acicules and prickles, less densely so above. The branches often bearing only infrastipular prickles. Stipules not glandular-ciliate. Fruit smallest, 1-10 mm across. First year shoot simple and sterile, branching and flowering the second year, often continuing to flower for a few years. Early summer. Edge of woods and prairies, common. -- (Wask-aka, O-nar) -- Alta.--150 (Lav. Turner) Laviv -- Ivery and fruit bristly. -- Alta. (15).

The typical form is glabrous and rare, but widespread. The more common phenotype is more or less pubescent and glandular, it is often distinguished as var. Penduliflora (Crep) Rydb. Taller individuals may reach 2 m and may be named var. ultramontana (Watson) Jepsen. Neither phenotype appears to be taxonomically significant.

Reports from east of Saskatchewan remain to be confirmed. All Ontario and Manitoba specimens at DA were revised to other species. The Val d'Or, Quebec (CA; DA, photo) collection was an especially heavily acicule specimen of R. blanda.

6. R. terronsi Linell (R. Woodsii Lindley var. Terrons (Lunell) Breitung) -- Much like the preceding but the first year shoot densely armed with acicules mixed with large flat prickles. Flowering very little the second year, but putting out long flagelliform branches armed with mostly recurved infrastipular prickles. Flowering abundantly in the early summer of the third year, the flowers mostly solitary and borne on short lateral branches. Usually dying after the third year. Mostly in the low bush along the water-courses in the dryer parts of the prairie. -- S, (US).

Macoun 1896 reports Rosa nutkana Presl from southwestern Alberta but this was never confirmed and the original specimen was not located. No Alberta collection could be found under that name at DA, E.T.O., etc., when we visited these herbaria. Possibly the original specimen has been revised to something else. There are a number of other similarly questionable reports in Macoun; most of them were ignored by later authors, but a few were repeated by others and some are still repeated in modern floras despite the apparent lack of herbarium justification.

Tribe 7. PRUNAE

Fruit a plum or a cherry, that is a fleshy fruit containing a single large seed.
17. PRÚNUS L.

PLUM, CHERRY

Carpel solitary with a terminal style. Calyx with 5 lobes.

Shrubs or trees with white flowers.

a. Flowers in elongated racemes .............. l. P. virgíniána

aa. Flowers solitary or in fascicles.

b. Petiole densely pubescent ventrally ..... 4. P. américa

bb. Petiole glabrous.

c. Leaves serrate from the middle, entire below ...................................... 3. P. pumíla

cc. Leaves serrate throughout ............ 2. P. pensylvánica

1. P. virgíniána L. (var. melanoçárpa (Nelson) Sarg.; P. melanoçárpa (Nelson) Rydb.) -- Choke-Cherry (Cerisier) -- Densely colonial shrub 1-5 m high with long racemes of white flowers followed by racemes of edible fruits. Leaves obovate, serrate, of two sizes, those of the flowering shoots only half as large as those of the leading shoots. Petals white, about 3 mm long, suborbicular. Fruit a globular cherry about 8 mm across, at first red purple, becoming nearly black at maturity, edible, sweet and delicious, but with a heavy after-choke. Late spring. Open woods, margin of bluffs, hillsides, etc., and quite common. -- swMack, NF-SPH, NS-BC, US -- E. xánthocárpa Sarg. -- Fruit whitish or yellowish at maturity. -- NS-(Q), S, (US).

Usually divided into an eastern var. virginiana, a western var. melanoçárpa and a Pacific Coast var. demíssá (Nutt.) Torrey based respectively on size of shrub, colour of fruit and pubescence of lower face of leaves. The colour of the cherry darkens as it matures and the pubescent phase var. demíssá (or better f. Deamíi G.H. Jones) is a rare variant sporadic in our range and elsewhere, while the height of the shrub is quite commonly 2-3 meters throughout the range. The occurrence of the odd small tree in some sheltered and undisturbed spot does not alter substantially the size picture of this shrub. Small trees are rare and we do not remember seeing any taller than 6 m in the east, although there are reports of up to 15 m for the eastern phase.

2. P. pensylvánica L. f. var. pensylvánica -- Pin Cherry (Cerisier) -- Varying from a stoloniferous shrub to a small tree up to 7-8 m high. Foliage glabrous and somewhat sticky when young. Leaves ovate to lanceolate, glabrous, glandular-serrate. Flowers white, numerous and showy, appearing with the leaves, in fascicles of 2-5 at the end of short or long shoots. Fruit a small clear-red cherry, edible, rather acid, 5-7 mm across. All spring. Open and semi-open habitats. -- swMack, L-SPH, NS-BC, US, -- Var. sáxímontana Rehder -- Leaves more or less pubescent and/or the inflorescence ± racemose. -- Waterton and Pigeon Lake. wAlta-BC, US.

Var. sáxímontana is a highly variable type and gives the impression of being a series of generation segregates and backcrosses from a possible hybrid of var. pensylvánica with the Pacific Coast var. mollis (Douglas) Boivin. The modern distribution of the 3 entities shows only a slight overlap of ranges.

PRÚNUS 70
with var. saximontana occurring mainly from the Rocky Mountain Trench to the east slopes of the Cascades, essentially filling the distribution gap between the other two taxa. The opportunity for hybridizing is nil for var. mollis with var. pensylvanica and only marginal for either with var. saximontana. There seems to be little doubt that the latter is now a population of its own and best treated as an interfertile variety rather than a complexion of hybrids.

1. E. pensylvanica Bailey; E. nana DiRoi -- Sand-Cherry. (Syn.: var. pensylvanica Bailey) -- A low shrub, often simulating a willow when sterile. Deciduous or creeping, more rarely sucker when shaded, 5 or high or less. Foliate glabrous. Leaves 3-7 cm. long, narrowly oblong to oblanceolate, paler to subalbic inflorescence, brownish at base. Flowers white, appearing with the leaves, or last year's wood. Fruit a cherry up to 1.5 cm. across, deciduous, dark purple, edible, often, but not always, sweet and tasty, sometimes chalky. Late spring. Sandy soils.

Proposed segregates of E. pensylvanica appear to be mainly growth forms ecologically conditioned (E. nana) or stages of maturity (E. pensylvanica).

2. E. americana March, var. americana -- Elm, Wild Plum (Syn.: var. occidentalis). -- Large semi-evergreen. Branchlets brown, pubescent, leaf and cluster 0.25-0.33 cm. long. Leaves ovate-oblong, abruptly acuminate, serrate. Teeth in 5-7 number but finely acuminate. Flower petals united to the base, fruit 2-3 cm. long, at first yellow, turning orange or red, edible, delicious. Late spring. Often with grass and shrubs or in clearings. -- swQ-sea, 63, (3A) -- Var. piana (Ait.) March (E. piana Ait.) -- Leaves with rounded teeth, entire; a large gland which becomes dark red later in the season. -- sw, Posey, 65.

The subdivision of E. americana into two species is not a convincing as it is part of the name where the fruit colour appears to be a stage of maturity rather than a taxonomic character. We have not had the opportunity to observe this character in the east in a good crop year.

The difference in leaf serration is real and sharp, but its meaning is weak, for the types have a rather broad area of overlapping. The leaf shape difference is as weak and indefinite as to be hardly worth mentioning.

16. LEGUMINOSAE (PULS. FAMILY)

Sтаllia papilionacea, of free pods, the calyx united; stems usually 1, one of which is free while the others are curled together by their filaments. Carrot solitary. Mostly leaves with compound leaves.

a. Plants climbing ..................................... Group A
aa. Non-climbing.

b. Leaflets entire.

c. Leaves pinnate ..................................... Group B

LEOPRINOSAE
cc. Leaves trifoliate or digitate, rarely simple ................................ Group C
bb. Leaflets denticulate or serrate .................. Group D

Group A
Herbs climbing by tendrils or by their twining stem.

a. Stem twining; leaves trifoliate.
   b. Calyx subtended by 2 bracts ...... 22. Phaseolus, p. 104
aa. Climbing by tendrils; leaves mostly with an even number of leaflets.
   c. Calyx lobes much longer than the tube, much dilated and rather foliaceous... 21. Pisum, p. 104
   cc. Calyx lobes narrow and shorter.
   d. Keel abruptly bent upwards around the upper third .............. 20. Lathyrus, p. 102
   dd. Keel straight, merely a little incurved at the tip ............. 19. Vicia, p. 101

Group B
Non-climbers, with pinnate leaves and entire leaflets.

a. Shrubs.
   b. Leaves even-pinnae .............. 11. Caragana, p. 84
   bb. Leaves odd-pinnae .............. 9. Amorpha, p. 82
   aa. Herbs.
   c. Stamens 5; flowers in compact terminal cylindric racemes .............. 10. Petalostemon, p. 83
   cc. Stamens 10; racemes axillary and usually loose.
   d. Stemless ...................... 13. Oxytropis, p. 95
   dd. Stem well developed.
   e. Flowers in a lax, globose head, or solitary.
   f. Inflorescence subtended by a bract, or the flower solitary .............. 7. Lotus, p. 80
   ff. No bract under the head...
   ee. Inflorescence elongate.
   g. Fruit catchy, by hooked prickles .............. 14. Glycyrrhiza, p. 99
   gg. Fruit not catchy.
   h. The legume constricted into a chain of articles which disarticulate at maturity ......... 16. Hedysarum, p. 100
   hh. Legume obviously a single unit.
   i. Legume sulcate dorsally or not
sulcate .......12. Astragalus, p. 84

ii. Legume sulcate
ventrally. One species of...

13. Oxytropis, p. 95

Group C
Non-climbers with trifoliate or digitate leaves, except
onally reduced to a single leaflet. Leaflets entire.

a. Stemless ................. 12. Astragalus, p. 84
aa. Stem well developed.

b. Flowers solitary or in small axillary
heads ......................... 7. Lotus, p. 80
bb. Flowers in terminal racemes.

c. Leaves all digitate ........... 2. Lupinus, p. 74
cc. Leaves all or in part trifoliate.

d. Leaves part trifoliate, part
5-foliate ..................... 8. Psoralea, p. 81
dd. Leaves all trifoliate.

e. Terminal leaflet clearly
petiolulate ........... 17. Desmodium, p. 101
ee. All leaflets sessile.

f. Leaflets conspicuously
dark punctate, narrowly
oblanceolate ....... 3. Psoralea, p. 81
ff. Leaflets not punctate
and much wider... 1. Thermopsis, p. 73

Group D
Non-climbers, the leaflets dentate or serrate.

aa. Leaves trifoliate.

b. Inflorescence contracted into a dense
head; flowers marcescent ........ 6. Trifolium, p. 79
bb. Flowers in loose to dense racemes,
the petals mostly deciduous.

c. Fruit straight ............... 5. Melilotus, p. 78
cc. Fruit strongly asymmetrical to
spirally twisted.

1. Thermopsis Br.
Stamen 10, all free. The legume very flat and curved.

1. T. rhombifolia (Pursh) Rich. -- Golden Bean, Bush-Pea
-- Very showy in late spring, forming patches of yellow flowers
in the prairie. Perennial stoloniferous herb 1-4 dm high,
bearing only one raceme. Leaves trifoliolate, the leaflets va-
riable, mostly obovate, entire. Flowers 2 cm long, yellow, in a terminal raceme. Legume 5-12 cm long, mostly semi-circular. Second half of spring. Common, specially on light soils. -- Man-Alta-(BC), US.

The name is often credited to Nuttall ex Pursh, but this seems to be an unwarranted assumption as Pursh gives no credit to Nuttall, neither for the name, nor for the diagnosis.

2. LUPINUS L. LUPINE

Calyx bilobed; leaf digitate; stamens 10, fused in a single group by their filaments; anthers dimorphous, alternately oblong and globular.

a. Annual, less than 2 dm high ............... 5. L. pusillus
aa. Perennials, mostly taller.
   b. Legume 3-5 cm long; flowers mostly 12-16 mm long.
   c. Larger leaflets 6-10 cm long and acute at tip ............... 1. L. polyphyllus
   cc. Shorter and rounded at tip ....... 2. L. nootkatensis
   bb. Shorter, the legumes 1.5-2.5-3.0 cm long and the flowers mostly 8-12 mm long.
   d. Leaflets glabrous to more or less strigose above ................ 3. L. argenteus
   dd. Densely strigose to sericeous or velvety ....................... 4. L. sericeus

1. L. polyphyllus Lindley -- Leaflets longest and the lower and basal leaves with petioles 3-6 times longer than their leaflets. Mostly 5-10 dm high. Herbage glabrous to hirsute, the hairs usually yellowish but the leaflets always glabrous above. Flowers blue, in a single terminal raceme. First half of summer. Moister open sites in the mountains. -- Aka, NF-SPM, NS-0, swAlta-BC, US, Eur.

Eastern reports are based on escapes from cultivation, not natural disjunctions.

2. L. nootkatensis Donn -- Generally smaller than the first and only 2-5 dm high, the petioles less than twice as long as the leaflets, the latter oblanceolate and rounded at tip. Herbage densely long villous. Early summer. Lush wet meadows towards timberline. -- sAka, (NF), whS, swAlta-BC.

Reports for the U.S.A. are questionable. All U.S. specimens so-called that we have examined proved to belong to other species. Eastern Canadian occurrences represent escapes from cultivation.

3. L. argenteus Pursh var. argenteus (f. albilorus Boivin, var. argyrophyllus AA., var. Macounii (Rydb.) Davis) -- Tufted perennial 3-5 dm high. Petioles about as long as the leaflets. Leaflets 6-9, narrowly oblanceolate to oblong, usually conduplicate, less pubescent above than below. Flowers normally blue, in a terminal raceme. Standard usually glabrous dorsally. Legume yellowish-silky. Early to mid summer. Table-THERMOPSIS
lands and hillsides. -- swMan-swAlta, US.

Adventive at Melita, indigenous from Rockglen westward.

A white-flowered form is sporadic. The type of the species was such an albino. Three other varieties of lower stature or smaller flowers also occur in the western U.S.A.

Usually subdivided in an endless series of minor segregates of doubtful value. The following L. sericeus may be distinguished as a pubescence extreme.

L. parviflorus Nutt. has recently been reported by Dunn 1967 as widespread across western Canada, a distribution map showing 2 localities in southern Saskatchewan. Both specimens mapped and annotated (DAO) are at hand and they fail to exhibit the smaller flowers in a denser raceme, the shorter petioles, and other distinguishing features from L. argenteus. The same dot map carries no dot to match his Alberta report, no specimen cited, no precise locality stated, and we have not encountered any Alberta specimen under that name.

L. alpestris Nelson is here reckoned as a synonym of L. argenteus, but in a recent treatment by Dunn 1967 it is presented as a putative hybrid of L. argenteus × L. caudatus Kell., with 3 mapped localities in Canada. All 3 localities are outside the range of both parents. Two of the mapped specimens are at hand (DAO); the Melita sheet has been returned to L. argenteus while the Waterton collection has been revised to L. sericeus. Correct disposition of the other sheet has not yet been ascertained.

L. sericeus Pursh var. sericeus (L. flexuosus Lindley; L. lepidus A.) -- Similar, the whole plant more densely pubescent; the leaflets densely striose to sericeous or velvety above. Lower petioles longer, 2-3 times as long as their leaflets. Flower blue, the standard usually densely pubescent dorsally. First half of summer. Foothill and montane prairies. -- swAlta-swBC, US -- F. leucanthus Boivin -- Flowers white. --

F. leucanthus f.m., petals albis. Type: Boivin & Alex Montagne de Lait, 10 milles au sud ouest de Milk River, 25 juin 1952 (DAO). Not to be confused with var. asotinensis (Phillips) J.L. Hitchc., also white-flowered, but the standard less pubescent.

In our var. sericeus the hairs hardly ever exceed 1 mm, while in southwestern Yukon a var. Kuschei (Eastwood) Boivin is normally clothed with hairs up to 1-3 mm long.

A distribution map by Phillips 1955 carries 2 dots in southeastern B.C., 6 across southern Alberta, and 2 in southwestern Saskatchewan. However, the text on page 168 includes only Alberta and B.C. in the range, which leads one to suspect that the Saskatchewan dots may be so many lapsus calami. One may also note that the dots on this and other maps in the same paper are more or less equidistant, a rather improbable type of plant distribution.

At least some of the specimens previously reported as L. lepidus Douglas or L. minimus Douglas have since been revised
to L. sericeus. However it may be that at least one collection from Waterton (CAN) may prove to belong to L. lepidus.

L. leucophyllus Douglas was reported for Alberta and B.C. by Phillips 1933 by means of an equidistant-dotted map. See comment above. Some Alberta specimens (DAO) originally identified as L. leucophyllus have since been revised to L. sericeus. A more recent report by Dunn 1967 from Lumby, B.C., has not been investigated.

5. L. pusillus Pursh var. pusillus (L. Kinii AA.) -- Erect annual, 2-6 dm high or less, densely velvety throughout, often much branched. Leaflets 3-7 entire, narrowly oblanceolate to linear. Flowers in few-flowered terminal racemes. Corolla white, tinted blue upwards. Legume velvety. Late spring to early summer. Loose sands. -- SW-O-Alta, US.

J.M. Macoun 1895 also reports L. arcticus Watson for Medicine Hat. This is undoubtedly based on a misidentification but we have not succeeded in locating the corresponding specimen, at CAN, HUH or elsewhere.

An Alberta report of L. leucopsis Agardh by Budd 1957 was based on material (SW; DAO, photo) now revised in part to L. sericeus and partly to L. polypyllus.

3. TRIGONELLA L.

Much like Melilotus, but the legume asymmetrical and dehiscent. Petals more or less marcescent over the young fruit.

1. T. COERULEA (L.) Ser. -- Sweet Trefoil (Mélilot bleu) -- Similar to Medicago sativa, but the legume nearly straight. Annual, glabrous or nearly so. Flowers in short dense axillary racemes borne on a long peduncle. Corolla sky-blue to violet. Legume ± 7 mm long, semi-ovate to nearly sigmoid. Summer and fall. Locally adventive in crops and around gardens. -- O-3C, (Eur)

4. MEDICAGO L.

MEDICK

Similar to Melilotus, but the indehiscent legume falcate to spirally coiled.

a. Annual with small yellow flowers ............

aa. Perennials.
b. Fruit spiny; flowers yellow, about

1 mm long ........................................ 1. M. lupulina

bb. Not spiny; flowers larger.
c. Fruit falcate; flowers yellow ...........

cc. Fruit spirally coiled; flower colour variable ........................ 1. M. sativa

1. M. SATIVA L. -- Alfalfa, Lucerne (Luzerne, Lente) -- Legume small, coiled into a tight spiral. Diffuse-branchy perennial about 1 m high. Leaflets finely serrate above the middle. Flowers in tight axillary racemes. Corolla 7-10 mm long, of variable colour, nearly always blue or violet tinted. All
1. M. ALBA L. -- Alba Medick (Luzerne alba) -- Yellow flowers, leaves sometimes turning blue in drying. -- Q, Kan-Alta

2. M. FALCATA L. var. FALCATA -- Yellow Lucerne, Sickle-Alba (Luzerne lanceolata) -- Very much like the preceding but the flowers always yellow and the leaves merely falcate. Leaflets finely serrate near the tip. Corolla 6-8 mm long. All summer. An occasional escape, especially along roadsides. -- (Aka), Q-B, (CA), Sun.

3. M. LUPULINA L. (var. glanulosa Heilreich) -- Black Medick, Honckeny (Luzerne triquetra) -- Legume small, black and spirally coiled at the tip. Annual or biennial with decumbent or prostrate stems, 1-4 dm long. Flower yellow, 2-3 cm long. Legume ovate, strongly angulicrural. All summer. An intrinsically introduced of grassy places along roads, rivers, etc. -- (A), (Aka), F-SP, CO-SD, TN, (CA, SA), Sun, Mt.

4. M. HISPIDA Gaertner (M. polymorpha A.) -- Bur Clover (Luzerne punaise) -- Pod spirally coiled and bent marginally, with an outward ring of hooked spines. Flower 1.5-4.5 cm long, yellow. Spines about 1-1.5 cm long. All summer. A rare weed. -- Spalding, -- (Aka), Q, B, 33, 50, 56, Sun.

5. M. polymorpha L., Sp. Pl. 2:777. 1753 fell into disuse more than a century ago as each of the original elements of this entity ceased to be known by a name of its own. In 1894, in 1955 it was correctly pointed out the binomial name should be typified and restored for one of the original elements. The name was subsequently restored but not typified by one of the original elements, it was instead typified by a later accretion, a variety L., published eight years later in Hortus Plantarum. The reason for this procedure was apparently to avoid a typification that would coincide with any of the varieties originally named by Linnaeus; the rationale behind this self-imposed restriction not being made clear. The restriction is, at least in this case, inconsistent with the long accepted principle of priority in nomenclature.

Since Linnaeus had subdivided M. polymorpha in 13 varieties and provided names for each one, including the alpha variety, it would seem unavoidable that M. polymorpha be typified in the sense of one of the original binomial varieties, if this species is to be typified by one of its original elements. Typification by a later accretion is unacceptable.

There is some variation in the binomial technique of designating varieties. Most of the time the existence of an alpha variety is merely implied by Linnaeus and only the other varieties are expressly dealt with. There seems to be no doubt that this was the procedure followed by Linnaeus; witness the various cases (p. 60, 61, etc.) where no alpha variety is published as such, yet is discussed in the notes. The other varieties, however, designated by consecutive Greek letter starting with S. A few
trivia" is often appended to the Greek letter, or else the variety is merely individualized by its diagnosis. Once in a while the alpha variety was also designated by its own Greek letter or even decorated also with a non trivial. The latter was the situation under M. polymorpha in its place of original publication.

Now it is fairly obvious from perusal of the Species Plantarum that Linnaeus generally intended the alpha variety to be the main phase of a species. Exceptions are few and are mainly discussed by Sprague 1955 and Stern 1957. Unless it can be demonstrated that M. polymorpha is one of the exceptions, we are of the opinion that it should be typified in the sense of its alpha variety. On that basis, the relevant synonymy for the two main taxa concerned is as follows.


There are two syntypes in the Linnaean Herbarium, sheets 933.11 and 933.15, both bearing large mature legumes.


Both species are cultivated in Canada, both occur as infrequent casual escapes.


5. MELilotus Miller

Herbs with trifoliate leaves and similar to Trifolium, but the flowers in elongate racemes. Legume straight, indehiscent.

a. Flowers 2-4 mm long; calyx lobes deltoid to triangular.
   b. Pedicel 2-3 times longer than the calyx... 3. M. wolga
   bb. Somewhat shorter than the calyx .......... b. M. indica
   aa. Larger, 4-7 mm long; calyx lobes narrower, lanceolate to linear.
   c. Flowers yellow ......................... 1. M. officinalis
   cc. Flowers white .............................. 2. M. alba

1. M. OFFICINALIS (L.) Lam. var. OFFICINALIS -- Yellow Sweet Clover (Trèfle d’odeur jaune) -- Biennial, branchy, about 1 m high. Flowers 4.5-7.0 mm long, yellow, drooping in long racemes. Legume black. All summer. Cultivated and frequently escaped, usually found with the following and quite distinct when fresh, although the flowers may fade in drying. -- N'ack-Aka, NF, NS-BC, US, Eur.

Many varieties are recognized in the Old World, such as a var. maximus (Langr.) O.E. Schulz with longer flowers and fruits, a var. micranthus O.E. Schulz with smaller flowers and fruits, etc.

2. M. ALBA Desr. var. ALBA -- White Sweet Clover (Trèfle MEDICAGO

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d'odeur blanc) -- Very much like the preceding. Taller, up to 2.5 m high. Flowers white. Legume brownish. Summer. A common escape, especially in evidence along new road- sides, where it is sometimes seeded in. -- (G), Mack-Y-(Aka), L-SPK, NS-BC, US, (CA), Eur.

Still taller is var. arborescens Castagne from western Asia which may reach a height of 6 m.

3. M. WOLGICA Poiret -- Pedicels longest, commonly about as long as the flower, the latter 2.5-4.0 mm long. Calyx 1.0-1.5 mm long, its lobes short and narrowly to broadly deltoid. Corolla white. First half of summer. Rare escape from experimental plots: Brandon. -- Man, (Eur).

4. M. INDICA (L.) All. -- Somewhat smaller than the first, with smaller flowers. Pedicels less than 1 mm long. Fruit ovoid, strongly verrucose with very sinuous nerves. First half of summer. Sometimes cultivated and a rare weed of cultivated or waste land: Brandon. -- NS, Man, BC, Eur, (Afr).

6. TRIFOLIUM L. CLOVER

The herb with the typical trifoliate leaves. Leaflets dentate. Inflorescence condensed into a pseudo-head. Corolla marcescent. The keel and wings usually more or less fused together.

a. Head subtended by an involucre of two trifoliate leaves ........................................ 5. T. pratense
aa. No involucre.

b. Flower yellow.

c. Central leaflet with a petiolule 1.5-4.0 mm long, at least twice as long as those of the lateral leaflets ............ 1. T. pratense
cc. All leaflets equally subsessile ..... 2. T. agrarium
bb. White to purple.

d. More or less erect and very branchy ..

................................. 3. T. hybridum

dd. Creeping, the stems branching near the base only ........................................ 4. T. repens

1. T. PROCONS L. -- Quite similar to the next, but annual and the stipules ovate, less than 1 cm long. Flower 3.5-4.5 mm long. Summer. Weed: Souris. -- (Aka, NS-BC)-Man, BC, US, Eur, (Afr).

All mentions of T. pratense for Saskatchewan are based on Breitung's collection at Bannock (DAO). This has been revised to T. agrarium and is the only collection of the latter for the province.

2. T. AGRAERUM L. -- Yeo Clover (Trèfle jaune) -- Erect or nearly so, 1-1.5 dm high, tufted, biennial, hispid. Stipules lanceolate, 1 cm long or more. Leaflets oblanceolate, 1.0-1.5 cm long. Flowers yellow, 5-6 mm long, marcescent, becoming brown and reflexed. Early summer. Cultivated and rarely escaped around farm buildings, etc.: Bannock, Coleman. -- (Aka, L)-NF-SPK, NS-0, S-(Alta)-BC, US, Eur.

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3. T. HYALIDUM L. -- Alsike (Trèfle Alsike) -- Erect or nearly so, 1-4 dm high, tufted, biennial or perennial, puberulent. Upper stem leaves all subtending either a branch or an inflorescence. Flowers more or less pinkish, pendent after anthesis. Late spring to end of summer. Cultivated and frequently escaped along roadsides, etc. -- (Mack)-Y-Aka, L-(NF)-SPM, NS-BC, US, Eur -- F. PROLIFERUM Dore -- Floral parts replaced by a mass of small scales. Known from Beaverlodge. -- (Q-3, Alta-BC) -- F. ALLIOIDES Dore -- Also a local form, has a mis-shaped corolla that remains included in the calyx and never opens: Sylvania. -- S.

4. T. REPENS L. var. REPENS -- White Clover (Trèfle blanc) -- The leaflets carry near the base a very obvious white marking shaped like a \( \lambda \). Perennial, creeping and rooting at the nodes. Shoots of the year floriferous but simple, the branches arising only the following year. Inflorescence globular, borne on a long erect peduncle. Flowers white to pinkish, drooping after anthesis. Late spring and summer. Often grown in lawns and escaping to wetterish places, ditches, roadsides, waste lots, etc. --G, Mack-Aka, L-SPM, NS-BC, US, Eur.

Some European authors will distinguish a number of varietal segregates, such as a much smaller var. alpinum Schur, a spreading-pubescent var. alpestre Gussone, and many others.

5. T. PRATENSE L. -- Red Clover, Honeysuckle-Clover (Trèfle rouge) -- The heads are subtended by usually two large trifoliate bracts, nearly as large as the leaves. Perennial, hispid, tufted, decumbent to more or less erect, 3-6 dm high. All upper stem leaves subtend either a branch or an inflorescence. Leaflets marked above by a pale green or purple \( \lambda \). Flowers red to purple, remaining erect. Calyx teeth very long and spinescent after anthesis. Late spring and summer. An infrequent escape along fences, etc. -- (G), Y-Aka, L-NF-(SPM), NS-BC, US, Eur -- F. LEUCOCRASUM Asch. & Prahl -- Flowers white. --Q, Man.

7. LOTUS L.

Anther filaments dilated towards the summit. Trifoliate and the flowers in heads as in Trifolium, but the leaflets entire and the heads few-flowered or even reduced to a single flower. Inflorescence subtended by a bract. Legume dehiscent.

a. Flowers solitary .............................. 3. L. Purshianus
aa. In small heads.

bb. Larger, 2.5-4.0 mm long; leaflets typically larger .............................. 2. L. pedunculatus

1. L. CORNICULATUS L. -- Birdsfoot-Trefoil (Patte d'oiseau) -- Leaf pinnate with 5 leaflets, two of which are borne near the stem and resemble a pair of large stipules at the base of a trifoliate leaf. Tufted, branchy perennial 2-6 dm high. Leaflets 3-10 mm long. Inflorescence a few-flowered head, axillary on a long peduncle, the bract subtending the head small and simple to trifoliate. Corolla two-toned: pale and brownish yellow. Legu-
nearly so, 1-3 dm high, tufted, biennial or perennial, puberulent. Upper stem leaves all subtending either a branch or an inflorescence. Flowers more or less pinkish, pendent after anthesis. Late spring to end of summer. Cultivated and frequently escaped along roadsides, etc.-- (Mack)-Y-Aka, L-(WF)-SPM, NS-BC, US, Eur -- F. PROLIFERUM Dore -- Floral parts replaced by a mass of small scales. Known from Beaverlodge.-- (Q-0, Alta-BC) -- F. ALLIOIDES Dore -- Also a local form, has a mis-shaped corolla that remains included in the calyx and never opens: Sylvania.

1. T. REPENS L. var. REPENS -- White Clover (Trèfle blanc)
   -- The leaflets carry near the base a very obvious white marking shaped like a \(\Lambda\) (= lambda). Perennial, creeping and rooting at the nodes. Shoots of the year floriferous but simple, the branches arising only the following year. Inflorescence globose, borne on a long erect peduncle. Flowers white to pinkish, drooping after anthesis. Late spring and summer. Often grown in lawns and escaping to wetish places, ditches, roadsides, waste lots, etc. -- G, Mack-Aka, L-SPM, NS-BC, US, Eur.
   Some European authors will distinguish a number of varietal segregates, such as a much smaller var. Alpinum Schur, a spreading-pubescent var. alpestre Gussone, and many others.

5. T. PRATENSE L. -- Red Clover, Honeysuckle-Clover (Trèfle rouge) -- The heads are subtended by usually two large trifoliolate bracts, nearly as large as the leaves. Perennial, hispid, tufted, decumbent to more or less erect, 3-6 dm high. All upper stem leaves subtend either a branch or an inflorescence. Leaflets marked above by a pale green or purple \(\Lambda\). Flowers red to purple, remaining erect. Calyx teeth very long and spinescent after anthesis. Late spring and summer. An infrequent escape along fences, etc.-- (G), Y-Aka, L-WP-(SPM), NS-BC, US, Eur -- F. LEUCOCRACUM Asch. & Fahl -- Flowers white. --Q, Man.

7. LOTUS L.
   Anther filaments dilated towards the summit. Trifoliate and the flowers in heads as in Trifolium, but the leaflets entire and the heads few-flowered or even reduced to a single flower. Inflorescence subtended by a bract. Legume dehiscent.

   a. Flowers solitary ...................... 3. L. Purshianus
      aa. In small heads,
      b. Calyx lobes 1.5-2.0-(2.5) mm long.... 1. L. corniculatus
         bb. Larger, 2.5-4.0 mm long; leaflets
              typically larger ............... 2. L. pedunculatus

1. L. CORNICULATUS L. -- Birdsfoot-Trefoil (Patte d'oieau)
   -- Leaf pinnate with 5 leaflets, two of which are borne near the stem and resemble a pair of large stipules at the base of a trifoliolate leaf. Tufted, branchy perennial 2-6 dm high. Leaflets 3-10 mm long. Inflorescence a few-flowered head, axillary on a long peduncle, the bract subtending the head small and simple to trifoliolate. Corolla two-toned: pale and brownish yellow. Legu-
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me 2-4 cm long. Summer. An infrequent escape of waste places, etc. -- MB-SPM, MB-Man, Alta-62, US, (Eur).

The only record for Saskatchewan, Blue Jay 1967. Sept. 1967 was based on Wagner & Ledingham, July, Regina, roadside ditch, plant over several square yards, July 17, 1964 (NY; DA, photo). It has since been revised to L. pedunculatus and is the only record of the latter for our area.

2. L. P. 


Highly variable south of the border and many debatable segregates have been proposed, but more recent floras have taken to dealing with this species sensu amplissimo. While this may be a justifiable procedure for the U.S. material, the Canadian specimens clearly fall into a pair of readily recognizable entities with good morphology and a wide geographical discontinuity. These may be defined as follows:

L. Purshianus -- Leaves all trifoliate, peduncle much longer than the flowers; mostly one-stemmed.

L. unifoliatum (Bongr.) Benth. -- Branch leaves mostly unifoliolate; peduncle shorter than the flower; mostly many-stemmed. Southeastern B.C.

8. PSORALEA L.

Anthers alternately dimidiate. Legume indehiscent, one-seeded. Leaves trifoliolate to digitate, usually punctate.

a. Leaves all trifoliolate -------------------- 1. P. lanceolata

aa. Some leaves digitate.

b. Silver; and silky appressed-pubescent -------------------- 2. P. argophylla

bb. Long spreading; hisurate ---------------------- 3. P. esculenta

1. P. lanceolata Pursh var. lanceolata (Psoraliium lanceolatum (Pursh) Rydb.) -- Sour-Sea -- Finely punctate throughout in brownish black. Long stolones sand binder. Leaves trifoliolate. Leaflets narrowly oblanceolate, entire, glabrous above. Inflorescence small, axillary. Corolla small, white, with a large blue dot on the keel. Legume 4-6 mm long, coarsely rugose-punctate. All summer. Dry sands. -- sw6-seAlta, US.

Ours have the legumes pilose with hairs 0.5-1.0 mm long. Specimens from the more western parts of the U.S. range exhibit legumes more densely pilose and the hairs more uniformly 1.0 mm.
long; these are barely distinguishable as var. Purshii (Vail) Piper.

2. *P. argophylla* Pursh (Psoralidium argophyllum (Pursh) Rydb.) -- The whole plant silvery-shiny in the sun, being densely appressed silky. Tap root thickened, weakly linked to the erect stem. The fine, dark green punctuation hidden under the pubescence. Main leaves with 5 leaflets, the other trifoliate. Leaflets oblong to oblanceolate, entire. Flowers small, in an interrupted spike. Corolla blue, drying brown. Summer. Steppes and hillsides. -- sMan-alta, US.

3. *P. esculenta* Nutt. (Pediomelum esculentum (Pursh) Rydb.) -- Cree-Turnip, Breadroot (Navet de prairie, Pomme de prairie, Pomme blanche) -- Very long villous throughout, not punctate. Taproot thin and fragile in the upper 5-10 cm, thickened below into an oblong, starchy, edible tuber. Leaves all or mostly with 5 leaflets, these oblanceolate, glabrous above. Flowers in a dense raceme, pale blue with a dark blue spot. Legume enclosed in the long calyx. Mid spring to mid summer. Hillsides, especially along coulees. -- sMan-Alta, US.

9. *AMORPHA L.* FALSE INDIGO

Corolla reduced to a single petal, the 10 stamens fused at the base only. Leaves pinnate, punctate. Leaflets stipellulate.

a. Densely short villous, often grayish ....... 1. *A. canescens*

aa. Glabrous to sparsely pubescent.

b. Leaflets 1 cm long or less ................. 2. *A. nana*

bb. Obviously longer .................... 3. *A. fruticosa*

1. *A. canescens* Pursh -- Leadplant, Shoestrings -- The year's shoots numerous, herbaceous, mostly simple, arising from a shrubby base. Leaf almost sessile. Leaflets crowded and very numerous, mostly 30-50, oblong, entire, about 1 cm long, much paler below. Flowers dark purple. Pod small, canescent. Mid summer. Dry hills, mostly on sandy or rocky ground. -- wO-sMan, US.

2. *A. nana* Nutt. (A. microphylla Pursh) -- Shoestrings, False Indigo -- Branched shrub less than 1 m high. Leaflets quite numerous, oblong, light green on both sides, conspicuously glandular-punctate below and glabrous or nearly so. Pod small, glabrous, strongly glandular-punctate. First half of summer. Hilly prairies, mostly on the Prairie Coteau. -- sMan, US.


In the more eastern var., *fruticosa* the pubescence of the younger parts is of spreading and somewhat longer hairs.
10. PETALOSTEMON Mx.  PRAIRIE CLOVER

Stamens only 5, alternating with the 4 petaloid staminodes and the lone petal. Flowers in very compact terminal racemes, looking much like a cylindrical to globular head. Leaves pinnate, punctate. Pod small, indehiscent.

a. Leaflets 11-13 ......................... 1. P. villosum
aa. Leaflets fewer, 3-7.

b. Flower violet-pink ...................... 2. P. purpureum
bb. Flower white .......................... 3. P. candidum

1. P. villosum Nutt. -- The large fleshy taproot like a red-brick carrot. Tufted perennial densely soft villous all over. Leaflets 0.5-1.0 cm long, black-punctate dorsally. Raceme 2-6 cm long. Calyx long villous, neither glandular nor punctate. Flowers pink. After mid-summer. Sandy blowouts. -- swMan-scS, US.


Var. purpureum is native in our area but adventive in Ontario at Inglis and possibly also at Pt. Edward.

3. P. candidum (W.) Mx. (var. oligophyllum (Torrey) Herman, var. occidentale Gray; P. occidentale (Gray) Fern.; P. oligophyllum (Torrey) Rydb.) -- White Prairie-Clover, White Tassel-Flower -- Much like the preceding and usually growing with it, but white-flowered. Stems and foliage glabrous. Leaflets 5-7, with dark-green spots on the back. Calyx with a ring of 10 or more large brown glands. Mid summer. Dry places, usually on hillsides. -- wO-sAlta, US.

Willdenow's publication precedes Michaux' by one year, hence the author reference used above. See Article 30 of the International Code of Botanical Nomenclature for the relevant dates of publication. Now this change of authorship should not affect the application of the name as Willdenow's type is presumably a duplicate of Michaux's collection.

Many authors will distinguish a more western var. oligophyllum (or var. occidentale). Sometimes treated as a distinct species, in which case the correct name is P. virgatum Nees because...
earlier. However we have not been able to distinguish clearly among our Canadian material a more western var. oligophyllum characterized by larger leaflets, longer peduncle, longer bracts, pubescent calyx, etc.

The various morphological types have the same range in our area and the intermediates are numerous. The primary character of calyx pubescence showed about 1/5 of intermediates and the remainder of the material from Manitoba eastward was about equally divided between the two types of pubescence while the more western material showed a preponderance of pubescent caliccs. Other characters were even less clearly segregated geographically and were not particularly linked together. Obviously all we can detect here is a difference in relative frequency of characters and it is not possible to detect a geographically restricted type unless one is willing to shift the emphasis now to one character, now to another, in accordance with the place of origin of the specimen and a preconceived distributional pattern. Our U.S. material is too limited and we can not confidently state that our observations are equally applicable south of the border.

11. CARAGANA Lam.

Shrubs with paripinnate leaves, that is the terminal leaflet is lacking and the rachis merely ends into a spiny point.

1. C. AREBRESCENS Lam.— CARAGANA (CARAGANA, Arbre aux pois) — Stoloniferous shrubs, usually 1-2 m high. Stipules somewhat spinescent. Flowers yellow, few, borne on the short shoots. Legume pendent. Mid spring. Much planted, persistent and more or less spreading by roots and perhaps also by seeds. — (Y), Q, Man-Alta-(BC), Eur.

12. ASTRAGALUS L.  

MILK-VETCH

A generalized type of Leguminosae. Perennial herbs with pinnate leaves and entire leaflets. Flowers papilionaceous with fused sepals and free petals. Stamens in two groups, one stamen being free, the other 9 fused by their filaments. Flowers in axillary racemes. Leaflets usually not punctate. Stem usually well developed.

a. Stemless or the stem short and poorly developed, usually less than 1 dm long, no longer than the peduncle of the inflorescence .................. Group A

aa. Stem well developed, usually more than 1 dm long,

b. Inflorescence very compact, almost in the manner of a Trifolium .................. Group B

bb. Inflorescence looser and more elongate, often secund.

c. Flowers small, 4-10 mm long ............... Group C

c. Flowers longer.

d. Flowers very long, 15-30 mm long .................. Group D

d. Flowers middle-sized .................. Group E
Note also that species 1-17 have unilocular legumes while 18 to 28 have a false partition and are more or less bilocular.

**Group A**

Stemless or the stem poorly developed, commonly no longer than the peduncles, and mostly less than 1 dm long.

Not to be confused with *Oxytropis* which has the leaves pinnate and the leaflets slightly asymmetrical at base.

- a. Not more than 3 leaflets.
  - b. Trifoliate .......................... 16. *A. gilviflorus*
    - bb. Leaf reduced to a single leaflet .... 12. *A. spathulatus*
  - aa. Leaves pinnate.
  - c. Flowers yellow, with or without a purple patch on the keel.
    - d. Flowers 8-9 mm long .............. 5. *A. lotiflorus*
      - dd. Flowers 20-25 mm long .......... 15. "Purshii"
  - cc. Whitish to mauve or purple.
  - e. Flowers 11-20 mm long .......... 11. *A. missouriensis*
  - ee. Obviously smaller.
    - f. "Varv" and fruit glabrous to lightly white strigose .............. 3. "Miser"
    - ff. Densely black pubescent.
      - g. Inflorescence dense at flowering time, elongating in fruit ......... 12. *A. algirus*
      - gg. Inflorescence clinate at flowering time .......... 9. *A. bourgii*

**Group B**

Flowers in compact heads, almost like a *Trifolium*.

- a. Tufted ................................. 27. *A. adsurgens*
  - aa. Finely stoloniferous .................. 26. *A. danicus*

**Group C**

Flowers small, 4-10 mm long; stem well developed.

- a. Leaflets sharp pointed and spinescent ... 11. *A. Kentrophyta*
  - aa. Leaflets not spinescent.
  - b. Raceme on a short peduncle, 1-2 cm long .............. 11. *A. vexilliflexus*
    - bb. Peduncle much longer.
    - c. Calyx teeth broadly deltoid and 0.5 mm long ............. 2. *A. americanus*
      - cc. Calyx teeth much narrower and longer.
    - d. Peduncle short, much shorter than its raceme ............ 7. *A. tenellus*
      - dd. Peduncle about as long as to much longer than its raceme.
    - e. Leaflets numerous, mostly
in 8-15 pairs.

f. Pubescence white ........ 6. A. flexuosus

ff. Black pubescent in the
inflorescence.

g. 4-15 dm high ........ 2h. A. falcatus

gg. Smaller, 3 dm high
or less ............ 18. A. alpinus

ee. Leaflets fewer, mostly in
4-9 pairs.

h. Stems weak, decumbent .... 3. A. sodinii

hh. Stems ascending to erect.

i. Stipules not fully
encircling the
stem .............. 19. A. eucosmus

ii. Lower stipules fully
encircling the stem
and ± fused together
on the other side of
the stem.

j. Remotely flowered ... 6. A. miser

jj. Flowers closely
imbricated at flower-
ing time.

k. Flowers borne on
pedicels 3-4 mm
long ...... 21. A. Robbinsii

kk. Pedicels shorter,
less than 3 mm
long ....... 20. A. aboriginum

Group D
Flowers large, 15-30 mm long. Stems well developed.

a. Leaves narrowly pectinate, the segments 2 mm
wide or less ......................... 13. A. pectinatus

aa. Leaves obviously pinnate.

b. Stem stiffly long-hirsute ........ 22. A. Drummondii

bb. Pubescence shorter and more or less
appressed.

c. Calyx more or less black-pubescent ..

................. 29. A. crassicarpus

cc. Entirely white-pubescent ........ 23. A. racemosus

Group E
Flowers middle-size; stem well developed.

a. Flowers white to yellow.

b. Flowers remote ......................... 6. A. miser

bb. Densely flowered.

c. Flowers yellow, ascending .......... 26. A. Cicero

cc. Flowers white to lightly greenish.

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d. Calyx teeth broadly deltoid and
  ✴ 0.5 mm long .......................... 2. A. americanus

dd. Longer and narrower.
  e. Stipules broad-based, short-
    connate on the other side of
    the stem ............................ 25. A. canadensis
  ee. Narrow-based and free from
    one another ........................ h. A. neglectus

aa. Flowers pink to purple.
  f. Standard very wide, almost orbicular .... 1. A. iochrous

ff. Narrow, the flower ± lanceolate.
  g. Leaflets all or mostly linear and
    2 mm wide or less ........................ 8. A. miser

gg. Leaflets wider.
  h. Most or all leaves with 15
    leaflets or less ........................ 21. A. Robbinsii

hh. Mostly 15 or more leaflets.
  i. Pod sulcate, black hairy .... 18. A. alpinus

ii. Bisulcate and white

The key above stresses the flowers. The text below stresses
the very characteristic fruits.

1. A. IOC~OU S Barneby (Swainsona salsula (Pallas) Taub.)
   -- Pod inflated and very large, very long stipitate. Coarse,
   tufted and long stoloniferous, the stems 1-2 dm long. Racemes
   elongate, loosely flowered. Pedicels rather long. Flowers about
   brick red, fading purple, with a very widely spreading standard.
   Legume glabrous, ovate, about 2 cm long, the stipe about twice
   as long as the calyx. All summer. Saline shores: Maple Creek.

   Sometimes placed in the Australian genus Swainsonia, some-
   times in the monotypic Sphaerophysa. The latter differs from
   Astragalus merely by a few more hairs on the style and one is
   tempted to say that the similarities to Astragalus greatly out-
   weigh the difference.

2. A. americanus (Hooker) M.E. Jones (A. frigidus (L.)
   Gray var. americanus (Hooker) Watson; Phaca americana (Hooker)
   Rydb.) -- With large pendulous pods, inflated and lanceolate.
   Stem erect, about 1 m high and mostly solitary, sometimes stolo-
   niferous. Stipules rather large. Flowers white, descendent.
   Calyx with very low teeth, glabrous or nearly so. Legume pale
   green, glabrous, about 2 cm long, thin walled, the stipe nearly
   twice as long as the calyx. First half of summer. Aspen groves
   and forest margins. -- Mack-Aka, Q-BC, US.

3. A. Bedini Sheldon var. yukonis (M.E. Jones) Boivin (A.
   yukonis M.E. Jones) -- The pod small, 0.5-10 mm long ellipsoid,
   strigose, sessile, asymmetrical. Tap root with a more or less
   buried crown, branching into a very large number of weak decum-
   bent stems, often forming circular mats about 1 m across. Raceme
   few-flowered on a very long peduncle. Corolla mauve to blue.
First half of summer. Grassy places, especially disturbed places. — Mack-Aka, NF, nMan, nAlta.

Stat. n., A. yukonis B. Jones, Rev. N. Am. Sp. Astr. 69. 1923. Our variety has a more elongate and much laxer inflorescence than the more southern typical phase.

The rather large apparent distributional gap across the central part of our area is presumably an artifact resulting from insufficient collecting across northern Saskatchewan.

Macoun 1883 reports A. microstis Gray for Saskatchewan on the basis of an 1875 collection from the Weyheye River. No such collection has been located and under that name we have found only the following: Macoun 4200, West of North Saskatchewan River, grassy slopes, Aug. 22, 1873 (CAN; DAC, photo). However, the latter has been revised to A. Bodinii var. yukonis.


Has been reported for northeastern Alberta by Raup 1936. At least his collection 7056 has been revised to A. Bodinii var. yukonis.

The correct name of this entity has given some trouble in the past. Astragalus neglectus (T. & G.) Sheldon 1891: is based on Phaca neglecta T. & G. 1838. The latter is in no way affected by the existence of an earlier Astragalus neglectus Fischer ex Steudel, Nom., ed. 2: 162.1840 since the latter is a nomen nudum. The case of Astragalus neglectus Freyn 1893 and of A. neglectus (Freyn) Freyn 1895 has been recently discussed by Barneby 1961; the first is an inadmissible form, being a binomial to designate a subspecies, while the second is illegitimate as a later homonym. There seems to be no reason to take up A. Cooperi Gray 1856.

5. A. lotiflorus Hooker (Batiophaca lotiflora (Hooker) Rydb.) — Tufted, the stems very short, 1–3 cm long, with the fruits mostly born among the leaf bases, or some of them on a scape. Plant and pods quite pilose or strigose. Raceme short. Flowers yellow, small. Pod sessile, broadly lanceolate. Mid spring. Gravelly or sandy hillsides. — swMan-BC, US.

Despite numerous Manitoba reports and many collections under that name, the Treesbank specimens proved to be the only collection east of Regina to be correctly identified. To be searched for along the Assiniboine from Craven east to Brandon.

6. A. flexuosus (Hooker) Douglas var. flexuosus (Pisophaca flexuosa (Hooker) Rydb.) — Pod cylindrical, 1–16 mm long, spreading to drooping, straight to falcate, finely pubescent. Tufted plant, gray pubescent. Stems 2–7 dm long. Racemes somewhat scented, the flowers distant. Corolla white to light purple. Early summer. Steppe, especially on light soils. — swMan-sBC, US.

Native in our area. Probably introduced at Cranbrook which is the only known locality west of us.

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Legumes mostly 3-9 mm thick. A more southern variety, var. Greenei (Gray) Barneby has somewhat inflated pods, 5-9 mm thick.

7. *Astragalus* Pursh var. tendelius (Homalobus tendelius (Pursh) Britton) -- Pod flat, purple-blotted and usually drying back. The whole plant tener to dry black. Stems 2-7 dm high. Racemes somewhat lax and secund. Flowers white, often with a large purplish patch. Legume 5-15 mm long, oblong to oblong-lanceolate, glabrous. Late spring to mid summer. Hillsides and shores. -- sMack-may, Man-BC, US.

The more southern var. striculosus (Rydberg) Hermann has a strigose ovary and legume, and a flower more consistently small, being 6-7 mm long.

8. *Astragalus* Douglas var. miser -- Flat, drooping pods about 2 cm long. Tufted and the stems very variable in length. Foliage rather thin, the leaflets mostly linear and mostly less than 2 cm wide, strigose on both faces. Flowers distant, white to pale rose or pale blue. Late spring to mid summer. Dry open slopes at low altitude in the Rockies, rare: Waterton. -- Alta-seBC, (US); -- Var. serotinus (Gray) Barneby (A. decumbens Nutt.) Gray var. serotinus (Gray) M.E. Jones; A. serotinus Gray) -- Leaflets glabrous above. Flowers somewhat smaller, the calyx 2-4 mm long; and the keel 6-8 mm long. More common: Rockies. -- Alta-seBC, WUS.

9. *Astragalus* Bourgoynei Gray -- Pods flat, black-strigose and unilocular, otherwise much like *A. alpinus* and easily confused with it. Also, more densely tufted and less densely flowered. Stems 1-2 dm high. Leaflets finely strigose. Fruiting racemes more or less secund, the pods spreading to drooping. Legume lanceolate, 1.5-2.0 cm long, short stipitate, the stipe shorter than the calyx tube. Up to mid summer. Alpine prairie. -- Alta-seBC, US.

10. *Astragalus* Kentrophyna (Kentrophyna montana Nutt.) -- Quite spine-like because of the stiff leaflets ending in a sharp point. Half-buried in loose sand and spreading from a central tap root. Densely strigose, the stem whitish. Stipules connate and forming obvious sheaths 1-2 mm long. Leaves small, mostly with 7 leaflets and sparsely dotted, the dots green to brown. Inflorescence rather small, on a short peduncle. Flowers few, 1-5 mm long, often with a purple patch. Legume 5-6 mm long, slightly compressed, narrowly ovoid. Late spring to mid summer. Loose sands. -- sw-Salta, US.

A number of varieties occur further south, of which one may mention var. elatus Watson, a more or less erect plant with more acuminate leaves.

11. *Astragalus* vexilliflexus Sheldon var. vexilliflexus (Homalobus vexilliflexus (Sheldon) Rydberg) -- Much like the preceding and similarly small, the leaves small, with few leaflets, the flowers and fruits also small. But the flowers bluish and the foliage soft. Stems 2 dm high or less, densely tufted, but not buried. Mid spring to mid summer. Eroded badlands. -- sw-sAlta-seBC, WUS.

Leaflets glabrous above. In central Idaho there is a var. rubilus Barneby with leaflets strigose or velvety above.

12. *Astragalus* spathulatus Sheldon (A. caespitosus (Nutt.) Gray;
Homalobus caespitosus Nutt.) -- Leaf reduced to a single leaflet. Stemless and forming dense convex cushions. Whitish-silky. Leaflets 1-3 cm long, linear. Scapes 3-8 cm high, few flowered. Flower purple, 6-7 mm long. Legume about 1 cm long, flattened, lanceolate, ascending. Mid spring. Badlands. -- sw5-Alta, US.

The name is usually written as spatulatus, but this form would seem to be more in accord with English usage. Spathulus is the correct Latin spelling.

13. A. pectinatus (Hooker) Douglas (Cheutidophacos pectinatus (Hooker) Ryd.) -- Leaf narrowly pectinate rather than pinnate, the remote segments mostly 1-2 mm wide and 2-5 cm long. Stems 2-5 dm long, half decumbent. Flowers 1.5-2.5 cm long, creamy yellow and quite showy. Legume 1-2 cm long, ellipsoid, becoming woody and with prominent sutures. Second half of spring. Steppes and hillsides. -- swMan-sAlta, US.

A. missouriensis Nutt. var. missouriensis (Xylophacos missouriensis (Nutt.) Ryd.) -- A short-stemmed species with rather large and deeply coloured flowers. The tufted stems 1-10 cm long. Hairs malpighiaceous. Leaflets grayish silky on both faces. Raceme compact in flower, elongating in fruit. Flowers 3.5-20 mm long, magenta to purple-blue. Calyx 5-11 mm long, including the teeth. Legume 2-3 cm long, chestnut brown, more or less sulcate ventrally. Spring and early summer. Dry prairies. -- swMan-sAlta, US.

Varies further south to a var. amphibolus Barneby with falcate legumes and to a var. minites Barneby with shorter flowers.

15. A. Purshii Douglas var. Purshii -- The pods whitish lanate with a very dense and very long tomentum. In small tufts and stemless, the whole plant densely villous. Flowers few, large, yellow with keel purple-tipped. Legume 1.5-2.0 cm long, ovoid, curved, somewhat sulcate ventrally. Early spring. Steppes on dry hills: Climax, Manyberries. -- sw5-sBC, US.

Flower very small, 2-3 mm long, yellow with a purple-tipped keel. Not too clearly distinct from the more western var. glaucescens (Douglas) Barneby with purplish flowers only 1.0-2.5 mm long.

16. A. gilviflorus Sheldon (A. triphyllus Pursh; Crophaca caespitosa (Nutt.) Britton) -- Leaves trifoliate. Stemless, caespitose, forming small dense cushions, silvery-silky throughout. Leaflets 1-3 cm long, oblanceolate. Racemes reduced to 1-2 flowers, subsessile among the leaf bases. Flowers 1.5-3.0 cm long, yellow, purplish on the keel. Legume small, white-lanate, more or less hidden in the calyx. Early spring. Eroded hillsides and very showy when in flower. -- (Man)-S-Alta, US.

The Manitoba reports are questionable. The records for Reston and Ladytown have yet to be traced to correctly named specimens. The East Crossing of the Souris River is a North Dakota locality (Woodend) at the mouth of the Willow River.

17. A. bisulcatus (Hooker) Gray var. bisulcatus (Diholcos bisulcus (Hooker) Ryd.) -- Skunk-Weed -- Pod deeply bisulcate ventrally. Malodorous, tufted, 2-7 dm high, finely striate.
Flowers 11-15 mm long, numerous, in dense racemes, magenta, fading blue, stinking of old urine. Legume 10-15 mm long, pendent, cylindrical, stribose, short-stipitate. Late spring to mid summer. Rolling prairies and steppes, often on saline or selenic soils. -- Shan-Alta, US -- F. albiflorus Boivin. Flowers white, local. -- S.


In the southwestern U.S.A. one may find two more varieties with shorter corolla and standard: var. Haydenianus (Gray) Barneby and var. nevadensis (M.E. Jones) Barneby.

18. A. alpinus L. var. alpinus (Atelephragma alpinum (L.) Ryd.) -- Pod black hairy, deeply sulcate dorsally. Tufted and stoloniferous from a deeply buried tap root, and forming loose patches. Stems thin, very short to 4 dm high. Leaflets glabrous to hirsute. Inflorescence black-stribose throughout, long-rebudded, secnd, few-flowered, at first dense, elongating in fruit. Calyx tube 2.5-3.5 mm long. Flowers 9-13 mm long, mauve, drying blue, the keel longer than the wings. Legume stipitate, exert, pendent, straight or falcate. Late spring. Alpine prairies, river gravels and disturbed soils. -- (G)-F-Aka. L-(NF), 2-nV-n-ne5-WAlta-BC, US, Eur -- Var. Brunetianus Fern. (var. labradoricus (DC.) Fern.) -- Calyx tube only 2.0-2.5 mm long. River gravels. -- 1-NF, 32-HC, US.

Habitually similar to Oxytropis deflexa var. capitata. The varieties distinguished herewith are defined differently from other current treatments; the resulting distributions are also different. Barneby 1967 places the accent on the stribose pubescence of the calyx. The resulting distribution for var. Brunetianus is much more restricted: NF, WHB-sq, noUS; but then Barneby admits that the distinction is not always very clear and that quite a few Rocky Mountain sheets must be identified with due regard to their place of collection. We are not very happy with varieties for which the place of origin tends to become a taxonomic character.

We consider that an individualized distribution is normally a resulting characteristic of a sound taxon at the level of variety or above. It results from the taxon having enjoyed an independent history on a geological time scale. A population having become isolated by genetic or geographical or other barriers, it will pursue an independent evolution until it may become phenotypically recognizable. Simultaneously the range of this taxon will also evolve independently, now expanding here, now retracting there, until it offers a pattern unlikely to be duplicated by any of its close relatives.

However an individualized distribution and a place of origin are not taxonomic characters per se. Any taxon in which the place of origin plays too large a role in identification is likely to prove to be of little taxonomic value, if not purely arbitrary.

19. A. eucosmus Rob. var. eucosmus (Atelephragma elegans ASTRAGALUS
(Hooker) Rydb. -- Ovoid pods drooping, black-pubescent. Somewhat similar to the foregoing. Tufted, 3-5 dm high. Leaves mostly with 13-15 leaflets. Inflorescence black-pubescent. Flowers 6-7 mm long, purplish. Legume 7-10 mm long, not sulcate, slightly falcate, sessile and usually rupturing the calyx at maturity. Late June. River gravels and sands on shores and bluffs. -- F-Aka, L-NF, NB-BC, US -- F. Leucocarpus Lepage -- Pods and calyces with the pubescence entirely white. -- (Aka, Q)-O, S-BC.

The more eastern var. Fernaldii (Rydb.) stat. n., Atelophragma Fernaldii Rydb., Bull. Torr. Bot. Club 55:126. 1928; Astragalus Fernaldii (Rydb.) H.F. Lewis, Can. Field Nat. 46:36. 1932, differs by its slightly larger and short stipitate legume, the stipe 1-3 mm long, the body of the legume 10-15 mm long. This variety is fairly nearly intermediate to A. Robbinsi.

In such a case of intermediate variety, it seems generally preferable to attach it to the species of coincident range. Because the intermediate type is much more likely to be derived from the species near at hand than from the more remote one. Further, any problem of distinctiveness and identification is much more likely to involve the near at hand species rather than the remote one.

20. A. aboriginum Rich. var. aboriginum (A. aboriginorum sphenalate; Atelophragma aboriginorum (Rich.) Rydb.) -- Long-stipitate, semi-lanceolate legume. Tufted, 2-4 dm high. Stem densely and finely hirsute, the hairs spreading. Leaves mostly with 9-11 leaflets, these 1-3 cm long, elliptic-lanceolate to linear-lanceolate, hirsute on both faces. Inflorescence at first dense, somewhat elongating. Flowers 7-10 mm long, creamy white to purplish on the keel and standard, drying bluish. Legume strongly flattened, straight to falcate, often slightly sulcate dorsally, the body glabrous to white-pubescent, 1.5-2.2 mm long, the stipe about twice as long as the calyx. Late spring. Open, sandy or gravelly places. -- S-Mack-Aka, seQ, Man-AC, US -- Var. major Gray (var. glabriusculus (Hooker) Rydb.; A. linearis (Rydb.) Pors.) -- Less densely pubescent to nearly glabrous, the pubescence appressed. -- Y-Aka, wO, sMan-AC, US.

This is a much subdivided species. None of the proposed segregates seems to present sufficient morphological discontinuity to warrant specific rank. The better defined phenotypes may be recognized as varieties as follows.

a. Stem hirsute.
   b. Flowers 6-10 mm long ...................... var. aboriginum
      bb. Larger, 10-15 mm long, and more deeply coloured, mostly pink to purplish, usually turnin
         bluish in drying ............................. var. Richardsonii
      aa. Pubescence stribose and usually less abundant.
   c. Flowers 6-10 mm long ............................ var. major
      cc. Larger, 10-14 mm long ........................ var. Lepagei

Var. Lepagei (Hultén) stat. n., A. Lepagei Hultén, Fl. Aka. Yuk, 10:1751. 1950. Known from northern Mackenzie district and

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21. A. Robbinsii (Cakes) Gray (A. Macounii Rydb.; A. occidentalis (Watson) M.E. Jones) -- The narrowly ellipsoid pods black-pubescent and descend. Stems 2-6 dm high. Leaves with 9-13 leaflets, these elliptic to lanceolate. Flowering racemes dense, elongating in fruit, becoming secund. Flowers 5-12 cm long, mauve or pale blue. Legume 1.0-1.5 cm long, stipitate, mid spring to early summer. Rivers shores and banks. -- (Mack-Y)-Aka, (NS), Alta, BC, US.

Varies in a manner reminiscent of A. aboriginum except that the various phenotypes do not seem to be restricted geographically.

22. A. Drummondii Douglas (Tium Drummondii (Douglas) Rydb.) -- The whole, and especially the stem, stiffly hirsute, the hairs very long. Stems 4-6 dm high. Flowers pale yellow, at first spreading, then pendulum. Legume glabrous, pale green, drooping, cylindrical, dorsally sulcate, long stipitate. The body of the fruit is 1.5-2.5 cm long. Late spring to mid summer. Growing as scattered clumps in the Fescue prairies. -- SK-Alta, US.

23. A. racemosus Pursh -- Pod triangular, flattened into 3 wings. Otherwise quite similar to A. canadensis and easily confused with it when in flower. Flowers bigger, 15-18 mm long, creamy white, spreading to drooping. Legume spreading to drooping, glabrous, sulcate dorsally and concave on both sides. Body of the pod about 2 cm long. Stipe very long. Late spring and early summer. Dry or eroded hillsides, tolerant of selenium; from Craven and Moose Jaw to the Dirt Hills. -- SK, US.

Mentioned for Alberta by Jones 1923 and Gleason 1952. There is no Alberta specimen in any Canadian herbaria, nor at NY, nor (fide Barnaby in litt.) at POM where M.E. Jones' herbarium is now preserved. This mention of Alberta was possibly based on a misinterpretation of the original report by Macoun 1883 for the Moose Jaw region.

24. A. FALCATUS Lam. -- Habitually similar to A. canadensis, but in its fruit more like A. alpinus, although much longer. Stems (1)-5-10-(15) dm high. Hairs strigose and partly malpighia-ceous, black in the inflorescence. Flowers 1 cm or a little longer, pendulum, whitish yellow with a purple tinge on keel and edge of standard. Legumes 2.0-2.5 cm long, pendulum, strongly falcate, deeply sulcate dorsally, black strigose. Early summer. Rarely spreading or persisting from experimental plantings: Brandon. -- SK-Man, (nWUS, Eu).

25. A. canadensis L. var canadensis -- The fruiting racemes very dense and of stiffly erect pods. Stems 1 mm high or less, erect, solitary or in small tufts. Peduncle usually much shorter than the subtending leaf. Flowers 11-15 mm long, at first slightly ascending, then slightly descending, those collected in bud
usually developing a large brown spot in drying. Legume about 1.5 cm long, short-cylindric, sessile, glabrous. First half of summer. Moist open places. -- Mack, Q-BC, US.

Not to be confused with the habitually similar Glycyrrhiza. The latter has larger, acute and punctate leaflets.

West of us var. canadensis gives way to var. Mortonii (Nutt.) Watson with the ovary and fruit densely strigose.

26. A. CICER L. -- (Chiche de montagne) -- The inflated pods heavily black-hirsute at maturity. Stoloniferous, the stems 0-6 dm high, solitary. Leaflets strigose on both faces. Inflorescence dense, black-strigose. Flowers yellow. Legumes 1.0-1.5 dm long, ovoid to globular, maturing black, thin-walled. Early to mid summer. Rare weed of field crops; Brandon, Stavely. -- Man, Alta, Eur.

F. Chandonnetii (Lunell) Boivin -- Flowers white or cream.


There has been a fair amount of tergiversation about the correct name of this entity and about the distinctiveness of the american plant from the eurasian A. hypoglot'tis, A. danicus and A. dasyglottis.

We cannot detect any difference between the american A. agrestis and the siberian A. dasyglottis. The resemblance of A. agrestis to A. hypoglot'tis L. is superficial only; the latter is pillose (agrestis is strigose) with longer hairs, the bracts are longer and muricate-ciliate, the leaflets are stubbier, the fruits is sharply triangular and at maturity the outer angles are
1967 Boivin, Flora of Prairie Provinces

much flattened and almost wing-like. The distinctiveness from A. hypoglottis is ample enough to justify specific rank.

But the difference between A. dasypollitis and A. danicus is much more tenuous. There is no morphological discontinuity, only a series of tendencies, and barely marked enough at that to justify varietal rank. In var. danicus the pubescence is generally somewhat looser, the calyx bears more appressed pubescence and its tube and lobes are generally a bit shorter, the fruit averages shorter. Hence the classification adopted here which is intended to reflect the taxonomic situation.


29. Oxytropis DC.

Technically different from Astragalus by the legume having a false partition arising from the ventral suture. In Astragalus there is no such partition or, if there is one, it arises from the dorsal suture. In practice Astragalus is normally caulescent, while Oxytropis is nearly always stemless and the leaflets are asymmetrical at the base.

a. Leaflets mostly fascicled in 2's or more, appearing subverticillate.

b. Inflorescence 1 capitulate, with few flowers

bb. Flowers numerous in an elongate, lanceolate inflorescence

aa. Leaflets alternate to subopposite.

c. Inflorescence reduced to (1)-3-(3)
flowers ................................. 2. *P. podocarpa

cc. Flowers more numerous.

d. Glandular-verrucose, especially so on
the calyx lobes ...................... 5. *P. leucantha

dd. Not glandular-verrucose.

e. Corolla 1-11 mm long; legumes
pendent ............................. 1. *P. deflexa

ee. Corolla obviously longer; legumes
erect to spreading.

ff. Flowers yellow or cream.

f. Flowers about 2 cm long;
leaflets 5-15 .............. 7. *P. sericeps

gg. Flowers smaller, mostly
around 1.5 cm long; leaflets
usually more numerous .... 6. *P. campestris

hh. Calyx long spreading villous.

i. Legume included in the
calyx .............................. 4. *P. Besseyi

ii. Long-exserted; leaves
much shorter .............. 3. *P. Laropus

hh. Calyx appressed-pubescent.

j. Flowers mostly around
2 cm long; hairs mal-
pigioscous ............. 8. *O. Lambertii

jj. Flowers smaller; hairs
basifixed ............. 6. *O. campestris

1. *P. deflexa (Pallas) DC. var. sericea T. & G. (var. deflexa Ait., var. foliolarosa (Hooker) Barneby; O. foliolarosa Hooker).

-- The stem usually short but clearly developed, the plant commonly 2-4 dm high. Abundantly tomentous. Leaflets mostly
25-45, the largest 1-2 cm long. Inflorsonese at first ovoid,
elongating while flowering, up to 1 dm long in fruit. Flower
6-11 mm, mauve to bluish, drying deep blue. Legume 13-17 mm
long. First half of summer. Around bluffs and near watercourses.

-- Mack-Scott, Alta - (Aka) -- Var. foliolarosa Ait., O. foliolarosa Ait. -- Nearl:, always stemless and
less than 2 dm high. Inflorsonese globular or nearly so, not
elongating in fruit. Calyx tube 2.5-3.0 mm. First half of sum-
mer. Shore travels, cliffs and alpine sere. -- (F), Mack-Aka,
NF, -no, swalta-no, US.

2. *P. podocarpa Gray var. inflata (Hooker) Boivin -- Very
large bladdery pods. Low, densely tufted, the scape up to 6 cm
high. Leaflets densely striate. Stipules long-ciliate, not
glandular. Raceme reduced to (1)-2-(3) flowers. Flowers blue,
13-16 mm long. Legume ovoid, short-stipitate, long-acuminate,
the body 1.5-2.5 cm long, suripose. First half of summer. High
alpine slate slides. -- (swMack), Alta - (Aka), Wor.

XYTH FIS 96
Often confused with typical var. podocarpha from the eastern arctic. The latter has a blackish-looking calyx because of the more abundant and longer black hairs, mostly 0.5-1.2 mm long; the white hairs absent or few, if present mostly 1.0-1.5 mm long and about 1 1/2 times as long as the black ones. In our var. inflata the black hairs are shorter and are long overtopped by the more abundant white hairs, the latter mostly 1.0-2.0 mm long and mostly 2-3 times longer than the black ones. Further, var. inflata shows more or less definite tendencies to laxer growth, longer leaves, longer and more numerous leaflets, longer scapes and bigger fruits.

3. O. Lampros Nutt. var. confusus Barneby -- Fruit similar to the next, the calyx enlarging at maturity and not splitting, falling off with the legume, but the latter partly exerted and larger, about twice as long as the calyx. In small and grayish-white tufts, the herbage being densely long villous. Leaves short, less than 5 cm long and bearing only 1-3 leaflets. Flowers like the next on a scape about 2-3 times taller than the inflorescence. Early spring. Rolling steppe on gravelly soil at Cardston. -- swAlta, nwUS.

The more southern var. Lampros has a longer leaf bearing more numerous leaflets borne on a longer rachis, at least twice as long as the leaflet.

4. O. Bekeaqy (Ryd.) Blank, var. Bekeaqy -- Rather similar to a small O. Lamprinus, but the pubescence not greyish-white and is part long spreading-villous, especially so on the calyxes. Main leaves commonly 1 dm long and bearing (11)-15-(17) leaflets. Inflorescence overtopping the foliages but the scapes less than twice taller. Flowers about 1 cm long, bright magenta, spreading. Legume small, included in the calyx and soon falling off with it. Early summer. Rolling steppes, rare; Canopus, Val-Marie. -- sw5, US.

The Alberta report by Boivin 1966 was based on a collection by Dawson incorrectly labelled Alberta. It came from along the Missouri River in Montana (W; DA photo).

Other varieties are all more southern and differ by shorter or fewer leaves, by a more compact inflorescence, etc.

5. O. leguminosa (Fass.) Fass. var. degressa (Ryd.) Boivin. (O. viscosa AA.; O. viscidula (Ryd.) Tid.) -- glandular-villous throughout and especially dense; so on the lower of the calyx and on the ovary. Also more or less strigosous, except on the ovaries and the calyx lobes. About 4-15 cm high. Leaflets 1-1.5 mm long. Calyx tube 1.5-5.5 mm. Flowers 12-15 mm long, macula to purple. Fruit 13-16 mm long. Mid spring to early summer. Steppes. -- swAlta-(sec); US -- Var. magnifica Boivin -- generally larger. About 15-25 cm high; leaflets (7)-9-12-(14) mm long. Calyx tube 5-8 mm long. Flowers 13-17 mm long, purple. Legume 14-22 mm long. -- swAlta-(sec).

When O. leucantha 1830 and O. viscosa Nutt. 1836 are subordinated as varieties of the same species, O. leucantha takes precedence because it is the earlier name.

6. O. sericeus L. var. gracilis (Nelson) Barneby (O. albertina (Greene) Ryd.; O. lownense AA.; O. gracilis Nelson; OXYTROPIS
son) K. Schum.; O. Macounii Greene; O. villosa (Rydb.) K. Schum.
-- In large dense tufts. Stipules densely silky and ciliate with long hairs. Strigose throughout, the scapes 1.5-1.9 dm high. Leaves in two sizes, the short ones about half as long as the more numerous long ones. Leaflets numerous, mostly 10-13 per leaf. Flowers 12-18 mm long, white or cream. Early to mid summer. Very common in prairies. -- Man-BC, US -- Var. varian s (Rydb.) Barneby -- Similar to var. gracilis, but the stipules ciliate with long hairs mixed with short glandular ones. Flowers yellowish. More northern. -- (F), Mack-Aka, nMan, nwBC -- Var. Cusickii (Greenman) Barneby -- Smaller than var. gracilis, about 0.5-1.5 dm high. Leaflets fewer, mostly 11-17. Inflor­escence shorter and more compact. Alpine prairies. -- swAlta­seBC, wJa -- Var. dispa r (Nelson) Barneby -- Flowers more or less mauve to purplish, drying bluish. Otherwise as var. gracilis, the foliage dimorphic. Sporadic mainly in the eastern prairies. -- Mack, nMan-Alta. (ncW3) -- Var. johannennis Fern. (O. johannennis Fern.; O. terrae-novae Fern.) -- Flowers purple, drying blue. Leaves mostly of about the same length. Scapes variable, mostly short. Churchill. -- (F), L-NF, (NS, NB)-Q-nMan, (ne US).

Our varieties belong to ssp. gracilis (Nelson) Boivin in which the lacteals typically lack a septum while the eurasian ssp. campestris comprises varieties with a weakly developed septum. Both subspecies are highly variable and may be subdivided into a series of weak varieties that are not always easy to define.

7. O. gericoa Nutt. var. spicata (Hooker) Barneby (O. spicata (Hooker) Standley) -- Often confused with either the following or the preceding. Flowers large, about 2 cm long and leaflets few, mostly 9-15, as in O. Lambertii. But the flowers yellowish and the pubescence not malpighiaceous, like O. campestris. Calyx lobes strongly contrasted from the tube by their heavy, black pubescence. Starts flowering around mid-spring and is in fruit by the time O. campestris is flowering. Prairies. -- Y, (soMan)-3-BC, US.

Our var. spicata has yellow flowers in an inflorescence usually 5 cm long or less. South of the border it grades into a more southern var. sericea with a white flower mauve-tinted on the keel, and an inflorescence elongating to ± 1 dm in fruit.

The range was extended to southern Mackenzie District by Raup 1947 on the basis of two fragmentary collections by Crickmay along the Liard River (CAH: DAO, photo). While it would be difficult to achieve positive identification of these fragments, it would seem equally difficult to justify their identification to O. spicata; the flowers are rather large, but not large enough for O. spicata and the lobes of the calyx are devoid of the black pubescence so characteristic of the latter. We have tenta­tively revised both collections to the more likely O. campestris var. varians.

8. O. Lambertii Pursh var. Lambertii -- Locoweed, Loco -- Pubescence obscurely malpighiaceous, the lower arm of the hair being very short. Pubescence also partly strigose and more or
less sericeous. Mostly 2-4 dm high. Leaves with only (9)-15- (19) leaflets, these rather narrow and ± linear. Inflorescence lax. Flowers bright and showy, about 2 cm long, purplish, usually drying very dark blue. Calyx lobes heavily white-villous, hence paler than the tube. Late spring to early summer. Prairies. -- sMan-seS, US.

Macoun and other earlier authors have used this name to cover more than one species, hence earlier reports are unreliable. Most older collections still filed under that name have now been revised to other species, mostly to *O. campestris* (L.) DC.

Two other varieties occupy the southern part of the range of the species: a var. Bigelovii Gray with broader leaflets, mostly lanceolate, and an often stipitate legume, and a var. articulata (Greene) Barneby with a somewhat longer calyx nearly enclosing a somewhat shorter legume, the latter not exserted except for the attenuate tip.

9. *O. arctica* Br. var. Bellii (Britton) Boivin (O. Bellii (Britton) Palibine) -- Some of the leaflets geminate and appearing subverticillate with 3-4 leaflets per verticil. Tufted, villous and small, about 1 dm high. Leaflets less than 1 cm long, 17-35 per leaf. Flowers few, mostly 4-6, closely aggregated at the summit of the scape. Flowers purple, about 2 cm long, more or less spreading. Legume densely black villous. Early spring to mid summer. Arctic gravels. -- F-K, nMan.

In the more widespread and generally more western var. arctica, the less numerous leaflets are alternate or opposite and only 11-19 per leaf.

10. *O. splendens* Douglas var. splendens -- Locoweed -- A very showy species, very densely long villous, the leaflets mostly subverticillate by 3-6 and the flowers deep pink. Densely tufted, 2-4 dm high. Grayish-villous, sometimes whitish-villous, less often with yellowish pubescence. Inflorescence dense. Flowers drying blue. Mid summer. Chernozems around bluffs and on top of hills. -- Mack-Y-(Aka), 0-eBC, US -- Var. Richardsonii Hooker (O. Richardsonii (Hooker) K. Schum.) -- Much less densely villous and green. Semi-open places. May be only an ecological form. -- (Mack), nW0, cS-wBC.

11. **GLYCYRRHIZA L.** LICORICE

Legume densely covered with hooked prickles. Otherwise much as in *Astragalus*.

1. *G. lepidota* Pursh var. lepidota -- Licorice, Wild Licorice -- Leaflets densely and finely punctate above in purple-black, but below only punctate with yellow glands. Erect herb about 1 m high, long stoloniferous and forming large colonies. Glanular throughout, the glandulosity sessile except on the calyces. Leaflets mostly lanceolate, entire, puberulent along the margin and the mid-nerve only. Legume 1-2 cm long, cylindric, ± brown, indehiscent, very catchy. Early to mid-summer. Open places, mostly river banks. -- O-seBC, US -- Var. glutinosa (Nutt.) Watson -- Glands stipitate not only on the calyx, but, also at

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least on the peduncle of the inflorescence. Rare. -- swAlta- (BC), US.

15. CORONILLA L.

Flowers in globose umbels as in Lotus or Trifolium, but the legume moniliform and at maturity breaking up into segments as in Hedysarum. However the legume is not flattened.


16. HEDYSARUM L.

Like Astragalus, but with a fruit which readily breaks up into flat indehiscent articles. Keel truncate at tip, longer than the standard. Leaflets minutely black-punctate above. Legume more or less narrowed towards the articulations.

a. Flowers yellow .................. 1. H. sulphureaens
aa. Flowers pink to purple.
   b. Calyx lobes much shorter than the
tube ......................... 2. H. alpinum
   bb. Lobes longer than the tube .......... 3. H. boreale

1. H. sulphureaens Rydb. -- Flowers yellow or cream. Calyx lobes slightly narrower and a bit longer, mostly 1.5-2.0 mm long, otherwise almost identical with H. alpinum. Late spring to mid summer. Open slopes. -- swAlta-seBC, US.

2. H. alpinum L. (var. americanum Mx., var. grandiflorum Rollins, var. philoscia (Nelson) Rollins; H. americanum (Mx.) Britton) -- Tufted erect perennial, 2-6 dm high. Flowers in elongate, more or less secund racemes. Calyx lobes (0.8)-1.0-(1.5) mm long, deltoid to triangular, shorter than the calyx tube. Corolla pink to carmine. First half of summer. Rich prairies, especially around Aspen groves. -- (F)-K-(Mack)-Y-(Aka, L) -NF, WA-BC, (US, Eur) -- F. albiflora (Standley) Fram. -- Flowers white. Local: Cypress Hills --(Aka), Q, S.

The american phase is usually separated varietally or specifically from the typical eurasian plant, however we have failed to detect a tangible and constant difference other than geography.

3. H. boreale Nutt. var. boreale (H. Mackenzii Rich. var. Fraseri Bolvin) -- Erect to decumbent, 2-5 dm high. Strigose throughout except on the glabrous upper face of the leaflets. Calyx lobes 3-4 mm long, lanceolate, all similar and nearly twice as long as the tube. Raceme elongate, not secund. Flowers 15-16 mm long, magenta to purple. Late spring to early summer. Hills and river valleys. -- w5-Alta- (BC, US) -- Var. cinerascens (Ryd.) Rollins (H. cinerascens Rydb.) -- Leaflets

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17. DLUMBING Desv. TICHT-RILL
Fruit very catchy, being covered with small hooked hairs. Otherwise much as in Hedysarum, the legume flat, indehiscent, constricted successively into a moniliform series of articles. The indehiscent articles separating readily at maturity. Leaves divided ternately rather than pinnately as in Hedysarum.
1. C. canadense (L.) DC. -- Beggars' Lice -- Erect perennial, mostly about 1 m high. Leaves trifoliate, the leaflets 3-3 cm long, ovate to lanceolate. Inflorescence a single terminal raceme or a panicle of racemes. Flowers purple. Legume slightly falcate, stipitate, more deeply constricted on the dorsal than on the ventral side. Mid summer. Wetter, open spots. -- (NS), N-B-Skan, US.

16. CICER L.
Leaves pinnate and serrate. A genus of herbs similar to Vicia and Lathyrus, but with the tendrils vestigial. However, our only species lacks any trace of tendrils and the leaf ends in a normal leaflet.

1. C. arietinum L. -- Chick-Pea (Pois chiche) -- Erect annual herb 3-6 dm high, glandular-pubescent. Leaflets 1.0-1.5 cm long, elliptic to obovate, serrate and mucronate. Flower axillary, solitary. Calyx rather large, overtopping the whitish corolla. Peduncle strongly geniculate. Pod 1.5-2.0 cm long, ovoid, much inflated. All summer. Sometimes cultivated and appears to reseed itself at times, but not persistent. -- 0-E, (SC), Bur.

19. Vicia L. 

Generally similar to Astragalus, but the terminal leaflet(s) replaced by 1-3 tendrils. Wings adnate to the keel. Style bearded at apex only. Legume dehiscent along both sutures, thus forming 2 valves.
a. Raceme with 1-7 flowers.
bb. Peduncle of the inflorescence longer than the lowest flower .............. 4. V. americana
aa. Flowers much more numerous and mostly smaller.
c. Calyx tube longer than the lobes .............. 2. V. crucca
cc. Shorter than the lower lobes .............. 3. V. villosa

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1. **V. SATIVA L.** var. **ANGUSTIFOLIA** (Reichard) Wahl. (V. angustifolia Reichard) -- Vetch (Pois sauvage) -- Flowers (and fruits) mostly 2 on a rachis, the latter less than 1 cm long. Flowers 12-18 mm long. Calyx lobes 3-6 mm long, subequal. Late spring to mid summer. Rare weed: Otterburne. -- (G), Aka, NF-SPM, NS-Man, US, Eur.

An earlier report from Fort Garry was based on a depauperate specimen of **V. americana**.

Var. sativa has larger leaflets and flowers, the leaflets mostly 5 mm wide or more, the flowers 20-(30) mm long. Not yet known from our area, but probably as likely to occur as var. angustifolia.

2. **V. CRACCA L.** (var. **tenuifolia** (Roth) G. Beck) -- Bird-Vetch, Tufted Vetch (Jargeau, Petits oiseaux) -- Perennial, mostly 1 m long or more, glabrous or appressed pubescent. Leaflets 13-21, linear to lanceolate. Racemes dense, second. Flowers blue, 9-13 mm long. Calyx-lobes up to 2.0 mm long. Legume flat, straight, stipitate. All summer. Cultivated and rarely escaped to roadides, etc. -- (G), K, Y-Aka, L-NF-(SPM), NS-BC, US, Eur.

Despite reports to the contrary, not obviously native in our area, or in any other part of North America. A number of varieties are sometimes recognized; none is clearly significant in the american part of the range.

3. **V. VILLOSA Roth** (V. Cracca L. var. **multiflora** (Poll.) Gaudin) -- Much like the preceeding, but the calyx seemingly attached dorsally because of a strong gibbosity on the ventral side. Reputedly annual or biennial. More or less villous throughout. Flowers purplish, 11-18 mm long. Calyx-lobes 3.5-5.0 mm long on the dorsal side, those of the ventral side much shorter. Summer. Cultivated and casual in fields and roadides: Brandon. -- (Aka), NS, Q-Man, BC, US, Eur.


**Vicia hirsuta** (L.) S.F. Gray was mentioned from Olds by J.M. Macoun 1897 on the basis of a collection by T.K. Willing. In 1964 we failed to find such a collection under *Vicia* at CAN.

20. **LATHYRUS L.** -- EVERLASTING PEA

Quite similar to *Vicia* from which it differs by its free wings and its style bearded along the upper side. More obviously different is the flower, straight in *Vicia*, sharply bent in ours.
1. L. TUBEROUS L. -- Tuberous Vetchling -- The thin and wingless stem from a larger tuber. Leaflets 2, narrowly elliptic to oblanceolate, mostly 2-4 cm long. Flowers few, purple, about 1.5 cm long. All summer. Spreading from cultivation. -- Q-Man, US, Eur.

2. L. SATIVUS L. -- Chickling Vetch (Lentille d'Espagne) -- Annual with solitary flowers. Stem winged. The 2 leaflets narrowly linear, 4-10 cm long. Flower white to pink or blue, about 1.5 cm long. All summer. Sometimes cultivated and rarely reseeding itself. Boharm. -- Q, S, (US), Eur, (Afr).

3. L. ODORATUS L. -- Sweet Pea (Pois de senteur) -- Flowers larger and mostly in 2's. Herbage somewhat hirsute, glandular and long ciliate. Flowers very showy 2.5-3.0 cm long, white or coloured, 1-3 and pendent at the end of a long peduncle recurved at tip. Legume long pilose. All summer. Cultivated ornamental sometimes reseeding itself in dumps or loose soil, but not long persistent: Brandon. -- Q-Man, Eur.

4. L. Japonicus W. (var. aleuticus (Greene) Fern., var. glaber (Ser.) Fern., var. pellitus Fern.; L. maritimus Big.) -- Beach-Pea, Indian-Pea (Pois de mer, Pois des dunes) -- Slightly fleshy succulent herb. Stem wingless, up to 1 m high. Stipules cordate or hastate and at least half as large as the leaflets. Leaves with 6-10 mostly oblong leaflets. Mid summer. Shores: Hudson Bay, Lake Winnipeg. -- (Q), K-Mack-(Y)-Aka, L-SPM, NS-Man, 3C, US, Eur.

Quite a few phenotypes have received names; they seem to have essentially the same distribution, although one or the other may be dominant locally. While this species is essentially a maritime plant, it does also occur inland on the shores of a few large bodies of freshwater.

5. L. palustris L. (var. linearifolius Ser., var. macran-thus (T.C. White) Fern., var. myrtifolius (Muhl.) Gray, var. pilosus (Chan.) Led.) -- Vetchling, Marsh-Pea (Pois de marais). More or less pubescent and 5-9 dm high. Upper leaves with 6-8 leaflets, these 3-5 cm long, lanceolate to linear. Stipules narrowly semi-sagittate. Racemes with 1-7 blue flowers. Early summer. Moist and wooded habitats. -- (K), Aka, (L-NF) - SPM. 

LATHYRUS
Quite variable, but the many described varieties do not seem to be in any way significant.

6. *L. vengosug* Mühl. var. intensus Butt. & St. John --

*Cattle-Pea-Vine* -- Pubescent and about 1 m high. Leaflets 10-12, elliptic, 2-5 cm long. Stipules semi-sagittate. Flowers numerous, violet. First half of summer. Moist places in and around woods. -- (Aka), Q-neBC, US.

In the more eastern var. *venosus* the herbage, including the calyces, is glabrous or nearly so.

7. *L. ochroleucus* Hooker -- *Yellow Pea* -- Flower two-toned, cream and pale orange. Glabrous and 4-8 dm high. Leaflets 4-8, ovate, 2-5 cm long. Stipules semi-ovate and coarsely toothed towards the base. Raceme with 5-11 flowers. Late spring and early summer. Moist places, mostly in Aspen groves. -- Mack, Q-BC, US.

**21. PISUM L.**

Differs from *Vicia* by its dilated calyx-lobes which are like leafy appendages.

1. *P. SATIVUM* L. -- *Pea (Pois)* -- Glaucous and glabrous annual mostly 1 m high. Leaflets 2-4, ovate to rhombic, 2-7 cm long, entire or dentate. Stipules semi-ovate to semi-elliptic, dentate, as large or larger than the leaflets. Flowers in 2's or solitary, 1,5-2,0 cm long, mostly white. Summer and fall. Cultivated in heavy soils and exceptionally reseeding itself: Saint-Pierre-Jolys. -- (G), Q-Man, BC, (Eur).

**22. PHASEOLUS L. BEAN**

Like the following, a climber with trifoliate leaves, but the calyx 5-lobed and subtended by a pair of accessory bracts.


**23. ANTHOCARPA Ell.**

Climbing by its twining stem. Calyx with only 4 lobes and bractless except for the bract at the base of the pedicel.

1. *A. bracteata* (L.) Fern. var. *bracteata* (A. monoica Ell.) -- *Hog-Peanut* -- Stems thin, up to 1 m long, finely retrorse-pubescent, with a ring of longer, reflexed and stiff hairs at each node. Raceme few-flowered, on a long peduncle. Flowers whitish to pale mauve. Mid-summer. Galerie-forests. -- NS, NB-sMan, US.

In our variety the pubescence is pale or transparent and more or less appressed, especially on the leaflets; the legumes may be lightly strigose on both faces or merely antorse-hirsute

*LATHYRUS*
at the edge. In the more southern var. comosa (L.) Fern., the
pubescence is tawny, coarser, more abundant and hirsute; it is
especially obvious on the stem, the petioles and at the margin
of the leaflets. The pubescence of the legume becomes retrorse
below the middle.

Order 9. SALICALES
Single family. This and the next two orders have flowers
in catkins.

17. SALICACEAE (WILLOW-FAMILY)

Dioecious trees and shrubs. Mature carpels liberating ma-
ny pappus bearing seeds. Leaves simple and alternate. The cat-
kin is a raceme (or spike) of highly reduced flowers, each sub-
tended by a bract. Calyx and corolla absent, each flower being
reduced to its stamens or to its ovary.

a. Buds covered by many overlapping scales ........ 1. Populus
b. Buds covered by a single hood-shaped
scale ........................................ 2. Salix

1. POPULUS L.

POPLAR

Stamens 5 or more per flower. Trees, often very large,
mostly with large leaves. Leaves always simple and entire to
coarsely toothed.

a. Leaves lanceolate or narrower ........... 5. P. angustifolia
aa. Leaves ovate to round or deltoid.
b. Leaves round or ovate,
c. Leaves ovate, strongly dis-
colour ..................................... 4. P. balsamifera
cc. Leaves roundish, barely paler
beneath.
d. Finely crenate ................. 1. P. tremuloides
dd. Coarsely toothed .............. 2. P. grandidentata
bb. Leaves broadly deltoid ............. 3. P. deltoides

Various other hybrids, besides those mentioned below, are
also known in our area, but are still under study.

1. P. tremuloides Ex. (var. aurea (Tid.) Daniels) -- As-
pen, White Poplar (Tremble, Peuplier blanc) -- The leaves quak-
ing even when there seems to be no breeze. Perhaps our most
common tree, stoloniferous and forming numerous bluffs in the
prairie. The bark pale grayish green to almost white. Leaves
round, glabrous, crenulate, abruptly short-tipped, not resinus-
c and slightly glaucous below. Petiole strongly flattened later-
ally. Very early spring. General, in depressions southward,
in well drained situations northward. -- (K) Mack-Aka, L-JM,

From the Red River and the Coteau de Prairie westward, this
is supposed to give way to var. aurea, but no such transition is
obvious in the field. In the herbarium no consistent difference
could be detected between the populations of eastern and western Canada and we came to the conclusion that the description of var. aurea was the description of a random specimen within the normal range of variation of the species. Other named varieties appear to be extremes of variation of no geographical significance.

2. P. grandidentata Mx. -- Poplar (Tremble) -- Very conspicuous in early spring when the foliage is entirely covered by a thick white tomentum. Otherwise much like the preceding. Leaves very coarsely toothed, soon glabrous. Very early spring. In better drained situations. -- NS-Man, US.

3. P. deltoides Marsh. var. occidentalis Rydb. (P. Sargentii Dode; P. virginiana AA.) -- Cottonwood (Liard, Cotonner) -- One of our larger trees, up to 20 m high, the trunk up to 1 m across, the bark deeply furrowed. Petioles flattened. Leaves broadly deltoid, coarsely serrate, long-acuminate, green on both faces. Bud scales ciliate, finely puberulent on back. Early spring. Sand hills and shores, usually sandy, of larger rivers. -- Man-Alta, US.

Populus Sargentii Dode is reputed to differ from P. deltoides by its pedicels shorter than the capsule, its puberulent bud scales and its coarser serration of fewer teeth. All our specimens, either eastern or western had short pedicels and we consider this difference to be of no account.

A sampling of Ontario and Quebec specimens contrasted with a sampling from Saskatchewan and Alberta showed that the difference in serration has a statistical value but is not a practical character to distinguish an eastern and a western population. On spring leaves the eastern specimens showed 10-27 teeth per side with the average around 15-20, while the western specimens had a much narrower range of 8-15 teeth per side. Leaves produced later in the season have gradually smaller and more numerous teeth with a maximum of 12 per side in the East and only 28 in the West. Another character worth noting, but hard to appreciate without a fair amount of comparison material on hand, is that in the East the serrations reach to the base of the acumen, while in the West they tend to stop may be 1 cm short of the base of the acumen.

The pubescence and ciliation of the bud scales is a more clear cut character. All our western specimens showed such pubescence, while it was present only in a few eastern ones (maybe 1 in 10). This character is however, of limited usefulness since about half of the specimens on hand were collected before mid summer and had not yet developed their winter buds.

In short, the characters of P. Sargentii show such a wide range of overlap that the taxon may best be treated as a variety of the eastern P. deltoides.

All specimens examined from our area proved to belong to var. occidentalis.

3 X. P. Bernardii Boivin -- Northwest Poplar -- A hybrid with P. tremuloides. Leaf broadly ovate to broadly cordate, not or little gummy, paler and slightly glaucous below. Serra-
tions well marked but not as coarse and much more abundant than in P. deltoides. Sporadic in sandhills, rare on river shores, but very common in cities and towns where it seems to be our most commonly planted tree. -- swQ-Alt, noUS.

h. P. Balsamifera L. var. balsamifera (var. Michauxii Dode) Henry, var. subcordata Hylander; P. Tacamahacca Miller — Black Poplar (Peuplier, Peuplier noir, Liard) -- Tree with strongly discolor leaves. Buds large and very resinous. Petiole terete. Leaves mostly ovate, varying from lanceolate on young shoots to cordate on old trees, minutely glandular-serrulate, minutely ciliate, glabrous to finely puberulent along the nerves, dark green above with a yellow mid-nerve, much paler below, whitish-green with a conspicuous reticulation, somewhat resinous and often developing, upon drying, large russet patches. Capsule finely rugulose. Styles and carpels 2. Early spring before the leaves. Shores and wetter places. -- sk-Aka, L-(NP-SPM), NS-(PaI)-NB-Alt-(BC), US -- P. candida (Aiton) Boivin (P. candida Aiton; P. gileadensis Rouleau) -- Leaves very finely puberulent below or on both faces and usually also cordate. Twigs and petioles also puberulent. Sporadic; sometimes planted. -- NP, NS, NB-0, 3, US, (Bbr) -- Var. Californica Watson (P. trichocarpa T. & G., var. hastata (Dode) Henry) -- Capsule coarsely verrucose and/or of 3 carpels. -- (Y)-Aka, sw-Alt-BC, wUS, (CA).

Older trees tend to produce more deeply cordate leaves (= var. subcordata).

h. X. P. Dutillyi Lepage -- Hybrid with P. tremuloides. The leaves not so strongly discolor, not so gummy and perhaps a bit glaucous below. Buds smaller and less gummy. Petioles a little flattened. Leaf broadly ovate or broadly cordate to roundish, abruptly short-acuminate at tip, minutely ciliate. -- Q-Alt.

5. P. angustifolia James -- Yellow Cottonwood, Black Cottonwood (Liard amer) -- A small tree with 2 lanceolate leaves and paler yellowish twigs. Petioles terete and short, mostly about 1 cm long. Leaf yellowish green, somewhat paler below, glabrous, glandular-serrulate to the tip, the marginal glands very resinous and usually marking the paper in drying. Early spring with the leaves. Flood-plains of large rivers. -- swS-swAlt, wUS, (CA).

5 X. P. acuminata Rydb. -- Hybrid of P. deltoides. Leaves rhomboid to elongate-rhomboid, more coarsely serrate. Petioles somewhat longer and compressed. Leaf definitely acuminate but not as much as in P. deltoides and the acumen entire except at base. Serrations often gummy. Rather frequent wherever both parents occur as P. angustifolia seems to hybridize very freely with any other Poplar that may occur near by. Backcrosses are also frequent -- swAlt, wUS -- Mr. Andrewsii (Sarg.) Boivin -- A backcross to P. deltoides. Leaves thick and firm, broadly ovate-rhomboid, long acuminate, coarsely serrate right up to the base of the acumen. Local and less frequent. Sometimes used as a shade tree further south. -- swAlt, wUS.

5 X. P. Sennii Boivin -- Hybrid of P. tremuloides. Leaves
dimorphic, the earlier ovate, the later ones elliptic lanceolate. Twigs yellowish, becoming pale gray. Buds small and only slightly glutinous. Petioles variable, tending to be short and mostly under 2 cm long, not compressed. Leaves slightly paler and slightly glaucous below, finely serrulate at margin. Older leaves not gummy, the younger ones gummy in the manner of _P. angustifolia_. Rare: Lethbridge. -- swAlta.

2. _SALIX_ L.  

WILLOW

Stamens fewer, mostly 2, sometimes 3-5 per flower. Buds covered by a single hood-shaped scale. Small to large shrubs, sometimes trees.

The following key is based on pistillate specimens. In the field staminate specimens plants may be readily associated with the pistillate plants of the same species. Foliage specimens do not key out easily and are best identified by comparison. Once well learned, a species can usually be recognized by its foliage alone.

a. Prostrate, or creeping alpine or arctic shrubs, 2 dm high or less ................................ Group 1
aa. Taller, erect or ascending.

b. Carpels glabrous.

c. Catkin scales pale coloured, yellowish to pale brown, fugacious ................................ Group 2
cc. Scales dark coloured, brown to black, remaining on the catkin to maturity ................................ Group 3

bb. Carpels pubescent.

d. Catkin borne on the old wood, not leafy at base, sessile or on a short leafless peduncle ......................... Group 4
dd. Catkin at the end of a leafy new shoot ................................. Group 5

Group 1

Low, prostrate or creeping shrubs, alpine or arctic, the ascending shoots less than 2 dm high.

a. Carpels glabrous.

b. Catkins subterminal, few-flowered, with less than 10 ovaries ................. 9. _S. herbacea_

bb. Catkin on lateral shoots and much more heavily flowered.

c. Catkin sessile, leafless at base ...................................... 23. _S. calcicola_

cc. Catkin on a leafy peduncle (i.e. terminating a leafy short-shoot).

d. Leaves crenulate ............. 21. _S. myrtillifolia_

dd. Leaves entire .................. 10. _S. arctophila_
aa. Carpels pubescent.
  e. Leaves finely and shallowly crenate
     all around with a gland in each sinus.
  f. Petioles at least one fourth as
     long as the blade ............... 7. S. reticulata
ff. Petioles much shorter, less than
     twice as long as the corresponding
     bud .................................. 8. S. vestita
ee. Leaves entire, not glandular-margined.
  g. Catkins subterminal, that is borne
     on a normal size shoot and opposite
     the uppermost leaf, with the terminal
     bud in the middle. Very small
     shrubs .......................... 7. S. reticulata
gg. Catkins terminal on leafy peduncles
     or short lateral shoots bearing only
     a few leaves without axillary buds,
     or with only poorly developed ones.
  h. Pistillate bracts light coloured,
     yellowish to light brown ........ 12. S. glauca
hh. Pistillate bracts dark coloured,
     blackish throughout or at least in
     the upper half.
  i. Capsule grayish to white-
     pubescent ....................... 11. S. arctica
ii. Capsule more thinly pubescent
     to glabrous, reddish, drying
     black ......................... 10. S. arctophila

Group 2
Carpels glabrous, subtended by a caducous pale-coloured
scale. Erect or ascending trees or shrubs, at least 2 dm high.
Stamens 4-5 in the first 3 species, only 2 in the others.
  a. Petiole glandular above near the junction of the limb.
  b. Capsules 4.5-7.0 mm long .................... 2. S. lucida
bb. Capsules 7.0-10.0 mm long .................. 3. S. serissima
aa. Not so glandular.
  c. Flowers and capsules clustered and sub-
     verticillate ..................... 1. S. amygdaloides
cc. Flowers and capsules spirally arranged.
  d. Leaves remotely serrulate to entire.
     e. Leaves remotely serrulate to
        nearly entire .................. 6. S. fluviatilis
     ee. Leaves entire .................. 26. S. pedicellaria
dd. Broader and closely serrulate.
     f. Branchlets brittle, the year's
        growth separating very rea-
        dily from the main branch ...... 4. S. fragilis
     ff. Not brittle ...................... 5. S. alba

Group 3
Like group 2, but the scales dark coloured, at least at
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the tip, brownish to black and persistent at least to the maturity of the catkin.

a. Catkin sessile on old wood and quite leafless at base, or on a short peduncle bearing a few very small leaves barely longer than the capsules.

b. Twigs long spreading-villous ........ 23. *S. calcicola*

bb. Twigs glabrous or somewhat pubescent when very young, by exception densely puberulent ................. 16. *S. monticola*

aa. Catkin terminating a lateral shoot bearing a few normal or reduced leaves.

c. Leaves entire, slightly revolute

c. Leaves glandular-serrulate.

cc. Leaves glabrous or nearly so below.

d. The 2- or 3-year old twigs jet black.

e. Young leaves villous on both faces, green below ...... 20. *S. commutata*

ee. Leaves glabrous and slightly glaucous below ............. 19. *S. Barclayi*

dd. The 2-year old twigs paler, yellow to reddish or brown.

f. Twigs yellowish or straw coloured, the new ones sometimes purplish ................. 17. *S. lutea*

ff. Twigs green, reddish or purplish to brownish, often drying blackish, the older ones turning gray.

g. Stipe slightly shorter to slightly longer than the scale ........ 21. *S. myrtillifolia*

gg. Stipes much longer than the small scales.

h. Young shoots with strong balsam fragrance ............. 15. *S. pyrifolia*

hh. Not odoriferous ... 16. *S. mackenziana*

Group 4

Erect or ascending shrubs or small trees with pubescent ovaries and capsules. Catkins appearing before the leaves, sessile or nearly so, leafless at base and borne on old wood.

a. Leaves glabrous or nearly so below.

b. Capsules 7-10 mm long on pedicels 1.0-2.5 mm long ......................... 27. *S. discolor*

bb. Capsules smaller, 5-6 mm long and sub-sessile ......................... 31. *S. phylicifolia*

aa. Leaves densely puberulent to white tomentose below.
c. Leaves densely soft villous on both faces .......................... 24. S. Barrattiana
cc. Glabrous to lightly floccose above.
  d. Leaves rather narrow, more than four times longer than wide.
    e. Twigs white-tomentose ........ 25. S. alaxensis
    ee. Twigs bluish to dark coloured ...................... 32. S. pellita
dd. Leaves oblanceolate to obovate.
    f. Capsule 2.5-4.0 mm long, white-silky at least when young ...................... 34. S. sitchensis
    ff. Capsule much longer.
      g. Pubescence of lower surface of leaf entirely of white hairs .................. 23. S. humilis
      gg. Pubescence of new leaves partly russet coloured .... 27. S. discolor

Group 5
Similar to group 4, but flowering later, at the same time as the leaves, and the catkins borne at the end of a short leafy shoot.
  a. Pedicels well developed, as long as to many times longer than the scales.
    b. Leaves narrowly lanceolate to linear ................................. 29. S. petiolaris
    bb. Leaves broader, ovate to oblong-lanceolate.
      c. Leaves of the sterile and fertile shoots of about the same size .................. 26. S. pedicellaris
      cc. Leaves of the sterile shoots many times larger .................. 22. S. Bebbiana
aa. Pedicels shorter to nearly lacking.
    d. Aments subterminal; stigma sessile ............................. 8. S. vestita
    dd. Aments terminal; style at least 0.5 mm long.
      e. Leaves entire to shallowly and remotely crenate.
        f. Leaves white-tomentose below, floccose above, remotely crenate ......................... 30. S. candida
        ff. Leaves glabrous to sericeous, entire.
          e. Leaves lanceolate to long-linear ........ 6. S. fluviatilis
          gg. Leaves broader, ovate to oblong-lanceolate.
h. Petiole very short, 2 mm long or less .......... 13. _S. brachycarpa_
hh. Petiole longer.
  - Capsule 2.5–3.5 mm long ................. 34. _S. sitchensis_
  - Much larger, 4–8 mm long.
    j. Catkins at the end of a leafy shoot bearing leaves at least half as long as the leaves of sterile shoots ...... 12. _S. glauca_
    jj. Catkins subsessile, bearing at base a few bracts hardly longer than the capsules ...... 31. _S. phyllicifolia_

ee. Leaves serrate.
  - Very remotely serrate ........... 6. _S. fluviatilis_
  kk. Closely serrate.
    1. Leaves glaucous and silky to lightly strigose below ............... 33. _S. arbusculoides_
    11. Leaves glabrous on both faces and slightly paler green below ........... 14. _S. MacCalliana_

1. _S. amygdaloides_ Andersson -- A fairly large native tree with yellowish-green foliage of long caudate and somewhat drooping leaves. Branchlets yellow. Stipules small and nearly always absent. Petioles slender, yellowish, glandless, rather inconspicuous, mostly about 1 cm. Leaf lanceolate, glabrous except when very young, finely glandular serrulate, slightly paler and glaucous below. Earlier leaves not caudate, much smaller, entire, cuneate at base and nearly sessile. Catkins lax, terminating short leafy shoots. Stamens about 5. Capsule glabrous, ± 4 mm long. Stipe glabrous, 1.0–1.5 mm long. Stigma subsessile. Scale about 2 mm long, white or nearly so, densely tormentose ventrally, at least partly glabrous on the back. Flowering in mid-spring with the leaves. River shores at the inner edge of the galerie-forest. -- SW-SC, US.

2. _S. lucida_ Muhl. (var. _amnustifolia_ Andersson, var. _intonsa_ Fern.; _S. candata_ (Nutt.) Heller, var. _carvifolia_ C.R. Ball; _S. lusandra_ Bentham, var. _caudata_ (Nutt.) Suaw., var. _lancifolia_ (Andersson) Bebb) -- (Saule laurier) -- A small native tree with long-caudate shining leaves. Twigs yellow to brownish. Leaves dark green, thick, lanceolate, glabrous or nearly so, paler to strongly glaucous below. Mid-nerve pale yellow. Catkins stout, terminating short leafy shoots. Sta-
mosses 4-(5). Capsules subverticillate, glabrous, 5-7 mm long.
Stipe 1-2 mm long. Style not well defined, 1 mm long or less.
Scale caducous, pale, mostly whitish, lightly pilose. Flow-
ering after mid spring, shortly after the leaves. Along streams
and lake shores. Mack-Aku, L-525, No-50, US.

The western plants are commonly distinguished as S. las-
landii but there is no geographical discontinuity and we
have been unable to detect a morphological one. However the pheno-
type with the leaves strongly glaucous below presents a statisti-
difference, being uncommon in the east but the most fre-
quent type in the west. Var. caudata is commonly used for west-
ern specimens with leaves green on both faces.

3. S. geranioides (Bailey) Fern. -- A colonial shrub with
dark shining leaves and the last to flower and fruit, usually
shedding its seed after mid summer. Similar to the proceeding
and often confused with it. Twigs shining and reddish brown.
Leaves lanceolate, merely acute to subacuminate, firm, glandu-
lar-serrulate, dark green above, paler and usually more or less
glaucous below. Mid-nerve pale yellow. Catkins terminating
short leafy shoots. Stamens 5. Capsules subverticillate, gla-
brous and shining, 7-9 mm long. Stipe glabrous. Scales cadu-
cous, pale yellow, villous. Style less than 1 mm long. Late
spring to early summer, after the leaves. Marshes and bogs.--
Mack, L-525, -Alta, US.

4. S. FRAGILIS L. -- Crack Willow (Saxa) -- A large in-
truded tree, rarely escaped, the new lateral shoots snapping
off very readily at the point of origin in a strong breeze or
when pressed backwards. Leaves about lanceolate, somewhat can-
date, closely glandular-serrate, glabrous, glaucous below. Cat-
kins long and narrow, terminating short leafy shoots. Stamens
only 2 (like all the following species). Capsule small, glo-
brous, 3-5 mm long, short stipitate. Flowering in mid spring
with the leaves. Planted and rarely escaped at Otterburne, A-
thabaska Landing, La Sale river and may be elsewhere.--SK, (No-
N4), -Alta, (US, Eur).

5. S. ALBA L. -- French Willow (Saxa) -- Similar to the
proceeding, Branchlets not brittle. Leaves lightly silky or
strigose, the hairs essentially parallel to the mid-nerve. Flow-
ers in mid-spring with the leaves. Rarely escaped to river

S. acutifolia L., S. alba L., var. appendiculata var.
serrata Gaud, var. vitellina (L.) Stokes and S. pentandra L.
were included in the Saskatchewan list by Breitwisch. This
There is a gradual transition from cultivated to spontaneous or natu-
ralized species and authors of floras vary greatly as to where
they draw the line between the escaped plants to be included in
a flora and the cultivated ones to be searched for in manuals on
cultivated plants. We have included such as are obviously or
apparently long persistent after cultivation, such as Rheum, or
spreading from cultivation, such as Hesperis, or at least very
readily reseeding itself, such as Lepidium sativum. Species
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more contingent upon the immediate or continuous care of the cultivator have been omitted. The six Willows enumerated above are omitted as being a clear case of "planted" or "cultivated" ornamentals and windbreaks.

6. *S. fluviatilis* Nutt. var. *fluviatilis* (*S. melanopsis* Nutt., var. *Bolanderiana* (Rowlee) Schneider) -- Differs from the more widespread var. *sericans* by its wider leaves 3-8 times longer than wide, mostly 5-10 mm wide, sometimes glaucous below. Twigs mostly purplish and turning black upon drying. Capsule variable, mostly glabrous and 4-6 mm long. Mostly a shore species.--swalta-seBC, US -- Var. *sericans* (Nees) Boivin (*S. exiguus* Nutt.); *S. interior* Rowlee, f. *wheeleri* (Rowlee) Rouleau, var. *pedicellata* (Andersson) C.R. Ball; *S. longifolia* Wahl.; *S. melanopsis* Nutt. var. *tenuifolia* (Hend.) R.R. Ball -- Leaves narrow-west. Sometimes a small tree, but commonly forming large dense colonies of flagelliform shoots 1-2 m high. Young shoots densely grayish-silky, soon becoming green and much less pubescent to glabrous. Leaves long linear 10-15 times longer than wide, mostly 5 mm wide or less, very remotely glandular-denticulate, or rarely entire, usually equally green on both faces. Catkins often in clusters of 2 or 3, terminating lateral shoots that carry normal-size leaves and often branch again to produce later catkins and carry the flowering into mid-summer. Scales yellowish, caducous. Ovary glabrous. Flowering with the leaves or a little later, from mid to late spring or sometimes up to mid summer. Wet places, but especially common on sandy shores. --Mack-Aka, NB-BC, US -- F. *Hindsiana* (Bentham) Boivin (*S. interior* Rowlee var. *exterior* Fern.) -- Pubescence spreading, longer, denser, velvety, persistent all summer. Local --Mack, 0, S-BC.

Travelling through the western U.S.A. in 1960, we found it impossible to recognize more than one species in the *S. fluviatilis* group. This confirmed our previous field experience in Canada and explained our troubles in the herbarium in trying to distinguish the 4 to 7 species that some authors recognize in this group. More heavily pubescent plants, such as *S. sessilifolia* Nutt. or *S. Hindsiana* Bentham are fairly frequent and will often appear to be genetically controlled or sometimes only ecologically conditioned; it seems doubtful if they deserve to rank taxonomically any higher than form.

Some specimens of var. *sericans*, from Saskatchewan or Manitoba, especially vigorous shoots, will on occasion exhibit larger leaves and may be found in various herbaria determined as *S. fluviatilis* or *S. melanopsis*, but do not seem to have ever been reported as such in the botanical literature.

Catkins subterminal on a normal shoot. Scales light to deep purple. Capsule densely pubescent, + purplish. Flowers after the leaves in late spring. Carpeting wet, open, arctic habitats. -- F-Aka, (L-NF), Q-Man-(nS), BC, wUS -- Var. nivalis (Hooker) Andersson (S. nivalis Hooker, var. maximontana (Rydberg) Schneider; S. maximontana Rydberg) -- Leaves entire. Often smaller and more completely buried underground except for the leafy tips. Leaves often smaller, mostly 0.5-2.0 cm long. Catkins rather short, mostly less than 1 cm long. Flowers after the leaves in late spring to mid-summer. Carpeting alpine prairies. -- swAlta-sBC, wUS.

8. S. vestita Pursh (var. erecta Andersson) -- Much like the preceding, but more pubescent and the branches not buried. Trailing to erect, 1-5-(10) dm high. Twigs grayish and densely pubescent. Leaves nearly always densely whitish-silky below. Petioles short, mostly about as long as the buds. Scales yellowish. Capsules grayish-pubescent. Flowers just after the leaves in early summer. Wet, shaded subarctic habitats, or subalpine near timberline. -- (F)-K, L-NF, Q-(nO)-Man, Alta-sBC, US.

In 1838 Hooker described a var. nana, "glabra, foliis multo minoribus amentis pauci-(6-8)-floris" from the Rocky Mountains. The exact disposition of this name remains in doubt. If it proves to be synonymous with var. nivalis of the previous species as proposed by Cronquist 1964, var. nana will have to supersede var. nivalis. However, such smaller (=f. menalis Fern.) or nearly glabrous (=var. psilophylla Fern. & St. John) types also occur as extremes of variation of S. vestita and the correct disposition of var. nana is not obvious on the basis of its description alone.

9. S. herbacea L. -- Very small and completely buried except for the leaves and catkins. Glabrous throughout or nearly so. Petioles short. Leaves about 1 cm, orbicular, crenate-serrate, often lined with red at margin, green on both faces. Aments subterminal, small, less than 1 cm long and few-flowered. Capsule glabrous, deep red, short stipitate. Flowers after the leaves in early summer. Arctic prairies. -- G-K-(Mack), L-(NF), Q, (nMan, US), Eur.

10. S. arctophila Cockerell -- Generally similar to the following, not so deeply buried and less pubescent. Branches trailing, often ascending at tip. Leaves sometimes sericeous, commonly glabrous, slightly shiny above, glaucous below. Catkins 3-9 cm long at maturity, terminating lateral leafy shoots. Ovary sometimes tomentose when very young, soon becoming lightly pubescent to glabrous, red to dark purple, often drying blackish. Scales about the same colour as the capsules and not conspicuous except for their abundant and very long pilosity. Flowers with the leaves from mid-spring to mid-summer. Mostly wet gravels in arctic tundra. -- (G-F)-K-Y, L-(NF), Q-(nO)-nMan, (US).

Quite closely related to the following with which it is largely sympatric.
11. *S. arctica* Pallas (var. *araioclada* (Schneider) Raup, var. *torulosa* (Trautv.) Raup) -- Half-buried trailing shrub with large and stiffly erect catkins. Foliage mostly glabrous, or somewhat villous. Leaves mostly 2-5 cm long, mostly obovate to oblanceolate, entire or minutely serrulate, rather dull above, slightly paler to glaucous below. Catkins 2-4-(8) cm long at maturity, terminating lateral leafy shoots, strongly two-toned because of the contrasting capsules and scales. Capsules densely grayish to whitish-tomentose. Scales dark brown to blackish, long pilose. Flowers with the leaves before mid summer. *Wet alpine slopes.*—(G)-F-Aka, L-(NF), W-nQ, wAlta-BC, US, (Eur).

Rather variable and many varietal or specific segregates have been proposed of which some are very rare and hence highly localized. The more common phenotypes tend to have the distribution of the species and are accordingly not reckoned as significant with the exception of *S. arctophila*.

11 X. *S. arctica* X *glaucum* -- Has been reported for Jasper.—(G, Y, NF, nQ, swAlta-seBC, US).

12. *S. glauca* L. var. *glaucum* (*S. desertorum* Rich.; *S. glaucescens* Andersson) -- A middling shrub, rather branchy, mostly about 1 m high, with grayish-tomentose twigs and a general dull-gray appearance; the foliage and catkins much as in *S. arctica*. Foliage often somewhat villous when young, usually glabrous at maturity. Petioles well developed. Leaves 2-5 cm long, mostly broadly oblanceolate, dull green above, glaucous below, entire or nearly so. Catkins terminating short, leafy lateral shoots. Capsules tomentose, at first grayish-white, later pale green to pale brown, short stipitate. Scales very pale yellow and as pale as the capsule, varying to brown and obviously darker than the capsule, lightly tomentose to somewhat villous, but not conspicuously so. Flowers with or after the leaves, but before mid summer. *Frequent in arctic or subarctic, alpine or subalpine habitats.*—(G-K)-Mack-(Y)-Aka, (L), nW-(O)-Man-BC, (US, Eur)—Var. *Macounii* (Rydb.) Boivin (*S. cordifolia* Pursh, var. *callicarnea* (Trautv.) Fern.) — Less pubescent. Usually lower, usually less than 1-5 dm high and leaves broader, obovate to oblanceolate. Not always clearly distinct and the specimens from our area are mostly transitional.—(G-F)-:(Mack)-Y, L-(ME-Si), US, —(O-Man).

Highly variable like the precedent and a wide selection of phenotypes have received names. The more eastern material is usually distinguishable as var. *Macounii*.

Many collections have been reported as the putative hybrid *S. brachycarpa* X *glaucum* (=*S. wyomingensis* Rydb.) All those we have examined were more like one or the other of the numerous variants of *S. glauca* or *S. brachycarpa*.

1 m high. Leaves (1)-2-3-(5) cm long, ovoid to obovate-lanceolate, entire, glaucous below. Petiole very short, usually less than 1 mm long. Catkins short, terminating short lateral shoots with leaves about as large as those of other sterile lateral shoots. Capsules 4-5 mm long, tomentose, subsessile. Scales pale. Flowers with the leaves in late spring to early summer.

Specimens from the sand dunes around Lake Athabasca tend to be more densely pubescent and were described as var. psammophila. Other described segregates seem to have the range of the species and are not considered to be significant, one exception being the more northern var. flexiae C.R. Ball, a larger plant, with the leaves mostly 5-6 cm long, often glabrous or nearly so above, and the catkins lower, mostly 2-3 cm long.

There is a dot in northern Manitoba on a map of S. nicholiana Rydb. (var. flexiae) in Porsild 1957. It may be only the result of a lapsus calami as the species is not mentioned in Scofield's Flora of Manitoba published the same year and we found no corresponding specimen at CAN in 1962.

Putative hybrids of $S$. brachycarpa $\times$ glauca parentage are not readily distinguishable from var. flexiae. However reports of this hybrid within our area were apparently based on ordinary specimens of $S$. brachycarpa.

13. $S$. virilis Boivin -- Hybrid with $S$. candida. Similar to the above but the branches, leaves and flowers tomentose in the manner of $S$. candida, not sericeous. Leaves obovate-lanceolate, the main ones 3.5 cm long, 1.0-1.5 cm wide. Sand dunes near Caddo. -- seK, man.

13'a. $S$. macrophylla Boivin -- Apparently a hybrid with $S$. lutea var. Turnerii and similar to the last, similarly purple, but more pubescent and the catkins borne on leafy shoots. New leaves white-tomentose, becoming grayish villous on expanding and glabrescent at maturity. Petiole 1.5 cm long, Catkins terminating short leafy shoots which bear only half as large as those of the sterile shoots. Capsule grayish villous. Dunes between Little Hill and Athabaska Lakes. -- nwS.

Hybr. n. At $S$. lutea var. Turnerii varipes, sed pubescentior et rami fertilibus foliosis. Folii in primis albomentosae, deinque griseis in aetate albumentosae. Petiolus brevis, 1-3 mm. Rami fertilibus foliosis, folii 1.0-1.5 cm long et 4-8 in ramo. Capsula purpurea sed griseo-villosa. Type: C.W. Arct. 194-2, Northern Saskatchewan, south shore of Lake Athabaska, east of Williams River, sand dunes north of "Little Hill" Lake, lat. 51°, long. 107°, lee slope of dune, 27 Jan. 1467. (C.W.).

14. $S$. macCallanensis Howle -- A colonial shrub with the foliage rather similar to that of $S$. serissima, equally thick, glaucous above and paler but not glaucous below, glandular-serrulate, acute but not caudate at tip. Midvein sharply yellow. Catkins terminating short lateral shoots. Stamens only two. Ovary and capsule white-tomentose, short stipitate. Scale...
persistent, rather large and conspicuous, + glabrous in the upper half and dirty brown, at least half as long as the ovary or capsule and seemingly enlarging at maturity, becoming 3-5 mm long. Flowers with the leaves, from early to late spring.

Swamps.--sMack, cQ-cBC, (US).

15. *S. pyrifolia* Andersson (*S. balsamifera* Barratt) -- A bog species, rather strongly balsam-scented and thin-leaved. Even in the herbarium, the leaves remain balsam-scented for years. Glabrous shrub, 1-3 m high. Stipules small and nearly always absent. Leaves 3-6 cm long, ovate to lanceolate, thin, shining green above, glaucous below, serrulate, acute at tip, mostly cordate at base. Catkins large, on very short shoots bearing leaves less than half the size of leaves on sterile shoots. Capsules glabrous, purplish. Stipe glabrous and long, subtended by a shorter, villous and tomentose scale. Flowers with the leaves around mid-spring. Very wet places, especially at the edge of bogs.--(sMack)L-NF, (NS-NB)-Q-Alta-(BC, US).

16. *S. monticola* Bebb (*S. Barclayi* AA.; *S. Farraræ* C.R. Ball; *S. pedophylla* Rydb.; *S. pseudomonticola* C.R. Ball, var. *pedophylla* (Rydb.) C.R. Ball) -- The foliage much as in the preceding but thicker and with stipules 5-10 mm long, conspicuous, nearly always present, especially on the leading shoots. Branchlets puberulent. Catkins sessile and leafless to short-peduncled and with 1-3 very small leaves. Capsules yellowish to purplish, often half hidden by the villosity of the scales. Stipe variable. Scales small and very long villous, the hairs longer than the scales, sometimes glabrous. Flowers before or with the leaves in early spring. Shores and wet places.--(Mack)-Y-Aka, (L), Q-BC, US.

After the catkins have fallen off, it may not be readily distinguished from *S. mackenzieana* except that the latter tends to narrowly oblanceolate leaves while they are mainly broadly oblanceolate in *S. monticola*.

17. *S. lutea* Nutt. var. *lutea* -- Last year's twigs yellow, the new ones often reddish, the older ones turning gray. Tall shrub, 2-4 m high. Foliage glabrous, except when very young. Stipules smallish, nearly always present. Leaves lanceolate, short-acuminate, serrulate, glaucous below. Catkins subsessile and bracteate at base. Capsule glabrous, pale green to reddish, long stipitate. Scales brown, small, long villous, persistent. Flowers in mid spring, with or slightly before the leaves. River banks and ditches.--(sMack), nO-Alta, US -- Var. *Turnorii* (Raup) Boivin (*S. Turnorii* Raup) -- Strongly purplish-tinged, especially the more vigorous new shoots, the petioles, the midnerves and the capsules. Leaves thickish, usually not acuminate. Catkins tending to be shorter, mostly 1-3 cm long. Dunes on the south side of Lake Athabaska.--nWS.


A report of *S. rigida* Muhl. for Otterburne by Løve 1959 was based on a collection now revised to *S. lutea* (DAO, MT).
Other western specimens similarly identified S. rigida or S. cordata were all revised to other species, mostly S. lutea, S. mackenzieana and S. monticola.

The more eastern S. cordata Mx. and its var. rigida (Muhl.) Carey tend to be more pubescent, the larger leaves are usually quite clearly cordate, and the catkins are borne on short shoots bearing a few reduced leaves.

18. S. mackenzieana (Hooker) Barratt -- The red tinted stipes very long, much overtopping the pubescence of the scales and at least half as long as the capsule. Shrub around 3 m high, with glabrous foliage, except when very young. Stipules large and usually present on leading shoots. Leaves lanceolate or narrowly lanceolate, serrulate, glaucous below. Catkins on a very short peduncle bearing quite small leaves. Capsules glabrous, often reddish. Scales brown, small, very loosely tomentose rather than villous. Flowers probably early. Along streams.--(Mack-Y), wS-BC, US.

19. S. barclayi Anderson -- The leaves soon glabrous below, but remaining villous-pubescent above, especially along the mid-vein, at least till mid summer; the coarse twigs rather jet black in the herbarium. Very young twigs often whitish-villous. Stipules mostly present and rather variable. Leaves mostly broadly obovate, serrulate, acute to rounded at tip, slightly glaucous below, tending to blacken in drying. Catkins on a short peduncle, bearing a few half-size or smaller leaves. Capsules glabrous, at least half buried in the very long villosity of the scales. Styles elongate, over 1 mm long. Stipe less than half as long as the blackish, lanceolate, long-villous scales. Probably flowers in late spring, or early summer, after the leaves. Near mountain lakes and creeks, below timberline.--(Mack-Y), wS-BC, US.

20. S. commutata Bebb (var. denudata Bebb) -- Much like the preceding in its black twigs; the pubescence, leaves and stipules similar, but the leaves equally green and equally villous on both sides, becoming equally glabrous. Catkins terminating short lateral shoots bearing a few somewhat reduced leaves. Stipe very short. Scales brownish, small, loosely tomentose to long-villous. Styles mostly less than 1 mm long. Flowers after the leaves in late spring. Near mountain lakes and creeks: Cameron Lake.--(wMack-aAka), swAlta-BC, (US).

21. S. myrtillifolia Andersson (var. brachyoda Fern., var. pseudomyrsinites (Andersson) C.R. Ball; S. curtiflora Anderson; S. pseudocordata (Andersson) Rydb.) -- A smallish bog species, commonly half buried in Sphagnum and looking somewhat like a Blueberry bush (i.e. like Myrtillus). Mostly 3-6 dm high. Stipules insignificant and mostly absent. Leaves oblong to lanceolate, mostly 2-5 cm long, soon glabrous, serrulate, acute to obtuse at summit, slightly paler to slightly glaucous below. Catkin terminating a short lateral branch with nearly normal to slightly reduced leaves. Stipe slightly shorter to slightly longer that the scale. Scale puberulent to villous,
strongly two-toned, pale yellow nearer the base, blackish near the tip. Flowers after the leaves in late spring. Marshy places, mostly in Black Spruce bogs.--(O-F)-K-Aka, L-(NF), NB-BC, US.

22. **S. Bebbiana** Sarg. (var. *capreifolia* Fern., var. *perrostrata* Rydb.; S. *rigida* Rich.) — (Chaton, Petit Minou) — Very loose catkins of finely silky capsules on very long pedicels. A very common species, colonial, a bush or a small tree, with the general appearance of *S. discolor* and not infrequently confused with it. Leaves fairly variable, typically the early leaves are villous or short sericeous when young, while the later leaves are felty-tomentose below when young, becoming nearly glabrous, without rusty hairs, broadly oblanceolate, entire to weakly glandular-serrulate, glaucous below. Vigorous shoots usually bearing large stipules and crisp-marginated leaves, the elongating branchlets grayish-tomentose. Catkins flowering from base to summit, borne on a very short peduncle bearing a few bracts or some very reduced leaves about as long as the capsules. Scales yellowish, somewhat villous, the villosity more or less overtopped by the stipes. Flowers in early spring with the leaves or almost ahead of them. All kinds of wet and not so wet or very wet places.--K-Mack-(Y)-Aka, (L-NF, NS-PEI)-NB-Man-(S)-Alta-BC, (US).

23. **S. calcicola** Fern. & Wieg. (var. *glandulosior* Boivin) — A low arctic shrub, flowering before the leaves. Up to 1.5 m tall but usually much lower, to depressed and trailing. Twigs coarse, the younger ones abundantly spreading-villous, becoming dark coloured and usually blackish. Leaves very variable, round to lanceolate, mostly ovate, often broadly cordate at base, entire to glandular-serrulate, glaucous below, with a thick and short petiole. Stipules commonly present and large. Catkins sessile, leafless at base, rather large, dense and thick, at maturity 5-10 cm long. Capsules rather large, almost sessile. Scales very long, very black and very long-villous, the villosity not infrequently overtopping the capsules. Very early spring, before the leaves. Wet tundra and mountain river gravels.--F-K-(Mack), L-(NF), Q-neMan, swAlta.

Reports of *S. richardsonii* Hooker from Churchill proved to be based on specimens of *S. calcicola* and *S. planifolia*.

24. **S. Marratianna** Hooker (var. *angustifolia* Anderson) — The leaves densely and permanently soft villous on both faces. Very variable in size, commonly around 1 m high. Twigs becoming coarse, permanently long spreading villous, darkish and with very prominent leaf scars. Leaves lanceolate, slightly paler below, entire to minutely glandular-serrulate. Catkins dense, rather large, 6-10 cm long at maturity, subsessile, the very short peduncle usually bracteolate. Capsules large, short stipitate, densely puberulent to white-sericeous, at least half buried in the long pilosity of the long and very black scales. Flowers in early spring before the leaves. Near lakes and creeks, mostly above timberline.--(Mack-Y)-Aka, (Alta-BC, nwUS).
25. *S. alaxensis* (Andersson) Cov. -- New twigs permanently white felty-tomentose. Mostly 1-3 m high. Leaves obovate to oblanceolate, slightly revolute and entire or minutely glandular-serrulate at margin, green and nearly glabrous above, white felty-tomentose below. Stipules large and mostly present. Catkins large, dense, up to 7-12 cm long at maturity, sessile on old wood, bractless to bracteolate at base. Capsules densely puberulent, subsessile. Scales long, black and very long villous, the villosity about equaling the top of the capsule. Flowers in early spring before the leaves. Alpine and arctic or subarctic lakes and streams.--F-Mack- (Y-Aka, nQ, nMan, swAlta-nBC, Eur) -- F. longicyllis (Rydb.) Boivin (var. obovalifolia C.R. Ball) -- The twigs not pubescent beyond the first year, often heavily pruinose the second year.--(K-Aka, nQ), nMan, (Alta) -- Var. *silicicola* (Raup) Boivin (S. silicicola Raup) -- More pubescent, the leaves grayish-tomentose above and somewhat concave. Subarctic lake dunes.--


26 X. *S. pedicellaris* X *phylicifolia* (S. *pedicellaris* X *planifolia*) -- Has recently been reported for a few northern localities.--(NS).

27. *S. discolor* Muhl. var. *discolor* (var. *Overi* C.R. Ball, var. *prinoides* (Pursh) Anderson) -- Pussy-Willow, Diamond-Willow (Chaton, Petit minou) -- A most common and most conspicuous species in very early spring, when it flowers so early that the capsules are almost ripe by the time the leaves come out. Colonial shrub to small tree. Leaves variable, obovate to lanceolate, mostly broadly oblanceolate, entire to serrulate or sinuate, glabrous at maturity and strongly glaucous below. Stipules smallish and mostly absent. Catkins subsessile on old wood, bractless and leafless, rather large, mostly 4-8 cm long at maturity. Capsules about 1 cm long, attenuate, densely puberulent. Scales black, long pilose, from about as long to about twice as long as the stipe. Styles 0.5-1.0 mm long. One of the earliest plants to flower. Most common where the land is subject to flooding right after the melting of the snow.--
28. S. humilis Marsh, var. humilis -- Leaves thick-velvety below, the lateral nerves immersed in the white pubescence. Rather similar to S. discolor var. latifolia, but generally smaller. Shrub 0.4-3 m high. Twigs cinereous-puberulent to velvety. Leaves glaucous below, sometimes glabrous. Catkins short-petioled, bractless and leafless at base, 2-4 cm long at maturity. Style rather short, 0.2-0.5 mm long. Flowers very early, long before the leaves. Dry open places, tolerates spring flooding.-- L-NF, NS-Alta, US --- Var. microura (Andersson) Fern. (S. triis Aiton) -- Generally only half as large, 1 m high or less. Leaves mostly 3-5 cm long. Fruiting catkins 1-2 cm long. Late spring before the leaves. Wetter spots in the prairie.--(O)—sMan, US.

29. S. petiolaris Sm. (var. gracilis Andersson, var. ros-marinoides (Andersson) Schneider, var. subsericea Andersson; S. gracilis Andersson, var. textoris Fern.; S. subsericea (Andersson) Schneider) -- The leaves rather narrow and glaucous below with a conspicuously yellow midnerve. Tufted shrub, mostly 1-3 m high, slender branched, the twigs deep red when fresh, usually blackening in drying. Leaves usually linear-lanceolate, at first appressed-pubescent, becoming glabrous or nearly so, serrulate. Stipules absent. Catkin on a short leafy peduncle, the leaves rather variable in size, often very small and not infrequently caducous. Stigma sessile or nearly so. Capsules finely silvery-silky, 5-7 mm long, the stipe usually well developed and as long to much longer than the brownish and villous scales. Flowers in early spring with the leaves. Moist places--sMan, James, US.


30. S. candida Flgge -- A common bog species, the leaves narrow and covered below with a snow-white tomentum. Mostly about 1 m high, the twigs ± grayish or floccose-tomentose. Leaves lanceolate or narrower, entire to crenulate or serrulate, revolute at margin, ± floccose above. Catkins terminal on short, lateral branches bearing a few much-reduced leaves. Style elongate. Capsule white-tomentose, with a short stipe, sub-tended by a longer, dark and villous scale. Flowers with the leaves in mid-spring. Muskegs and sometimes marshes.--K-Y-(Aka, L)-NF-SM, NS-PEI-(NB)-Q-BC, US --- F. denudata (Andersson) Rou-leau -- Leaves more or less glabrous below. Occasional.--NF, Q-0, S-(Alta).
31. S. phylicifolia L., var. phylicifolia (ssp. planifolia (Pursh) Breitung, var. Nelsonii nomen; S. planifolia Pursh, var. Nelsonii (C.R. Ball) E.C. Smith) -- Rather similar to S. discolor and readily confused with it, but flowering somewhat later. Also the leaves more glaucous below and more entire, the twigs and branchlets more strongly blackened in drying. Leaves mostly broadly oblanceolate, soon glabrous. Catkins on a short peduncle and usually bracteolate at base. Capsules densely puberulent, subsessile. Scales black, long pilose. Flower early before the leaves. Wet places, especially if subject to spring flooding.--(F-K)-Mack-(Y, L-SPM), Q-(0-Man)-S-(BC, US), Eur.

Taken as a group, the American specimens (S. planifolia) have a less pronounced denticulation than the eurasian ones, but the difference is not sharp enough to be taxonomically tenable.

A more northern var. subglauca (Andersson) Boivin has longer, narrower and marcescent stipules.

32. S. pellita Andersson var. pellita -- The narrow leaves densely silky-pubescent below, appearing somewhat silvery. Usually a tall shrub and mostly with strongly pruinose twigs. Leaves lanceolate to linear, not floccose, but finely puberulent above, minutely glandular-serrulate, but appearing somewhat entire due to the revolute margin. Catkins subulate and bracteolate at base. Capsules more or less white-silky and rather small, 4-5 mm long, subtended by a dark brown to black, long-villous scale. Styles 1 mm long or more. Flowers very early before the leaves. Shores.--(L)-NF-(SPM, NS, NB)-Q-(0-Man)-S, (US) -- F. psila Schneider -- Leaves glabrescent and strongly glaucous below, except for the half grown new leaves. Local.--Q-(0-S) -- Var. angustifolia (Bebb) Boivin (S. Drummondiana AA., var. bella (Piper) C.R. Ball, var. subcoerules (Piper) C.R. Ball) -- Pubescence of the underside of the leaves shorter, more compact and more uniform. Hairs (0.2)-0.3-(0.5) mm long.--(Y, Alta-BC, US).

33. S. arbusculoides Andersson -- Much resembling S. petiolaris but the leaves permanently silky below and the catkins narrower and longer. Usually a tall, tufted shrub with thin branches. Leaves lanceolate or narrower, glabrous above even when very young, glandular-serrulate. Catkins terminating very short branches bearing a few much-reduced leaves at base. Capsules 3-7 mm long, densely sericeous, subsessile. Scales small, dark brown, somewhat villous. Flowers early with the leaves. Mostly on river banks.--(K)-Mack-(Y-Aka), Q, (nMan)-S-(Alta-BC) -- F. glabra (Andersson) Boivin (S. Tyrellii Raup) -- Foliage and capsules glabrous.--(S).

34. S. arctica Sanson -- The ovoid capsules very small, 2.5-3.5 mm long, and white-silky at least when young. Pubescence much as in S. pellita, but the leaves broader, oblanceolate to elliptic-oblanceolate and the twigs not bluish. Leaves white-silky below, lightly silky above, sometimes becoming only lightly silky on both faces at maturity. Catkins varying from
sessile and bractless to short-peduncled and leafy-bracted at base. Scale brown to black, long villous. Flowers now with the leaves, now much earlier. Mountain streams: Waterton.--Saska, Alta-BC, wUS.

Re S. nigra Marsh. reported from near Maple Creek by Macoun 1886, see comment under Rosa nutkana.

Order 10. MYRICALES
A single family.

18. MYRICAEC (SWEET-GALE FAMILY)
Like the Salicaceae, but the ovary one-celled and one-seeded. Seed devoid of pappus. Ovary subtended by a group of bracts. Single genus.

1. MYRICA L.
SWEET-GALE
Catkins borne on separate leafless branches.


We have found no specimen to justify a report by Gleason 1952 of M. aspleniifolia L. from Saskatchewan. See comment under Buchloe dactyloides.

Order 11. FAGALES
Much as in the Myricaceae, but the ovary inferior and with 3 or more cells and ovules, only one of which matures. Calycule present.

a. Male and female flowers calyculate .............. 21. Fagaceae
aa. Either, but not both, with a calycule.

bb. Female flowers calyculate .............. 20. Corylaceae

19. BETULACEAE (BIRCH FAMILY)
Both male and female flowers borne in long catkins. Each seed subtended by a bract.

a. Pistillate catkins axillary ....................... 1. Betula
aa. Pistillate catkins in a leafless panicle or raceme ....................... 2. Alnus

1. BETULA L.
BIRCH

a. Shrub with compact bark; petiole 5 mm long or less (except sometimes on leading shoots) ....................... 4. B. nana
aa. Tree with papery bark; petiole longer.
1. B. papyrifera Marsh. var. papyrifera (var. commutata (Regel) Fern; B. Winteri Dugle) -- Birch, Paper-Birch (Bouleau, Bouleau à papier) -- A tree with the outer bark readily peeling off in paper-thin sheets. Bark colour mostly whitish-gray or chalky-white. Twigs minutely puberulent, often somewhat glandular-verrucose. Leaves ovate to rhomboid, serrate, rounded to truncate at base, pubescent below with tufts of hairs in the axils of the main nerves, otherwise usually glabrous. Catkins pendulous, mostly 4–5 cm long. Very early spring before the leaves. Mostly along banks and bluffs of larger rivers. -- Mack (-Y)-Aka, L-NF-(SPM), NS-BC, US. -- Var. cordifolia (Regel) Fern. (var. subcordata (Kyd.)) Sarg.; B. cordifolia Regel) -- Leaves mostly cordate and usually doubly serrate. More pubescent, the twigs and petioles abundantly pilose. Leaves pilose along the nerves on both faces, more so and often velvety below. Catkins often stubbier. Bark tending to gray. Scattered tree in Spruce forests. -- (K-)Mack, L-NF, NS, NB-BC, US.

The distinction between var. papyrifera and var. cordifolia is quite sharp in some parts of Canada, hence some authors will quite understandably treat the two taxa as specifically distinct.

B. Winteri was originally described as the hybrid B. neoalaskana (B. resinifera) X papyrifera. Some of the specimens cited came from well outside the range of B. neoalaskana (West Hawk Lake, Craven, etc.) and it seems highly questionable that these could represent a hybrid as postulated. About two thirds of the syntypes were examined and most seem to belong to B. papyrifera. One collection from Mt. Saskatoon could be doubtfully retained as a possible B. neoalaskana X papyrifera, yet it seems closer to B. neoalaskana. The type collection has not been seen.

2. B. neoalaskana Sarg. var. neoalaskana (B. papyrifera Marsh. var. humilis AA., var. neoalaskana (Sarg.) Raup; B. resinifera AA.) -- White Birch -- Much like the preceding, somewhat smaller and with smaller thickish leaves. Twigs densely glandular-verrucose. Bark white to pale pinkish brown. Leaves deltoid-ovate, simply serrate, short caudate, glabrous. Catkins descending, 2–3 cm long. Early spring, before the leaves. Scattered in Spruce forests, especially on wetter sites. -- (K-)Mack-Aka, nO-nBC.

B. resinifera Britton was based on a B. alba L. var. resinifera Regel which was in turn based on a Middendorf collection from Siberia. As our species does not occur in Siberia,
the epithet *resimifera* is obviously not available to designate our plant as some authors have done, unless one is willing to divorce *B. resimifera* from its basionym by Regel; this certainly is not a practice condoned by the International Code of Botanical Nomenclature.

In *Rhodora* 47: 321-3. 1945, Fernald typified *B. alba* L. var. *huminis* Regel in the sense of *B. neoaslaskana* by selecting as the type a Bourgeau sheet from the "Bords de la rivière Cas-tor" in Saskatchewan. However, in his original description Regel included as a synonym *B. papyrifera* var. *minor* Tuck. and he also cited Tuckerman's collection from the White Mountains. There is no evidence that Regel meant to describe a var. *huminis* different from a var. *minor*; quite the contrary, var. *minor* and its type were unequivocally included by Regel in his var. *huminis*. We are therefore, of the opinion that the type of var. *minor* automatically becomes the type of var. *huminis* and that the 1945 type selection was both superfluous and incorrect.

In Yukon and Alaska there occurs a var. *kenaiaca* (Evans) Boivin which differs from our typical variety by its leaves not caudate. Also they are usually pilose above and also towards the margin below.

3. *B. occidentalis* Hooker var. *occidentalis* (B. arbuscula Dugle; B. *Eastwoodiae* Sarg.; B. *fontinalis* Sarg.; B. *uliginosa* Dugle) -- Mountain Birch, Black Birch (Merisier rouge) -- A smaller and usually tufted species of sandy soils with dark, purple-brown, papyry bark, but the layers not peeling off readily. Young leaves and twigs lightly pilose and very resinous, soon glabrous, rarely densely puberulent. Leaves small, round-ovate, usually glabrous. Catkins spreading, 1-2 cm long. Early spring before the leaves. Sandy shores and hollows between sand dunes.--K-(Mack)-Y-Aka, NS, NB-BC, US.

West of us it grades into a more pubescent var. *inopina* (Jepson) C.L. Hitchcock, the twigs strongly pubescent and the leaves pubescent below, bearing hair tufts in the axils of the main nerve junctions.

There has been some disagreement as to the correct interpretation of *B. occidentalis*. As pointed out by Hitchcock 1964, Hooker obviously intended to describe the plant later renamed *B. fontinalis*. An earlier and rejected typification by Sargent was in the sense of one of the variants of *B. papyrifera* because it was cited first, as was the practice of the tenants of the American Code. The International Code of Botanical Nomenclature allows retypification whenever an earlier one is demonstrably in error. This is applicable here and *B. occidentalis* should be typified in the sense of the specimens and notes by Drummond and Douglas. The concept of nomen confusum is not applicable here since the name is obviously typifiable one way or another.

*B. utahensis* Britton (= *B. Andrewaii* Nelson), a putative hybrid of *B. occidentalis* X *papyrifera*, was described from Utah and recently reported from Yukon, Alberta and B.C. by J.R. Du-
Many specimens reviewed by Miss Dugle are at hand from B.C. Saskatchewan and Mackenzie, the latter two areas are not yet reported in the botanical literature. The many B.C. specimens fit into our concept of *B. occidentalis* Hooker var. *inopina* (Jepson) C.L. Hitchc., while the Sask. sheet belongs to typical *B. occidentalis* and the many Mackenzie sheets fit better in *B. neoalaskana*. The correct disposition of the Yukon and Alberta reports remains in doubt as the relevant sheets have not been examined.

*B. uliginosa* was described as a putative hybrid of *B. glandulifera* (=*B. nana* var.) X *resinifera* (=*B. neoalaskana*) from two localities in central Alberta. A photo of the type gives the superficial appearance of *B. occidentalis*; but none of the specimens cited were at hand for examination. However, a large number of authentic specimens are available ranging from Manitoba to B.C.; mostly they belong to *B. occidentalis*, the remainder to *B. nana* var. *glandulifera* and a few of them were collected outside the range of one of the putative parents.

The type of *B. Eastwoodae* was illustrated in Can. Journ. Bot. 44: 953. 1966. It is obviously similar to *B. uliginosa* illustrated on the page facing and neither seem to differ significantly from *B. occidentalis*. Most of the many specimens cited or identified as *B. Eastwoodae* fall within our concept of *B. occidentalis*, but the Saskatchewan ones belong to *B. nana* var. *glandulifera*.


Intermediates between our two varieties are quite common and *B. Sargentii* was created precisely to designate them.

4X. *B. Sandberghi* Britton -- Hybrid of *B. papyrifera*. Rather variable, a tall shrub or small tree with dark brownish bark in the manner of *B. occidentalis*. Petiole somewhat less than 1 cm long, except on strong leading shoots. Leaves mostly about 3 cm long, broadly ovate to rhomboid-ovate, rounded to subacuminate at tip, rather finely but irregularly serrate, thickish and glutinous, but + pubescent below, especially in the main axils. Shores and bogs, rare: Saint-Norbert.--Q-Man, (US).

Recently reported, Can. Journ. Bot. 44: 992-7. 1966, from a number of additional localities west to Alberta. Most sheets so-named and examined were more characteristic of *B. occidentalis* while a few rather resembled *B. papyrifera* or *B. nana* var. *glandulifera*. 
2. ALNUS  B. Ehrhart  

ALDER

Seeds winged or wingless. Pistillate scales very thick and somewhat woody, not lobed. Buds sessile or stipitate.

a. Buds sessile; seeds winged

aa. Buds stipitate; seeds wingless, merely thin-margined

1. A. viridis

(Chaix) DC. var. sinuata Regel (A. crispa (Nut.) Pursh, var. mollis Fern., ssp. sinuata (Regel) Hultén) -- Alder, Green Alder (Aulne, Bois à rames) -- A shrub bearing woody ellipsoid catkins about 1.5 cm long. Very glutinous when young, pubescent to glabrous. Leaves ovate, serrate to nearly doubly serrate, green and often shiny below. Flowers in midsummer after the leaves. Often forming a continuous understory in Coniferous woods.--G, (K)-Mack-Aka, L-NF-(SPM), NS-BC, US.

Not always clearly distinct from the eurasian var. viridis. Our var. sinuata is commonly a larger shrub with much larger leaves and somewhat longer pedicels and pistillate catkins. Var. mollis is an extreme of pubescence which will be found to be somewhat more obvious and more common eastward.

2. A. incana (L.)Moench var. incana (var. virensensis Watson, ssp. rugosa (DuRoi) Clausen, ssp. tenuifolia (Nutt.) Breitung; A. rugosa (DuRoi) Sprengel, var. americanus (Regel) Fern., f. hypomalaca Fern.) -- Alder, Speckled Alder Mountain Alder (Aulne, Verne) -- A shrub or small tree with stipitate buds, the stipe 1-2 mm long. Leaves ovate, doubly serrate, green to glaucous below, densely pubescent to nearly glabrous. Flowers very early before the leaves. Shores of streams and lakes.--Mack-Aka, L-SPM, NS-BC, US, (CA), Eur.

We cannot detect a satisfactory difference between the eurasian A. incana and the American A. rugosa. The best character appears to be the colour of the pubescence and on this basis one could distinguish an American var. americana Regel (not the earliest epithet available) with the pubescence of the underside of the leaves + light brown, especially in the axils of the nerves, but sometimes white. In var. rugosa, the pubescence is white and only exceptionally brown tinted. Many other characters have also been stressed, but surely some of them are unrealistic, like the supposed difference in leaf serration, while others exhibit such a broad range of overlap as to have little practical value, even if they may have a statistical one. The difference in size has been overemphasized. The American plant is commonly a shrub 2-4 m high, especially when pioneering in wettest neglected fields. In more stable and less disturbed habitats, such as the floodplains of rivers in undisturbed forested regions, it will usually reach about 5 m with a trunk around 1 dm thick, reaching exceptionally 10-15 m and a trunk of 2 dm. The European counterpart is described as a "tree or shrub.
up to 10-(25) m".

Var. *virescens* will designate the specimens with leaves greenish below. This phenotype is sporadic throughout the range as pointed by Hultén 1944, but it is more common in our area than the glaucous type, which in turn becomes the more common phase in eastern Canada.

Our plants have ovate and doubly serrate leaves, as contrasted with the primarily planicostal var. *serrulata* (Aiton) stat. n., *Betula serrulata* Aiton, Hort. Kew. 3: 338, 1789, with ovovate and simply serrate leaves. The two varieties show a fair amount of intergrading and an *A. rugosa* var. *subelliptica* Fern. is indeed based on such intermediate material.

When *A. incana* and *A. rugosa* are treated as a single species, *A. rugosa* is usually given the priority because its specific epithet dates from 1788 while *rugosa* is supposed to date only from 1794. However there appears to be an earlier *Betula incana* (L.) L. f., Suppl. Pl. 417, 1781 which we have not seen but would seem to give priority to *A. incana*.

20. CORYLACEAE (FILBERT FAMILY)

Nut partly to completely enclosed by a group of partly fused, accrescent bracts.

a. Leaves simply serrate ..................... 1. Ostrya

aa. Leaves doubly serrate ................... 2. Corylus

1. OSTRYA Scop.

IRONWOOD

Fruits in an elongate catkin. Seed small, enclosed in a large, inflated involucrum of fused bracts.

1. *O. virginiana* (Miller) K. Koch var. *virginiana* -- Ironwood, Hop-Hornbeam (*Pois de fer, Bois dur*) -- The mature catkins resemble Hops. Small tree. Leaves elliptic-ovate, acuminate, pubescent, the terminal leaves on each twig many times larger than the lower ones. Second half of spring. Deciduous forests on hillsides.—NS, N.—sMan, US.

Quite local in our area, being known only from *Korden, Sprague and Falcon Lake*. It was also noted by Nicholas Garry in his diary in 1821 at *Forêtage de Chute d’Esclave* on the Winnipeg River. See Proc. Trans. Roy. Soc. Can. ser. 2, 6: 150. 1900.

In var. *virginiana* the twigs are glabrous to lightly pilose or sometimes stipitate-glandular. The more southern and primary planicostal var. *laxa* Fern. has densely pilose to velvety twigs.

2. CORYLUS L.

HAZEL-NUT

Pistillate catkin reduced to a short cluster. Involucre tightly enclosing the nut. Seed edible.

a. Twigs densely covered with spreading glandular hairs ..................... 1. *C. americana*
aa. Twigs not glandular ........................................ 2. C. cornuta

1. C. americana Walter -- Hazel, Filbert -- A shrub with the twigs densely beset with long, stiff, spreading, purple, glandular hairs. Leaf ovate, pubescent on both faces and somewhat glandular above. Nut largely enclosed by an involucre. Involucre flaring above the middle, leaving the top of the nut exposed. Early spring, before the leaves. Oak forests and sandy hillsides.--swQ-sMan, US.

2. C. cornuta Marsh. var. cornuta (C. rostrata Aiton) -- Hazel, Filbert (Noisetier, Courrier) -- The nut completely enclosed by the flask-shaped involucre. Twigs not glandular, lightly pilose with somewhat appressed hairs, glabrescent. Leaves much as in the preceding but not glandular. Involucre covered with stiff, almost acicular hairs, prolonged into a tube 1.5-2.5 cm long. Early spring, before the leaves. Rocky hillsides and dry deciduous woods.--NF-SFM, NS-BC, US.

Two more varieties occur west of us.

In the intermontane area: var. californica (D.C.) Sharp with a shorter beak, 0.5-1.5 cm long, and the twigs remaining pubescent all summer.

Along the coast, south to California: var. glandulosa, var. n. Ramulis petiolisque pubescentia pilis opaci glandulosisque intertexta. Ceteris us var. californica. Type: Calder & MacKay 31517, head of Finlayson Arm below Mt. Finlayson, north of Victoria, common and scattered in open areas along river and in woods, to 15' high, July 16, 1961 (DAO). By its glandular pubescence this new variety is reminiscent of the more eastern C. americana.

21. FAGACEAE (BEECH FAMILY)

Nut subtended by a cupule made up of a large number of fused bracts.

1. QUERCUS L.

Involute not dehiscent.

1. Q. macrocarpa Mx. -- Oak (Chêne) -- Leaves lyrate and strongly discolour. A tree with crooked branching. Leaves lyrate lobed, dark green and nearly glabrous above, pale green and densely stellate-puberulent below. Acorn sitting in a fringed cup. Mid spring, with the leaves. Upper part of galeric forests and forming bluffs on hillsides and drier prairies. --NB-seS, US.

Westward it is a gradually smaller tree (Q. mandanensis Rydb.) and becomes eventually restricted to the major coulées, namely the Souris, Pipestone and Qu'Appelle in southeastern Saskatchewan.

Order 12. URTICALES

Flowers not in catkins. Petals lacking. Calyx present,

CORYLUS
of fused sepals. Stamens as many as the calyx lobes.

a. Trees ..................................................... 22. Ulmaceae
aa. Herbs.
   b. Non climbers ....................................... 23. Urticaceae
   bb. Plant climbing by its twisting stem ................. 24. Cannabinaceae

22. ULMACEAE  
Trees with distichous, asymmetrical leaves.

a. Leaf with the middle lateral nerves stronger than those above and below ........................................ 1. Ulmus
aa. Lower pair of nerves longest, those above gradually shorter ........................................ 2. Celtis

1. ULMUS L.  
ELM
Fruit a round samara with the seed at the center.

1. U. americana L. -- Elm (Orme) -- A common tree with doubly serrate, asymmetrical leaves. Leaf soft-puberulent to scabrous, short-acuminate, with numerous and conspicuous, strictly parallel nerves. One side of the leaf is broader, ovate and cordate at base; the other side is obovate and cuneate at base. Flowers very early, before the leaves. Galerie-forests; often planted.—NS-(PEI)-NB-S, US.

2. CELTIS HACŒERRY
Fruit a drupe, solitary, similar to that of a Pin-Cherry.

1. C. occidentalis L. var. occidentalis—Hackberry, Sugarberry (Bois inconnu, Bois connu) — A tree with the leaves very obliquely truncate at base, ovate to oblong, caudate, serrate. Fruit black, long pedicelled. Flowers in mid-spring, with the leaves. On the eastern half of the sand dune at Delta. —swQ-Man, US.

Varieties are usually distinguished primarily on the leaves being smooth or scabrous, but this character is not geographically restricted. We have distinguished two varieties on a new basis as follows:

Var. occidentalis. Leaves 6-20 cm long, mostly 1 dm or somewhat less, ovate to oblong-lanceolate, mostly semi-cordate at base, acuminate-caudate at tip. Margin regularly dentate, the teeth mostly 20-30 to a side. This is var. pumila and var. canina sensu Fernald and also var. canina and var. crassifolia sensu Gleason. A photo of the Linnean type, 1209.4, shows a Kalm specimen with caudate leaves about 8 cm long.

Var. crassifolia (Lam.) Gray. More southern, the leaves smaller, 4-10 and mostly 5-7 cm long, broadly oval and mostly rounded at base, merely short acuminate at summit. Margin mo-
re irregularly toothed with fewer teeth, mostly 10-20 teeth to a side. This is var. occidentalis sensu Fernald and also sensu Gleason.

23. URTICACEAE  (NETTLE FAMILY)
Herbs, often stinging herbs. Calyx of 2-5 fused sepals.

a. Leaves opposite ........................................ 1. Urtica
aa. Leaves alternate.

b. Strongly hirsute with stinging hairs ...... 2. Laportea
bb. Not stinging; finely puberulent with catchy hairs .................. 3. Parietaria

1. URTICA L.

Stinging herbs with opposite leaves. Sepals and stamens

4.

a. Tall perennial ............................................. 1. U. dioica
aa. Low annual ............................................. 2. U. urena

1. U. dioica L. var. procera (Muhl.) Wedd. (U. crucilis Aiton; U. Lyallii Watson; U. procera Muhl.; U. viridis Rydb.)
-- Stinging Nettle (Ortie) -- Stinging herb with a square stem. Perennial in large colonies, commonly 1 m high. Leaves ovate or cordate below, becoming narrowly lanceolate above, coarsely serrate. All summer. Wettish places.--(G), Mack-Aka, L-NP-(SPM), NS-BC, US, Eur.

West of us occurs a more densely pubescent var. californica (Greene) C.L. Hitchcock, the stem and leaves grayish puberulent or densely villous, the pubescence mixed with much longer and stiff hairs.


2. LAPORTEA Gaud.

WOOD-NETTLE
Stinging herbs with alternate leaves. Sepals and stamens

5.

1. L. canadensis (L.) Gaud. -- Wood-Nettle (Ortie du Canada) -- Perennial herb with large, round-ovate leaves, remotely alternate below, close together near the summit. Leaves serrate, acuminate. Early summer. Forms large colonies on flood-plains.--SPM, NS, N3-seS, US.

3. PARIETARIA L.

PELLITORY
Non-stinging; the small flower-clusters subtended by overtopping bracts.

1. P. pensylvanica Muhl. -- A weak, small and inconspicuous.

Not yet reported from Alberta, although we know of 5 or 6 collections, some more than 40 years old.

24. CANNABINACEAE  (HEMP FAMILY)
Non-stinging herbs. Calyx reduced to a single sepal.
Dioecious.

a. Self supporting herb; leaves digitate........ 1. Cannabis
aa. Climber; leaves trilobed ..................... 2. Humulus

1. CANNABIS  HEMP
Ackene completely enclosed at maturity by an accrescent and long acuminate bract.
1. C. SATIVA L. -- Hemp, Marijuana (Chanvre) -- Tall annual herb with digitate leaves. Dioecious and conspicuously dimorphic in appearance. Lower leaves opposite, the upper alternate. Leaflets 5-9, very narrow, sessile, serrate. Mid summer. Rare weed of cultivation and waste places: Spirit River.--Q-0, Alta, US, Eur.

2. HUMULUS L.
Inflorescence a dense spike of achenes, each subtended by a very large pale green bract.

Order 13. CUNONIALES
Shrubs with inferior or semi-inferior ovary, the sepals partly fused and forming a more or less developed calyx-tube, the free petals inserted at the top of the calyx-tube.

a. Leaves alternate; flowers pentameric.

................................. 25. Grossulariaceae
aa. Leaves opposite; flowers tetrameric.

................................. 26. Hydrangeaceae

25. GROSSULARIACEAE  (GOOSEBERRY FAMILY)
Carpels 2, the flower otherwise pentameric with only 5 stamens. Single genus.
1. RIBES L.  CURRANT, GOOSEBERRY
Shrubs, often spiny, with palmately lobed leaves.
Fruit a berry.
a. Flowers 1-3-(5) in a very reduced raceme.
   Mostly spiny ........................................ 1. R. oxyacanthoides
   aa. Flowers more numerous, in elongate racemes.
   b. Densely spiny along the internodes.
      ....................................................... 2. R. lacustris
   bb. spineless or with a few nodal spines.
   c. Ovary and fruit densely stipitate-glandular.
   d. Leaves coarsely glandular above ..................... 9. R. viscosissimum
   dd. Leaves glabrous or finely puberulent above.
   e. Ovary (and fruit) abundantly and finely puberulent underneath the glandulosity.
      ...................................................... 3. R. laxiflorum
   ee. Ovary merely glandular-stipitate .................... 4. R. glandulosum
   cc. Ovary glabrous or bearing a few sessile glands.
   f. Leaves dotted below with yellow, resinous glands.
   g. Pedicels many times longer than the small bracts..
      ....................................................... 6. R. hudsonianum
   gg. Bracts much longer than the short pedicels .... 7. R. americanum
   ff. Not glandular-dotted.
   h. Leaf lobes closely and uniformly serrate from base to tip ..................... 5. R. rubrum
   hh. Leaf lobes with a few coarse teeth above the middle.
   i. Calyx long tubular; bracts persistent in fruit ..................... 8. R. aureum
   ii. Calyx saucer-shaped; bracts caducous after flowering ........... 10. R. diacanthum

1. R. oxyacanthoides L. var. oxyacanthoides (R. setosum Lindley; Grossularia oxyacanthoides (L.) Miller; G. setosa (Lindley/Cov. & Britt.) -- Wild Gooseberry (Groellier sauvage) -- Abundantly armed with straight prickles and aci-cules, the branches often recurved and then forming fierce-ful tangles. Racemes very short and few-flowered, mostly shorter than the petiole of the subtending leaf. Bracts glandular-ciliate. Flower yellowish white, the tube variable in length. Berry glabrous, pruinose, dark bluish purple. Early to mid spring. Sandy or rocky places.--(K-Jack)-Y, (NP), PEI, (c)-O-BC, (US) -- Var. saxosum (Hooker) Cov. (R.
Boivin, Flora of Prairie Provinces

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hirtellum Mx., var. calcicola Fern., var. saxosum (Hooker) Fern.; R. inermie Rydb.; Grossularia hirtella (Mx.) Spach --
(Pausee épine) -- Bracts long ciliate with glandless hairs;
acicules and prickles fewer, weaker and somewhat fugacious.
---L-(NF-SPM), NS-Alta-(BC), US.

2. R. lacustris (Pers.) Poiret (Limnobotrya lacustris
(Pers.) Rydb.) -- Swamp-Current, Swamp-Gooseberry (Grosseillier sauvage) -- Like the precedent, with the stem and twigs
densely armed with prickles and acicules, but the fruit glandular-bristly. Pedicels glandular. Flower saucer-shaped,
greenish to purplish. Fruit purplish-black. Late spring.
Forests.--Mack-Aka, L-NF, NS-BC, US.

3. R. laxiflorum Pursh -- Quite thornless, but the ovary
and fruit both stipitate-glandular and finely puberulent.
More or less finely glandular throughout. Flower saucer-sha
ped, pale green to deep purple. Fruit purplish-black. Late
spring. Wet woods.--Mack-Aka, L-NF, NS-BC, US.

4. R. glandulosum Grauer (R. prostratum L'Hér.) --
Skunk-Current, Wild Cranberry (Cadellier sauvage, Castilles)
-- Ovary and fruit stipitate-glandular with red glands, but
not pubescent. Stems and branches often decumbent. Foliage
glabrous to glandular or pubescent. Flowers whitish to rosea
ate, saucer-shaped. Berries red. Late spring. Wet woods.

5. R. rubrum L. var. alaskanum Trautv. & Mey. (R. tris
be Pallas) -- Red current, Wild Cranberry (Cadellier sauvage)
-- The leaves rather squarish and more prominently 3 lobed
with 2 other smaller lobes, very wide. Leaves devoid of
yellow dots, mostly pubescent below. Racemes finely glandul
ar and puberulent, but the ovary quite glabrous. Flowers
saucer-shaped, greenish-yellow, often red-dotted, the small
petals often reddish. Early to late spring. Wet woods.--
(sh)-Mack, NF, NS-BC, US, Eur -- Var. alaskanum (Berger)
Boivin -- Flowers more showy, pink to deep red. -- Mack-Aka,
Alta-BC.

Ribes triate is merely a statistical variation of R. rubrum with the
anthers of the latter averaging larger.

6. R. hudsonianum Rich. var. hudsonianum -- Black Cur
rant, Wild Black Currant (Cadellier sauvage) -- Ovary and
lower surface of leaves dotted with large clear-yellow glands.
Flowers white, tomentose, without a well defined tube.
Fruit dull black, with a few yellow glands. Late spring.
Wet woods and swamps.--(Mack-Y)-Aka, wq-BC, US.

The more western var. petiolare (Douglas) Jancz. is
less pubescent on often nearly glabrous. Leaves generally
lightly pilose below, rather than puberulent. Racemes denser,
the pedicels rather short, mostly shorter than the flowers.

7. R. americanum Miller (R. floridanum L'Hér.) -- Black
Currant (Cadellier noir) -- Cladular-dotted like the prece
ding, but the glands reddish or brownish-tinted and present

135
on both faces of leaf while lacking on the ovary. Flowers whitish green, with a tube about as long as the lobes. The long bracts persistent. Fruit black. Mid to late spring. Ravines and galerie-forests.--Ni-Alta, (US).

8. **Ribes aureum** Pursh. (**R. odoratum** Wendland f.; **Chrysobotrya aurea** (Pursh) Rydb.) -- Golden Currant, Buffalo-Currant -- Very showy in mid-spring with its long, golden-yellow flowers with purplish center. Glandless and nearly always entirely glabrous. Leaves thickish, all or mostly trifoliate and curlate at base. Raceme with large persistent bracts. Flowers long tubular, the tube about 1 cm long. Fruit red to yellow brown or black brown. Mid spring. Wooded ravines.--sw-O, S-Alta-(BC), US.

Most authors will distinguish var. **R. aureum** var. **grandeiflorum** Jancz. (=**R. odoratum**) with longer flowers and somewhat more pubescent. This may be a valid distinction south of our borders, but the Canadian material is mostly intermediate and the distinction is neither significant nor practical in our area. Native with us, it occurs only as an escape from cultivation in other parts of Canada.

9. **R. viscosissimum** Pursh var. **viscosissimum** -- Sticky Currant -- Densely covered throughout with stiff and thick glandular hairs. Leaf lobes rounded. Flowers greenish-white to pinkish, the tube well developed, rather large. Berry bluish black. Late spring. Slopes, bluffs and wet woods: Waterton--Alta-BC, w-US.

The fruits are abundantly glandular-stipitate in our var. **viscosissimum** while they are glabrous or nearly so in the more southern var. **R. Hallii** Jancz.

10. **R. DIACANTHUM** Pall. -- Dioecious. Leaves thickish as in **R. aureum** and more or less trifoliate, or merely obovate and coarsely toothed. Glabrous or nearly so. Sometimes with a pair of small acicules at each node. Flowers small, saucer-shaped, greenish, subtended by a long bract which falls off soon after flowering. Berry scarlet, small. Mid spring. Cultivated and more or less naturalized at the edge of an Oak bluff in Brandon.--Man, (Eur).

26. **HYDRANGEACEAE** (HYDRANGEA FAMILY)

Carpels 4, also 4 petals and 4 sepals, but numerous stamens.

1. **PHILODEPHUS** L.

Capsule 4-locular and opening by as many valves.

1. **P. Lewisii** Pursh. -- Mock Orange, Syringa -- Shrub with a short terminal raceme of large, white, opposite flowers. Leaves ovate to lanceolate, entire to coarsely toothed, triple-veined. Early summer. Hillsides, open to lightly wooded: Waterton.--Alta-BC, US.

We are not quite convinced that this is really different from the more eastern **P. coronarius** L.
Order 14. **ARALIALES**

Similar to the **Rosales**, but the carpels united into an inferior ovary. Sepals fused; petals free; carpels 1-5.

a. Leaves simple and entire; carpel and style 1.

aa. Leaves lobed to compound; carpels and styles 2-5

27. **Cornaceae**

Shrubs with simple, entire and opposite leaves and white flowers in cymes.

1. **CORNUS** L.

Fruit a one-seeded berry. Stamens and petals 4.

a. Semi-herbaceous, with verticillate leaves.

aa. Woody with alternate or opposite leaves.

b. Leaves alternate

bb. Leaves all opposite.

c. Twigs pale green, mottled with purple

d. Branches reddish purple

dd. Branches gray


The bracts of the upper pair are sometimes intermediate in size to the leaves of the verticil. This variant is often designated as var. *intermedia* Parr. or less commonly as the putative hybrid *C. unalaschakensis* Led. (=*C. canadensis* X *sucica*). However, one of the putative parents is absent from our area and the variant appears to be only an infrequent phenotype of sporadic occurrence (Reynolds, Gillam, McKague, La Ronge, Beaverlodge, etc.)

2. **C. alternifolia** L. f. -- Green Osier -- Similar to the following, the leaves alternate on the leading shoots, subapproximate to subverticillate on flowering shoots. Twigs greenish. Usually a tall shrub with a flattish top. Early summer. Open woods: Prairie Coteau.--NP-SPM, NS-Man, US.

A report of *C. Baileyi* by Macoun 1890 from Saskatchewan was based on a collection with the typical pubescence of var. *alba*. Reports from Alberta have not been investigated.


4. **C. rugosa** Lam. (C. *circinata* L'Hér.) -- (Bois de calumet) -- Branches pale green with numerous purple patches. Leaves broadly ovate to nearly round, woolly beneath. Berries blue. Early summer. Open woods. --(NS), NB-s-Man, US.

5. **C. racemosa** Lam. (C. *candidissima* Maran.; C. *paniculata* L'Hér.) -- Quite similar to *C. alba*, but the leaves tending to be narrower, mostly lanceolate, and with only 3 pairs of lateral nerves. Inflorescence broadly pyramidal, about as high as wide. Early summer. Open woods. --Q-Man, US.

28. **ARALIACEAE**

(GINSENG FAMILY)

Herbs or semi-woody shrubs, mostly with large compound leaves. Flowers in umbels. Umbels often in racemes or panicles.
a. Leaf simple ........................................ 1. Oplopanax
aa. Leaf compound ................................. 2. Aralia

1. OPLOPANAX (T. & G.) Miq.
Carpels 2, styles 2.

1. O. horridus (Sm.) Miq. -- Devil's Club (Bois pi-
quant) -- Coarse and very spiny shrub. Stems, branches, pe-
tioles, leaves and inflorescence spiny. Leaves very large, pa-
mately lobed, spiny along the nerves. Inflorescence a
raceme of umbels. Early summer. Rocky woods: Waterton,
Lesser Slave Lake. -- Aka, WO, Alta-BC, US.

2. ARALIA L.
Styles and carpels mostly 5.

a. Stemless ......................................... 3. A. nudicaulis
aa. Stem present.

b. Spineless ...................................... 1. A. racemosa
bb. Stem densely spiny below ............ 2. A. hispida

1. A. racemosa L. -- Spikenard, Petty Morrel (Grande
Salsepareille, Anis sauvage) -- A large herb with very lar-
ge leaves, compound of numerous and large leaflets. Stem
course, up to 2 m high. Umbels in elongate axillary racemes.
Deciduous woods. -- NS-Man, US.

2. A. hispida Vent. -- Sarsaparilla, Dwarf Elder
(Salsepareille) -- A herb with a semi-woody and densely spi-
ny lower stem. Leaves variable, ternately divided to bipin-
nate. Umbels terminal and axillary on long peduncles in the
upper part of the plant. Mid summer. Rocky openings in coni-
ferous forests. -- NF, NS-Alta, US.

3. A. nudicaulis L. -- Wild Sarsaparilla (Salsepareil-
le) -- A large basal leaf, mostly with 13 large leaflets.
Stemless and stoloniferous, producing numerous scattered lar-
ge leaves, the sterile ones mostly with 11 leaflets. Inflo-
rescence of 3 umbels on a scape shorter than the petiole.
Late spring. Very abundant and almost ubiquitous in coni-
ferous forests. -- Mack, NF-SPM, NS-BC, US.

Order 15. BIXALES
Similar to the Rosales, but the carpels (mostly 5) u-
ited into a unilocular ovary with parietal placentation.
Style 1.

29. CI
tACEAE
Petals free. Leaves opposite. Sepals 5, the 2 outer
much smaller.

a. Petals 5.
b. Flowers of two kinds, the terminal ones with larger petals

bb. Flowers all alike, all axillary

aa. Petals 3

1. HELIANTHEMUM Miller

ROCK ROSE

The two outer sepals very narrow, sometimes lacking. Flowers of two kinds; the terminal ones with 5 fugaceous petals; the others smaller, cleistogamous, with petals minute or wanting.

1. H. Bicknellii Fern. -- Frostweed -- A smallish tenacious shrub, in tufts or a few stems. Leaves variable, those of the stem 2-3 cm long and about lanceolate, those of the branches much smaller. Flowers large, yellow, in terminal racemiform corymbs of 2-15 flowers. Early summer. Open soils, sandy or rocky: La Petite Montagne de Cyprès.

2. HUDSONIA L.

HUDDSONIA

Small shrubs with reduced and closely overlapping leaves, somewhat in the manner of Juniperus horizontalis. Flowers axillary, all alike, all with 5 bright yellow petals.

1. H. tomentosa Nutt. var. tomentosa (var. intermedia AA.) -- Poverty-Grass, Dog's Dinner -- On sand dunes, a very small and very branched shrub, forming small hemispherical tufts which, seen from a distance, appear blackish. Leaves 1.0-3.5 mm long, lanceolate to linear, lanate. Peduncle short. Petals white at tip. Early summer. Sand dunes and Precambrian outcrops.

Peduncle no longer than the calyx. In the eastern var. intermedia Peck the peduncles are longer, clearly exceeding the leaves and 1-2 times longer than the calyx. The latter is sometimes treated as an interspecific hybrid because it appears to be intermediate to H. ericoides L., but this is not a convincing hypothesis as var. intermedia extends much beyond the common range of the putative parents. This var. intermedia has been reported for lake Athabaska, but all specimens examined (CAN, DAO) for that area turned out to have the shorter pedicels of the typical variety and were revised accordingly.

3. LECHEA L.

PINWEED

Petals 3; sepals 5, of which the outer 2 are very narrow.

1. L. maritima (Leggett) Gray (L. intermedia Leggett) -- A low, tufted shrub, with numerous stiffly erect stems bearing alternate leaves, and numerous
basal offshoots bearing opposite or verticillate leaves. Stem leaves 1.5-2.0 cm long, narrowly lanceolate. Flowers deep red, small. Petals shorter than the sepals. Inner sepals deep red. Outer sepals green, very narrow and slightly shorter than the inner ones. Mid summer. Open, sandy soils. --NS-Man, US -- Var. superata (Hodgdon) Boivin -- Smaller, the stem about 1 dm long and decumbent at base; Lake Athabasca. --S.

Order 16. THYMELEALES
Petals reduced or most often absent. Sepals usually well developed and petaloid, fused into a pseudo-corolla. Ovary mostly reduced to a single carpel.

30. NYCTAGINACEAE (FOUR-0’CLOCK FAMILY)
Calyx persistent and enclosing the fruit at maturity. Fruit a one-seeded utricle.
a. Involucral bracts fused into a peltate involucre ........................................ 1. MIRABILIS
aa. Bracts free; flowers sessile .............. 2. ABRONIA

1. MIRABILIS L. FOUR-0’CLOCK
Flowers conspicuous by the petaloid calyx. Petals absent. Flower clusters subtended by a 5-lobed calyx-like involucre of fused bracts. Leaves opposite.
a. Leaves broadly ovate ....................... 1. M. nyctaginea
aa. Much narrower ................................ 2. M. hirsuta

1. M. nyctaginea (Mx.) MacM. (Allionia nyctaginea Mx.; Ā. ovata Pursh; Oxybaphus nyctagineus (Mx.) Sweet) -- Perennial herb from a large orange-red taproot. Plant glabrous. Leaves ovate or deltoid-ovate. Involucre saucer-shaped, about 1 cm wide, ciliate, becoming larger in fruit. Calyx pink. First half of summer. Open, sandy soils of southern Manitoba, railway embankments elsewhere. --Q- млн, US.

2. M. hirsuta (Pursh) MacM. var. hirsuta -- (Allionia hirsuta Pursh; Ā. pilosa (Nutt.) Rydb.; Oxybaphus hirsutus (Pursh) Sweet) -- Stem lightly to densely long-pilose. Leaves variable, the main ones usually lanceolate and 1 cm wide or larger, often pilose below, abruptly contracted into a short petiole. Glandular-pubescent in the inflorescence. Mid to late summer. Sandy or gravelly prairies and hills. --Q- млн, US -- Var. linearis (Pursh) Boivin -- (Allionia linearis Pursh; MIRABILIS linearis (Pursh) Heimerl; Oxybaphus albidos (Walter) Sweet; O. linearis (Pursh) Rob.) -- Leaves much narrower and gradually attenuate at base, sessile or with a poorly distinct petiole. The grayish-white stem sometimes glabrous, more commonly short-puberulent with curved hairs. Leaves usually puberulent. Mid summer. Arid hillsides. --SchMan-s млн, US, (CA).
2. ABRONIA Juss.

SAND-VERBENA

Involucral bracts free. Flowers sessile.

1. A. micrantha Torrey -- Long tubular flowers, green and yellow in pedunculate glomerules with an involucrum of large and free bracts. Somewhat fleshy perennial, puberulent. Leaves opposite, entire, those of the same pair strongly dimorphic. Calyx small but accrescent into a winged fruit 1.5-2.5 long. Wings 2-3. Early summer. Loose alluvial sands, rare: Manyberries Creek. -- Alta, Utah.

Order 17. VIOLALES

Petals and sepals free, but the flower zygomorphous. Single family.

31. VIOLACEAE  VIOLET FAMILY

Ovary with 3 carpels and parietal placentation. Flower pentamerosus.

1. VIOLA L.

Herb with the lower petal spurred, thus the flower is a typical Violet. Low herba. The zygomorphous flowers are reminiscent of the Leguminosae, but there are two upper petals.

a. Stem present and leaf-bearing .................... Group A
aa. Stemless; all leaves basal ...................... Group B

Group A

Stem present, bearing at least one leaf. Flowers terminating the stem and branches, some may be axillary.

a. Stipules about as big as the leaf blades and pinnatifid; annuals.

b. Petals about as long as the sepals or somewhat shorter ................ 2. V. arvensis

bb. Petals larger, one and a half times to three times as long as the sepals .... 1. V. tricolor

aa. Leaf blade many times larger; perennials.

bb. Flowers yellow.

c. Leaves cuneate to rounded at base ............ 3. V. Nuttallii

dd. Leaves deeply cordate.

e. Leaves mostly basal, the stem leaves few and much smaller ..

......................... 4. V. orbiculata

ee. Stem leaves quite as large and as numerous or more numerous.

f. Stipules 2-10 mm long .. 5. V. rlabella

ff. Stipules 6-18 mm long ..

......................... 6. V. pubescens

cc. Flowers white to mauve to blue.
1967  Boivin, Flora of Prairie Provinces

\[ \begin{align*}
\text{g. Stipules coarsely dentate} & \quad 7. \textit{V. adunca} \\
\text{g}. \textit{Stipules entire} & \quad 8. \textit{V. rugulosa}
\end{align*} \]

**Group B**

Stemless, all leaves and flowers borne directly on the rhizome.

\[ \begin{align*}
\text{a. Leaf deeply divided} & \quad 9. \textit{V. pedatifida} \\
\text{aa. Entire to shallowly crenate.} & \quad \text{b. Flowers yellow} \quad 2. \textit{V. Nuttallii} \\
\text{bb. White to mauve to violet.} & \quad \text{c. Lateral petals bearded at throat; rhizome thick and fleshy} \quad 10. \textit{V. cucullata} \\
\text{cc. Rhizome slender and elongate; petals mostly not bearded.} & \quad \text{d. Flowers white to mauve.} \\
\text{e. Leaves strigose above} & \quad 11. \textit{V. Selkirkii} \\
\text{ee. Foliage glabrous} & \quad 12. \textit{V. palustris} \\
\text{dd. Flowers white with purple lines.} & \quad \text{f. Leaves reniform, puberulent below} \quad 14. \textit{V. renifolia} \\
\text{ff. Leaves broadly cordate-ovate; glabrous below} & \quad 13. \textit{V. blandii}
\end{align*} \]

1. \textit{V. TRICOLOR L.} -- Pansy (Pensée) -- Large-flowered annual with widely spreading petals. Leaves ovate to spatulate, crenate. Flower variously multicoloured, with a yellow center. All summer. Cultivated and casually reseeding itself in and around gardens.--SPM, NS, NB-S-(Alta)-BC, (US), Eur.

2. \textit{V. ARVENSIS} Murray var. ARVENSIS (\textit{V. Kitaibeliana var. Rafinesquii} AA.; \textit{V. Rafinesquii} AA.) -- Field Pansy (Petite pensée, Pensée des champs) -- Quite like the preceding but the yellow flowers much smaller. Stem finely reflexed-pubescent along the angles. Leaves small, ovate to narrowly oblanceolate. Summer, farmed land and sandy soils, uncommon.--(G), NF-SPM, (NS)-PEI-O, S-BC, US, Eur.

All Canadian reports of the glabrous-stemmed var. \textit{Rafinesquii} Greene appear to be incorrect. The reports from our area were from Tisdale (DAO, SASK) and Edmonton (ALTA, DAC, photo).

3. \textit{V. Nuttallii} Pursh var. \textit{Nuttallii} (var. linguifolia (Nutt.) Henry; \textit{V. Russellii} Boivin; \textit{V. vallicola} Nelson) -- Densely tufted, yellow-flowered prairie species. Stems variable, often very short. Leaves ovate to narrowly lanceolate, entire or nearly so. Flowers yellow, often reddish to bluish-tinted outside. Early to mid spring, Steppes on hillsides.--Man-BC, US.

The many segregates proposed for this species are mostly morphologically continuous and sympatric, such as broad-
leaved and narrow-leaved forms. Similarly with the phenotype with flowers smaller and not tinged in brown-red dorsally (var. Bakerii = V. Russelli). However, west of us there is a more distinct var. praemorsa (Douglas) Watson with denser and coarser pubescence, the hairs up to 1 mm long or more on the petioles.


5. V. glabella Nutt. -- Much like the following, the stipules smaller, the rhizome somewhat thicker and more elongate, the leaf serrations mostly smaller and more numerous, the leaf tip less broadly acuminate. Late spring to early summer. Wet woods in Waterton.--Aka, Alta-BC. US.

6. V. pubescens Aiton var. leiocarpa (Fern. & Wieg.) Boivin (V. eriocarpa A.) -- Yellow Violet -- A forest species with yellow flowers. Stem usually leafless below the middle. Leaves cordate to reniform, mostly deltoid, crenate-serrate, becoming very large. Late spring. Common in Oak woods.--NS-sMan, US.

All Manitoba specimens examined turned out to belong to the glabrous-fruited var. leiocarpa.

The separation of Viola pubescens and V. eriocarpa Schwein, as proposed in current manuals is not satisfactory. This was clearly expressed by C.C. Deam, Flora of Indiana, p. 691. 1940. Quote:

"V. eriocarpa ... Most of our specimens are more pubescent than the typical form, in fact many so closely approach V. pubescens that it seems wrong to place them with this species".

"V. pubescens ... The separation of this species from the preceding is not at all satisfactory. The characters used in their separation are not constant and it appears from my specimens that all characters fail about equally, so that a preponderant character is absent."

He expressed our own experience quite clearly. The character of pubescence is not realistic, intermediate specimens being more numerous than the typical ones.

The character of presence or absence of basal leaves has only a statistical value. Standing in any one colony, it is obvious that it belongs to one type or the other, but a minority of 10-30% of individuals plants will be atypical. Herbarium specimens are not always carefully collected and are rarely numerous enough or any one sheet to carry over the statistical value of this character.

Distinctions based primarily on the above two characters result in entities of roughly the same distribution.

The character of glabrous vs. lanate ovary or fruit is
We have adopted the rank of variety for these taxa and it is worth pointing out that var. leiocarpa is a good example of the difference between a variety and a species as it is just barely short of the minimum morphological discontinuity essential to a species. This minimum is of two linked characters, but var. leiocarpa exhibits only one clearly defined character, the other being only partially linked.

7. **V. adunca** Sm. (var. minor (Hooker) Fern.; **V. arenaria** AA.; **V. conspersa** Rchb.; **V. subvestita** Greene) -- Densely tufted cauliflorescent species with blue flowers. Stems all or mostly spreading. Foliage more or less pubescent, becoming glabrous. Leaves ovate, finely crenate. Lateral petals long-bearded. Ovary glabrous. All spring. Common in dry to wet, open habitats. -- G, K-Aka, L-SHM, NS-BC, US. -- F. Magonii (Farw.) Boivin (f. albiflora Vict. & Rouss.) -- Flowers white. Local. -- NS, 4-0, S-(Alta, US).

8. **V. rugulosa** Greene (**V. canadensis** AA.) -- Long stoloniferous forest species, forming large open colonies or carpeting the forest floor. Rhizome thin and fragile, but thickened near the base of the stem. Leaves villous, the lower and basal broadly reniform, the upper subopposite and more or less cordate. Flowers mauve. Lateral petals long-bearded. Capsule finely puberulent. Late spring
to mid summer. Ubiquitous in Aspen groves.--Mack, wO-BC, US.

As pointed out by Boivin 1948, V. canadenensis L. is a strictly eastern species and all western material of the group belongs to V. rugulosa. Most western authors have reported both species as occurring in our area and some of them, finding the distinction difficult to establish, have quite understandably expressed some doubt as to the value of V. rugulosa. If western collections are compared only with eastern ones, the morphological distinction is reasonably satisfactory, even if the two species are obviously closely related. The differences may be contrasted as follows.

V. canadenensis -- Tufted and many-stemmed. Rhizome short, thick, ascending, branched. Not stoloniferous. Herbage glabrous to lightly puberulent. Leaves cordate, about 1½ times as long as large, the summit acutely acuminate. Sepals 7-10 mm long.

V. rugulosa -- Stems solitary, rarely in 2's. Long stoloniferous, the stolons thin but becoming thicker just below the base of the stem. Forming extensive colonies of mostly single stems. Leaves larger, reniform-cordate, about as long as large, more abruptly short acuminate. Sepals shorter, 4-7 mm long.

9. V. pedatifida G. Don -- Prairie-Violet -- Leaves pedatifid. Flowers large, very showy, reddish purple. Lateral petals densely long-bearded. Late spring. Sandy prairie.--wMan-Alta, US.

10. V. cucullata Aiton (V. nephrophylla Greene, var. cognata (Greene) C.L. Hitchc.; V. sororia W.) -- Tufted species with broadly cordate leaves and large blue flowers. Rhizome thick, short, ascending. Foliage glabrous to villous, the leaves with a broadly open basal sinus. Flowers 1.5-2.0 cm long, the spur about 3 mm long. All petals long-bearded at the throat, or the upper two glabrous. Late spring to early summer. Shores and other open, wet places.--K-(sMack), NF-(SPM), NS-BC, US, (CA)--F. albiflora Britton -- Flowers white. Roofyhern.--Q-0, S, (US).

11. V. Selkirkii Pursh -- Similar to V. cucullata, but generally smaller, with the flower 1.0-1.5 long, and a rather long spur, about 5 mm long and at least 1/3 as long as whole flower. Rhizome thin and elongate. Leaves lightly strigose above, glabrous below, the basal sinus narrow, nearly closed. Petals pale bluish violet, not bearded. Late spring. Deep, wet woods.--(G), K, (Y-Aka, L-NF, NS, N3-Q)-0-Alta-(BC, US, Eur).

12. V. palustris L. -- Marsh-Violet -- Rosettes poorly developed, most leaves being alternate on the long thin stolons; this species thus forming a carpet. Plant glabrous. Leaves reniform, deeply cordate. Flower mauve or pale violet, 12-13 mm long including the short spur. All petals glabrous or the lateral ones minutely papillate. Late
spring. Wet woods.--(G), K-(Mack-Y)-Aka, L-(NF), Q-(C)-Man-
(S-BC, US, B.C.) -- P. albilora Neum. (var. brevipes (M.S.
Baker) Davis) -- Local form with white flowers.--(NF), Alta-
(BC, US).

13. V. gland W. (V. pallens (Banks) Braine Jr.) -- Whi-

te Violet, White Snowdrop, Mayflower -- Tufted, with long,
leafless stolons. Leaves broad-ovate to round reniform,
lightly pubescent above to glabrous. Flower 8-12 mm long,
with deep purple lines, the spur short. Petals beardless
or the lateral bearded. Early spring. Moist, rich woods.
--(K-Aka), L-NF-(SPX, NS-PEI)-Man, swAlta-BC, US.

14. V. repentis Gray (var. Brainerdii (Greene) Fern.)
-- Tufted species with reniform leaves and white flowers.
Foliage pubescent to nearly glabrous. Flowers with deep
red lines, small, about 8 mm long including the short spur.
Petals beardless. Mid spring to mid summer. Wet coniferous
woods.--K-(Mack-Aka, L-NF), NS-(PEI-NB) Q, BC, US.

Order. 18. POLYGALACTALES

Flowers more strongly zygomorphous than in the Violales
and with some reduction or fusion of floral parts.

32. POLYGALACTACEAE (MILKWORT FAMILY)

Only one genus with us, easily recognized by its unus-
usual type of zygomorphic flower.

1. POLYGALA L. MILKWORT

Sepals 5, free, persistent in fruit, the inner ones
(termed wings) larger and petaloid. Petals reduced to 3,
partly fused at base, the lower one (termed keel) larger
and crested dorsally. Stamens 6 or 8, their filaments uni-
tied into an incomplete tube and partly fused with the petals.
Ours are low herbs.

a. Leaves verticillate ............... 4. P. verticillata

aa. Leaves alternate.

b. Leaves elliptic or ovate ........... 1. P. paucifolia

bb. Much narrower.

cc. Leaves linear, 1-2 mm wide ....... 3. P. alba

cc. More or less lanceolate and 2-5 mm broad
or wider ...................... 2. P. Senega

1. P. paucifolia W. (P. pauciflora sphaer.) -- Flowe-
rering Winter-green, Bird-on-the-Wing -- Stem merely bracte-
oblate below, with a few large leaves above and a few rather
large and showy pink flowers. Wings 1.5 cm long, about as
long as the corolla. Stamens 8 (all others have 8). Late
spring and early summer. Rich woods on light soil.--N3-eCS, US.

2. P. Senega L. var. Senega (var. latifolia AA.) --
Snakeroot (Senega) -- Leaves alternate, but the uppermost
opposite or verticillate, narrowly lanceolate, rarely over 1 cm wide, finely denticulate, the teeth barely 0.1 mm long. Densely tufted perennial with the upper leaves gradually larger. Raceme dense, whitish. Early summer. Black soils, mostly around Aspen groves.—NB-Alta, US.

Var. latifolia T. & G. has larger leaves, the upper lanceolate to ovate-lanceolate, the larger ones up to 1.5-2.5 cm wide, the denticulation not quite so fine, the teeth often ± 0.3 mm long. Fruit tending to be larger. This var. latifolia is more southern and barely enters Canada in southwestern Ontario. Intermediates are however widely distributed, especially in southern Manitoba and southwestern Quebec. A previous report for Saskatchewan was based on such an intermediate.

3. P. alba Nutt.—A rather sparse herb. Leaves all alternate, very narrow, the uppermost smaller. Raceme whitish. First half of summer. Eroded coulées.—sS, US.

4. P. verticillata L. (var. isocycla Fern.) — Another sparse herb with the leaves disposed in a few distant verticils. Tufted and branched above. Raceme whitish. Second half of summer. Steppes on hillsides.—soq-sMan, US.

Order 19. CUCURBITALES

Mostly herbs climbing by tendrils. Flowers unisexual and the ovary inferior.

33. CUCURBITACEAE (GOURD FAMILY)

One stamen with only 1 locule, the other 1-4 stamens with 2 locules. Sepals and petals more or less fused.

a. Leaf minutely denticulate ............. 1. Thladiantha
aa. Leaf lobed.

b. Leaf deltoid, irregularly lobed ........ 2. Bryonia
bb. Leaf palmately and deeply 5-lobed ... 3. Echinocystis

1. THLADIANTHA Bunge
Flowers solitary in the axils.


2. BRYONIA

Staminate flowers in racemes; pistillate flower solitary or in small clusters.
1. B. DIOICA L. -- Bryony, Cow's Lick (Bryone, Navet bâtard) -- Tendrils simple. Leaf deltoid, coarsely and irregularly toothed to deeply lobed, very scabrous. Perennial from a carrot. Flowers greenish-white, about 1 cm long. Fruit a berry less than 1 cm across. (Early summer?). Cultivated as ground cover and rarely weedy or long persistent in and around gardens: Altona.--aMan, Eur.

3. ECHINOCYSTIS T. & G.
Fruit covered with numerous soft spines. Male flowers in panicles; female flower solitary.

1. E. lobata (Mx.) T. & G. (Micranthia lobata (Mx.) Greene) -- Wild Cucumber, Balsam Apple (Concombre sauvage, Concombre rameur) -- Annual with huge and persistent cotyledon leaves. Leaf palmetely 5-lobed, the terminal lobe larger, the basal ones much smaller. Fruit pale green, soft and juicy, 2-locular with 4 seeds. Mid summer. Scrambling over the floodplain vegetation; cultivated and readily escaping to brush piles.--NS-BC, US.
Native from N.B. to Sask., escaped elsewhere.

Order 20. CACTALES
Petals and stamens very numerous and free over an inferior ovary.

34. CACTACEAE (CACTUS FAMILY)
Very fleshy and ferociously spiny. Leaves vestigial and fugaceous. The enlarged stem is the fleshy part.

a. Globular .......................... 1. Mamillaria
aa. Elongate and made up of a series of articles...

.......................... 2. Opuntia

1. MAMILLARIA Haw.
Globular and covered with crowded nipple-like protuberances, each of which is topped by a rosette of spines.

1. M. vivipara (Nutt.) Haw. (Neomamillaria vivipara (Nutt.) Britton & Rose) -- Purple Cactus, Ball-Cactus -- Just about like a pin cushion and around 5 cm across. Sometimes tufted and forming a half sphere of pin cushions. Flower purple-red, open in the morning only. Early summer. Top of dry hills.--sMan-sAlta, US.

2. OPUNTIA Miller
PRICKLY PEAR
The fleshy stem constricted into a series of jointed articles. Spines in clusters over the surface of the article.

a. Articles 1-3 cm. long .............. 1. O. fragilis
aa. Articles much larger

1. **O. fragilis** (Nutt.) Haw. -- Cactus, Prickly Pear (Crapaud vert) -- Much like the following, but generally smaller and the articles only slightly compressed, readily detaching themselves to become attached to the skin and fur of animals. Spines apparently catchy. The terminal and flower-bearing article often much larger than the others. Early summer, rarely flowering. Steppes, especially near the base of hills.--0-BC, US.

   Occurs as far north as 56°N, on the sunny south-facing slopes of the couleé of the Peace River.

2. **O. polyacantha** Haw. -- Cactus, Prickly Pear (Raquette, Corne de raquette) -- Articles 5-11 cm long, broadly flattened, orbicular to broadly obovate. Spines ivory to bright red. Flower large and showy, shining yellow with a red center, fading red. First half of summer. Dry steppes, mostly on hills.--SS-BC, US.

   More southern than the first, and all reports for the Peace are probably based on misidentification of **O. fragilis**.

   All Manitoba collections examined turned out to be **O. fragilis**. Presumably other collections cited for the province should be similarly revised.

Order 21. **TILIACEAE**

Trees or shrubs with a rather typical flower of free sepals and petals, stamens also usually free, but the carpels fused into a superior ovary.

35. **TILIACEAE**

   (Linden Family)

A primitive type with pentameryous flowers and numerous stamens.

1. **TILIA** L.

   Basswood

   Rachis of the inflorescence fused to the back of a large bract which acts like the wing of a samara.


   The pubescence is rather variable on the lower face of the leaves and some authors will distinguish a glabrous or nearly glabrous type (**T. americana** or **T. glabra**) and a pubescent or velvety type (**T. neglecta** Spach). Both occur in our area and are sporadic throughout the Canadian part of the range. They obviously represent an arbitrary dis-
Order 22. MALVALES
Much as in the Tiliarys, but the numerous stamens fused into a tube around the style. Single family. Ours all herbs.

36. MALVACEAE (MALLOW FAMILY)
Sepals fused below. Petals 5, free. Carpels united into a ring.

a. Calyx without bractlets; leaves entire or nearly so ................................. 1. Abutilon
aa. Calyx usually subtended by 2-9 bractlets; leaves shallowly to deeply divided.
   b. Bractlets more than 5.
      c. Flowers in a terminal inflorescence.
         .................................. 4. Althaea
         cc. Axillary and solitary ........... 7. Hibiscus
         bb. Only 3 or sometimes less.
   d. Leaves palmatifidte ............... 2. Sphaeralcea
      dd. Not so deeply lobed.
         e. Flowers in axillary racemes .... 6. Iliamna
         ee. Mostly in axillary clusters or solitary.
         f. Bractlets fused ............... 3. Lavatera
         ff. Bractlets free ............... 5. Malva

1. ABUTILON Miller
   INDIAN MALLOW
   Calyx not bracteolate. Fruit a ring of numerous dehiscent follicules.

   1. A. THEOPHRASTI Med. -- Velvetleaf, Pie-Marker
      (Mauve jaune, Mauve des Indes) -- Large annual herb, soft velvety-pubescent throughout, with large cordate leaves, entire or nearly so. Flower variable in size, yellow. Fruit of 10-15 large carpels, each with a spreading beak. Mid summer to fall. Casual weed of gardens and disturbed soils: Brandon, Biggar.--(NS)-PEI, 4-S, US, (Eur).
      Also reported from B.C. by Groh 1944, but the justification specimen was not preserved and the report remains essentially unverifiable, although it is not an improbable one.

2. SPHAERALCEA St.-Hilaire FALSE MALLOW
   Calyx normally with about 3 bracts, but these usually lacking in our only species. Carpels of two kinds: the upper dehiscent and sterile, the lower indehiscent and seed-bearing.
1. **S. cocinea** (Pursh) Rydb. (**Malvastrum cocineum** (Pursh) Gray) — Moss-Rose — Densely stellate-pubescent perennial prairie-herb with conspicuous scarlet flowers. Leaf compound or deeply divided into about 5 lobes, the lobes entire to more or less divided. Flowers in a terminal raceme. Late spring and summer. Steppes and prairies, flowering more readily around gopher holes.—Man-BC, US.

3. **LAVATERA L.**
Calyx with 3 large fused bracts.

1. **L. THURINGIACA L.** — Gay Mallows — Flowers solitary and long-peduncled in the axils of the upper, reduced leaves, forming terminal pseudoracemes. Densely stellate-pubescent. Around 1 m high. Leaves palmately lobed, serrate. Calyx large, the double calyx almost as large. Flowers rose, about 6 cm across. First half of summer. Rare adventive. Minnedosa, Maidstone.—NB-S, Eur.

4. **ALTHAEA L.**
Calyx very obviously double, being formed of 5 sepals fused at base and subtended by a verticil of 6-9 bractlets also fused at base. Fruit as in *Malva*.


5. **MALVA L.**
MALLOW
Bractlets 3, free. Carpels numerous, indistinguishable, one-seeded. The fruit breaking up into a ring of achenes at maturity.

a. Petals 1.5-3.0 cm long.
   b. Flowers in axillary clusters ..... 1. **M. sylvestris**
   bb. Mostly in a terminal corymb ..... 6. **M. moschata**
   a2. Flowers smaller.
   c. Stem erect; leaves very cren-margined.

------------------------------- 2. **M. verticillata**
cc. Stem becoming decumbent to trailing.
   d. Petals 2-3 times as long as the calyx.

------------------------------- 5. **M. neglecta**
dd. Smaller, about as long as the calyx.
e. Calyx up to 1 cm wide; fruit 5-6 mm across ............... 3. **M. rotundifolia**
ee. Calyx becoming larger, its lobes broader; fruit larger .... 4. **M. parviflora**

**SPHAERALCEA**

In the typical var. *sylvestris* the herbage is long hirsute and the leaf lobes are most often triangular or oblong.


In the typical var. *verticillata* the leaves are not crisp along the margin.

3. *M. ROTUNDIFOLIA* L. (M. borealis Wallr.; M. pusilla Sm.) — Dwarf Mallow (*Petite Malou*) — Leaves nearly round and broadly crenate, serrate, deeply cordate. Herbage hirsute to stellate-pubescent. Very branchy and more or less decumbent or trailing. Flowers in axillary clusters of 2-5. Bractlets 3, very narrow, partly adnate to the base of the calyx. Petals white to pale mauve, about as long as the calyx. Calyx up to 1 cm wide, often glabrous dorsally, hirsute-ciliate with hairs about 1 mm long, the lobes triangular or deltoid. Fruit 5-7 mm wide. Carpels with sharp edges, strongly reticulate on the back. Summer and fall. Common weed of disturbed soils, especially of trampled places; frequent in farmyards and towns. — PEI-SC, US, (CA), Eur.

4. *M. PARVIFLORA* L. — Closely similar to the last. Calyx enlarged, in fruit up to 10-15 mm, ciliate and pubescent dorsally with hairs less than half as long as in the last, the lobes at first overlapping and narrowed at base, becoming 3-3 times wider than long in fruit. Fruit 7-8 mm across. Carpels similar, but the sharp edge produced into a narrow and scalloped wing. Summer. Rare weed. — Winton, Craven, Sunny Brrn. — C, (BC), Eur.

Reported by Moss 1957 for Alberta but we know of only one collection from that province, McCallo 1122, Calgary, 1950 (Dc) and this was correctly revised to *M. pusilla* (= *M. rotundifolia*) by Dr. C. Frankton in 1955.

5. *M. NEGLICATA* Wallr. — Cheese, Cheeseweed (*Amour de fromage*) — Quite similar to the last two, but the flowers larger. Petals about 13 mm long, mostly mauve. Carpels not reticulate, but short-serrate or bicolored and ridged on the edges. Late spring to fall. Rare weed. — Notre.

All other reports from Manitoba and all reports from Saskatchewan were apparently based on specimens of _M. rotundifolia_, while the Alberta entry was a mere speculative listing.

6. _M. MOSCHATA_ L. -- Musk-Mallow (Mauve musquée) -- Leaf palmatifid, the segments pinnatifid, the lobes linear. Basal leaves less divided. Herbage lightly hirsute with simple hairs, or sometimes with stellate hairs on the calyx. Petals 2-3 cm long, mostly mauve. Summer. Cultivated and locally escaped to waste places or disturbed soils: Saint-Norbert.--NF, NS-Man, BC, US, Eur.

6. _ILIACNA_ Greene

Similar to _Malva_, but the carpels 2-4 seeded and dehiscent at maturity. Bractlets 3, free.

1. _I. rivularis_ (Douglas) Greene -- Wild Hollyhock, Mountain-Hollyhock -- Tall, virgate, maple-leaved herb with pink flowers. Tufted perennial, about 1 m high. Leaves large, palmately veined and lobed, serrate to doubly serrate. Flowers pink, in axillary clusters and a terminal raceme. Petals about 2 cm long. Summer. Wet woods along creeks, also ditches.--swAlta-BC, US.

7. _HIBISCUS_ L.

Carpels only 5, becoming a loculicidal capsule at maturity. Bractlets numerous, free.

1. _H. TRIONUM_ L. -- Flower-of-an-Hour, Modesty (Fleur d'une heure, Oeil de faisan) -- Calyx very large, pale green with deep purple nerves. Annual, stellate-hirsute herb. Leaves tripartite to almost trifoliolate, the lower sometimes palmatifid. Petals large, pale yellow, darker along one edge, with a large purple patch at base. Summer. Rare garden weed.--(KS-FEI)-NB-S, US, Eur.

Order 23. EUPHORBIALES

Flowers imperfect and more or less reduced. Single family.

37. EUPHORBIACEAE (SPURGE FAMILY)

Represented with us by a single genus characterized by its highly specialized and flower-like inflorescence termed a cyathium.

1. _EUPHORBIA_ L.

Perianth absent, the male flower reduced to a stamen, the female flower reduced to its ovary. Cyathium composed of 4-5 fused bracts, mostly bearing a stam and a pedicellate appendage, plus numerous single stamens, plus a single ovary, short stipitate and often exserted. Herbs with milky juice.

2. **E. CYPARISSIAS** L. -- Cypress-Spurge, Irish Moss (Rhubarbe des pauvres, Petit cyprès) -- Upper part of stem bearing sterile and densely leafy branches, which may become flower-bearing late in the season. Stem leaves 1-2 cm long, alternate, linear, 1-3 mm wide. Inflorescence subtended by a verticil of numerous leaves. Inflorescence leaves deltidial, opposite. Late spring to late summer. Cultivated and rarely spreading to dry open places.--ON, NS-M, BC, US, Eur.

3. **E. ESULA** L. (**E. virgata** Waldst. & Kit.; **Galorrhoeus Esula** (L.) Rydb.) -- Leafy Spurge, Wolf's Milk (Embranchée) -- Like the preceding, but larger and devoid of sterile branches, or the branches leafy in the same manner as the stem. Leaves mostly much larger, mostly long attenuate at base. Inflorescence leaves very broadly deltoid and yellowish-green. Late spring to fall. Agressive weed of disturbed soils, sometimes invading the prairie.--NS-PHL, -3C, US, Eur.

We are not convinced that **E. virgata** (or **E. intercedens** Posp., or **E. uralesis** Fischer) is a tenable segregate; its diagnostic characters are not realistic, at least as far as the specimens examined are concerned.

4. **E. LUCIDA** Waldst. & Kit. (**Galorrhoeus lucidus**

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(Waldst. & Kit.) Rydb.) -- Much like the preceding, but the leaves still larger, 1-2 cm wide, triangular-lanceolate and cordate at base, subsessile. Inflorescence leaves about semi-circular. Summer. Locally naturalized.--(V), S-Alta, (US, Eur).

Gleason 1952 (and Croizat 1945) would rather place our plants in E. atrata Bieb., but we are not convinced that this is a tenable segregate.

5. E. PEPLUS L. -- Petty Spurge, Wild Caper -- Stem leaves obovate with thin petioles, alternate, the terminal verticil: 3 or 4 leaves. Inflorescence elaborate, dichotomously bracted, with oval, opposite, subsessile leaves. Summer and fall. Local weed of gardens and waste places.--Aka, NF-SMP, NS-S, BC, US, Eur.

Known only from Morden and Wallwort. The reports from Winnipeg and Boissevain are apparently based on a mis-reading of Orch 1950.

6. E. MARGINATA Pers. -- Snow-on-the-Mountain, Ghost-Weed -- A showy herb because of the broad white margins of the inflorescence leaves. Stem leaves fleshy, alternate, ovate to lanceolate. Inflorescence villous, subtended by a verticil of 3-4 leaves. Late summer. Cultivated and casually reseeding itself. Otterburne, Saint-Norbert.--C-Swan, US.


8. E. serpyllifolia Pers. (E. glyptosperma Eng.; Chamaesyce glyptosperma Eng.) Small; E. serpyllifolia (Pers.) Small} -- Prostrate to erect annual herb, abundantly and somewhat dichotomously branched. Leaves all opposite, 0.5-1 cm long, broadly to narrowly oblong, strongly inequilateral, minutely serrulate, especially towards the tip, not spotted, more or less reticulate, often with a large purple patch in the center. Cyathium small, axillary, solitary, with small appendages. Seed quadrangular with sharp angles, smooth to transversely corrugate, gray to brown-red. Summer. Sandy and gravelly places.--nKd-BC, US, (Ca).

Usually sub-divided into two species: E. serpyllifolia with seeds smooth or nearly so, and E. glyptosperma with seeds ridged transversally. Both types are equally frequent and sympatric in Canada and intermediates are common; the value of the distinction, if any, is not obvious to us.

Order 24. CUSHTINGOLES
Single family and genus with us. Leaves opposite.

88. HYPERICACEAE (St. John's-Wort Family)
Flowers perfect with the numerous stamens often fused in 3 or 5 clusters.

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1. HYPERICUM L. ST. JOHN'S-WORT

Herbs (ours) with transparent-dotted leaves. Flowers yellow, pentamersous.

a. Leaves lanceolate.......................... 2. H. majus
aa. Leaves broader, oblong to suborbicular.
   b. Leaves, sepals and petals black-dotted along the edge................ 1. H. formosum
   bb. Not black-dotted ....................... 3. H. virginicum

1. H. formosum HBK. var. Mortoniae (M.E. Jones) C.L. Hitchc. (var. Scouleri AA.) -- Leaves and petals, and to a lesser extent the sepals, abundantly black-dotted along the edge. Perennial herb, about 1 dm high, with ovate to suborbicular leaves. Later half of summer. Wet places in the mountains.--swAlta-BC, WUS.

   The more western var. Scouleri (Hooker) Coulter is taller, 2-5-(8) dm high, and has narrower leaves.

2. H. majus (Gray) Britton (H. canadense AA.) -- Petals yellow, small, somewhat shorter than the sepals. Stiffly erect herb 1-4 dm high. Leaves more or less lanceolate, not black punctate. Sepals elongating up to 5-7 mm in fruit. Summer. Shores.--NS-BC, US, (Eur).

   The only Alberta collection studied was from Grouard.

   The only known collection of H. canadense L. for Manitoba was J.G. Feller, Whitemouth (WIN; DAO, photo). It has been revised to H. majus. Similarly a report of H. anagalloides C. & S. by Macoun 1883 was based on Macoun, Cypress Hills, 1880 (CAN; DAO, photo), a collection later revised and correctly reported by Breitung 1954 as H. majus. Again, the range of H. canadense was extended to B.C. by Macoun 1895. But both specimens cited (CAN; DAO, photo) have since been revised to H. majus.

3. H. virginicum L. var. Fraseri (Spach) Fern. (Triadenum Fraseri (Spach) Gleason) Fruit larger, about 1 cm long. Stem 3-6 dm high. Leaves ovate to oblong, shallowly cordate at base, glaucous below. Petals pink to mauve, slightly longer than the sepals. Mid summer. Shores, often boggy shores. Amisk Lake and eastward.--(L)-NF-SPM, NS-eastS, US.

   In the more southern and eastern var. virginicum the sepals are 5-7 mm long in fruit and acute at tip while the styles are 2-3 mm long. On the other hand our var. Fraseri has shorter sepals, 3-5 mm long, and rather obtuse or rounded at tip, while the style is shorter, mostly a bit less than 1 mm long.

Order 25. ERICALES

Anthers acuminate at tip or prolonged into a horn, opening by apical pores. Otherwise a rather variable group and transitional between the groups with free petals and superior ovary and the groups with fused petals and inferior
ovary. Leaves simple, often entire and persistent.

a. Stamens free.
   b. Ovary superior.
         d. Green plants .......... 41. Pyrolaceae
            dd. Parasitic plants devoid of green
                colour .......... 42. Monotropaceae
          ........................ 39. Ericaceae
     bb. Ovary inferior .......... 40. Vaccinioaceae
       aa. Stamens adnate to the corolla .... 43. Diapensiaceae

39. ERICACEAE

Shrubs, mostly with persistent and rather thickish or leathery leaves. Flowers mostly with fused sepals, and also mostly with fused petals. Ovary superior.

a. Leaves opposite.
   b. Leaves small, less than 1 cm long.
      c. Flowers in a terminal corymbose cluster.
          ........................ 4. Loiseleuria
      cc. Flowers axillary ............ 7. Cassiope
   bb. Leaves larger ............... 5. Kalmia
  aa. Leaves alternate.
   d. Flowers solitary in the leaf axils.
       ............................ 11. Gaultheria
      dd. Flowers more or less aggregated in usually
terminal inflorescences.
   e. Inflorescence a terminal cluster or
corymb overtopping the foliage.
      f. Leaves linear, 2 mm wide or less.
         g. Leaves green below ...... 6. Phyllodoce
            gg. Covered below with a dense rus-
ty felt ............... 1. Ledum
      ff. Broader leaves.
         h. Inflorescence not punctate, but
glabrous ............... 8. Andromeda
            hh. Inflorescence glandular-punctate
to puberulent or pilose.
               i. Inflorescence densely glandu-
               lar-punctate, but not pubes-
cent ............... 2. Rhododendron
               ii. Densely glandular-puberulent
                   or pilose ............... 1. Ledum
      ee. Inflorescence lateral, or leafy, or more
          or less overtopped by the leaves.
         j. Flowers in axillary clusters at leaf-
            less nodes on old wood ... 2. Rhododendron
            jj. Inflorescence more or less terminal.
k. Leaves deeply cordate at base ................. 10. Epigaea
kk. Rounded to cuneate at base.
  l. Leaves scaly-punctate
     below .................. 9. Chamaedaphne
  ll. Not punctate.
   m. Leaves pubescent on
      both faces with glandular hairs ........ 3. Menziesia
   mm. Glabrous on both
      faces ........... 12. Arctostaphylos

1. LEDUM L. 
   LABRADOR TEA
   Petals free. Flowers white, in terminal umbels.

a. Leaves felty-tomentose below ............. 1. L. palustre
aa. Glaucous and glandular-dotted below ... 2. L. glandulosum

1. L. palustre L. var. latifolium (Jacq.) Mx. (L.
   groenlandicum Oeder) -- Labrador-Tea (Thé du Labrador, Bois
   de savane) -- Leaves strongly revolute and covered below
   with a very thick rust-coloured felt, but green and gla­
   brous above. Leaves lanceolate, mostly 5-10 mm wide. Flo­
   wers white and making the shrub very conspicuous in the
   bogs at flowering time. Late spring and early summer.--C,
   K-Aka, L-SPM, NS-BC, US -- Var. decumbens Aiton (L. decum­
   bens (Aiton) Lod.) -- Generally smaller and lower, the
   leaves linear, 1-2 mm wide, sparsely glandular above.
   Spring. Arctic and alpine tundras.--G-Aka, L, Q-nO-nMan­
   nBC, (Eur).

   The bog phase grades northward into the tundra phase.

   The report of var. decumbens by Anderson 1949 and
   Szczawinski 1962 for Newfoundland is probably to be inter­
   preted in the sense of Labrador, a territory which we have
   listed separately here in accordance with traditional botan­
   ical practice, but which is also administratively part of
   Newfoundland.

2. L. glandulosum Nutt. var. glandulosum -- Trapper’s
   Tea -- Leaves densely dotted with yellow glands below and
   also usually very white below with a dense and minute pu­
   bescence. Twigs white-puberulent. Leaves nearly flat, o­
   vate to lanceolate, deep green and glabrous above. Inflo­
   rescence finely puberulent. Early summer. Moist woods.--
   swAlta-BC, US.

   In the western U.S.A. occurs a var. columbiae (Pi­
   per) C.L. Hitchc. with strongly revolute and narrower lea­
   ves, etc. It was also reported by Szczawinski 1962 from
   Vancouver, but this report is held to be questionable as
   the original 1901 collection has never been confirmed,
   is out of range by more than 150 miles, and might have been
   a cultivated plant.
Petals unevenly fused, two of them being fused at least half their length, the other 3 much less united, thus the flower is slightly asymmetrical.

a. Flowers borne on the old wood, below the foliage ...................... 1. R. albiflorum

aa. Inflorescence terminal .................... 2. R. lapponicum


2. R. lapponicum Wahl. -- Except the purple corolla, densely covered throughout with crowded glandular dots, some clear yellow, some reddish brown. Low prostrate shrub with persistent leaves, the blade oblong-lanceolate, revolute, soon drooping. Spring. Arctic and alpine tundra.--Q-Aka, L-NF, Q-nMan, swAlta-BC, US, Eur.

3. MENZIESIA Sm.

Petals fused into an urceolate corolla. Fruit a septicidal capsule. Shrubs with deciduous leaves.

1. M. ferruginea Sm. var. glabella (Gray) Pack (M. glabella Gray) -- Hood's Huckleberry -- Flowers in an umbel at the ends of last year's shoot. Foliage mostly carried on paired branches borne just below the inflorescences. Leaves obovate to oblanceolate, serrulate. Flowers 4-merous, creamy to pinkish. Early summer. Moist mountain forests.--swAlta-BC, (nwUS).

Var. glabella has leaves obtuse or rounded at summit, densely puberulent below, the pubescence obscurely mixed with some sessile glands. The upper face of the leaves has pubescence similar to var. ferruginea, but mixed with a less abundant and very fine puberulence. Calyx and ovary finely puberulent and glandular-ciliate.

The more costal var. ferruginea tends to leaves more acute at summit, but differs mainly on minor rearrangements of kinds of pubescence. Leaves not puberulent and sometimes glabrous, but commonly bearing a scanty and coarse pubescence of long hairs mixed with glandular hairs and sessile glands; also glandular-ciliate. Calyx and ovary glandular and glandular-ciliate, but not puberulent.

A Laggan collection (CAN; DAO, photo) dated 1913 fits var. ferruginea but it has never been confirmed and it is so far out of range that we are inclined to suspect a mixture of labels in this case. Our experience of herbaria
would indicate that the probability of a mixed label is about one in 1000 to 10,000 specimens. It varies greatly from herbarium to herbarium and also with the period in time in each herbarium. In most cases label mixtures are so obvious as to constitute no serious source of error.

4. LOISELEURIA Desv.
Flower similar to the preceding, campanulate with fused petals. Capsule septicidal. Leaves opposite. Scales of the flower buds enlarging, becoming green and persistent.


The various reports for Alberta, Campbell 1900, Hultén 1948 and, doubtfully, Boivin 1966 are likely all unjustified, even if the possibility of its occurrence in the northern parts of the province is not exactly improbable. Campbell's report is presumably based on a misidentification; see comment under _Coronopus didymus_, part II. Boivin's report is based on Hultén's, which reads "Alberta (54°N.)" and which in turn is likely to be a misreading of Hooker 1834 repeated by Macoun 1884 of "Mount Edgecombe, lat. 54°". The said mountain is a feature of the Alaska Panhandle in the vicinity of 54°N, not of the Rockies of Alberta.

5. _KALMIA_ L. AMERICAN LAUREL
Corolla rotate with 10 depressions in which the anthers are held under pressure from the tensed filaments.

1. _K. polifolia_ Wang. var. _polifolia_ (K. polifolia aphalm.) -- _Gold Witty_, _Bog Laurel_ -- Internodes flattened in alternating planes. Leaves opposite, persistent, lanceolate to linear, 2-3 cm long, strongly revolute, almost white and seemingly glaucous below, but actually densely covered with minute stellate hairs, the midrib prominent and usually beset with purple, olate hairs. Flower pinkish red. Late spring and early summer. Common in bogs.--K-Mack-(Y)-Aka, L-SPM, NS-S, (BC), US -- Var. _microphylla_ (Hooker) Rehder -- _Lower_ and with shorter and broader leaves. Mostly about 1 dm high. Leaves around 1 cm long and more or less oblong, only slightly revolute, the midrib glabrous. Alpine meadows and subalpine forests.--K-Y-(Aka), Alta-BC, wUS.

West of us the distinction of our two varieties becomes meaningless as most of the B.C. material is intermediate, the leaves being usually long and narrow but glandless on the midrib.
6. PHYLLODOCE Sal.
Foliage rather similar to that of Picea, linear, persistent, coriaceous and likewise borne on raised leaf bases. Flower urceolate and the capsule septicidal. Low shrubs.

a. Flowers yellowish ................. 3. P. glanduliflora
aa. Pink to purple.

b. Calyx glabrous ..................... 2. P. empetriflorus
bb. Densely glandular .................. 1. P. caerulea


2. P. empetriflorus (Sm.) D. Don -- Heather, Pink Mountain-Heather -- Calyx glabrous; plant otherwise densely glandular as in P. caerulea. Corolla glabrous, pink. Early to mid summer. Marshy meadows around timberline.--(Mack)-Y-(Aka), swAlta-BC, US.


7. CASSIOPE D. Don
Dwarf shrubs with small imbricated leaves and solitary axillary flowers.

a. Leaves with a deep and obvious dorsal groove ......

................................. 1. C. tetragona
aa. Leaves level on the back .......... 2. C. Mertensiana

1. C. tetragona (L.) D. Don var. saximontana (Small) C.L. Hitchc. -- White Heather, Moss-Plant -- Leaves thick, short, densely imbricate into squarish branchlets. Leaves 3-5 mm long, densely short ciliate. Flower white, on a finely glandular peduncle. First half of summer. Rocky alpine and subalpine slopes.--Y, swAlta-seBC, (nwUS).

The typical phase is more northern, has longer pedicels, mostly over 1 cm long, and tends to slightly larger flowers, 5-7 mm long.

2. C. Mertensiana (Bong.) D. Don var. Mertensiana -- Quite similar to the preceding, but the leaves not grooved on the back and not ciliate. Peduncles densely puberulent. Mid summer. Open forest and alpine prairies around timberline.
The more southern var. gracilis (Piper) C.L. Hitchc. has ciliate leaves and glabrous peduncles.

8. ANDROMEDA L. ANDROMEDA

Flower and fruit as in Menziesia, Chamaedaphne, etc., but the leaves persistent and the inflorescence a terminal bracteolate umbel.

1. A. Polifolia L. var. Polifolia -- Crystal-Berry, Gold-Withy -- Leaves much as in Kalmia polifolia, but alternate. About 1 dm high and glabrous throughout. Leaves 1-3 cm long, narrowly elliptic to narrowly lanceolate, strongly white-glaucous below. Flower pinkish. Late spring to early summer. Bogs.--G, K-Mack-(Y-Aka), Q-BC, Eur -- Var. glaucophylla (Link) DC. (A. glaucophylla Link) -- Plant generally larger, the leaves very finely and very densely white tomentose below, lanceolate to linear.-(G)-P-K, L-(NP)-SPM, (NS-NB)-Q-S, US.

9. CHAMAEDAPHE Moench LEATHER-LEAF

Sepals nearly free, subtended by 2 bractlets. Corolla and fruit as in the preceding. Flowers solitary in the axils of the upper leaves, forming a leafy terminal raceme.


10. EPIGAEA L.

Calyx similar to the preceding, with 2 subtending bracts and 5 practically free sepals. Flower with an elongate tube and flaring throat.

1. E. repens L. var. glabri folia Fern. -- Mayflower, Trailing Arbutus (Fleur de mal) -- Leaves deeply cordate at base, ovate to oblong. Creeping and barely woody, coarsely glandular-hispid throughout, especially on the branchlets. Flowers white, in a few-flowered terminal raceme. Late spring. Coniferous woods.-(L)-NP-SPM, (NS-NB)-Q-(O)-sMan, US.

In our variety the leaves are glabrous below at maturity, except sometimes on the midvein, while in the more southern var. repens they are variously pubescent (usually pilose) below at maturity.
11. GAULTHERIA L. WINTERGREEN

Calyx becoming thick and fleshy, growing around the capsule into a pseudo-berry. Flower otherwise similar to that of <i>Andromeda</i>, etc. Low shrubs, not very woody.

a. Leaves small, entire .................. 3. <i>G. hispida</i>  
   aa. Larger, serrulate.

b. Leaves cuneate at base ............. 1. <i>G. procumbens</i>  
   bb. Leaves rounded at base .......... 2. <i>G. humifusa</i>

1. <i>G. procumbens</i> L. -- Ivyberry, Checkerberry (<i>Thé des bois, Thé rouge</i>) -- Only 1 dm high or less, with the 3-5 leaves clustered near the top of the erect stem. Long stoloniferous. Leaves narrowly obovate, 1.5-4.0 cm long. Flowers white, few, nodding. Berry bright red. All summer. Sandy coniferous woods.--NF-SPM, NS-seMan, eUS.

2. <i>G. humifusa</i> (Graham) Rydb. -- Mountain-Teaberry -- Leaves serrulate, the teeth setiferous on the younger leaves. Stoloniferous and very low. Leaves about 1 cm long, oval to suborbicular, the margin finely penciled in white. Flower pinkish. Fruit reddish. Mid summer. Wet mountain slopes.--swAlta-BC, wUS.

3. <i>G. hispida</i> (L.) Muhl. (<i>Chiogenes hispida</i> (L.) T. & G.) -- Teaberry (<i>Petit thé, Oeufs-de-perdrix</i>) -- Flowers small, only 2 mm long, and 4-merous. Extensively creeping. Leaves numerous, broadly ovate, subsessile, (0.3)-0.5-(1.0) cm long and ciliate with a few coarse hairs. Berry white. Spring. Forming tangled mats in mossy woods.--K, L-SPM, NS-BC, US.

12. ARCTOSTAPHYLOS Adanson

Fruit a berry developing in the usual manner from the ovary.

a. Leaves serrulate ......................... 1. <i>A. alpina</i>  
   aa. Leaves entire ...................... 2. <i>A. Uva-Ursi</i>

1. <i>A. alpina</i> (L.) Sprengel var. alpina -- Foxberry, Poisson-Berry (<i>Berbe à caribou, Raisin d'ours</i>) -- Leaves thin, impressed above and rugose below. Stem prostrate and mat forming. Leaves more or less marcescent, obovate to spatulate, long cuneate, finely ciliate towards the base and along the petiole. Flower yellowish. Fruit red to blackish. Early spring. Rocky and gravelly arctic or alpine tundras, --G-Aka, L-SPM, Q-(n0)-nMan, swAlta-nBC, (neUS), Eur -- Var. rubra (Rehder & Wilson) Bean (<i>A. rubra</i> (Rehder & Wilson) Fern., <i>Arctous erythrocarpa</i> Small) -- Leaves very rugose, little or not at all marcescent, not ciliate or barely so. Berry remaining scarlet at maturity.--(F)-K-Aka, (NF), Q-(0)-nMan-nAlta-BC, (Eur).

GAULTHERIA 164
2. 

A. Uva-Ursi (L.) Sprengel (var. adenotricha Fern. & Macbr., var. coactilis Fern. & Macbr.) — Kinnikinick, Bearberry (Raisin d'ours, Sac à commis) — Leaves finely tomentose-ciliate, also more or less tomentose along the mid-nerve. Widely spreading, carpeting shrub. Leaves thick, spatulate, entire, persistent. Flowers white to pinkish. Berries dull red. Late spring and early summer. Forming carpets over dry or sandy ground.—(G), K-Aka, L-SPM, NS-BC, US, Eur.

Var. adenotricha and var. coactilis are less common phenotypes, rather than geographically restricted varieties.

40. VACCINIACEAE (HUCKLEBERRY FAMILY)

Like the Ericaceae, but the ovary inferior and the fruit a juicy berry. Petals and sepals fused.

1. VACCINIUM L. BLUEBERRY

Fruit a berry with numerous small seeds.

a. Peduncles much longer than the leaves ....

......................... 8. V. Oxyccocos

aa. Peduncles much shorter.

b. Leaves persistent, retuse at tip ....

......................... 7. V. Vitis-idaea

bb. Deciduous and not retuse.

c. Flowers in terminal bracteolate racemes ......... 6. V. angustifolium

cc. Flowers solitary in the axils of normal leaves, or 1-3 in a small leafless terminal glomerule.

d. Leaves entire ........... 1. V. uliginosum

dd. Serrulate.

e. Twigs round, puberulent ....

......................... 2. V. caespitosum

ee. Twigs narrowly winged-decurrent, usually glabrous.

f. Berries red; peduncles up to 3 mm long ...... 3. V. scoparium

ff. Berries blue to black; peduncles usually longer, up to 1 cm.

g. Low, the leaves mostly 1-2 cm long ... 4. V. Myrtillus

gg. Taller, the leaves mostly 3-4 cm long ..

......................... 5. V. membranaceum

1. V. uliginosum L. var. uliginosum (var. alpinum Big.) — Ground-Hurts, Bog Bilberry (Bleuet trainard, Bleuet magane) — Leaves entire, obovate. Stem trailing, with erect branches 1-5 dm high. Leaves obovate, around 1 cm

The more western var. occidentale (Gray) Hara has narrower leaves, 2-3 times as long as large. Many other segregates have been proposed, including a smaller V. microphyllum (Lange) Löve, but all these phenotypes are sympatric and grade into one another.

2. V. caespitosum Mx. -- English Blueberry, Dwarf Bilberry (Bluets, Bluets manganés) -- Much like the preceding and growing in similar habitats. Leaves 1-3 cm long, typically narrowly obovate to narrowly lanceolate, serrulate, thin. Late spring. Cold woods.--K-Aka, L-NF, NS, NB-O-(Man)-S-BC, US, (Eur).

3. V. scoparium Leiberg -- Grouseberry, Whortleberry -- Low shrub, broom-like, with numerous rather stiffly erect branches. Mostly about 1 dm high. Leaves small, less than 1 cm long at flowering, sometimes up to 1.5 cm later. Peduncles 2-3 mm long. Fruit red, drying blue. Late spring. Dry coniferous forest at higher altitudes.--swAlta-BC, (US).


The only known Greenland collection is from Alangors-suak (CAN; DAO, photo) and represents probably an introduction rather than a range disjunction. Unless it be a case of mixed labels.


6. V. angustifolium Aiton var. angustifolium (var. laevifolium House; V. boreale Hall & Alders; V. Lamarckii Camp; V. pensylvanicum Lam., var. angustifolium (Aiton) Gray) -- Blueberry (Bluets, Bleuets de sauvage) -- Flowers in short leafless racemes borne at the end of last year's shoot. Commonly 3-4 dm high. Twigs and leaves glabrous. Leaves 1.0-3.5 cm long, mostly lanceolate, finely serrate. Berry delicious, blue with a heavy bloom. Late spring. Bogs and acid rocks or soils.--K, L-NF-(SPM), NS-(PEI-NB)-Q-O-(seMan, US) -- F. nigrum (Wood) Boivin (V. Brittonii Porter; V. nigrum Britton) -- Fruit black, without bloom.
(NF, NS-NB)-Q-0-(seMan, US) -- Var. myrtilloides (Mx.) House(V. canadense Kalm; V. myrtilloides Mx.; Cyanococcus canadensis (Kalm) Rydb.) -- Twigs and leaves pubescent, the latter usually entire. (Flowering some two weeks later?). Shadier and wetter places.--(Mack, L-NF), NS-(PEI)-NB-BC, US.

Usually subdivided into two or more species. Although we have had much field experience with this entity, we have never been able to detect more than one species in the field and var. myrtilloides has always remained an arbitrary distinction best made in the herbarium with a good hand lens or binocular. Intermediates occur between our two varieties; some show an intermediate morphology, others present unusual combinations of the diagnostic characters. The various kinds of intermediates have been decorated with binomials. Diploid and tetraploid forms occur and have been named respectively V. boreale and V. Lamarokii.

7. V. Vitisidea L. var. minus Lodd. (Vitis-idea punctata Moench) -- Partridge-Berry, Redberries (Graines rouges, Pommes de terre) -- Leaves sparsely glandular-pubescent below with small brown hairs. Low shrub with thick, persistent leaves, some of which are retuse at tip. Flowers in bracteolate terminal racemes. Fruit red. Late spring to early summer. Bogs and acid woods.--(G)-F-Aka, L-SPM, NS-BC, US, (Eur).

In the Old World var. Vitisidea the leaves average larger, not always a clear cut distinction.

8. V. Oxycoccos (var. ovalifolium Mx.; Oxycoccos ovalifolius (Mx.) Forsild; O. palustris Pers.; O. quadripetalus Gilibert) -- Cranberry, Marashberry (Atocas, Grisettes) -- Small shrub, little woody, with thin wiry stems half buried in Sphagnum. Leaves 5-6 mm long, persistent, mostly elliptical. Flowers red or pink in clusters of 1-4 at the end of branches or stems. Peduncle 2.0-3.5 cm long, finely puberulent. Corolla deeply lobed. Berry 8-10 mm across, at first punctate, turning red, then black. Early summer. Sphagnum bogs.--K-Mack, L-NF, NS-PEI-(NB)-Q-BC, US, Eur -- Var. microphyllum (Lange) Rouss. & Raym. (var. ovalifolium AA; V. microcarpum (Turcz.) Hooker; V. Oxycoccos AA; Oxycoccos microcarpus Turcz.; O. ovalifolius AA) -- Generally smaller. Leaves (2)-3-4-(5) mm long, mostly ovate. Peduncles 1-2 cm long, often glabrous or nearly so. Fruit somewhat smaller.--(G), K-Aka, I-SPM, NS-PEI, Q-BC, US, Eur.

We have examined the type of Michaux' var. ovalifolium in 1950 and we have photos of the Linean material to compare. Both belong to var. Oxycoccos as interpreted here. And our usage conforms to that of Gleason, Hitchcock, Forsild, Scoggan, etc. But there has been some divergence of opinion and the opposite interpretation prevails with Breitung, Fernald, Roland, etc.

Our two varieties are often treated as species, but
the diagnostic characters are not quite constant and various recombinations of characters occur here and there. He who would here accept two species will eventually be led to accept four, then perhaps eventually eight.

41. PYROLACEAE (WINTERGREEN FAMILY)
Similar to the Ericaceae. Herbaceous or nearly so. Petals free.

a. Stem leafy in the lower half ............. 1. Chimaphila

aa. Leaves all or nearly all in a basal rosette ..

b. Flowers in a terminal corymb. Stem leafy, lacking a basal rosette.

1. CHIMAPHILA Pursh.
Flowers in a terminal corymb. Stem leafy, lacking a basal rosette.

1. C. umbellata (L.) Barton var. cneantlantica Blake (var. occidentalis (Ryd.) Blake) -- Pipisiseswa, Prince's Pine (Herbe À peigne, Herbe À clef) -- A small shrub, practically herbaceous, with a few large and persistent leaves. Leaves obovate, serrate above the middle. Flowers pink. Early summer. Pine woods, uncommon. --(Aka), NF-(SPW), NS-BC, US.

In Old World var. umbellata the leaves have obtuse to subacute teeth. The American phase is weakly distinguishable by its acute to subacuminate teeth. Also the neogean plants tend to average larger with leaves a bit longer and the nerves more rugose than the paleogean.

We have found the characters of var. occidentalis, mainly the weaker venation, to be too elusive and we have not been able to distinguish this taxon other than by its geography.

2. PYROLA L.
Flowers in a raceme. Plants scapose with a basal rosette.

a. A single terminal flower ............. 1. P. uniflora

aa. Flowers in a terminal raceme.

b. Style straight and vertical on the top of the ovary.

c. Raceme conspicuously secund ....... 2. P. secunda

c. Not at all secund .................. 3. P. minor

bb. Style curved and strongly deflexed at the base.

d. Leaves dentigulate.

c. Pedicel much longer than the subtending bract .......... 6. P. picta

e. Bract much longer .......... 7. P. bracteata

dd. Leaves crenulate to subentire.
f. Calyx lobes deltoid, 1.0-1.5 mm long.

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There occurs in Mexico a var. elatior (Lange) Boivin with narrower, more acute and thicker leaves.

The neogean plant shows a broader amplitude of variation than the paleocean and the smaller neogean plants with smaller and more rounded leaves and a sparser inflorescence have been described as var. obtusata. To apply var. obtusata to the whole of the neogean population is certainly unrealistic as most of the American plants fit well within the range of variation of the Eurasian type. To try to segregate the smaller extremes is too arbitrary and somewhat meaningless when our plants obviously form a single population.


Northward and eastward the leaves are commonly smaller, but this tendency proved to be insufficiently marked to allow taxonomic recognition.


5. Pyrola elliptica Nutt. -- Shinleaf, Wild Lily-of-the-Valley -- Leaf thin and large, broadly ovate to elliptic, the blade 3-6 cm long. Flowers white, darkening in drying. Towards mid-summer. Aspen woods. -- NF, NS-BC, (eEur).
6. *P. pilosa* Sm. -- Leaf nervous outlined with a double white line for the central nerve and simple white lines along the main lateral nerves. Leaf denticulate, otherwise rather variable in size and shape. Calyx lobes 1.5-2.5 mm long, deltoid to triangular. Flowers greenish-white to yellowish. First half of summer. Rare, in dry coniferous woods; Waterton.—Alta-BC, US.

7. *P. bracteata* Hooker -- Bract slightly longer than, to twice as long as, the pedicel. Leaves elliptic to suborbicular, denticulate through the nerves being short-excurrent. Nerves sometimes lightly outlined in white. Calyx lobes 3.0-4.5 mm long, lanceolate. Flowers pink to crimson. Anthers yellow to pink. Early summer. Damp coniferous woods. --swalta-BC, US.


The leaf shape varies in a continuous manner and segregates such as var. *purpurea* or *P. uliginosa* appear to be both arbitrary and sympatric.


Usually subdivided into 3 taxa of which *P. americana* and *P. grandiflora* are American while the largely Eurasian *P. rotundifolia* is also reported as cisatlantic towards the northeast. We have been unable to detect here any essential difference except that the more northern specimens (*P. grandiflora* or var. *pumila* (Horn.) Hooker) tend to be smaller. The amphiatlantic *P. rotundifolia* is supposed to differ from the cisatlantic *P. americana* in a number of characters of floral mensuration, but our Eurasian specimens at DAO did not conform to this dichotomy and we were unable to find any tangible characters other than the amplitude of variation in the length of the anthers which is lesser in Eurasian (2.0-3.0 mm) than in American specimens (1.7-3.5 mm). Hence the present consolidation.
42. MONOTROPACEAE (INDIAN PIPE FAMILY)

Parasitic herba, fleshy and devoid of green colour.
Leaves reduced to fleshy scales. Ovary superior.

a. Petals free ........................................ 1. Monotropa
   aa. Petals fused into a campanulate corolla .. 2. Pterospora

1. MONOTROPA

INDIAN PIPE

Petals free. Sepals vestigial or missing. Anthers
awnless. Plants odd-coloured and often mistaken for mush-
rooms.

a. A single terminal flower ................. 1. M. uniflora
   aa. Flowers in a terminal raceme ........ 2. M. Hypopitys

1. M. uniflora L. -- Indian-Pipe, Ghost-Flower -- A
waxy-white and almost translucent simple herb with a nodding
flower of similar texture, the whole plant turning jet black
in drying. Sometimes pinkish; becoming somewhat woody in
fruit. Late summer and early fall. Parasitic on roots of
Conifers.--(Aka), L-SPM, US, (CA), Eur.

2. M. Hypopitys L. (ssp. lanuginosa (Mx.) Breitung,
var. latisquama (Rydb.) Kearney & Peebles; Hypopitys latis-
quama Rydb.) -- Pinesap (Saucepin) -- The whole plant orange-
coloured or similarly tinted. Pubescent. Drying brownish
black. Flowers in a nodding terminal raceme. Late summer
or early fall. Parasitic on roots of Conifers, not so com-
mon as the preceding.--Aka, NF-SPM, US, CA, Eur.

We have been unable to detect any constant differen-
tes that could justify the distinction of a transatlantio var.
Hypopitys from a western var. latisquama and an eastern
ssp. lanuginosa.

2. PTEROSPORA Nutt.

PINE-DROPS

Petals fused into an urceolate corolla. Anthers
awned. Sepals present, fused at base.

1. P. andromedea Nutt. -- Brownish herb, simple and
densely glandular-pubescent. Up to 1 m tall. Flowers on
elongate recurved pedicels in an elongate raceme. Flowers
yellow and purple. Mid summer. Parasitic on Conifers; Roc-
kies, Cypress Hills.--(seAka), PEI, swQ-0, swS-BC, US, (CA).

Rare, highly sporadic and perhaps producing flowering
stems only at intervals of many years. Hence rarely col-
clected and we see no reason to dispute the accuracy of the gen-
eral distribution given above.

43. DIAPENSIACEAE (DIAPENSIA FAMILY)

Like the Ericaceae, but the stamens adnate to the co-
rolls.
1. DIAPENSIA L.

No staminodia. Flower solitary.


Order 26. CELASTRALES

Petals free, subtended by the small fused calyx. Ovary superior, usually with a disk. Stamens as many as the petals and alternating with them. Leaves simple.

a. Leaves evergreen ......................... 44. Empetraceae
   aa. Leaves deciduous ...................... 45. Celastraceae

44. EMPETRACEAE (CROWBERRY FAMILY)

Low shrubs with evergreen leaves. Ovary superior and maturing into a berry similar to that of Vaccinium.

1. EMPETRUM L. CROWBERRY

Leaves acicular, subverticillate. Flower trimerous, bracteolate.

1. E. nigrum L. var. purpureum (Raf.) DC. (var. hermaphroditum (Lange) Sorensen) -- Blackberry, Crowberry (Graines noires, Crottes de corneille) -- Carpet-making shrub with some leaves alternate, some opposite, most subverticillate. Leaves linear-oblong, (3)-5-(7) mm long, minutely glandular-ciliate. Flower small, purple. Fruit purple, turning black. Late spring. Bogs, tundras and rocky places.--(G)-F-Y-(Aka), L-(NP-SPM), NS-(PEI)-NB-Alta-(BC), US, (Eur).

In our variety the flowers are perfect or rarely pollygamous and the branchlets are finely glandular or sometimes lightly brownish-tomentose. The anthers are marcescent and normally persist at the base of the fruit; the floral type is thus readily determined in most herbarium specimens. In the paleogeon var. nigrum the branchlets and leaves are glabrous while the flowers are dioecious and the fruit is black.

45. CELASTRACEAE (STAFF-TREE FAMILY)

Seeds surrounded by a fleshy or membranous aril.

a. Leaves alternate ......................... 1. Celastrus
   aa. Opposite ............................. 2. Pachystima

1. CELASTRUS L. STAFF-TREE

Woody climbers by twining stems. Flower functionally unisexual, 5-merous.
1. **C. scandens** L. -- Bittersweet (*Houreaux des arbres*)

   -- The woody stems becoming quite thick and hard, eventually strangling the host shrub or tree. Leaves ovate to elliptic, serrate, abruptly acuminate. Flowers small, yellowish-green, mostly in a terminal raceme. Fruit orange, opening by three valves and exposing the bright red arils. The mature fruits used for decoration. Early summer. Woods, mostly sand dunes and galerie-forests; Estevan and eastward. --NB-seS, US.

2. **PACHYSTIMA** Raf.

   Non climbing, but a low shrub with opposite evergreen leaves. Flower 4-merous.

   1. **P. myrsinites** (Pursh) Raf. -- Mountain-Box, False Box -- Low shrub with numerous small leaves, 1-3 cm long, ovate to lanceolate, serrulate, subsessile, leathery. Flowers reddish, small, axillary. Fruit not seen. Late spring. Coniferous woods. --Alta-BC, US.

Order 27. **SANTALALES**

   Ovary inferior and the perianth reduced to a single verticil of fused parts. Stamens opposite the perianth lobes. Parasitic plants.

   a. Parasitic on branches of Conifers .... 46. **Loranthaceae**

   aa. Terrestrial and not so obviously parasitic ......................... 47. **Santalaceae**

46. **LORANTHACEAE** (MISTLETOE FAMILY)

   Parasitic plants, devoid of roots and growing on branches of trees and, when present in abundance, deforming them into witch-brooms. Leaves reduced, opposite. Fruit sticky.

1. **ARCEUTHOBium** Bieb.

   Leaves opposite, connate and reduced to a small sheath at each node. Flowers dioecious, much reduced and insignificant.

   a. Plant light green ...................... 1. **A. americanum**

   aa. Plant blackish ...................... 2. **A. pusillum**

   1. **A. americanum** Nutt. -- Growing on the branches of *Pinus banksiana* and usually shorter than the needles. Stem branched, often tufted. --Man-BC, US.

   2. **A. pusillum** Peck -- Dwarf Mistletoe -- Growing hidden among the needles of *Picea mariana*. Stem usually simple and shorter than the needles, often a mere 1-3 mm in length. --NF, NS-Man, US.

47. **SANTALACEAE** (SANDALWOOD FAMILY)

   Similar to the Mistletoes, but terrestrial and not al-
ways parasitic on roots of other plants. Leaves alternate. Fruit indehiscent, a nut or slightly fleshy drupe. A single genus with us.

1. COMANDRA Nutt. BASTARD TOAD-FLAX

Long stoloniferous herbs with alternate leaves. Sepals and stamens 5.

a. Inflorescence terminal ..................... 1. C. umbellata
aa. Flower axillary ........................... 2. C. livida

1. C. umbellata (L.) Nutt. var. umbellata (C. Richardsiana Fern.)—Calyx lobes whitish and more or less giving their color to the flowering corymb. Otherwise a rather inconspicuous plant. Glabrous. Stem (1)-2-(3) dm high, nearly simple. Leaves lanceolate, entire, thin, paler and somewhat glaucous below, often slightly revolute at margin. Calyx lobes 2-3 mm long, triangular to oblong. Fruit greenish, 3-6 mm across. Late spring. Common in open, grassy places.—L-NF, NS-BC, US

Var. angustifolia (A.DC.) Torrey (C. pallida A.) -- Like the preceding, but the leaves thickish, slightly fleshy, somewhat glaucous on both faces. Nervation indistinct or nearly so, not rugose. Calyx lobes mostly larger, (2)-3-4 mm long. Fruit bigger, 5-8 mm across.—Man-Alta, US

Var. pallida (A. DC.) G.N. Jones -- Generally somewhat taller and commonly 3-4 dm high. Branches usually numerous, elongated and bearing leaves that are much narrower than the stem ones, the latter as in var. angustifolia. Flowers in a corymb or more often in a panicle. Calyx and ovary connected by a well defined neck about 2 mm long. Calyx lobes 3-4-(5) mm long. Fruit with a neck 1-2 mm long.—wAlta-BC, US.

Our treatment is different in one way or another from any of the current floras. We have been unable to maintain Comandra Richardsiana as a consistent segregate. But we have distinguished the prairie phase from both the eastern phase and the mountain one, while most authors will lump this prairie phase now with the eastern, now with the western type.

Most specimens of the prairie phase will be found identified as C. pallida, but reading the description of De Candolle, studying photos of his specimens and considering the geographical origin of the type collection, it becomes clear that such usage must be erroneous.

C. pallida has also been reported by many authors, Hultén 1944, 1950, Anderson 1946, Forsild 1951, Scoggan 1957, from the Dawson area of Yukon, but we have not seen the cited specimens and are not therefore in a position to decide upon their varietal apparenance. There is also a Mackenzie collection of var. angustifolia labelled "MacTavish, on Anderson River near Port Hope" (CAH) which we consider to be questionable as to locality because it is so far removed from the rest of the range and has never been confirmed.
2. *C. livida* Rich. (*Geocaulon lividum* (Rich.) Fern.) -- A simple herb usually bearing a single red fruit borne half way up a long axillary peduncle. Glabrous. Leaves ovate to elliptic-lanceolate, entire. Flowers green to reddish, few or solitary in a single or a few axillary inflorescences. Fruit a red and fleshy drupe. Late spring. Usually in wet places or coniferous woods.--K-Aka, L-NF, NS, NB-BC, US.

Order 28. RHAMNALES

Similar to the Santalales, but the petals present and the stamens opposite them or, if the petals are absent, the stamens alternate with the calyx lobes.

a. Foliage stellate-pubescent ................. 49. Flaeagnaceae
aa. Pubescence, if any, not stellate.
   b. Inflorescence axillary or terminal ..... 48. Rhamnaceae
   bb. Inflorescence borne opposite a leaf .... 50. Vitaceae

48. Rhamnaceae (BUCKTHORN FAMILY)

Flower perigynous with a well developed disk. Petals generally clawed and more or less hooded over the stamens.

a. Inflorescence axillary ......................... 1. Rhamnus
   aa. Inflorescence terminal .................... 2. Ceanothus

1. RHAMNUS L. BUCKTHORN

Fruit fleshy, indehiscent. Petals reduced or lacking.

a. Spinescent, the terminal buds opposite and flanking
   a short spine ........................... 2. *R. catharticus*
   aa. Not spiny; terminal bud solitary.
   b. Leaves serrate ............................ 1. *R. alnifolius*
   bb. Entire or nearly so .................... 3. *R. Frangula*

1. *R. alnifolius* L'Hér. (*R. alnifolius* aphan.) -- Dwarf Alder -- Colonial shrub, decumbent at base, the flagellate branches leafy at tip only. Leaves ovate to elliptic-lanceolate, usually short acuminate, all alternate. Flowers small, greenish, few, without petals. Fruit a black berry. Late spring. Marshy woods and bogs.--NF, NS-BC, US.

Nearly all latin names of trees and shrubs are of the feminine gender, but there are a few exceptions and *Rhamnus* is one of them. So are *Acer*, *Ceanothus*, *Ribes*, *Viburnum*, etc.

2. *R. catharticus* L. -- Buckthorn (Épine noire, Bois noir) -- Small tree or shrub with lateral branches ending in a short sharp spine flanked by two opposite buds. Leaves ovate, serrulate, most of the leaves opposite or subopposite and usually with a few of the lower leaves alternate. Petals small, greenish or deep red. Berries black. Late spring. Sometimes planted and readily naturalizing itself in the nearby bush.--NS-P&E-(NB)-Q-S, US, Eur.

RHAMNUS

2. **CEANOTHUS L.**  
NEW JERSEY TEA

The petals long-clawed and conspicuously hooded over the stamens. Fruit a capsule separating at maturity into 3 dehiscent 1-seeded carpels. Leaves with 3 main nerves, parallel to converging, and about equally strong.

a. Leaves lanceolate ................................ 1. **C. ovatus**
   aa. Leaves ovate to elliptic ...................... 2. **C. velutinus**

1. **C. herbaceus** Raf. (**C. ovatus** Desf.) -- Lanceolate leaves with 3 main nerves. Low branchy shrub. Leaves glabrous to velvety, glandular-serrate, the glands dark purple. Flowers white, umbellate, most of the umbels closely inserted on a short rachis, forming a terminal corymb borne on a long peduncle. Early summer. Semi-open sandy places. -- SW-seMan, US.

2. **C. velutinus** Douglas var. **velutinus** -- Snow-Brush, Deer-Brush -- Strongly resin-scented. Leaves persistent into the following summer, the new leaves not appearing until flowering time, the old leaves falling off in the latter part of the summer. Soft puberulent on the twigs and lower surface of the leaves. Flowers white, in numerous umbels, gathered in ill-defined pani- cles. Early summer. Light woods on dry soils. -- SW-Alta-BC, US.

   The more western var. **laevigatus** (Hooker) T.&G. is glabrous.

49. **ELAEAGNACEAE** (OLEASTER FAMILY)

Shrubs with the lower leaf surfaces and other parts densely covered with scale-like stellate hairs which give the plant a silvery or otherwise unusual appearance.

a. Leaves opposite .................................. 2. **Shepherdia**
   aa. Leaves alternate.
   b. Calyx lobes 2 ................................ 1. **Hippophae**
      bb. Calyx lobes 4 ............................. 3. **Elaeagnus**

" 1. **HIPPOPHAE** L.  
SEA BUCKTHORN

Calyx lobes 2; stamens 4.

2. SHERPHERDIA Nutt.

Calyx lobes 4; stamens 6. Leaves opposite.

a. Twigs brown-stellate

1. S. canadensis (L.) Nutt. -- Soopolalie, Bitter Berries

aa. Twigs silver-stellate

2. S. argentea Nutt. -- Buffalo-Berry, Bullberry (Graines de boeuf)

3. ELAEAGNUS L.

Calyx lobes 4; stamens 4.

a. Twigs brown-stellate

1. E. commutata

aa. Twigs white-stellate

2. E. angustifolia

50. VITACEAE (VINE FAMILY)

Climbing shrubs, ours climbing by tendrils borne opposite the leaf.

a. Leaf simple

1. Vitis

aa. Leaf compound

2. Parthenocissus
1. VITIS L.  
Grape

Petals fused and falling off as a unit before anthesis. Climbing shrubs bearing panicles of edible fruits called "grapes".

1. V. riparia Mx. (V. palmata AA.; V. vulpina AA.) — Grape, Frost-Grape (Vigne, Vigne des battures) — Woody climber with palmately-nerved leaves. Climbing to the top of the trees, its trunk up to 2-3 cm in diameter. Leaves alternate, broadly cordate, more or less 3-5 lobed, coarsely toothed. Fruit black with a bluish bloom. Early summer. Galerie-forests.—NS, NB-Man, US.

2. PARTHENOCISSUS Planchon

Petals free and remaining until after anthesis.

1. P. quinquefolia (L.) Planchon (Psedera quinquefolia (L.) Greene) — Virginia-Creeper (Vigne vierge) — A woody climber with a large digitate leaf. Climbing into trees by means of branched tendrils that end in adhesive disks 1.5-3.5 mm wide. Leaf long-petioled, with 5 leaflets, the latter short-petioled, ovate to broadly oblanceolate, coarsely dentate. Early summer. Floodplain forests.—(NS-NB)-Q-O-(Man, US, CA) — P. macrophylla (Lauche) Boivin (P. inserta (Kerner) K. Fritsch) — Tendrils merely twining, not producing adhesive disks.—(NS)-PEI-(NB)-Q-O-(Man, US).

Order 29. LOGANIALES

Sepals fused and the petals also fused. Stamens borne on the corolla and alternating with the corolla lobes. Ovary superior. Flower actinomorphic.

51. OLEACEAE  
(OLIVE FAMILY)

Stamens only 2.

a. Leaves compound .................................. 1. Fraxinus
aa. Simple ........................................... 2. Syringa

1. FRAXINUS L.  
ASH

Fruit a paddle-shaped samara. Flowers much reduced, the calyx minute and the petals lacking.

a. Leaflets 5-7 .................................. 1. F. pennsylvanica
aa. Leaflets 9-13 .................................. 2. F. nigra

1. F. pennsylvanica Marsh. var. Austini Fern. — Ash, River-Ash, (Frêne, Frêne rouge) — River shore tree with opposite and compound leaves, mostly with 7 leaflets. Buds gray-brown. Branchlets short-pubescent, the racemes and lower surface of the leaflets more or less pubescent. Leaflets lanceolate, serrate, the lower with a short petiole. Samara flat and
broader above, terete and much narrower below. Early spring.
Shores and floodplains.--NS, NB-Man, US -- Var. subintegerrima
(Vahl) Fern. (var. lanceolata (Borkh.) Sarg.; F. campestris
Britton) -- Green Ash (Frêne vert) -- Twigs, rachises and leaflets glabrous.--NS-PEI, Q-S, US.
Reports by Scoggan 1957 of var. Austinii from Saskatchewan and of var. subintegerrima from Alberta would seem to be
credible to a lapsus calami, according to Scoggan (verbatim).
2. F. nigra Marsh. -- Black Ash, Swamp Ash (Frêne noir,
Frêne gras) -- Tree with large jet-black buds. Much as in the
preceeding, but the leaflets more numerous and sessile. Samara
flat throughout, oblong-lanceolate and not particularly wider
above than below. (Early spring?). Marshy woods.--NF, NS-Man,
US.
2. SYRINGA L.
LILAC
Fruit a capsule. Corolla showy.
1. S. VULGARIS L. -- Lilac (Lilas; Arbre de lilas) --
Shrub with a showy panicle of sweet-scented tetramerous flower.
Leaves opposite, glabrous, deltoid-ovate and entire, the base
truncate to subcordate. Early summer. Sometimes planted and
rarely persisting on moister sites: Moose Jaw.--NF-(PEI-NB)-Q-
Order 30. APOCYNALES
Much as in the Loganiaceae, but the two carpels fused by
their styles only.
a. Flower of a standard type ..................... 52. Apocynaceae
aa. Flower very complex, with corona, horns and pol-
linia ........................................ 53. Asolepiadaceae
52. APOCYNACEAE
(DOBANE FAMILY)
A typical and unspecialized pentamerous flower with a calyx and corolla of fused parts and a bicarpellate ovary.
1. APOCYNUM L.
DOGBANE
Herbs with very abundant white latex, opposite leaves and
twined pendent fruits.
a. Corolla 5-6 mm long, pink, or white with pink li-
nes ........................................... 1. A. androsaemifolium
aa. Corolla 2-4 mm long, greenish-white, without pink
lines ....................................... 2. A. cannabinum
1. A. androsaemifolium L. var. incanum A. DC. (var. gla-
brum A.; A. scopulorum Greene) -- Dogbane, Flytrap (Herbe à
puce, Gobe-mouche) -- Dichotomously branched, the stem 3-7 dm
high, overtopping the branches. Main leaves mostly ovate or su-
b orbicular, 5-6 cm long, cuneate to rounded at base, more or less pubescent below, short petiolate. Flowers campanulate, mostly drooping or pendent. Calyx lobes deltoid or lanceolate, 1/3 or 1/4 the length of the corolla tube. First half of summer. Open places, mostly on hillsides.--Mack-Aka, NF, NS-BC, US, (CA) -- Var. Woodginn Boivin -- Generally smaller and with erect fruits. Mostly 2-4 dm high. Leaves about 2-4 cm long, pubescent below, often subcordate at base: Waterton.--swAlta-BC, US -- Var. pumilum Gray -- Like the last, but glabrous throughout. Cypress Hills.--seAlta-BC, US.

There has been some derogation as to the application of var. androsaemifolium. It was originally described as having leaves glabrous on both faces by Linnaeus and the name was used in that sense until Woodson, Rhodora 34: 30-31. 1932 pointed out that the glabrous phase was known only from the western parts of North American, well outside the area of origin of the material available to Linnaeus. Woodson concluded that the typical phase cannot be anything but the common and pubescent eastern plant later described as var. incanum by De Candolle. However it was pointed out by Boivin 1966 that glabrous plants do occur also in eastern Canada and the glabrous specimen of the Hortus Cliffortianus cannot be ignored. We have accordingly returned to the older practice of distinguishing a var. incanum from the typical and glabrous var. androsaemifolium.

1. X. A. medium Greene -- Very variable hybrid of our two species. Commonly with narrower leaves than the above and rounded to cuneate at base, often petiolate, but usually glabrous. Calyx lobes most often as long as the corolla tube. Flowers variable, mostly large and white to pink-lined, but usually tubular with erect lobes.--NF, NS, N3-BC, US.

2. A. cannabinum L. var. hypericifolium Gray (nec (Aiton) Gray; A. cannabinum Ait.; A. sibiricum Jacq., var. cordigerum (Greene) Fern., var. salignum (Greene) Fern.) -- Indian Hemp (Chanvre sauvage) -- Coarser, about 1 m high, with opposite branching and the branches overtopping the stem at anthesis. Glabrous throughout. Stem leaves mostly 6-8 cm long, sessile, subcordate. Branch leaves smaller and narrower. Flowers 2-4 mm long, tubular, yellowish-white, with long calyx lobes. Late spring to mid-summer. Shores and open places.--Mack, NF, NS, NB-BC, US -- F. arenarium (F.C. Gates) Boivin (A. sibiricum Jacq. f. arenarium (F.C. Gates) Fern.) -- Half smaller and decumbent at base. Shores subjected to violent spring floods.--NF, NS, N3-0, S-Alta, (US).

Usually subdivided into two species, each with two varieties, but as pointed out by Boivin 1966 the distinction is not realistic and the entity currently distinguished as A. cannabinum var. glaberrimum A.Boivin is not substantially distinct from the typical phase of A. sibiricum. Hence the present usage.

53. ASCLEPIADACEAE (MILKWEED FAMILY)

Pollen grains adnate into pollinia in the manner of the

APOCYNUM
Orchidaceae. Pollinia attached in 2's to black translators. Anthers and stigmas fused together to form a platform termed "gynostegium". Otherwise as the Apocynaceae and equally productive of an abundant milky juice.

1. ASCLEPIAS L. MILKWEED

Complex flower with a supplementary pseudo-corolla termed a "corona". This corona is formed of 5 large, petaloid, conspicuous hooded appendages which arise from the back of the largely hidden filaments of the anthers. Each hood bears inside a secondary appendix termed a "horn", from its obvious shape.

a. Leaves filiform, verticillate ........... 5. A. verticillata

aa. Leaves broader and essentially alternate to opposite.

b. Flower purplish.

c. Glabrous or nearly so ............... 1. A. incarnata

c. Velvety puberulent throughout.

d. Hoods very long and showy, over 1 cm long .................. 4. A. speciosa

dd. Hoods less than half as long .... 3. A. syriaca

bb. Flower greenish to yellowish-white.

e. Stem coarsely spreading-hirsute... 7. A. lanuginosa

ee. Stem finely recurved-puberulent.

f. Hoods overtoping the gynostegium by about half their length.... 2. A. ovalifolia

ff. Hoods much lower, about reaching the level of the gynostegium ... 6. A. viridiflora

1. A. incarnata L. var. incarnata -- Swamp-Milkweed -- With a showy terminal umbel (or corymb of umbels) of deep purple flowers. Glabrous except in the inflorescence. Leaves lanceolate to narrowly lanceolate, opposite or sometimes verticillate in the inflorescence. Flowers less than 1 cm long. Fruit glabrous and spineless. Mid summer. Shores and ditches. -- NS-KE, US.

Mentioned for Saskatchewan by Britton 1913 and Groh 1947, but not in the more recent floras. Source of report is not known to us.

In our variety the stem is glabrous and the leaves are glabrous or nearly so below. In Nova Scotia and more locally inland, there occurs a var. pulchra (Enr.) Pers. more or less pubescent on the stem and both faces of the leaves; the latter are also often larger.

2. A. ovalifolia DC. -- The common prairie species, the flowers whitish and the stems usually less than 5 dm high. Finely recurved pubescent throughout. Leaves very variable, mostly ovate and opposite. Umbels loosely flowered. Peduncles green, 1.5-3.0 cm long. Fruit spineless. First half of summer. Well drained prairies, often on sandy soil. -- wO-Alta, US.
3. *A. syriaca* L. var. *syriaca* -- Milkweed, Silkweed (Cot·
tonier, Cochons de lait) -- A coarse sticky herb with dense
globular clusters of purple flowers. About 1 m high and densely
short glandular-pubescent throughout. Leaves 1-2 dm long,
about oblong, opposite. Peduncles purple, 2-3 cm long. Fruit
densely covered with soft spine-like projections. First half
of summer. Floodplains. -- NS-Man, US.

In var. *syriaca* the stem leaves are mainly subcordate at
base. To the south of us it is largely replaced by a var.
*Palm. kansasae* & Stay. with leaves rather truncate at base and
fruits covered with thinner and filiform spine-like projec­
tions.

Saskatchewan is included in the range given by Fernald
1950, but we found no corresponding specimen at HUH in 1965.

*A. syriaca* x *speciosa* was listed by Love 1959 for southern
Manitoba on the basis of J.P. Bernard, Otterburne (MSM; DAO,
photo). This specimen is not obviously different from typical
*A. syriaca*.

4. *A. speciosa* Torrey -- Very conspicuous flowers, with
the hood elongated to 10-15 mm. Much like the preceeding, but
more densely pubescent, becoming white-lanate in the inflo­
rescences. Leaves ovate to oblong. Peduncles 2-3 cm long. Over­
all length of the flower around 2 cm. Pods reputedly spiny,
like the preceeding, but none of our material is fruiting.
Early to mid-summer. Wetter spots in the prairie; occurring
in widely scattered colonies, often along roadsides, but seems
to be native. -- sMan-sBC-US.

5. *A. verticillata* L. -- Leaves linear-filiform and mostly
verticillate in whorls of about 5-6. Stem 1-6 dm high, more
or less pubescent in lines. Leaves glabrous to puberulent,
strongly revolute, numerous. Peduncles 1 cm long or less.
Flowers small, greenish white, in a terminal corymb or panicle
of umbels. Fruit glabrous and spineless. Mid-summer. Prai­
rries on chernozems; rare, from Estevan eastward. -- swO-Man­
seS, US, (CA).

6. *A. viridiflora* Raf. var. *viridiflora* (var. lanceolata
(Ives) Torrey, var. *linearis* (Gray) Fern.; *Acerates angusti­
folia* (Nutt.) Dcne.; *Acerates lanuginosa* AA.; *Acerates viridi­
flora* (Raf.) Eaton, var. *lanceolata* (Ives) Gray, var. *linearis
Gray*) -- Green Milkweed. -- Hooda not developing horns. Ex­
ceptionally variable. 2-6 dm high. Puberulent throughout.
Leaves lanceolate to long-linear, mostly opposite. Umbels
mostly 2-3, rather densely flowered, axillary, or one of them
sometimes terminal. Peduncles 1.0-1.5 cm long. Flowers green­
ish-white. Fruit spineless. First half of summer. Sandhills.
-- 0-S-(Alta), US -- Var. *obovata* (Ell.) Torrey (*A. viridi­
flora* AA.) Leaves broader, ovate to oblong-lanceolate. -- (0)-
Man-S-(Alta), US.

Var. *obovata* is of doubtful value. It might be nothing
more than an ecological variant.

7. *A. lanuginosa* Nutt. (*Acerates lanuginosa* (Nutt.) Dcne.)
Inflorescence a single terminal umbel. Otherwise similar to the preceding, but coarsely hairy throughout. Leaves ± lanceolate, alternate to subopposite. (Early summer?). Sandhills of the Agassiz delta. -- sW-ScMan, US.

A rather rare plant in Canada, it has been collected only at Sidney, Aweme, Pointe Pelée and Grand Bend.

Order 31. RUBIALES

Like the Loganiaceae, but the ovary inferior. Leaves opposite or verticillate.

a. Herbs ........................................ 54. Rubiaceae

aa. Shrubs ........................................ 55. Caprifoliaceae

54. RUBIACEAE (MADDER FAMILY)

Leaves either verticillate or opposite and stipulate. Mostly woody plants with entire leaves, but ours all herbs.

a. Leaves opposite ......................... 1. Houstonia

aa. Leaves verticillate.

b. Flowers in an open cyme ............... 3. Galium

bb. In an involucrated head ............... 2. Asperula

1. HOUSTONIA L.

BLUETS

Small herbs with 4-merous, opposite leaves and interpetiolar stipules, that is stipules alternating with the leaves, there being only 2 stipules for each pair of leaves, instead of the normal pair of stipules to each leaf.

1. H. longifolia Gaertner var. longifolia -- Bluets -- Tufted perennial, the erect stems up to 2 dm high. Leaves 1-3 cm long, ± lanceolate, glabrous or sometimes very minutely scabrous along the margin. Flower 5-8 mm long, funnelform, pale blue. Late spring and very early summer. Dry and sandy prairies. -- sW-sE3, US -- Var. muscii Boivin -- Basal leaves sparsely and irregularly ciliate along the petiole and towards the base of the blade. -- sMan-cAlta.

A study of the genus published in Rhodora 61: 157-180, 183-207, 1959 dealt primarily with the U.S. species. We found the Canadian material to fall readily into two species, an eastern H. caerulea L. and a more widespread H. longifolia. The latter could be further subdivided on minutiae of pubescence into four geographical variations as follows:

a. Basal leaves glabrous and eciliate or at most very finely scabrous ............... var. longifolia

aa. More or less ciliate.

b. Ciliate with hairs 0.1-0.5 mm long;
   stem nearly always glabrous ............. var. ciliolata

bb. Ciliation of shorter hairs; stem glabrous or more commonly hisrute.
c. Stem glabrous at least along the
internodes; rosette leaves irregularly
and sparsely ciliate ................. var. Musci

cc. Lower part of the stem hirsute on the
internodes and along the lines of decur-
rence; leaves uniformly short-ciliate...var. Soperi

Two varieties occur in the U.S.A. Var. longifolia has the
basal leaves quite glabrous or at most finely scabrous with
minute hairs less than 0.1 mm long and barely detectable with
the hand lens; stems mostly glabrous or sometimes more or less
hirsute along the lines of decurrence, especially in the vic­
inity of the nodes. This first variety also occurs in Canada
in Quebec (Richmond Co.), Ontario (Kenora, Middlesex, Rainy Ri-
ver and Simcoe Cos.), Manitoba (Macdonald, Marquette, Neepawa,
Provencher and Springfield districts) and Saskatchewan (Melvil-
le, Rhinoest and Yornton districts).

Var. ciliolata (Torrey) stat. n., H. ciliolata Torrey, Fl. N. US. l: 173.1824; H. canadensis W. Basal and stem leaves re-
gularly ciliate with longer hairs. Stem nearly always glabrous.
This second variety is much more restricted in its Canadian
distribution; we know it only from the following Ontario coun-
ties: Bruce, Frontenac (Westbrook), Lincoln, Northumberland
and Welland.

The last two varieties are strictly Canadian in their dis-
tribution and by their morphology they seem to be intermediate
between the first two varieties. Yet it is remarkable that
these two Canadian varieties are absent from the area of over-
lap of the first two varieties.

Var. Musci var. n. Folia rosettae sparse et ir'regulariter
ciliata, s'aëpfiis ad basas et secundum petiolum. Caulis glaber
vel ad basas ± hirsutus secundum lineas, praecipue ad nodos,
glaber tamen in internodis. Type: Boivin, Moss, Turner &
Alex 10176, Bruderheim, 2 miles north, Pinetum Banksianae on
fixed sand dunes, Aug. 13, 1952 (DAO); Paratypes: Manitoba:
H. Marshall 31, Brandon, (DAO); Boivin & Dore 3263, Shilo,
(DAO); C. Fyles, Treesbank, (DAO); H. Groh, Aweme, "Bluets",
(DAO); Frankton & Bibby 97, Shilo (DAO); Boivin & Alex 5292,
Saint-Laize, (DAO); Th. Rowe 510, East Gate, Riding Mountain
National Park,"Bluets", (DAO); Love & Love 3306, Pointe du
Bois, (DAO); Boivin & alli 1065E, Brokenhead, (DAO); Boivin,
Laishley & Schindler 31412, Reserve Forestière Whiteshell, col-
nord du lac Falcon, (DAO); SASKATCHEWAN: A.J. Breitung 551,
McKague, (DAO); A.J. Breitung s.n., McKague, (DAO); C.T. Sei-
leck 76, Esternary, (DAO); A.J. Breitung 31.75, 12 mi. n. of
Meadow Lake (DAO); R.C. Russell 5131, MacIsowall (DAO); Leding-
ham & Hudson 510, Prince Albert (DAO); Boivin & Breitung 3111,
Musdet Provincial Forest (DAO); Sern, Groh & Russel 3003, St.
Louis (DAO); ALBERTA: E.H. Moss 1002, near Edmonton, (DAO);
E.H. Moss 10257, north of Ft. Saskatchewan (DAO).

So named after the late E.H. Moss, author of an excellent
manual on the flora of Alberta.

HOUSTONIA 184
Var. Soperi var. n. Folia rossetae breviter ciliata pilis 0.2-0.3 mm. Caulis ad basas hirsutus secundum lineas et in internodis. Type: J.H. Soper 588, Turkey Pt., sandy banks along edge of dry upland woods, July 4, 1938 (DAO); Paratypes: ONTARIO: T.W. Burgess, Burford (DAO); Victorin, Rolland & Dominique 6377, Normandale, (DAO); Victorin, Rolland & Dominique 6377, Saint Williams, (DAO); W.G. Dore 64-27, Walsingham, (DAO); J. Dearness, West of Simcoe (DAO).

2. ASPERULA L.

Much like Galium with a well defined tube to the corolla.

1. A. ARVENSIS L. -- Quinsywort (Rapette) -- Inflorescence a glomerule of pale blue flowers subtended by an involucre of very long ciliate and narrowly oblanceolate bracts. Nearly glabrous annual with a red taproot. Leaves in 6's or 8's. (Early summer?) Rare adventive: Delta. -- 0-Man, BC, (US), Eur.

Only 2 other localities in Canada: Hamilton and Essendon.

3. GALIUM L. BENSITRAW

Fruit geminate, yet born of a single flower. Herbs, often catchly, with verticillate leaves.

a. Ovary and fruit densely pubescent.
   b. Leaves in 6's
      bb. Leaves in 8's
         c. Main leaves verticillate in 8's
         cc. Main leaves verticillate in 6's

aa. Ovary glabrous.
   d. Flowers yellow; leaves strongly revolute, with merely the midnerve showing below.
      dd. White or greenish; leaves flat to merely narrowly revolute along the margin.
   e. Flowers in many-flowered cymes, on peduncles usually less than 5 mm long
      ee. Flowers in terminal cymes of (1)-2-3-(5)
         flowers on peduncles usually 5-10 mm long


3. *G. boreale* L. (*G. septentrionale* R. & S.) -- Crosswort -- Ovary and fruit densely hispid, but the hairs not hooked. Stems stiffly erect and smooth to slightly scabrous. Leaves in 4's, the main ones conspicuously 3-nerved with white parallel nerves. Flowers white or nearly so, in dense terminal panicles. Early summer. Common in prairies and quite showy at flowering time. -- (G), Mack-Aka, NS, NB-BC, US, Eur.

4. *Galium verum* L. -- Bedstraw, Our Lady's Bedstraw (Grappelle, Herbe à la Vierge) -- The yellow flowers small but numerous and growing in rather large and dense colonies that are quite noticeable at flowering time. Leaves linearly revolute, the main ones in 6's or 8's. Flowers in terminal panicles. First half of summer. Sometimes cultivated and locally naturalized at Holland and Calgary. -- NF-SFM, NS, Man, Alta, BC, US, Eur, Afr.

5. *Galium palustre* L. -- A fine and weak herb, rather catchy and forming tangled masses in wet places. Stem usually slightly scabrous, glabrous at the nodes. Stem leaves linear to oblanceolate, some in 4's, but usually also a few in (5)-6's. Flowers in cymes, in many-flowered cymes and more or less forming a terminal panicle. Pedicels usually less than 5 mm long. Corolla lobes 4, up to 1 mm long. First half of summer. Wet places. Reported for southern Manitoba and northern Alberta. -- (Y, NF-SFM, NS-NB)-Q-O-(Man)-S-Alta, BC, US, Eur, Afr.

Reports from our area (and from Yukon) need to be confirmed. The only sheet we have seen from west of Ontario was from Manitoba (DAO) and it has been revised to *G. trifidum*. The same may possibly apply to other reported western collections.

6. *G. trifidum* L. (*G. labradoricum* Wieg.) -- Dyer's Cleavers, Goosegrass (Tissavoyanne rouge) -- Much like the preceding and not always clearly distinct, but rather fewer-flowered. Usually somewhat scabrous. Stem leaves nearly always all in 4's. Inflorescence more diffuse, the flowers solitary or in cymes of 2-4 in 4's flowers on very widely divergent pedicels, the latter commonly 5-10 mm long in fruit. Corolla lobes 3-4, 0.5-1.5 mm long. First half of summer. Wet shaded places. -- (G, K)-Mack-(Y)-Aka, L-(NF)-SPM, NS-PEI-(NB)-Q-O-(Man)-S-Alta-BC, US, (Eur)-- P. halophilum (Fern. & Wieg.) Boivin -- Glabrous or nearly so and slightly fleshy. Seashores. -- L-NF-(SPM), NS-PEI-(NB)-Q, nMan, (US).

Usually subdivided into a series of microspecies which appear to us to be so many arbitrary distinctions within a mor-
55. **CAPRIFOLIACEAE** (HONEYSUCKLE FAMILY)

Shrubs with opposite leaves, the stipules nearly always lacking. Leaves entire or commonly toothed to lobed or even compound.

a. Leaves compound ........................................ 1. **Sambucus**

aa. Leaves simple.

b. Leaves entire.

c. Flowers twinned and sessile at the end of a common peduncle .............. 5. **Lonicera**

c. Flowers not in 2's but in small axillary clusters ....................... 3. **Symphoricarpos**

bb. Leaves serrated to lobed.

d. Low and almost herbaceous, with leaves small, less than 2 cm long ...... 4. **Linnaea**

dd. Quite woody and larger-leaved.

e. Flower rotate; stigma sessile ..... 2. **Viburnum**

ee. Flower funelform; style rather long ................................ 6. **Diervilla**

1. **SAMBUCUS** L.

**ELDER**

Shrubs with opposite and pinnate leaves. Flower similar to **Viburnum**, but the stigma borne on a style. Fruit a 3-seeded berry.

1. **S. racemosa** L. var. pubens (Mx.) Watson (S. pubens Mx.) -- Catberry, **Elder** (Sureau rouge, Sirop rouge) -- The common shrub with opposite and pinnate leaves. Mostly 1-3 m high. Twigs with large brownish pith. Leaflets broadly lanceolate, mostly 5. Inflorescence a panicle 3-5 cm wide, with a well defined axis, stronger than its branches. Flowers white, darkening in the herbarium. Fruits bright red and small. Early summer. Moister spots in open woods, Saskatoon eastward. -- NF, NS-², US -- F. **saubertica** Cock. -- Fruit yellow. Local: Delta. -- Man, (US) -- Var. **arborescens** (T. & G.) Gray (var. melanocarpa (Gray) McMinn.; S. melanocarpa Gray) -- A coarser shrub, 2-5 m high. Leaves more often glabrous, Inflorescence broader. Fruit dark red and somewhat purplish. -- Aka, Walta-BC, WUS.

There is a fair amount of morphological overlap between our two varieties and a substantial proportion of the specimens could not be assigned to one variety or the other on the basis of their morphology alone. We have however interpreted all the more western references to **S. pubens** as applicable to var. **arborescens**.

There is also a fair amount of overlap in the diagnostic characters of our varieties and the eurasian var. **racemosa**. These are three very weak varieties at best, although they are often treated as so many species.

**S. canadensis** L. has been reported for our area from Shoal Lake. However all 3 collections (WIN; DAC, photo) examined...
Boivin, Flora of Prairie Provinces

from that area have been revised to S. racemosa var. pubens.

2. VIBURNUM L.

Flower regular, rotate, small and 5-merous, the stigma sessile and the fruit reduced to a single-seeded berry (i.e.: a drupe).

a. Leaves dentate, pinnately veined.
   b. Finely serrate .................. 1. V. Lentago
      bb. Coarsely toothed ................ 2. V. Rafinesquianum

aa. Leaves lobed, palmately veined.
   c. Inflorescence on a short side branchlet
      bearing a single pair of leaves .......... 3. V. edule
      cc. Flowering branchlets longer and bearing
         2 pair of leaves ...................... 4. V. Opulus

1. V. Lentago L. -- Nannyberry, Wild Raisin (Alisier, Bourdaine) -- Inflorescence about 4-rayed and nearly sessile at the end of a branch which is naked below, but bears 2-4 pairs of leaves closely inserted just below the inflorescence. Leaves ovate, finely serrate, abruptly acuminate. Flowers small, white, in large corymb. Fruit blue. Late spring. Deciduous woods, especially galerie-forests. -- NB-se\$, US.

2. V. Rafinesquianum Schultes var. Rafinesquianum (V. affine Bush var. hypomalacum Blake; V. pubescens A.A.) -- Shrub with opposite leaves, coarsely dentate and soft villous below. Leaves ovate. Flowering shoot elongate. Inflorescence on a long peduncle, with about 7 primary rays. Fruit nearly black. Early summer. Dry woods. -- Q-eMan, US.

The more southern var. affine (Bush) House has the leaves glabrous below or at most pubescent along the main nerves. We know it in Canada only from the Grand Bend on lake Huron.

3. V. edule (Mx.) Raf. (V. eradiatum (Oakes) House; V. pauciflorum La Pylaie) -- Pimbina, Squashberry (Pimbina, Pim­mìna) -- Rather inconspicuous shrub with few-flowered inflorescences of small flowers, borne on a short lateral shoot which bears only one pair of leaves and matures very few fruits, often only one. Leaves vaguely pentagonal, somewhat 3-lobed and coarsely serrate. Fruit bright red-orange. Late spring to early summer. Common forest species, especially in bogy woods. -- K-Aka, L-SM, NS, (NB)-Q-BC, US.

Supposed to range as far as northeast Asia according to Fernald 1950, but Hultén 1949 makes no such mention and it is not included in the Flora U.R.S.S. (vol. 23).

4. V. Opulus L. var. americanum Aiton (ssp. trilobum (Marsh.) R.T. Clausen; V. trilobum Marsh.) -- Pimbina, Squash­berry (Pimbina, Quatre-Saisons des bois) -- Remarkable by its large inflorescences of dimorphic flowers, the periperal ones being many times larger, sterile and very showy. Leaves deeply 3-lobed and more or less dentate. Inflorescence on a long peduncle. Flowers white, the sterile ones asymmetrical, the outer lobes being larger and about twice as long as the inner.
Typically the transatlantic var. Opulus has filiform stipules attenuate at tip; petiole bearing towards its summit one or more coarse glands, these sessile, discoid, concave and mostly 1.0-1.5 mm wide; leaves uniformly velvety-pubescent below. Our cisatlantic variety has shorter stipules, 5 mm long or less, and capitate at tip; glands smaller, capitate, stipitate, 0.2-1.0 mm wide and mostly convex; leaves glabrous to velvety below, commonly pubescent only along the nerves. However both varieties are highly variable in respect to all the characters mentioned and, undoubtedly, geography plays an important role in the determination of many specimens.

Early reports by Macoun 1884 of V. acerifolium L. and V. cassinoides L. from Saskatchewan have long since been discounted.

3. SYMPHORICARPOS Duhamel

FLOWER CAMBRICATE, NOT TWINNED, REGULAR OR NEARLY SO; STYLE ELONGATE. FRUIT A 2-SEEDED BERRY.

a. Stamens and style included; berry drying white ........................................ 1. S. albus

aa. Longer and more or less exserted; berry drying purplish black ................ 2. S. occidentalis

1. S. albus (L.) Blake (var. laevigatus: Fern.) Blake, var. pauciflorus Robbins; S. pauciflorus (Robbins) Britton: S. racemosus Mx.,) -- Snowberry (Graine d'hiver) -- Shrub with nearly round, entire leaves and fat waxy-white berries drooping at the end of the branches. Forms large colonies. Glabrous or pubescent. Leaves ovate to orbicular, mostly 1-2 cm long, sometimes lobed on leading shoots. Flowers ± 5 mm long, mostly whitish, subsessile, borne in short axillary or terminal racemes. Corolla lobes usually shorter than the tube, the style and stamens usually not exserted from the tube. Early summer. Common, especially in and around bluffs. -- sMack, Aka, NS-(PEI)-NB-BC, US.

Nearly glabrous specimens (var. laevigatus) are sporadic throughout the range, but they become the more common type west of us. They also tend to bear larger fruits, up to 1.0-1.5 cm across.

Since the days of Hooker it has been traditional to divide our material into a smaller S. albus and a larger S. occidentalis. Both are common in our area, they will often grow together; they seem to occupy about the same kind of habitats, and they intergrade to a limited extent. It might be better to treat them as varieties of a single species. The range of S. occidentalis is essentially included within that of the somewhat more widely distributed S. albus.

2. S. occidentalis Hooker -- Wolfberry (Graine de loup) --
Tending to be more vigorous and larger-flowered than the first. Leaves sometimes small, more commonly about 3-5 cm long. Inflorescences tending to be more heavily flowered. Corolla mostly 7-8 mm long and mostly pink or pinkish. Corolla lobes mostly longer than the tube. Berry ± 6 mm wide, waxy-white like the first when fresh, but discolouring in drying. First half of summer. Mostly around Aspen bluffs. -- Mack, Q-BC, US.

4. **LINNAEA L.** TWIN-FLOWER

Peduncle forked and each branch bearing a drooping flower. Corolla regular, funnel-shaped. Stamens only 4; the flower otherwise 5-merous.


Var. borealis is Eurasian and Alaskan; it has shorter corolla, mostly 7-10 mm long, with a shorter tube flaring more abruptly. Not always a clear-cut distinction. Our American plants are usually further subdivided on corolla size into a larger var. longiflora west of the Rockies and a smaller and more eastern var. americana. Actually both American varieties have about the same range of variation and the difference between the two is only one of frequency, longer flowers being decidedly more frequent west of the Rockies. This may be expressed succinctly as follows:

Var. americana: flowers (8)-10-12-(15) mm long.
Var. longiflora: flowers (9)-12-15-(16) mm long.

Throughout this flora we have systematically denied taxonomic recognition to taxa with an essentially statistical basis such as the above. We have insisted on a minimum of morphological discontinuity as a sine qua non basis for the recognition of a taxon.

5. **LOHICERA L.** HONEYSUCKLE

Flowers borne 2 together at the end of a common peduncle. Ovaries free to fused. Corolla elongate, more or less zygomorphic, but free from its twin, even when the ovaries are fused. Leaves entire.

a. Flowers in a short terminal spike subtended by a pair of connate leaves.
b. Leaves thickish, usually sessile and glaucous above .......................... 7. **L. dioica**
bb. Leaves thin, not glaucous above, the middle ones short-petioled ............... 8. **L. hirsuta**

SYMPHORICARPUS
aa. Flowers all axillary; no connate leaves.
  c. Ovaries fused, ripening into a single
     berry .............................................. 1. L. caerulea
cc. Ovaries free, ripening into a pair
    of berries.
    d. Involucre of 4 large and showy
       bracts ............................ 6. L. involucrata
dd. Involucre small relative to the
    ovary or fruit.
    e. Branchlets fistulose except
       at the nodes, the brown pith
       merely lining the empty core.
    f. Leaves and peduncles gla-
       brous ......................... 3. L. tatarica
ff. Lower leaf faces and peduncles
densely pilose .................... 2. L. Morrowii
    ee. Branchlets solid, the white pith
       filling the core.
    g. Leaves glabrous or lightly
       long pubescent below ........... 4. L. utahensis
    gg. Densely pubescent at
        least below ............... 5. L. oblongifolia

1. L. caerulea L. var. villosa (Mx.) T. & G. (L. coerulea
    sphalm.; L. villosa (Mx) R. & S. var. Solonis (Eaton) Fern.;
    Xylosteum caeruleum (L.) Dum.-Cours.) -- Fly-Honeysuckle --
    Ovaries fused. -- Leaves oblong, usually more or less villous at
    least below. Flowers yellow, appearing with the leaves. Ovary
    subtended by a pair of elongate bracts, about 5 mm long. Berry
    blue. Second half of spring. Common in bogs. -- Sk, L-SPM,
    NS-Alta, US.

The eurasian var. caerulea is generally somewhat taller,
    it tends to be less pubescent and the corolla lobes are a bit
    shorter than the tube. In our variety the corolla lobes are
    somewhat longer than the tube.

Many other american varieties have been described but as
    far as we can determine they run freely into one another and
    are essentially sympatric, except perhaps a more western var.
    caurina (Fern.) Boivin which is reputed to have red berries.
    But we have yet to see any mature fruits of the latter.

2. L. MOORWII Gray -- Quite similar to the more common
    L. tatarica, but more pubescent. Twigs and peduncles densely
    pubescent. Leaves lightly to densely pubescent above, densely
    pubescent to grayish-tomentose below. Inner bracts about as
    long as the ovary. Flowers pubescent, white, turning orange-
    yellow, thus seeming to be of two different colors when the
    shrub is in full bloom. Berries orange to red. Late spring.
    Sometimes planted and apparently escaped in the coulée of the
    South Saskatchewan at Saskatoon. -- Q-C, S, US, Sur.

2X. L. BELLA Zabel -- Hybrid with the next and much more
    lightly pubescent to nearly glabrous. Flowers pink, turning
    yellow. Inner bracts shorter than the ovary. Sometimes planted
and exceptionally escaped or persistent: Wolseley. -- NB-O, S, US, Eur.

3. L. TATARICA L. (L. tartarica sphalm.; Xylosteum tataricum (L.) Med.) -- Honeysuckle, Twin Sisters (Chêvrefeuille) -- Glabrous throughout and commonly planted. Leaves oblong to cordate. Inner bracts less than half as long as the ovary. Flowers whitish pink, glabrous outside. Berries red or yellow. Late spring. Often planted and readily escaping, although not aggressive. -- NB-S-(Alta), US.

4. L. utahensis Watson -- Red Twinberry -- Inner bracts of the ovary minute or lacking, the outer ones present. Leaves oblong to cordate, usually ciliate and somewhat pilose below. Otherwise glabrous. Flowers cream-yellow, appearing with the leaves. Berry red. Late spring. -- sw-Alta-sBC, US.

5. L. oblongifolia (Goldie) Hooker (Xylosteum oblongifolium Goldie) -- Fly-Honeysuckle -- Leaves broadly oblongolate. Densely puberulent throughout, including the corollas, but the leaves sometimes nearly glabrous above. Outer bracts lacking, the inner very short. Flower pale yellow, often pink tinged. Berry deep red, drying blue. Late spring. Edge of bogs and wet open woods. -- (NB)-Q-ecS, US.

6. L. involucrata (Rich.) Banks var. involucrata (Distegia involucrata (Rich.) Cock.) -- Fly-Honeysuckle, Black Twinberry -- Very showy in fruit with each pair of large deep purple berries subtended by larger purple bracts. Leaves ovate to obovate, often acuminate, glabrous above, pilose to glabrous below. Bracts glandular, smaller and only slightly purplish at flowering time. Corolla yellow, glandular. Early summer. Occasional in wet coniferous woods. -- K, Y-Aka, Q-BC, US.

Our typical variety is usually 2 m high or less, the herbage glabrous or somewhat pubescent, the flowers 1.0-1.5-(2.0) cm long, the stamens equaling the tube or slightly exserted. On the other hand, the Californian var. Lebedourii (Escn.) Jepson is generally taller, more pubescent, the flowers 1.5-2.0 cm long and the stamens included.

7. L. dioica L. var. glaucescens (Rydb.) Butters (L. glaucescens Rydb.) -- Red Honeysuckle -- Shrub climbing by its tendril-like twining stems. Leaves thickish, glaucous above, the middle ones subsessile, the upper two connate into a huge saucer-shaped involucre, oblong to suborbicular, subtending the terminal spike. Inflorescence a peduncled terminal spike of verticillate flowers, with 3 pairs of sessile flowers to a verticil. Flowers longest, yellow and somewhat pinkish tinged. Berry red. Late spring and early summer. Woods. -- Mack, Q-BC, US.

Leaves villous below, glabrous above. The more eastern var. dioica has ciliate leaves glabrous on both faces.

Two more phenotypes, var. dasygyna (Rehder) Gleason and var. orientalis Gleason, are also distinguished sometimes. The typically glabrous ovary is densely glandular in var. orientalis, a variant known to occur in Canada mainly in southern Ontario, but also sporadically from southwestern Quebec to Narcisse.

LONICERA
Manitoba, and Saskatoon, Saskatchewan. Intermediates with sparsely or irregularly glandular ovary are more common than well characterized glandular specimens. And this glandulosity is in no way linked to the variation in leaf pubescence. From this we can conclude that var. orientalis is a sporadic variation of no particular significance. In var. dasygna the ovary is not only glandular like var. orientalis but also pubescent. It is a rather uncommon phenotype which occurs sporadically and seems to be of no more significance than var. orientalis itself.

8. *L. hirsuta* Eaton var. *Schindleri* Boivin — Hairy Honeysuckle — This variety is intermediate to the previous species from which it differs by its thinner leaves, not glaucous above, the middle ones with a petiole 5-10 mm long. Early summer. Rocky woods at Falcon Lake. — Q-seMan.

As pointed out by Scoggan 1957, earlier Manitoba reports were based on misidentifications. A similar explanation probably accounts for Fernald 1950 extending the range to Saskatchewan.

Var. *Schindleri* var. n. foliis superne glabris vel fere glabris, ad basas et ad nervum medium tantum paulum pilosum. Type: Boivin, Laishley & Schindler 13058, Lac Falcon, Réserve Forestière Whiteshell, près d’un ruisseau de montagne, 24 juin 1959 (DAO). Paratypes: QUEBEC: J. Richard, canton Rémigny (QFA); Dutilly & Lepage 35179, rivière Nottaway (DAO); ONTARIO: Taylor, Hosie & Fitzpatrick 1192, Sault Ste. Marie (DAO); Bartlett & F. Richards 464, Mamainse Point (DAO); C. E. Garton 1831, Little Pigeon Bay (DAO).

Throughout most of their overlapping range, *L. dioica* and *L. hirsuta* are easily distinguished. In the first the leaves are glabrous on both faces, or at least above, and the twigs are glabrous. In the latter the young twigs are glandular and pubescent and the leaves are hirsuta or velvety below, pilose or lightly strigose over the whole of the upper surface, except the involucral leaves which are most often glabrous above. In *L. dioica* the more eastern var. *dioica* grades into our var. *glaucens* in which the leaves are villous below, glabrous above. True, the odd specimen of var. *glaucens* may be slightly pubescent above towards the base of the limb or near the mid-nerve, but such variants are easily referred to var. *glaucens* by their rather thick leaves, sessile or nearly so and strongly glaucous above.

A more puzzling intermediate occurs in the northern part of the range of *L. hirsuta* in which var. interior Gleason, the normal phase of the species in eastern Canada, grades into a var. *Schindleri* fairly intermediate to *L. dioica*. By its large and thin leaves, dark green and little if at all glaucous, by its middle leaves borne on petioles 5-10 mm. long, this intermediate is clearly related to *L. hirsuta*. But its young twigs are less pubescent than in *L. hirsuta*, or even completely glabrous and leaves are glabrous or nearly so above, thus verging towards *L. glauca*.

It is a pleasure to associate the name of this new variety...
with the name of a resident amateur naturalist from Falcon Lake. His kind help made it possible to locate rapidly quite a few of the highly localized plants of southeastern Manitoba.

6. DIERVILLA Duhamel

Flower rather like that of Lonicera, but each flower borne on its own peduncle.

1. DIERVILLA Miller, var. Lonicera -- Bush-Honeysuckle, Life-of-Man (Herbe bleue, Chêvrefeuille d'Acadie) -- The inferior ovary linked to the calyx by a thin neck 3-4 mm long. Low shrub. Leaves large, ovate-lanceolate, serrate, acuminate, glabrous or nearly so. Inflorescence terminal. Flower yellow, often red-tinged. First half of summer. Dry woods. -- NF-SPM, NS-eC, US.

As early as 1833 Hooker reported this to range west to the Rockies and the report has been accepted by various later authors. It has not been confirmed by more recent collections as they are all from central Saskatchewan and eastward. A single sheet from Alberta, McVicker, L. Slave Lake, 1911 (TRT; DAO, photo) proved to be Lonicera involucrata. The magnificulvar. hypomalaca Fern. has the leaves abundantly pilose below.

Order 32. VERBENALES

Like the Loganiales, but the corolla more or less zygomorphic and the stamens usually reduced in number, most often to 4 or 2, and fewer than the corolla lobes. Ours are all herbs with opposite leaves.

a. Flowers alternate to very crowded .......... 56. Verbenaceae
   aa. Flowers obviously opposite in a lax spike ........................................ 57. Phrymaceae

56. VERBENACEAE (VERVAIN FAMILY)

Calyx actinomorphic. Rather similar to the Labiatae, but the ovary not lobed and the style terminal. Corolla 5-lobed, but the stamens only 4 and dimegueth or even only 2.

1. VERBENA L.

VERVAIN
corolla barely zygomorphic.

a. Leaves serrate.
   b. Inflorescence lax; flowers white .... 1. V. urticifolia
      bb. Inflorescence dense; flowers blue ...... 2. V. hastata
      aa. Leaves deeply divided .............. 3. V. bracteata

1. V. urticifolia L. (V. urticaefolia spalm.) -- White Vervain, Bur-Vine -- Resembling the next, but the inflorescence more open, the spike lax and more elongate and the flowers white. Leaves narrowly ovate. Mid summer. Dry and more or less open places: Gainsborough. -- NB-eO, eS, US.

DIERVILLA
2. Verbena hastata L. -- Simplex's Joy, Iron-weed -- Stiffly erect perennial herb with a terminal panicle of dense spikes of small blue flowers. Leaves lanceolate. Fruit included in the calyx. Mid to late summer. Wet places, usually near shores, west to Wadena and Roche-Perce. -- NS, NB-SE, BC, US.

A sight record for Alberta by Groh 1949 has never been confirmed and is discounted as improbable.


57. PHRYMACEAE (LOPSEED FAMILY)

A single species of a rather unusual type and doubtful position. Calyx zygomorphic, with 5 lobes, the lower two minute, the upper 3 prolonged into subulate hooks.

1. PHRYMA L. LOPSEED

A square-stemmed herb with opposite leaves and bilabiate flower, rather resembling a Labiate, but the ovary unilocular and one-seeded, maturing into a single achene.

1. Phryma Leptostachya L. -- Lopseed -- Long stiff spikes of flowers that are at first strictly erect, becoming stiffly spreading at anthesis and maturing into closely pendant, catchy fruits. Leaves few, large and thin, broadly ovate, coarsely and irregularly serrate, pubescent. First half of summer. Alluvial woods; Pembina Hills, Portage. -- NB-Man, US, (CA, Eur).

The Far Eastern plants are supposed to be slightly different, var. oblongifolia (Koidz.) Honda (= var. asiatica Hara), a point we have not had the opportunity to check.

The Rutaceae of the order Rutales are not definitely represented in our area. Ruta graveolens L. was reported from Twin Butte, Alta., in the Prov. B.C. Rep. Prov. Mus. 1941: Clh. 1942, and was repeated by Groh 1944 and 1950, but we have not yet checked this point and have no idea if the plant was correctly identified and represented cultivated or escaped material.

Order 33. SAPINDALES

Stamens not on the corolla, but rather perigynous. Shrubs and trees mostly with the leaves compound or sometimes palmately lobed.

a. Leaves opposite ..................... 58. Aceraceae
aa. Leaves alternate ..................... 59. Anacardiaceae

58. ACERACEAE (MAPLE FAMILY)

Flowers dioecious with the petals minute and free or lacking. Carpels 2. Leaves opposite.
1. ACER L. MAPLE
Fruit a pair of asymmetrical samaras, each like a half propeller.

a. Leaf compound ........................................ 4. A. Negundo
aa. Leaf simple.

b. Palmatifid, the lobes rhomboid ...... 3. A. saccharinum
bb. Palmately lobed, the lobes deltoid to triangular.

c. Inflorescence a racemose panicle.... 1. A. spicatum
cc. Inflorescence a corymb ................... 2. A. glabrum


2. A. glabrum Torrey var. douglasii (Hooker) Dippel -- Mountain Maple -- Similar but glabrous and the inflorescence corymbose. Late spring. Coniferous forests at the lower altitudes. -- Akta, swAlta-BC, US.

Var. glabrum from the southern Rockies has smaller leaves, 6 cm wide or less, and more deeply lobed, palmatifid leaves.


Planted here and there as a shade tree, susceptible of escaping to river shores. Despite many previous Manitoba reports, this tree is not native to the province and every time we tried to follow a lead we always ended up with cultivated trees. In 1951 we came across a single young shoot on the shores of the Assiniboine at Portage-La-Prairie, but in 1959 it had disappeared. The following year we found it to be naturalized in the extensive galerie-forest of the Moose Jaw Creek at Moose Jaw.

4. A. Negundo L. var. Negundo -- Sugar-Maple, Box-Elder, Manitoba Maple (Erable, Erable à Giguère) -- A tree with leaf-green and glabrous twigs. Leaves compound, most commonly with 3 leaflets. The latter ovate to lanceolate, entire to irregularly few-lobed. Inflorescence a panicle. Ovary red, becoming green before the fruit is half grown, the wing becoming green before the fruit is half grown, the blade of the wing becoming green before its dorsal nerve. First half of spring. Galerie-forests; commonly planted, as are also its varieties. -- NS-Man, US. -- F. sanguineum L. Martin -- Young fruit at first purple, the rib of the wing turning green around mid June, the blade remaining purple for another 2-3 weeks. Local: Brandon, Letellier. -- 0-Man -- Var. violaceum (Kirchner) Jaeger -- Like the first, but the twigs strongly glaucous. Escaped in Alberta, indigenous further east. -- Mack, NS, MB-sC-sAlta, US -- F. Dorei
Boivin -- Young fruits purple-red, not becoming green until midsummer, the dorsal nerve being first to turn green. Occasional. -- Q-Man, US -- Var. interius (Britton) Sarg. (Negundo interius (Britton) Rydb.) -- Twigs finely and densely grayish-puberulent. -- Mack, (O) - Man-Alta, US -- P. coelestorum Boivin (f. sanguineum AA.) -- Twigs as in var. interius, fruits as in var. Dorei.--FEI, Man-S.

Var. interius occurs as a native from southeastern Alberta to Lake Superior, naturalized further north and east. Eastern reports for the other varieties are also based on naturalized plants.

59. ANACARDIACEAE  
(CASHW FAMILY)

Petals present, 5, free. Carpels solitary. Leaves alternate.

1. RHUS L.  
SUMAC

a. Leaves pinnate ........................................ 1. R. glabra
aa. Leaves trifoliate.
   b. Leaflets sessile ................................. 2. R. aromatica
   bb. Leaflets petiolate ............................. 3. R. radicans


   In the more eastern var. aromatica the terminal leaflet is 1-7 cm long and bears 7-13 teeth while the bracts are glabrous dorsally in the upper half. In our var. triloba the leaflets are smaller and cut into only 3-5-(7) teeth while the bracts are uniformly densely pubescent dorsally. The difference in the size of the leaflets may be only a climatic reaction, if we are to judge by a Saunders collection of material cultivated at Ottawa (D.0) and originating from Lethbridge.

3. R. radicans L. var. Rudbeckii (Small) Rehder (R. Toxicodendron A.; Toxicodendron desertorum Lunell; T. Rudbeckii (Small) Greene) -- Poison-Ivy, Poison-Oak (Herbe à puce, Bois de chien) -- Rather inconspicuous low shrub with 3 large leaflets on a long erect petiole. Leaflets ovate, entire to coar-
sely toothed. Flowers in a small panicle between the leaf bases. Fruit a small pale green drupe, glabrous. Late spring. Common, abundant and almost ubiquitous in forests, shores and sand dunes. -- NS-BC, US.

The slightest contact with any part of this shrub may cause a very itchy and painful dermatite that can easily degenerate into a hospital case. In some parts of its range this shrub is very virulent, but in our region it seems to be almost innocuous, perhaps because of the drier or cooler climate.

Our variety is a low shrub and strictly non-climbing. The typical phase occurs in southwestern Quebec and southern Ontario and southward; it will climb up to the nearest tree by means of adventive rootlets in the manner of Vitis.

ERRATA GRAVIOBA

Page 5, line 11 from bottom. Instead of: niche
read: niche
Page 10, last line. Instead of: 0.05
read: 0.5
Page 15, line 19 from bottom. Instead of: mm
read: m
Page 22, line 20 from bottom. Instead of: aquilinum
read: aquilinum
Page 22, line 10 from bottom. Instead of: mm
read: m
Page 26, line 22. Instead of: cm
read: dm
Page 30, line 5 from bottom. Instead of: virgianum
read: virginianum
Page 38, line 8. Instead of: mm
read: m
Page 70, line 4 from bottom. Insert the single letter n so the sentence will read in part: a series of n generation segregates.

ERRATA
ADDITIONS AND CORRECTIONS

The following were accidentally omitted or came to our attention after the corresponding text had been given its final form for printing.

Page 62 — A report of typical Potentilla flabellifolia from Alberta by Hitchcock 1961 was repeated by Boivin 1966. It could not be substantiated by specimens at NY or WUT and may represent only a lapsus calami.

Page 74 — The range of Thermopsis rhombifolia should probably be amended to eliminate BC, as the reports (Ulke 1934, Eastham 1947, Taylor 1966 and Boivin 1966) and specimens from that province are likely to represent errors of identification or mislabels or cultivated plants. None has ever been confirmed and most are far out of range and by as much as 400 miles. The Field report carries the unlikely habitat of "open woods" and there was no specimen under that name in 1964 at TRT where Ulke's herbarium is preserved; the original sheet may have been revised since. The Summerland specimen (UBC; DAO, photo) is dated 1935 and carries no habitat data; it is impossible to eliminate the possibility of its being cultivated material. Further if it were native it would be surprising that such a showy plant would have escaped the attention of the many visiting botanists and the numerous resident research botanists at Summerland. The Goat Mt., Erikson (V; DAO, photo), collection carries no habitat data, but the many sheets at UBC from the same area by the same collector are all annotated "garden grown". Another sheet at UBC (photo at DAO) was revised in 1964 from Lupinus nootkatensis to Thermopsis montana Nutt. and appears to be the basis of the inclusion of the latter in the list by Taylor 1966. We have revised it to T. rhombifolia. It is a mere fragment of inflorescence labelled C. V. Copley, Ingenika River, soil gravelly bench, very wet, springy, lat. 56, 46; long. 126, 25, June 18-26, 1914 (UBC; DAO, photo). The habitat is wrong and the specimen is out of range by some 10 degrees of longitude. Thus we are left without convincing vouchers for either species of Thermopsis from British Columbia.

Page 79 — Add the following which keys out to M. wolfgica.

5. MELILOTUS ELEGANS Salzm. — Legume strongly ridged transversally. Glabrous or nearly so. Flowers yellow, about 4 mm long. Pedicel about 2 mm long. Calyx slightly shorter, 1.5-2.0 mm long, its lobes triangular. Legume ± 3 mm long, obovoid, glabrous, turning black. Summer. Rarely escaped to waste places; Brandon. — s Man, (Eu, Afr).

Like M. indica and M. wolgica, a casual escape from experimental plantings.

Page 107 — Add after Populus balsamifera.

4 X. P. Jackii Sarg. (P. manitobensis Dode) — Hybrid with P. deltoides. The leaves not so white below, more coarsely serrate, deltoid-cordate and caudate. Local, especially in sand dunes. — sQ-Alta, (US).

Our western plants could be treated as a nothomorph of the
eastern type, but the morphological distinction to be established.

Page 141 -- The range of *Mirabilis hirsuta* var. *hirsuta* should be extended to include B.C. as it was collected at Keremeos in 1963. The species is native in our area, but occurs east and west of us only as a railway introduction.

Page 173 -- *Arceuthobium americanum* has been reported from White Otter Lake in western Ontario by J. Kuijt, Nat. Mus. Bull. 156: 138. 1963 quoting an earlier (1956) report by Horne & Quirke. The corresponding voucher, McPhee & Miller 4240, White Otter Lake, on *Pinus banksiana*, 1-IX-1955 (Sault Ste. Marie Forestry; DAO, photo), was in 1967 revised by Kuijt to *A. pusillum*. We concur.

Page 173 -- The range of *Arceuthobium pusillum* should be extended westward to the region of Hudson Bay Junction in east-central Saskatchewan according to J. Kuijt (see above) in the same paper. The relevant voucher specimen (not seen) is reportedly preserved at UBC.

Page 173 -- The report by Boivin 1966 of Alaska for *Arceuthobium douglasii* Eng. was a lapsus calami for Alberta based on the earlier report by Hitchcock 1964. However *A. douglasii* is restricted in Canada to the valleys of the Kootenay and the Okanagan and, pending checking of the relevant specimens, we are withholding judgement on its presence or absence in Alberta.

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<td>Thladiantha</td>
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1 - Dédicace: L'abbé L. Provancher, 1820-1892. -
   L. Cinq-Mars

L'herbier de l'avenir. - Louis-Marie Lalande, o.c.o.

Mise au point sur les Violettes (Viola spp.) du Québec. -
   L. Cinq-Mars

2 - Flora of the Prairie Provinces. Part I. -
   B. Boivin