PAC 8821

COMOX LAKE BLUFFS

Field Trip with A. & O. Ceska Apr. 22, 1991 CSNHS

Plants to add to list: (Not in order)

Luzula campestris - [illegible]

*Senecio macounii R4

Epilobium minutum or paniculatum

Saxifraga rudifula (occ. is sim. but higher el., S. rufidula has broader leaf and is lower)

Polygonum sperulaeriforme

*Trifolium tridentata R4

Arenaria (ck. later)

Arabis hirsuta - check seeds

Lithophragma bulbifera (smaller, darker pink than the other, bulbils in the axils of the leaves)

Frageria vesca

Sedum oreganum -leaves alternate (opp on divergens)

Asteriella yellow liverwort with fruiting capsules
Marchantia sp.

Galium aparine ?

Potentilla pubescens

Antennaria (racemosa or neglecta)

Panicum grass (occidentalis or scribnerianum)

Hieracium albiflora

*Botrichium simplex R2 - seepage area on lower open bluff (r. trail) (very tiny)

*Polystichum imbricans R1 (discovered formerly, confirmed)

[illegible] canes (name change)

Gonnmacrophyllum (by road in)

Grola isarifolia "

Montia fontena (water montia or "blinks"

VASCULAR PLANTS OF COMOX LAKE BLUFFS

Alphabetical by family, genus & species:

ACERACEAE		MAPLE FAMILY
Acer macrophyllum		broad-leaved maple
APOCYNACEAE		DOGBANE FAMILY
Apocynum androsaemifolium		spreading dogbane
ASTERACEAE		ASTER FAMILY
Achillea lanulosa		western yarrow
Anaphalis margaritacea		pearly everlasting
Antennaria sp. (racemosa or neglecta)		pussytoes
Eriophyllum lanatum		wooly sunflower
Heiracium albiflorum		white-flowered hawkweed
Luina hypoleuca		silverback
Mycelis muralis		wall-lettuce
*Senecio macounii	R4	Macoun's groundsell
BERBERIDACEAE		BARBERRY FAMILY
Achlys triphylla		vanilla leaf
Mahonia aquifolium		tall Oregon-grape
Mahonia nervosa		dull Oregon-grape
CAMPANULACEAE		HAREBELL FAMILY
*Campanula scouleri	R4	Scouler's harebell
CAPRIFOLIACEAE		HONEYSUCKLE FAMILY
Linnea borealis		twinflower
Lonicera ciliosa		orange honeysuckle
Symphoricarpus albus		common snowberry
Symphoricarpus hesperius		trailing snowberry
CARYOPHYLLACEAE		PINK FAMILY
Moehringia macrophylla		large-leaved sandwort
Cerastium arvense		field chickweed
CELASTRACEAE		STAFF-TREE FAMILY
Paxistima myrsinites		falsebox
CORNACEAE		DOGWOOD FAMILY
Cornus nuttallii		Pacific dogwood
Cormus unalaschkensis		western bunchberry

CRASSULACEAE		STONECROP FAMILY
Sedum oreganum		Oregon stonecrop
CRUCIFERAE		MUSTARD FAMILY
Arabis hirsuta		hairy rockcress
CUPRESSACEAE		CYPRESS FAMILY
Juniperus scopulorum		Rocky Mountain juniper
ERICACEAE		HEATH FAMILY
Arbutus menziesii		arbutus
*Arctostaphylos columbiana	R4	hairy manzanita
Arctostaphylos x media		intermediate manzanita (hybrid)
Arctostaphylos uva-ursi		kinnikinnick
Gaultheria shallon		salal
Vaccinium caespitosum		dwarf blueberry
Vaccinium parviflorum		red huckleberry
GRAMINAE		GRASS FAMILY
Panicum sp. (occidentalis or scribnerianum)		panicum, witch grass
GROSSULARIACEAE		CURRANT FAMILY
Ribes sanguineum		red-flowering currant
HYPERICACEAE		ST. JOHN'S WORT FAMILY
*Hypericum anagalloides	R4	bog St. John's wort
JUNCACEAE		RUSH FAMILY
Luzula campestris		field woodrush
LABIATAE		MINT FAMILY
Prunella vulgaris		self-heal
*Satureja douglasii	R4	yerba buena
LILIACEAE		LILY FAMIILY
*Brodiaea coronaria	R4	harvest brodiaea
*Brodiaea hyacinthina	R4	white triteleia, fool's onion
*Camassia quamash	R4	common camass
Fritillaria lanceolata		chocolate lily
Lilium columbianum		tiger lily
Zygadenus venenosus		death camas

LEGUMINOSAE		PEA FAMILY
*Trifolium tridentatum	R4	tomcat clover
Vicia americana		American vetch
MONOTROPACEAE		INDIAN PIPE FAMILY
*Allotropa virgata	R4	candystick
ONAGRACEAE		EVENING PRIMROSE FAMILY
Epilobium angustifolium		fireweed
Epilobium sp. (minutum or paniculatum)		willowherb
OPHIOGLOSSACEAE		ADDER'S TONGUE FAMILY
*Botrychium simplex	R2	least grape fern
OROBANCHACEAE		BROOMRAPE FAMILY
*Boschniakia hookeri	R1	Vancouver grouncone
Orobanche uniflora		cancer root, naked broomrape
ORCHIDACEAE		ORCHID FAMILY
Calypso bulbosa		fairy slipper
Corallorhiza maculata		spotted coral root
Platanthera unalaschensis		rein orchid, elegant piperia
Listera cordata		heart-leaved twayblade
Goodyera oblongifolia		rattlesnake-plantain
PINACEAE		PINE FAMILY
Pinus contorta		lodgepole pine
Pinus monticola		western white pine
Pseudotsuga menziesii		Douglas fir
PLANTAGINACEAE		PLANTAIN FAMILY
Plantago major		common plantain
POLEMONIACEAE		PHLOX FAMILY
*Collomia heterophylla	R4	varied-leaved collomia
Microsteris gracilis		pink twink
POLYGONACEAE		BUCKWHEAT FAMILY
Polygonum spergulariforme		fall or spurry knotweed
POLYPODIACEAE		FERN FAMILY
Aspidotis densa		Indian's dream fern
Asplenium trichomanes		maidenhair spleenwort

Cryptogramma crispa		parsley fern
*Pityrogramma triangularis	R3	golden-backed fern (roadside bluffs)
Polypodium glycyrrhiza		licorice fern
*Polystichum imbricans	R1	imbricate sword-fern
Polystichum munitum		sword-fern

PORTULACACEAE — PURSLANE FAMILY

*Lewisia columbiana	R3	Columbia lewisia
*Montia fontana	R4(if subsp. variabilis)	water montia, blinks
Montia parvifolia		small-leaved montia

PRIMULACEAE — PRIMROSE FAMILY

Trientalis latifolia	broad-leaved starflower

PYROLACEAE — WINTERGREEN FAMILY

Chimaphila menzeisii	Menzie's pipsissewa
Chimaphila umbellata	prince's pine
Pyrola asarifolia	large-leaved (pink) wintergreen

RANUNCULACEAE — BUTTERCUP FAMILY

Anemone lyallii	Lyall's anemone

RHAMNACEAE — BUCKTHORN FAMILY

Ceanothus sanguineus	redstem ceanothus, snowbush

ROSACEAE — ROSE FAMILY

Amelanchier alnifolia	Saskatoon
Fragaria chiloensis	coastal strawberry
Frageria vesca	wood strawberry
Geum macrophyllum	large-leaved avens
Holodiscus discolor	ocean-spray
Potentilla pubescens	hairy cinquefoil
Rosa gymnocarpa	woodland rose
Rosa nutkana	nootka rose
Rubus leucodermis	blackcap
Rubus ursinus	trailing blackberry

RUBIACEAE — MADDER FAMILY

Galium boreale	northern bedstraw

SCROPHULARIACEAE — FIGWORT FAMILY

Castilleja miniata		Indian paintbrush
Collinsia grandiflora		small-flowered blue-eyed Mary
Collinsia parviflora		large-flowered blue-eyed Mary
*Mimulus alsinoides	R3	little or baby monkey-flower
Mimulus guttatus		yellow monkey-flower

Pedicularis ornithorhyncha	bird's-beak lousewort
Veronica wormskjoldii	alpine speedwell
Penstemon serrulatus	coast penstemon
SALICACEAE	WILLOW FAMILY
Salix sp.	
SAXIFRAGACEAE	SAXIFRAGE FAMILY
Heuchera sp.	alumroot
Lithophragma bulbifera	bulbiferous fringecup
Saxifraga ferruginea	rusty (Alaska)saxifrage
Saxifraga integrifolia	early saxifrage
Saxifraga rufidula	rusty-haired saxifrage
Tiarella unifoliata	one-leaved foamflower
UMBELLIFERAE	PARSLEY FAMILY
Lomatium utriculatum	spring gold
VALERIANACEAE	VALERIAN FAMILY
Plectrites congesta	sea blush
VIOLACEAE	VIOLET FAMILY
Viola adunca	early blue violet
Viola glabella	yellow (stream)wood-violet
Viola sempervirens	trailing (evergreen) yellow violet

16 sp. on rare list, 5 R1 & R2
From list by Harry Jackson 1987
with additions from B. Brooks, A. & O. Ceska to 1991

B. Brooks.

uva-ursi
RARE STATUS: R1

Boschniakia rossica (Cham. & Schlecht.) Fedch.
Northern Groundcone
HERBARIA: CAN, DAO, UBC, V
REFERENCE: Porsild and Crum 1961
MAP: Hultén 1968, Porsild 1966
RANGE: AK and YT, east to Mackenzie and south to n BC
BC RANGE: Icefield Ranges, Teslin Plateau, Liard Plateau (Liard Hot Springs, Atlin)
BIOGEOCLIMATIC ZONE: SW, BS, CH
HABITAT: Thickets, woods, tundra, parasitic on roots of **Alnus crispus**
RARE STATUS: R1
STATUS OUTSIDE BC: Rare in AB

Botrychium lanceolatum (S.G. Gmel.) Angstr.
Lance-leaved Grape Fern
HERBARIA: CAN, DAO, UBC, V
REFERENCE: Taylor 1971
MAP: Taylor 1971
RANGE: Circumpolar, south in w North America to s WA, UT and CO
BC RANGE: Scattered in Province (Garibaldi, Cheakamus and Squamish Rivers, Revelstoke, Wells, Liard Hot Springs, Haines Road, Terrace, Taku Plateau, Strathcona Park, Tsitika River area)
BIOGEOCLIMATIC ZONE: AT, BS, MH, CH
HABITAT: Grassy slopes, talus slopes, subalpine meadows
RARE STATUS: R3
STATUS OUTSIDE BC: Rare in AB, YT, SK, ON, PQ, NS, WA, UT, WY, MN, RI, WI, endangered in NC, threatened in OR

Botrychium lunaria (L.) Swartz in Schrader subsp. **minganense** (Victorin) Calder & Taylor = **B. minganense** Victorin

Botrychium minganense Victorin
Mingan Grape Fern
HERBARIA: DAO, UBC
REFERENCE: Taylor 1970, 1971
MAP: Taylor 1970, 1971
RANGE: YT and BC east to PQ and s Labrador
BC RANGE: Queen Charlotte Islands (n Graham Island), Wells Gray Park (Surprise Lake, Helmcken Falls)
BIOGEOCLIMATIC ZONE: CH, CA, IH
HABITAT: Woods, fields
RARE STATUS: R1
STATUS OUTSIDE BC: Rare in Continental NT

Botrychium montanum W.H. Wagner
Mountain Grape Fern
HERBARIA: DAO
REFERENCE: Wagner and Wagner 1981
RANGE: Southern BC south to c OR and east to nw MT
BC RANGE: Lost Lake (19 mi. east of Enderby)
BIOGEOCLIMATIC ZONE: IH
HABITAT: Hemlock forest
RARE STATUS: R1

Botrychium paradoxum W.H. Wagner
HERBARIA: V
RANGE: Flathead area of MT, sw AB and s BC
BC RANGE: Okanagan Range (Juniper Slope)
BIOGEOCLIMATIC ZONE: ES
HABITAT: Subalpine meadow
RARE STATUS: R1
STATUS OUTSIDE BC: Rare in AB

Botrychium simplex E. Hitchc.
Little Grape Fern
HERBARIA: CAN, UBC, V
REFERENCE: Taylor 1971
MAP: Taylor 1971
RANGE: Scattered in Europe and North America, south to CA, NM and PA
BC RANGE: Southern Vancouver Island (Sooke Hills, Mt. Benson, Port Alberni), Nairn Creek, Crevice Mtn.
BIOGEOCLIMATIC ZONE: CF
HABITAT: Vernal pools, seepage areas
RARE STATUS: R2
STATUS OUTSIDE BC: Rare in AB, NS, IL, IA, OR, WY, endangered in IN, WI, threatened in RI

Bouteloua gracilis (H.B.K.) Lag. & Steud.
Blue Grama Grass
HERBARIA: UBC, V
REFERENCE: Hubbard 1955
RANGE: East of the Rocky Mountains from BC to MB, south to MT, WI, CA and TX; MX
BC RANGE: Rocky Mountain Trench (Jaffray, Roosville)
BIOGEOCLIMATIC ZONE: IF
HABITAT: Short-grass prairie
RARE STATUS: R1

Braya americana (Hook.) Fern. = **B. purpurascens** (R. Br.) Bunge in Ledeb.

Braya purpurascens (R. Br.) Bunge in Ledeb.
Purple Braya
HERBARIA: UBC, V
MAP: Hultén 1968, Porsild 1964
RANGE: Circumpolar, south in w North America to n BC
BC RANGE: AK Hwy. (Summit Pass)
BIOGEOCLIMATIC ZONE: AT
HABITAT: Alpine meadows, rocky limestone slopes
RARE STATUS: R1
STATUS OUTSIDE BC: Rare in AB, YT, Continental NT, PQ

Brickellia oblongifolia Nutt. var. **oblongifolia**
Narrow-leaved Brickellia
HERBARIA: DAO, UBC, V
RANGE: Southern BC east to ND and south to CA and NM
BC RANGE: Okanagan Highland (Hedley, Keremeos, Ashnola)
BIOGEOCLIMATIC ZONE: PP
HABITAT: Sagebrush hillsides
RARE STATUS: R1

Brodiaea coronaria (Salisb.) Engl.
Harvest Brodiaea
HERBARIA: DAO, UBC, UVIC, V
REFERENCE: Taylor 1974b
MAP: Niehaus 1971, Taylor 1974b
RANGE: Southwestern BC and Puget Sound, south to WA, w OR and CA
BC RANGE: Southwestern BC (Vancouver Island north to

Map: References in which there are maps of the taxon in the Province are given.
Range: The general distribution for each taxon is given using the following standard postal abbreviations for provinces and states:

Alberta	AB
British Columbia	BC
Manitoba	MB
New Brunswick	NB
Newfoundland	NF
Northwest Territories	NT
Nova Scotia	NS
Ontario	ON
Prince Edward Island	PE
Quebec	PQ
Saskatchewan	SK
Yukon	YT
Alabama	AL
Alaska	AK
Arizona	AZ
Arkansas	AR
California	CA
Colorado	CO
Connecticut	CT
Delaware	DE
District of Columbia	DC
Florida	FL
Georgia	GA
Hawaii	HI
Idaho	ID
Illinois	IL
Indiana	IN
Iowa	IA
Kansas	KS
Kentucky	KY
Louisiana	LA
Maine	ME
Maryland	MD
Massachusetts	MA
Mexico	MX
Michigan	MI
Minnesota	MN
Mississippi	MS
Missouri	MO
Montana	MT
Nebraska	NE
Nevada	NV
New Hampshire	NH
New Jersey	NJ
New Mexico	NM
New York	NY
North Carolina	NC
North Dakota	ND
Ohio	OH
Oklahoma	OK
Oregon	OR
Pennsylvania	PA
Rhode Island	RI
South Carolina	SC
South Dakota	SD
Tennessee	TN
Texas	TX
Utah	UT
Vermont	VT
Virginia	VA
Washington	WA
West Virginia	WV
Wisconsin	WI
Wyoming	WY

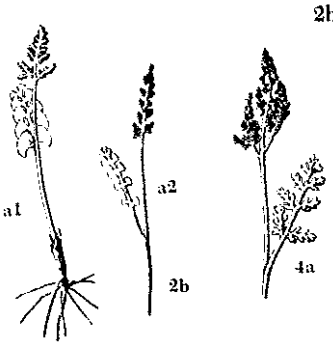
B.C. Range: General distribution and specific locations in the Province are listed for each taxon based on herbarium specimens examined. Physiographic subdivisions of the Province follow Holland (1964).
Biogeoclimatic Zone: Abbreviations for the biogeoclimatic zones according to Krajina as used in Taylor and MacBryde (1977) are as follows. For a discussion of these zones refer to Beil *et al.* (1976).

Alpine Tundra — AT
Boreal Spruce — BS
Cariboo Aspen-Lodgepole Pine-Douglas Fir — CA
Coastal Douglas Fir — CF
Coastal Western Hemlock — CH
Engelmann Spruce-Subalpine Fir — ES
Interior Douglas Fir — IF
Interior Western Hemlock — IH
Mountain Hemlock — MH
Ponderosa Pine — PP
Subboreal Spruce — SS
Spruce-Willow — SW

Habitat: Specific habitat preferences for each taxon are listed.
Rare Status: Four categories of rarity within the Province are defined as:

R1 — Single or few populations, composed of few plants
R2 — Several populations, locally common
R3 — Widespread or scattered populations with small numbers of plants
R4 — Restricted distribution, large populations

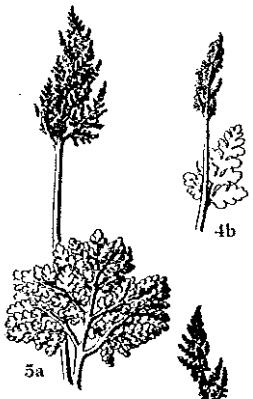
Distribution maps are included for each taxon in the first two categories of rarity. The dots are based on herbarium specimens we have seen.
Status Outside B.C.: When known, the rare status in other provinces and states is given for each taxon. This information is based on publications of rare plant lists for other provinces as mentioned previously and publications of national and state lists as follows: United States (Ayensu and deFilipps 1978), Alabama (Thomas 1976), Alaska (Murray 1980), California (California 1980), Colorado (Weber and Johnston 1976), Connecticut (Mehrhoff 1978), Delaware (Tucker *et al.* 1979), Florida (Ward 1979), Georgia (McCollum 1976), Idaho (Henderson *et al.* 1977), Illinois (Ebinger 1981), Indiana (Bacone



2b Sterile bl attached well above ground level (common stalk well >3 cm in well-developed pls), sessile or petiolate, distinctly pinnate and often with > 4 pairs of pinnae; moist or wet places but seldom in meadows, mid- to high-mont; widespread esp in cooler part of N Hem; moonwort; 2 vars. in our area 2 B. lunaria (L.) Swartz

a1 Sterile bl sessile or on a short stalk gen < 5 mm, typically bright green; pinnae gen crowded and somewhat overlapping, flat, mostly flabellate and wider than long, the proximal margin of each pinna forming an obviously retrorse angle with the axis of the sterile bl; wet places, but gen not in deep shade; chiefly e Cas in our range var. lunaria

a2 Sterile bl with petiole gen > 5 mm, typically yellowish-green; pinnae tending to be ± remote, often somewhat spoon-shaped rather than flat, not strongly flabellate, not notably wider than long, proximal margin diverging widely from axis of sterile bl; more often in dense for at lower elevs, as in Cas and OM and n Ida *(B. o.)* var. onondagense (Underw.) House



1b Sterile bl gen subbipinnate or bipinnate to dissected, often much > 7 cm

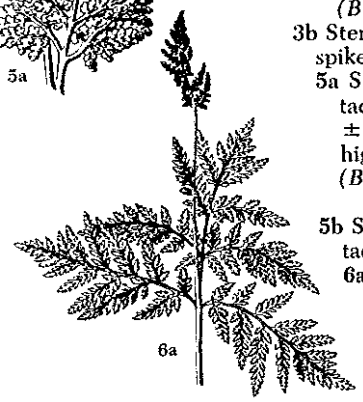
3a Sterile bl gen longer than wide, not > ca 9 cm; fertile spike erect or nearly so in bud

4a Sterile bl gen oblong and evidently petiolate, ultimate segms mostly longer than wide; pl gen 1–3 dm; woods, rare in our area, where known only from n Ida, but interruptedly circumboreal; camomile g. *(B. lunaria* var. *m.)* 3 B. matricariaefolium (Doell) A. Braun

4b Sterile bl gen ovate or ovate-oblong and sessile, ultimate segms nearly or fully as long as broad; pl 1–2 dm; moist or wet, ± open places, mont; Alas and BC to Wn, ne Ore, and ne Nev; Eurasia; northern g. *(B. b.* var. *obtusilobum, B. pinnatum)* 4 B. boreale Milde

3b Sterile bl ca as wide, or wider than, long, often much > 9 cm; fertile spike reflexed in bud

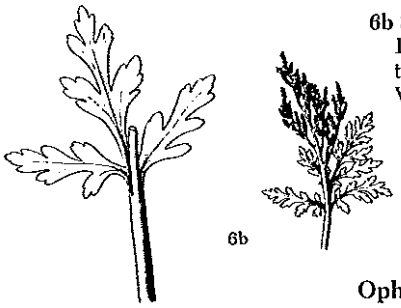
5a Sterile bl evergreen, evidently petiolate (petiole at least 1 cm), attached near ground level; pl 1–5 dm, sparsely hairy when young, later ± glab; moist or wet, open or shaded places, from sea level to fairly high mont; circumboreal, s to Cal, Ida, Wyo, Ia, and NC; leathery g. *(B. californicum, B. coulteri, B. occidentale, B. silaifolium)* 5 B. multifidum (Gmel.) Trevis.



5b Sterile bl deciduous, sessile or with a short petiole up to 5 mm, attached well above ground level

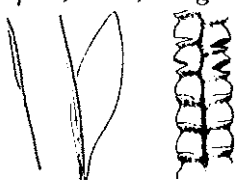
6a Sterile bl large, gen (5) 7–20 × (6) 10–30 cm; stalk of fertile spike gen 4–17 cm; pl 1.5–5 dm, slightly hairy when young, soon glab; moist woods and thickets, seldom in meadows, valleys to midmont; circumboreal, s irreg to Mex, in our range chiefly in s BC, n Ida, and nw Mont, also in n and w Wn; Va g. *(B. v.* var. *occidentale)* 6 B. virginianum (L.) Swartz

6b Sterile bl smaller, gen 1–6 × 1–9cm; stalk of fertile spike short, gen 1–3 cm; pl 0.5–3.5 dm, glab from the first; moist or wet places, mont to high mont; interruptedly circumboreal, s to s Wn, Utah, Colo, Wis, and Pa; lance-lvd g. 7 B. lanceolatum (Gmel.) Angstr.

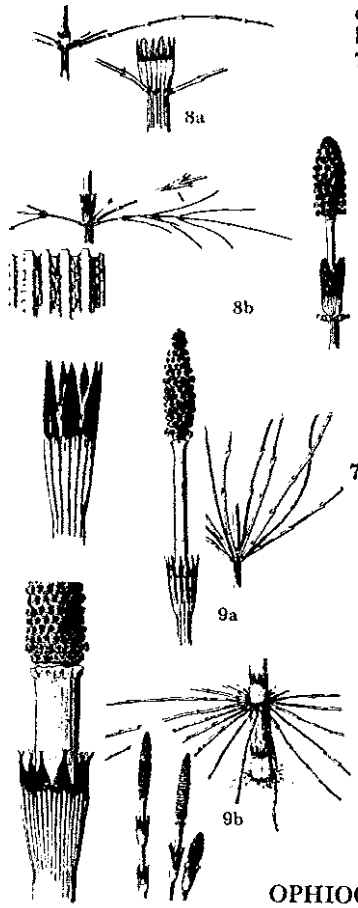


Ophioglossum L. Adder's-tongue

Lf solitary (rarely 2–several); sterile bl simple, entire, with reticulate venation; veins anastomosing; fertile spike unbr, with 2 rows of coalescent, sessile or embedded sporangia along 1 side. (Gr *ophis*, snake, and *glossa*, tongue).



O. vulgatum L. Pl gen (0.5) 1–3 dm; sterile bl attached well above ground level (common stalk gen 3–15 dm), sessile or nearly so, elliptic to ovate, entire, rounded to obtuse or merely acutish at the tip, gen 2.5–10 × 1–4 cm; fertile stalk gen 3–15 cm, the fertile spike erect, 1–4 cm; meadows and woods; circumboreal (but not high-mont), s irreg to Fla and Mex, known from widely scattered stations in our area.



often with tubercles or spicules, or merely papillate or almost smooth, but seldom at all cross-wrinkled; pls fr in the spring

7a Fertile sts ± persistent, becoming green and br; ridges of the st beset with spicules, or high tubercles, or very short, high transverse ridges

8a Teeth of sheaths free or nearly so, as many as the internodal ridges, black or blackish with pale margins; brs simple, and with the first internode short, scarcely > the associated sheath of the main st; sterile sts smoothish toward base, otherwise beset with spreading, high, blunt siliceous tubercles or very short, high, transverse ridge-crests on the 10–18 ridges; streambanks and moist woods; circumboreal, s to s BC, nw Mont, Ia, and NJ; shady h. 7 E. pratense Ehrb.

8b Teeth cohering in several broad brown lobes; brs gen again br, and with the 1st internode relatively long, commonly > the associated sheath of the main st; sterile sts beset with 2 rows of small, spreading or recurved spicules on each of the 10–18 ridges (or nearly smooth toward the base of the internode); wet places to moist woods; circumboreal, s to s BC, n Ida, and nw Mont (GNP), SD, Ia, and Ky; wood h. 8 E. sylvaticum L.

7b Fertile sts permanently whitish or brownish, unbr, soon withering; ridges of st with inconspicuous low tubercles or papillae, or practically smooth

9a Pls less robust; sterile sts 1.5–6 (10) dm × 1.5–5 mm, evidently (4) 10–12-ridged, with small c cavity ca 1/4 diameter of st; sheaths 5–10 mm, greenish, teeth 1–3 mm; fertile sts up to ca 3 dm × 8 mm; sheaths 14–20 mm, with large, partly connate teeth 5–9 mm; cone 0.5–3.5 cm; moist to moderately dry places throughout our range, often weedy; common h., field h. *(E. saxicola)* 9 E. arvense L.

9b Pls more robust; sterile sts 5–30 dm × 0.5–2 cm, gen 20–40-ridged, c cavity > 1/4 diameter of st; sheaths 1–2.5 cm, teeth 3–8 mm; fertile sts 2.5–6 dm × 1–2.5 cm; sheaths 2–5 cm, with teeth connate in groups of 2–4; cone 4–10 cm; moist low places; interruptedly circumboreal; in N Am from Alas to s Cal, wholly W Cas; giant h.; ours gen called var. *braunii* Milde *(E. t.* var. *hillii)* 10 E. telmateia Ehrb.

OPHIOGLOSSACEAE Adder's-tongue Family

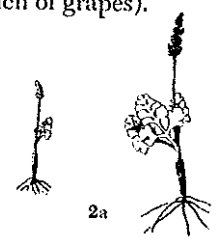
St erect, underground; lvs gen only 1 each year, consisting of a fertile and a sterile segm which are united below into a short or elongate common stalk; stalk of fertile segm (fertile spike) continuous with the common stalk, the 2 forming an axis on which the sterile segm (sterile bl) is sessile or petiolate, the common stalk enlarged at base and partly or wholly enclosing the bud; sterile bl erect in bud or often bent over, but not circinate; sporangia ∝, relatively large (commonly ca 1 mm thick), stalked to sessile or even embedded in the axis of the simple or br fertile spike, thick walled, 2-valved, without an annulus; spores all of 1 kind.

1a Sterile segm (apparent lf-bl) gen lobed or compound; veins free, forked; sporangia short-stalked Botrychium

1b Sterile segm entire; veins anastomosing; sporangia sessile and coherent in 2 rows on the axis of the spike Ophioglossum

Botrychium Sw. Grape-fern; Moonwort

Sterile segm gen pinnately or ternate-pinnately compound to dissected, seldom simple; veins free, forked; fertile segm pinnate to decompound; sporangia ∝, gen short-stalked and free. (Gr *botrys*, bunch of grapes).



1a Sterile bl once-pinnate or ternate-pinnate (simple), or only the basal segms again divided, always relatively small, not > ca 7 cm

2a Sterile bl attached near ground level (common stalk seldom > 3 cm), evidently petiolate, tending to be somewhat ternate-pinnate rather than strictly pinnate, basal pair of pinnae somewhat larger than the next pair, often stalked and sometimes again cleft; pinnae mostly 2–4 (5) pairs; midmont meadows; circumboreal, s to s Cal, NM, and NJ, in our range chiefly e Cas; little g. 1 B. simplex E. Hitchc.

Woodsia scopulina **D.C. Eaton**
Mountain cliff fern, or Rocky Mountain woodsia
Habitat/Range: Dry to mesic rocky crevices and scree slopes in the lowland and steppe vegetation to subalpine zones; frequent in W BC and SC BC, mostly south of 55°N; N to AK and YT, E to PQ and S to SD, WY, CO, NM, AZ and CA, disjunct in VA, TN and AR.

HYMENOPHYLLACEAE

MECODIUM

Mecodium wrightii **(van den Bosch) Copeland** (*Hymenophyllum wrightii* van den Bosch)
Wright's filmy fern
Habitat/Range: Wet shady rock cliffs, epiphytic on trees in lowland zone; infrequent in coastal BC, sporophytes known from the Queen Charlotte Islands, male gametophytes known on the coast from AK to Long Beach, W Vancouver Island; amphiberingian, N to AK; E Asia.

MARSILEACEAE

MARSILEA

Marsilea vestita **Hook. & Grev.**
Hairy water-clover
Habitat/Range: Inundated lake margins in the steppe vegetation and montane zones; rare in SC BC; E to SK and S to TN, LA, TX, CA, and MX.

OPHIOGLOSSACEAE[34,35]

1. Veins free; trophophores lobed to pinnate (rarely simple); sporophores branched, with fully exposed sporangia ..... *Botrychium*
1. Veins reticulate; trophophores simple and unlobed; sporophores simple with embedded sporangia ..... *Ophioglossum*

BOTRYCHIUM

1. Trophophore transformed into a second sporophore, so that the leaf has two sporophores but no trophophore ..... *B. paradoxum*
1. Trophophore normally developed without sporangia (or rarely with a few sporangia near the base); sporophore present or absent.
   2. Sporophores commonly absent; trophophores 2-4x pinnate; leaves mostly more than 18 cm tall.
      3. Leaves wintergreen, thick and leathery; sporophores arising at ground level; trophophores stalked with segments ovate, shallowly crenulate or entire ..... *B. multifidum*

[34] The leaves of this family are unique in having two parts - a sterile photosynthetic blade (trophophore) and spore-bearing appendage (sporophore) that arises from the common stalk.
[35] Editors note: Four species of *Botrychium* (*B. ascendens* W.H. Wagner, *B. hesperium* (Maxon & Clausen) W.H. Wagner & Lellinger, *B. montanum* W.H. Wagner, and *B. pedunculosum* W.H. Wagner) have recently been described by Wagner and Wagner (1981, 1983, 1986). Since these species are known from only a single or a few collections in British Columbia, and since their taxonomic status is still questionable, we prefer to follow more traditional taxonomic treatments.

3. Leaves deciduous, thin and herbaceous; sporophores arising in middle of leaf; trophophores sessile, the segments lanceolate to linear lanceolate, coarsely toothed ..... *B. virginianum*

2. Sporophores always present; trophophores simple (rare) to 1- or occasionally 2-pinnate; leaves mostly less than 18 cm tall.

4. Trophophore attachments strongly variable, those with simple blades usually attached high on the leaf, those with lobed, non-ternate leaves in the middle of the leaf, and those with ternate blades near the base of the leaf ..... *B. simplex*

4. Trophophore attachments relatively uniform, usually attached in the middle to near the top of the leaf.

5. Trophophores ternate, segments linear to narrowly lanceolate ..... *B. lanceolatum*

5. Trophophores not ternate, segments mostly broader.

6. Pinnae or ultimate segments with at least a slight midrib, pinnately constructed.

7. Pinnae mostly at right angles or slightly ascending, imbricate with overlapping margins ... . *B. pinnatum*

7. Pinnae all in one plane, not imbricate, margins distant ..... *B. matricariifolium*

6. Pinnae or ultimate segments lacking midribs, broadly to narrowly flabellate, dichotomously constructed.

8. Lower pinnae broadly flabellate, the anterior and basal margins at an angle of well over 90°; all segments tending to be contiguous or overlapping ..... *B. lunaria*

8. Lower segments narrowly flabellate, the anterior and basal margins at angles of 90° or less; all segments tending to be well separated or remote ..... *B. minganense*

***Botrychium lanceolatum* (Gmel.) Angstr.**
Lance-leaved moonwort
Habitat/Range: Mesic to wet rocky slopes, meadows and woods in the montane to subalpine zones; infrequent throughout BC; circumpolar, N to AK, E to NF and S to VA, WV, OH, MI, WI, NM, UT, AZ and OR; Eurasia.

***Botrychium lunaria* (L.) Sw.**
Common moonwort
Habitat/Range: Mesic to moist woods, meadows and heath from the montane to alpine zones; infrequent throughout BC; circumpolar, N to AK, E to NF and S to ME, VE, NY, MI, MT, CO, AZ and CA; Eurasia, Australia, New Zealand, Patagonia.

***Botrychium matricariifolium* (A. Br. ex Doell) A. Br. ex Koch**
Chamomile moonwort
Habitat/Range: Dry to moist woods, thickets, and meadows in the montane zone; rare in SC BC; circumpolar, E to NF and S to VA and ID; Eurasia.

***Botrychium minganense* Vict.** (*B. lunaria* var. *minganense* [Vict.] Dole, *B. lunaria* ssp. *minganense* [Vict.] Calder & Taylor)
Mingan moonwort
Habitat/Range: Mesic to wet woods and meadows, in the montane to alpine zones; infrequent throughout BC; N to AK, YT and NT, E to NF and S to NY, MI, WI, UT, NE and CA.

Botrychium multifidum **(Gmel.) Rupr.** (*Sceptridium multifidum* [Gmel.] Tagawa, *B. silaifolium* Presl, *B. occidentale* Underwood, *B. ternatum* [Thunb.] Swartz var. *intermedium* Eaton)
Leathery grape fern
Habitat/Range: Wet meadows, lake margins, peat bogs, river banks and alluvial forests from the lowland to montane zones; frequent in BC north to 55°N; circumpolar, N to AK, E to NF and S to VA, OH, IA, NM, CO, AZ and CA; Eurasia.

Botrychium paradoxum **W.H. Wagner**
Two-spiked moonwort
Habitat/Range: Mesic to moist subalpine sedge meadows in the subalpine zone; infrequent in SC BC, known only from Juniper Creek (Ashnola River) and Mt. Kobau; E to SK and S to MT and UT.

Botrychium pinnatum **St. John** (*B. boreale* auct. non [Fries] Milde, *B. boreale* var. *obtusilobum* [Rupr.] Broun)
Northwestern moonwort
Habitat/Range: Mesic to moist streambanks, meadows and heath communities in the montane and subalpine zones; infrequent throughout BC; N to AK, YT and NT, E to MT and S to NV and OR.

Botrychium simplex **E. Hitchc.** COMOX BLUFFS species.
Least moonwort
Habitat/Range: Vernal pools and ephemeral seepages in the lowland and montane zones; rare in BC (known only from Vancouver Island); circumpolar, disjunct E to ON, PQ and NF and S to NJ, MI, WI, IA, WY, NM, CO, UT, NV and CA; Eurasia.

Botrychium virginianum **(L.) Sw.** (*Botrypus virginianus* [L.] Michx.)
Rattlesnake fern
Habitat/Range: Wet alluvial forests, swamps and riverbanks, in the lowland, steppe vegetation and montane zones; infrequent throughout BC; circumpolar, N to AK, YT and NT, E to NF and S throughout the USA from FL to CA; Eurasia.

OPHIOGLOSSUM

Ophioglossum pusillum **Raf.** (*O. vulgatum* auct. non L., *O. vulgatum* L. var. *pseudopodum* [Blake] Farw., *O. alaskanum* Britton)
Northern adder's-tongue
Habitat/Range: Periodically flooded wet meadows and lake margins, in the lowland and montane zones; rare in S BC; N to AK, disjunct E to ON, NB and NS, S to VA, OH, IL, MT and WA.

POLYPODIACEAE

POLYPODIUM

1. Leaves leathery; veins anastomosing; rhizomes white ..... *P. scouleri*
1. Leaves not leathery; veins free; rhizomes green with yellowish or orange tinge.
   2. Leaves with a row of hairs along the rachis and on veins of pinnae on the upper side of the leaves ... . *P. glycyrrhiza*
   2. Leaves with midveins and rachis glabrous or with occasional hairs on the upper side.
      3. Sori without (or with only a few) dark, glandular aborted sporangia (paraphyses) .... *P. hesperium*

OPHIOGLOSSACEÆ—ADDER'S-TONGUE FAMILY

Herbaceous, leafy, often fleshy plants with a short vertical rhizome bearing many fibrous, usually fleshy roots, and a single frond. Frond erect, consisting of a simple or variously compounded sterile blade and a simple or panicle-like compound fertile portion. Sporangia large, superficial or sunken in the leaf tissue, opening by two valves, annulus lacking. Spores thick-walled, very numerous, all of one type.

A small family of about ninety species in tropical and temperate regions, some of the tropical species being epiphytes.

BOTRYCHIUM Sw. Grape-fern, Moonwort

Fleshy terrestrial plants. Rhizome short and thick, erect, bearing a few unbranched, coarse, often corrugated roots. Leaves usually solitary, somewhat fleshy, glabrous or rarely clothed with simple hairs; base of the stalk containing the bud of next year's frond. Sterile blade sessile or long-stalked, 1–4 times pinnately or ternately compound. Fertile portion erect, a long-stalked, simple spike or variously pinnately compound panicle. Sporangia large, globose, free, mostly sessile, opening transversely by two valves. Spores very numerous, sulphur-coloured.

A cosmopolitan genus of about twenty-five species, usually preferring sub-acid damp soil in open or partially shaded situations. Often overlooked on account of the small size of some species. (Name from the Greek *botryos* (a bunch of grapes).)

a. Sterile blades simple to pinnate-pinnatifid, glabrous, longer than broad (except *B. lanceolatum*); buds glabrous; small, rather fleshy plants.

b. Sterile blades oblong to ovate, rarely deltoid; ultimate divisions rounded to obtuse; both fertile and sterile segments erect in bud or slightly inclined but never both completely reflexed.

c. Sterile blades simple or 1-pinnate; both leaf segments erect in the bud.

Pinnæ fan-shaped, approximate, lower edge of median pinnæ descending; median pinnæ about 10 mm. wide.....*B. lunaria*

Pinnæ not fan-shaped, cuneate at base, distant, lower edge of median pinnæ ascending, median pinnæ about 4 mm. wide.....*B. minganense*

.....*B. simplex*

cc. Sterile blades variously divided but usually 2-pinnate in mature specimens; in the bud the upper part of the sterile segment commonly bent down over and covering the erect fertile portion.....*B. boreale*

bb. Sterile blades deltoid, essentially sessile; ultimate divisions acuminate; both segments completely reflexed in bud .....*B. lanceolatum*

aa. Sterile blades 2-pinnate to 4-pinnatifid, broadly deltoid, rather large, sparsely pilose; buds pilose; larger plants with coarse, or finely dissected blades.

Sterile blades long-stalked, stalk arising from below ground or at least very low on the plant, evergreen, coriaceous or fleshy; stipe much shorter than the sterile blade.....*B. multifidum*

Sterile blades sessile, deciduous, herbaceous; stipe equalling or exceeding the sterile blade.....*B. virginianum*

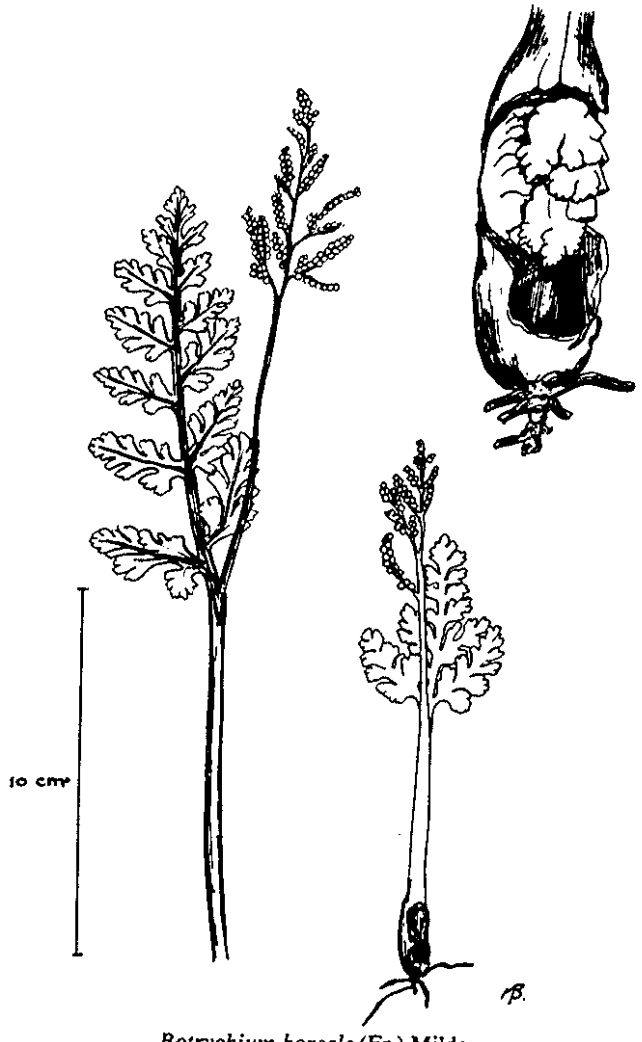
Botrychium boreale (Fr.) Milde. Northern Grape-fern

Plant relatively stout and fleshy, 4–26 cm. tall, bud glabrous. Fertile segment erect in bud, sterile blade with its apex bent over the tip of the fertile segment. Common stalk 3–14 cm. long. Blade inserted above the middle of the plant, usually sessile, 1–4 cm. wide, 1–9 cm. long, oblong-triangular to broadly oblong-lanceolate, pinnate-pinnatifid to 2-pinnatifid; lower pinnæ more or less stalked and decurrent, segments oblong and obtuse at the apex. Stalk of fertile segment 2–20 mm. long, mostly shorter than the blade. Fertile segment simple or paniculate, up to 5 cm. long. (*B. pinnatum* St. John.)

Habitat.—Open grassy places, alpine meadows, peaty soil.

Range.—Alaska to w. Alta., s. to Ore. and Mont.; Eurasia.

Comments.—A boreal and alpine species met with quite infrequently although of wide occurrence in the Province. Our form has been named ssp. *obtusilobum* (Rupr.) Clausen. Its ecological requirements are apparently similar to those of *B. lunaria* as the two species are often found growing together. The present species can be recognized by its more or less oblong blade, the pinnæ of which are lobed or divided into oblong and obtuse segments.



Botrychium boreale (Fr.) Milde.
Northern grape-fern.

Botrychium lanceolatum (Gmel.) Angstr. Lance-leaved Grape-fern

Plant stout, fleshy, 6–42 cm. tall, both sterile blade and fertile segment completely reflexed in vernation. Common stalk 4–15 cm. long. Sterile blade sessile or nearly so, inserted near the summit of the plant, 1–9 cm. wide, 1–6 cm. long, glabrous, deltoid with dark-green, pinnate-pinnatifid, lanceolate segments, 1–6 mm. wide, of which the lowest pair is longest. Stalk of the fertile segment 5–11 mm. long, much shorter than the sterile blade. Fertile segment paniculate, 1–5 cm. long, rather compact with ascending branches.

Habitat.—Peaty slopes, open sandy places, alpine meadows and open woods.

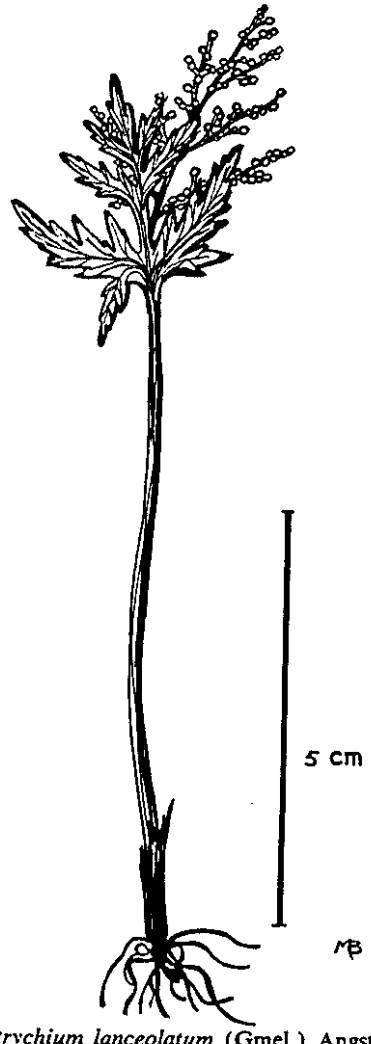
Range.—Alaska to Nfld., s. to Wash., Colo., Wyo., Wis., Ont., Pa., and W. Va.; Greenland; Eurasia.

Comments.—Apparently rare but small enough to be overlooked. The few collections made in the Province are too scattered to give any idea of the pattern of its distribution, consequently the species is one that may be expected anywhere. The stalk of the fertile segment being very much shorter than the deltoid sterile blade is a useful diagnostic feature. All our specimens are referable to var. *lanceolatum* with thick fleshy blades and the lobes of the pinnæ rounded at the apex and broad at the base.

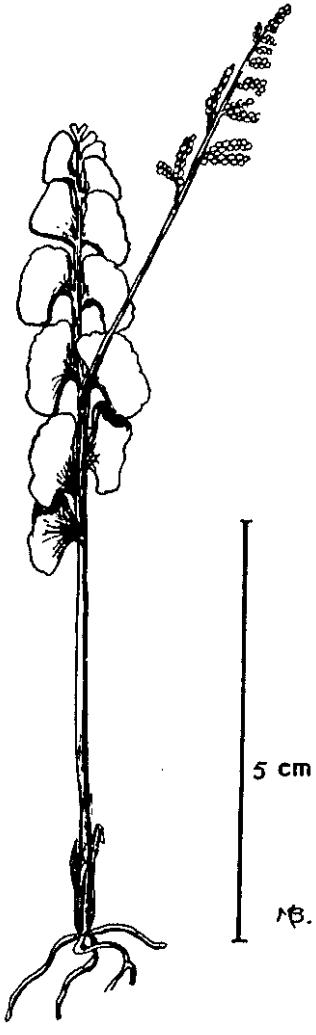
Botrychium lunaria (L.) Sw. Moonwort

Stipe mostly 3–8 cm. tall; bud glabrous, included within the stipe-base, with both fertile and sterile portions erect. Sterile blade oblong to oblong-ovate, essentially sessile, attached at or slightly below the middle of the plant, somewhat leathery, glabrous, up to 6 cm. long and 3 cm. wide, pinnate. Pinnæ 3–7 pairs, more or less opposite, broadly fan-shaped to semi-circular, often overlapping, unequally curved at base, rounded at the apex, entire or somewhat incised, without a midrib. Fertile stalk up to 5 cm. long, mostly shorter than the sterile blade, fertile segment 1- or 2-pinnate.

Habitat.—Open places, alpine meadows, turfy slopes.



Botrychium lanceolatum (Gmel.) Angstr.
Lance-leaved grape-fern.



Botrychium lunaria (L.) Sw.
Moonwort.

Range.—Alaska to Nfld., s. to Calif., Ariz., Colo., Minn., Mich., and Me.; Greenland; Iceland; Eurasia; Patagonia; N.Z.; Australia.

Comments.—Generally distributed in the interior of the Province, but on account of its small size likely to be overlooked. One of our widest-ranging ferns and very variable in form; many of the minor variations have been named. In our region two are sufficiently distinctive for mention: var. *lunaria,* the commonest, has a broad oblong blade inserted toward the middle of the plant, while var. *miganense* (Vict.) Dole has a blade much longer than broad with variously shaped, but not usually flabellate, divisions often inserted somewhat below the middle of the plant.

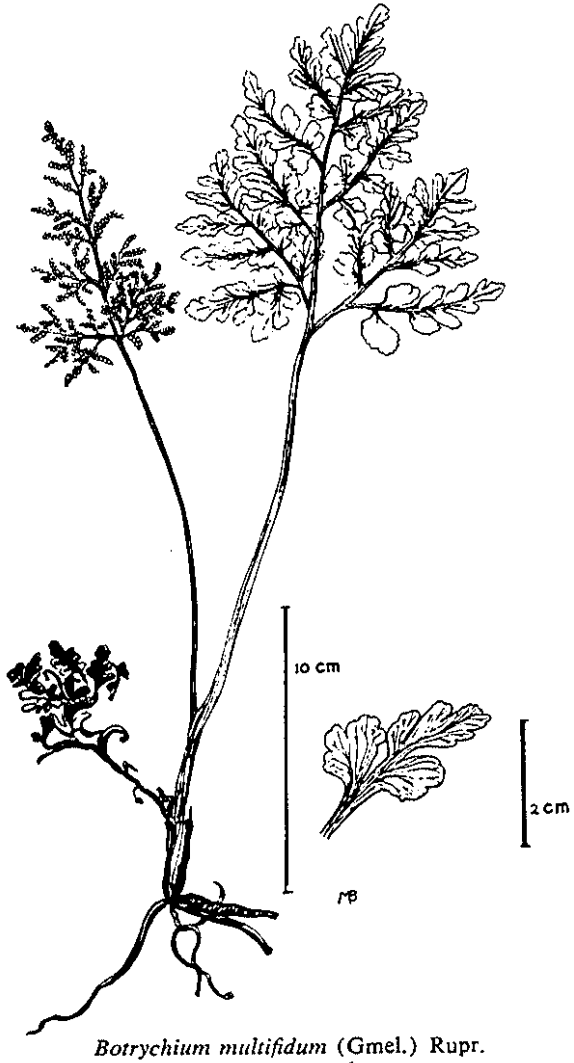
Botrychium minganense Victorin. Mingan Grape-fern

Plant slender, somewhat fleshy, from a short erect rhizome, up to 15 cm. tall, ratio of total length to length of sterile portion about 4 to 1. Bud glabrous, enclosed within the base of the stipe, both sterile and fertile portions erect, the two parallel and about the same length. Sterile blade practically sessile, simply pinnate, usually with 3–5 pairs of pinnæ, the lowermost rather remote and none overlapping as a rule. Pinnæ broadly cuneate, the angle between lower and upper margins of basal pinnæ being about 90°, median pinnæ 3–4 mm. wide, ascending with respect to the rachis, penultimate segment of blade small and rounded. Stalk of fertile portion up to 3.0 cm. long, fertile portion bipinnate.

Habitat.—Edge of woods and damp grassy areas.

Range.—British Columbia to Quebec, south to northern California, Colorado, Wisconsin, and Michigan.

Comments.—Apparently rare in British Columbia but easily overlooked. Easily confused with the much commoner *B. lunaria,* from which it can be distinguished, however, by its much narrower median pinna (about 3.5 mm. against 10), the broadly cuneate base as against a cordate base, the lower margin of the median pinnæ ascending rather than descending, and by the pinnæ being distant rather than approximate (often overlapping).



Botrychium multifidum (Gmel.) Rupr.
Leathery grape-fern.

Range.—Alaska to Nfld., s. to Calif., Ariz., Colo., Minn., Mich., and Me.; Greenland; Iceland; Eurasia; Patagonia; N.Z.; Australia.

Comments.—Generally distributed in the interior of the Province, but on account of its small size likely to be overlooked. One of our widest-ranging ferns and very variable in form; many of the minor variations have been named. In our region two are sufficiently distinctive for mention: var. *lunaria,* the commonest, has a broad oblong blade inserted toward the middle of the plant, while var. *miganense* (Vict.) Dole has a blade much longer than broad with variously shaped, but not usually flabellate, divisions often inserted somewhat below the middle of the plant.

***Botrychium minganense* Victorin. Mingan Grape-fern**

Plant slender, somewhat fleshy, from a short erect rhizome, up to 15 cm. tall, ratio of total length to length of sterile portion about 4 to 1. Bud glabrous, enclosed within the base of the stipe, both sterile and fertile portions erect, the two parallel and about the same length. Sterile blade practically sessile, simply pinnate, usually with 3–5 pairs of pinnæ, the lowermost rather remote and none overlapping as a rule. Pinnæ broadly cuneate, the angle between lower and upper margins of basal pinnæ being about 90°, median pinnæ 3–4 mm. wide, ascending with respect to the rachis, penultimate segment of blade small and rounded. Stalk of fertile portion up to 3.0 cm. long, fertile portion bipinnate.

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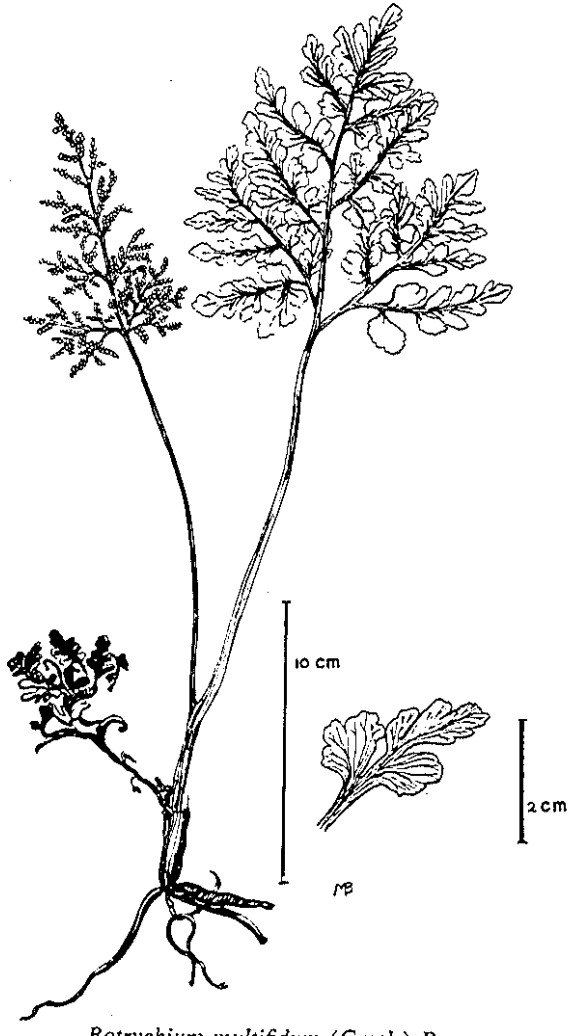
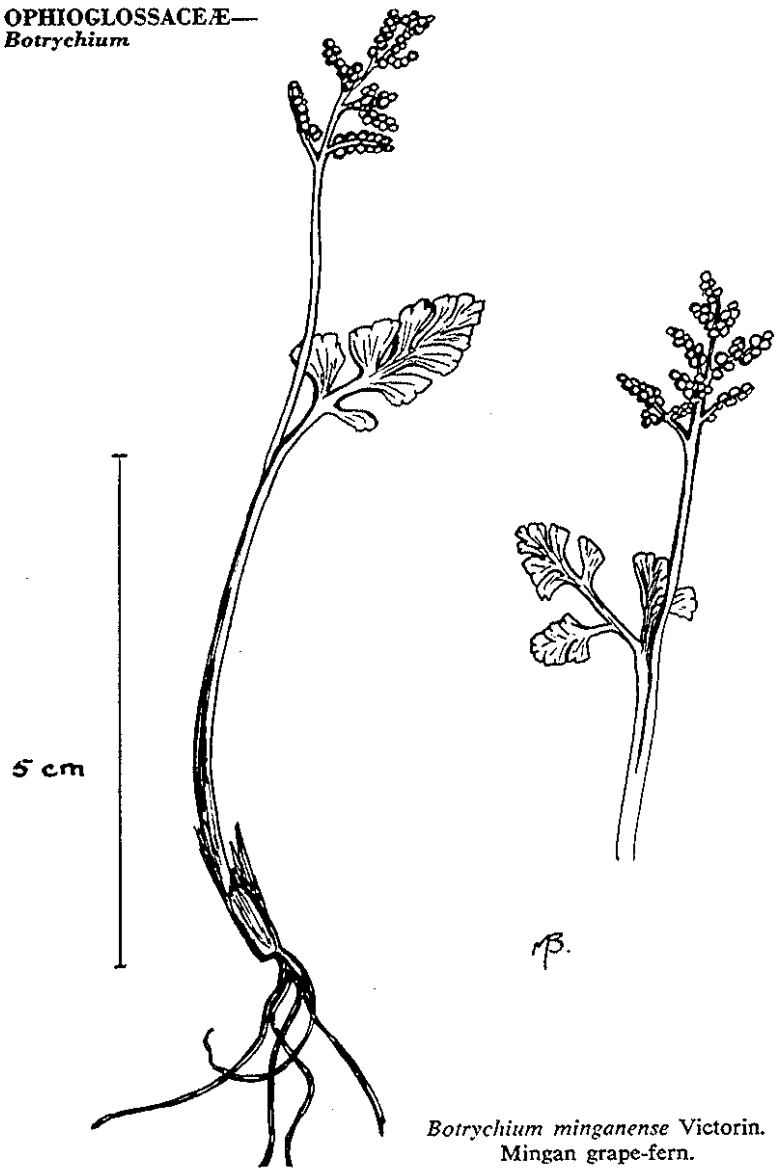


Botrychium multifidum (Gmel.) Rupr.
Leathery grape-fern.



Botrychium minganense Victorin.
Mingan grape-fern.

Botrychium multifidum (Gmel.) Rupr. Leathery Grape-fern

Rhizome short with numerous long wrinkled roots. Stipe up to 7 cm. long; bud silky pilose, included within the closed stipe-base, the sterile and fertile portions completely reflexed in the bud. Stalk of the sterile blade up to 13 cm. long, stout, arising from near the base of the plant and usually underground. Blades evergreen, very fleshy to leathery, sparingly pilose, broad triangular, ternate, 2–4-pinnate, about as broad as long. Basal pinnæ largest, obtuse, more or less pentagonal, the ultimate divisions oval to obovate, obtuse, subentire to dentate, cuneate, decurrent. Fertile segment 2–4-pinnate, loose, spreading. (*B. silaifolium* Presl.)

Habitat.—Fields and open woods in acid soil.

Range.—Alaska to Lab., s. to Calif., Mont., Iowa, Ohio, Pa., and N.J.; Eurasia.

Comments.—Common everywhere in suitable sites. Our plants nearly all belong to var. *intermedium* (D. C. Eaton) Farwell. This is characterized by its larger size, 15–40 cm. tall, with blades 7–15 cm. long and 3–21 cm. wide, the ultimate divisions being rather remote and not imbricate. This species is late in starting into growth in the spring; the sterile frond of the previous year may be found persisting even until September. This feature, together with the fact that the stalk of the sterile blade arises from below ground, will distinguish this species from *B. virginianum*.

Botrychium virginianum (L.) Sw. Rattlesnake Fern

Plant erect, 25–76 cm. tall, glabrous or sparsely pubescent. Bud pilose and, at least late in the season, partially exposed by the sheathing base which opens on one side. Fertile and sterile segments both completely reflexed in vernation. Common stalk 7–25 cm. long. Blade deciduous, thin and membranous, rarely somewhat leathery, deltoid, large, 4–21 cm. long, 5–36 cm. wide, nearly sessile, ternately decompound, much divided, basal pinnæ largest; ultimate divisions oblong-lanceolate, variously toothed or lobed,

(FERN • *Cryptogramma sitchensis*
IN PARSLEY

L: Small, **evergreen, densely clustered** from nding, branched rhizomes clothed with scales l stalk bases; sterile and fertile leaves **markedly**

Stipes **straw-coloured**; sterile leaves to 20 cm ggg-shaped, thick, crisply firm, usually **3 times** leaflets mostly 3–10 pairs, largest at the base, gments finely toothed; fertile leaves to 30 cm broadly lance-shaped, 2–3 times branched, stly 3–10 pairs, **with inrolled margins** and

ntinuous along the length of fertile leaflets, y **their rolled-under margins.**

Y: Fairly dry, rocky, open sites (cliffs, ledges, alus slopes) at low to high elevations.

arsley fern is often called *C. acrostichoides*, ndes *C. sitchensis*. • The evergreen sterile nniscent of parsley, are distinctive in their rgreen ferns from dry cliff-faces and talus am fern (*Aspidotis densa*, also known as *thes siliquosa*) and lace fern (*Cheilanthes* ble parsley. **Pod fern** has 2 kinds of leaves **tnut-brown** stipes, **3-times-branched** fer- te segments that are **abruptly pointed**; its lacking. **Lace fern does not** have separate are 25 cm tall, **twice branched and cinnamon-felted on** n suitable habitats at low to middle elevations (*A. densa* fa- *racillima* favours acid igneous rocks), from southern Van- land south to California.

ILE FERN • *Cystopteris fragilis*

ERAL: Delicate, small, to 30 cm tall; rhizomes creeping, densely scaly.

/ES: Stipes **straw-coloured, hairless**, short, ling or shorter than the blades; blades lance- ed, tapering at both ends, 2–3 times pinnate, **hairless** except for a few hairs towards the base leaflets; leaflets 8–18 pairs, lower ones ed; ultimate segments irregularly toothed.

: Small, **roundish**, partially covered with a ate, **hood-like**, somewhat toothed or lobed ium, **which soon withers and curls back.**

OGY: Cool, moist to dry, often calcium-rich, forests and openings, rock cliffs, crevices, dges, talus slopes; at all elevations.

ES: Fragile fern could be confused with **g or stunted specimens of lady fern** stipes, at least near the base. • **Moun-** poradic but often overlooked species of ocky slopes with seepage and stream- ations in southeast Alaska, typically on *ntana* looks more like a *Gymnocarpium* or **aped, twice-pinnate, narrowly dissected** n. • *Cystopteris* is from the Greek for 'blad- ring to the hood-like indusium.

COMMON MOONWORT • *Botrychium lunaria*

GENERAL: Erect, deciduous, yellowish-green or bluish, 10–25 cm tall.

LEAVES: Stipes equalling or exceeding the length of the sterile blades; blades more or less **stalkless, oblong,** hairless, **somewhat leathery, once-pinnate**; 2–5 pairs of **roundish to fan-shaped leaflets.**

REPRODUCTIVE: Fertile stalk 0.5–8 cm long, equalling or exceeding the length of the fertile spike; fertile spike 1–7 cm long, 2–3 times pinnately compound, the numerous sporangia mostly stalkless and free.

ECOLOGY: Grassy slopes, fields, moist meadows, heath, turfy ledges, open forest; scattered at all elevations.

NOTES: Several other species of *Botrychium* resemble moonwort and need to be examined closely with the aid of technical manuals to make an accurate determination. • *Botrychium* spp. are not 'true' ferns, because their sporangia (spore sacs) are borne in grape-like clusters on a naked stalk, rather than on leaves as in 'true' ferns. They are commonly referred to as 'grape ferns' or 'rattlesnake ferns.' • Ancient English folklore bestowed supernatural powers on this plant. Moonwort was said to loosen the shoes of horses ridden through it, and it was believed that it could be inserted into locks to unlock doors. The spores of moonwort can reportedly make you invisible. • *Botrychium* is from the Greek word *botryos* ('a bunch of grapes') in reference to the sporangia; *lunaria* and 'moonwort' both refer to the half-moon-shaped leaflets.

LEATHERY GRAPE FERN • *Botrychium multifidum*

GENERAL: Erect, evergreen, 10–50 cm tall, from several thick, wrinkled roots.

LEAVES: Fleshy and leathery, with a **long leaf stalk attached near the base** of the plant, **2–4 times compound,** to 30 cm across; usually 1 new, green and 1 old, over-wintering leaf.

REPRODUCTIVE: Fertile leaf as tall or taller than the sterile leaf, with a much-branched, panicle-like, fertile spike.

ECOLOGY: Moist or wet meadows, fields, grassy slopes, lake-shores, stream-banks, swampy or alluvial (especially cottonwood) forests; from sea level to subalpine elevations.

NOTES: 3 deciduous *Botrychium* species within our region are lance-leaved moonwort (*B. lanceolatum*), northwestern moonwort (*B. boreale*, also known as *B. pinnatum*), and rattlesnake fern (*B. virginianum*). The **lance-leaved moonwort** has a small, **stalkless, triangular blade** (with narrowly **lance-shaped segments) attached immediately below** the much-branched fertile spike; its home is open woods, sandy clearings, meadows and wet redcedar forests at middle to alpine elevations, from Alaska to northern Oregon (Mt. Hood), but not on the Queen Charlotte Islands or Vancouver Island. The somewhat similar **northwestern moonwort** has an **egg-shaped, stalkless blade** with broader, **oblong segments** and a fertile spike that is **longer** than the sterile leaf; it occurs on open, grassy meadows, stream-banks, heath and peaty ground at middle to subalpine elevations from Alaska to Washington. **Rattlesnake fern** is the **largest** of the 3, with large (to 20 cm wide), **broadly triangular, much-dissected blades** that are **thin**, not fleshy or leathery; it is a species of moist, usually deciduous forests, meadows, and wet clearings, from Skeena River to California, on Vancouver Island but absent from the Queen Charlotte Islands. Its common name refers to the fancied resemblance of the fertile leaf to the tail tip of a rattlesnake.