

Brassicaceae mustards

Nearly 3000 species in 340 genera comprise this large family. Oils, seeds, greens and condiments are produced from cultivated species.

Flowers typically are four-merous: petals and sepals, with six stamens and a single superior ovary, divided into two locules. The inflorescence is terminal, with the flowers borne singly or in racemes.

It is not unusual to have fruit and flowers present simultaneously. Fruits are capsules, splitting longitudinally or siliques.

Leaves are alternate, pinnately lobed. Ours are all herbaceous plants.

Keys (first based on flower colour. Mature fruits are often required to confirm species.)

- | | |
|---|-------|
| A. Flowers yellow. | Key 1 |
| aa. Flowers white, green or violet, but not yellow. | Key 2 |

Key 1 Flowers yellow.

- | | |
|---|--------------------|
| A. Fruits < 6mm long, <3 times longer than wide. | B |
| B. Leaves entire or serrate. | C |
| C. Leaves glossy; fruit oval and smooth. | <i>Camelina</i> |
| cc. Leaves rugose; fruit round and rugose. | <i>Neslia</i> |
| bb. Leaves palmately lobed or finely cleft. | D |
| D. Leaves finely divided; fruit 2 connate nutlets. | <i>Coronopus</i> |
| dd. Leaves at least the lower lobed; fruit oblong and not doubled. | <i>Rorippa</i> |
| aa. Fruits >6mm long, 4 or more times longer than wide. | E |
| E. Fruit indehiscent; the septum fleshy and hardening, breaking up into single-seeded sections. | <i>Raphanus</i> |
| ee. Fruit dehiscent lengthwise. | F |
| F. Seeds in 2 rows in each locule. | <i>Diplotaxis</i> |
| ff. Seeds in 1 row in each locule. | G |
| G. Leaves pinnate or pinnately lobed. | H |
| H. Racemes bracteate. | <i>Erucastrum</i> |
| hh. Racemes not bracteate. | I |
| I. Fruits appressed; flowers 3mm wide. | <i>Sisymbrium</i> |
| ii. Fruits not appressed, or if so flowers large. | J |
| J. Fruits very long and no wider than pedicels. | <i>Sisymbrium</i> |
| jj. Fruits wider than pedicels. | K |
| K. Plants with stellate pubescence; leaves finely divided. | <i>Descurainia</i> |

kk. Plants merely pubescent or smooth; leaves pinnately lobed.	L
L. Plants biennial or perennial; flowers less than 1cm wide.	M
M. Leaves much-lobed; creeping rootstocks; flowers <5mm wide.	<i>Rorippa</i>
mm. Leaves with a large terminal lobe and many smaller lateral ones; creeping rootstocks absent; flowers >5mm wide.	<i>Barbarea</i>
II. Plants annual, flowers 1–1.5cm wide.	N
N. Capsule with 3–5 raised veins.	<i>Sinapis</i>
nn. Capsule with a prominent midrib and weaker lateral veins	<i>Brassica</i>
gg. Leaves entire or merely toothed.	O
O. Leaves smooth, sagittate, clasping at the base.	<i>Conringia</i>
oo. Leaves rugose, not sagittate, toothed, not clasping.	P
P. Leaves ovate, >1.5cm wide, coarsely toothed; plant merely pubescent.	<i>Brassica</i>
pp. Leaves linear or lanceolate, usually <1.5cm; plants with bifurcate or stellate hairs.	<i>Erysimum</i>

Key 2 Flowers white, green or purple

A. Plants of marine habitat, fleshy; fruits divided into 2 cells crosswise or lengthwise.	B
B. Fruit crosswise divided; widespread beach plant.	<i>Cakile</i>
bb. Fruit lengthwise split; limited to offshore islands.	<i>Cochlearia</i>
aa. Plants not restricted to marine habitat, not fleshy; fruits split lengthwise.	C
C. Fruit, short, less than 4X the width.	D
D. Fruit flattened parallel to the septum.	E
E. Plant low and compact; leaves toothed; stems and capsules green; petals not lobed.	<i>Draba</i>
ee. Plants tall and freely branching; leaves entire; stems and capsules with white hairs; petals deeply two-lobed.	<i>Berteroa</i>
dd. Fruit flattened perpendicular to septum, or nearly round in cross-section.	F
F. Leaves irregular, deeply pinnately lobed.	<i>Capsella</i>
ff. Leaves entire or sparsely toothed.	G
G. Fruit rounded, flat, pointed or notched distally.	H
H. Fruit 10–12mm wide; plants rarely branched.	<i>Thlaspi</i>

	hh. Fruit 2–4mm wide; freely branching at the top.	I
	i. Fruits ovate to round, notched.	<i>Lepidium</i>
	ii. Fruits cordate, acutely tipped with prominent style.	<i>Cardaria</i>
	gg. Fruits round to cylindrical.	J
	J. Fruits round; leaves widely clasping	<i>Neslia</i>
	jj. Fruits ovate or oblong; leaves various.	K
	K. Lacustrine plants; 3–8cm tall; leaves linear and basal.	<i>Subularia</i>
	kk. Plants not limited to lacustrine habitats; not as above.	L
	L. Leaves clasping; not toothed.	<i>Camelina</i>
	ll. Leaves not clasping; toothed.	<i>Armoracia</i>
cc. Fruit >4X the width in length.		M
M. Leaves simple; cauline leaves not clasping.		N
N. Plant with strong odour of garlic; leaves reniform at the base of the plant; cauline leaves cordate.		<i>Alliaria</i>
nn. Plant without strong odour; leaves lanceolate; cauline leaves usually sessile.		<i>Hesperis</i>
mm. Leaves pinnately lobed; cauline leaves clasping or auriculate; petals generally shorter than 15mm.		O
O. Leaves lanceolate, entire or serrate.		P
P. Basal leaves pubescent, the hairs entirely unbranched or hairs on short stalks or absent. Stalks < 0,06mm long; siliques 1-2.5mm wide.		<i>Boechea</i>
pp. Basal leaves pubescent but the hairs with 2-4 rays, long-stalked to 0.6mm long; siliques <1.3mm wide.		Q
Q. Petals very pale yellow; stem leaves glabrous and glaucous; siliques terete.		<i>Turritis</i>
qq. Petals white or slightly pink;		<i>Arabis</i>

cauline leaves pubescent and not glaucous; siliques compressed.

oo. Leaves pinnately lobed.

R. Stems freely branching, leafy, diffuse; capsules straight with the seeds in 2 rows in each locule.

rr. Stems unbranched or only near the base, erect; leaves mostly basal; capsules straight, seeds in a single row per locule.

R

Rorippa

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Cardamine

***Alliaria* Heister ex Fabr.**

Tall coarse biennial herbs, they exude a strong odour of garlic or onions when crushed. The leaves are simple, the basal leaves reniform and long-petiolate. Cauline leaves reduce in size upwards on the plant; the uppermost are sessile. Flowers are arranged in a raceme, white-petalled, producing long, linear siliques. Seeds are borne in a single row per locule.

***Alliaria petiolata* (Bieb.) Cavara & Grande.**

Garlic Mustard; alliaire officinale



Photo by Martin Thomas

As above.

Long known as a culinary herb, the leaves, flowers and fruit are delicious in salad when collected young. Plant can self-fertilize, promoting its rapid spread.

Invades roadsides, fallow fields, riparian areas and disturbed sites. Invasive threat to our herbaceous communities of floodplains and deciduous forest.



Photo by Sean Blaney

Kings Co.: Grand Pre, along the Ben Jackson Road, Hortonville, Lower Wolfville, Gaspereau River valley; Port Williams; along the Cornwallis River in Coldbrook; Colchester Co.: Truro and spreading into Victoria Park.

Elsewhere in North America, from NS to ON, south to KS and GA. BC to OR and CO. Native to Eurasia and Africa.

***Arabis* L** **rock-cresses**

Northern hemisphere species, there are about 180 *s.l.* in total, although more recently New World species have largely been placed in *Boechea*. Erect and unbranching, generally the leaves clasp at the base. Flowers have white petals. Fruit are stiffly erect on short pedicels. Valves may be marked with a rib. Nova Scotia has a single species

***Arabis hirsuta* (L.) Scop.**



Photo by Martin Thomas

Its long slender stems bear lanceolate or oblong leaves clasping it. Basal leaves are arranged in a petiolate rosette. Flowers are loosely clustered in a long raceme. The species is Asiatic and western. Our plants belong to var. *pyncocarpa* (M. Hopkins) Rollins.

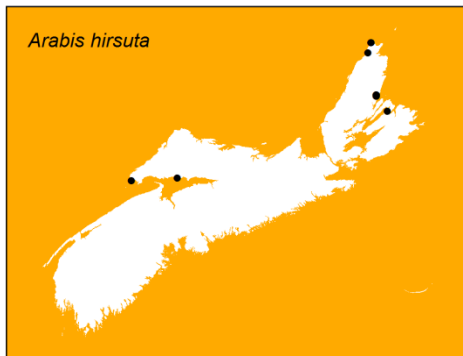
Also flowers May and June.

Species of dry sites as along ledges, in crevices, cliffs, talus slopes and gravels.

Rare and locally distributed in Nova Scotia: Refugee Cove, Cumberland Co., Moose Island, Colchester Co. and at several Victoria, Inverness and Cape Breton Co. stations.

NS to AK, south to GA, MO and CA.

STATUS: ORANGE-listed.



***Armoracia* Gaertn., Meyer & Scherb.**

A Eurasian genus, it has a single escape from cultivation in Nova Scotia. Lower leaves are large, borne on long petioles, while the cauline leaves reduce in size towards the top of the plant. Fruits are ovate and inflated, and the style is exerted and persistent. Valves are marked by a faint midrib.

***Armoracia rusticana* (Lam.) G.M &S.**
Horse-radish; raifort



Photo by Martin Thomas



Photo by Martin Thomas

Arising from creeping rootstocks, the stout stems may reach 1m in height. The lower oblong leaves are superficially similar to dock. The blades may be 30cm long, arising from long-winged petioles. Lanceolate cauline leaves sessile or nearly so, toothed on the margins. White petals narrow to a claw form racemes on elongated peduncles in the upper leaf axils.

June flowering.

Fertile soils near old gardens.

Established colonies at various places from Truro and westward.

Widely introduced and found from NS to BC south to CA and NC; FL and LA.

***Barbarea* R. Br.**
winter-ress

Another north-temperate genus, it has 20 species. Nova Scotia has one species, a smooth herb, bearing dark green foliage. Basal leaves each have terminal lobes, with several smaller ones beneath. Cauline leaves are smaller, entire or variously cleft. The linear fruits are round in cross-section or only slightly angled. Valves are marked with strong midveins.

***Barbarea vulgaris* WT Aiton**
Yellow Rocket; Winter-cress; barbarée vulgaire

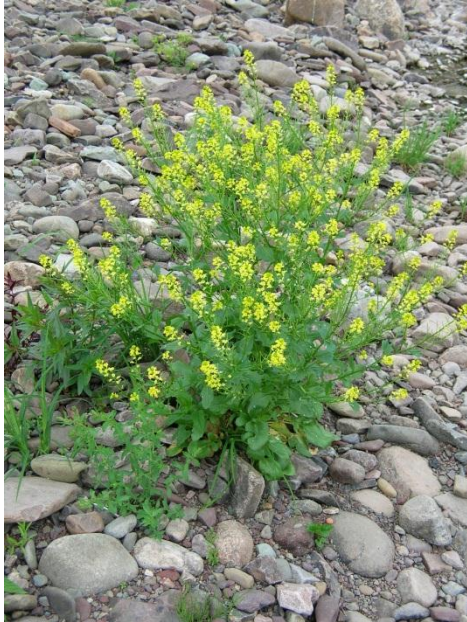


Photo by Ross Hall

The dark green basal leaves are long-petiolate, with 1–4 lobes. Cauline leaves are sessile, clasping the stem. Fruits are ascending, to 3 cm long.

Flowers from late May to early June, rather early for mustards in Nova Scotia.

Spreading to alluvial soils and other fertile situations from agricultural land.

Common throughout where suitable habitat occurs.

Widely introduced from Europe.



Photo by Martin Thomas

***Berteroa* DC**

Five species comprise this small genus of Eurasian natives. A single herb reaches Nova Scotia. Leaves are entire. Flowers have white or yellow, deeply-cleft petals. Fruit is round or ovoid and flattened along the valve constriction.

***Berteroa incana* (L.) DC** **Hoary Alyssum; bereroa blanc**



Photo by Andy Dean

A tall erect species it is densely covered in soft pubescence. Leaves are small and elliptic. Branching loosely, the branches terminate in columns of small white flowers producing erect fruit, 5–8mm tall.

Flowers June through to September.

Grows in sandy soils and can be an aggressive colonizer.

Limited to several localities in the Annapolis Valley, including Aylesford and Greenwood.

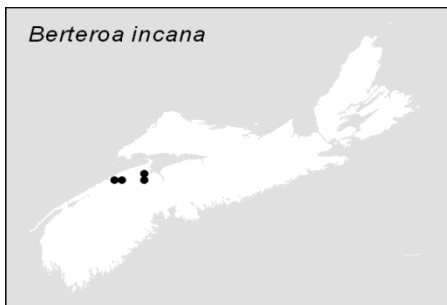
NS to BC and AK, south to NV, NM and VA.



Photo by Andy Dean



Photo by Martin Thomas



***Boechera* A. Löve & D. Löve**

Species were formerly included in *Arabis*, genetic and cytological evidence now places them in their own genus, of North American species. Many are triploids and most diverse in the western part of the continent. Apomixis occurs in some species, a form of asexual reproduction. Nova Scotia has a single species.

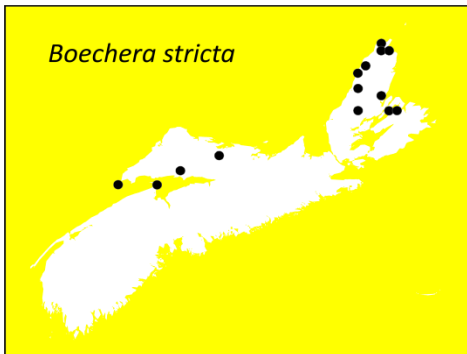
***Boechea stricta* (A. Gray) A. Löve & D. Löve**
(=*Arabis drummondii* A. Gray)
arabette de Drummond



Photo by David Mazerolle



Photo by David Mazerolle



Cauline leaves are numerous and lanceolate, sessile to the stem and often appressed. Basal leaves are borne on short petioles. Fruit is long and narrow, 1.5mm wide and 4–7mm long. Seeds are arranged in two rows per valve.

Flowers May to July.

At higher elevations it is associated with talus slopes; at lower elevations may be in more fertile soils.

Rare and limited to northern sites, from the Fundy shores to northern Cape Breton. New Annan, Colchester Co.

Across the continent south to the Gulf of Mexico.

***Brassica* L. mustards**

The mustards are another Eurasian genus of 35 annuals or biennials. Many have been genetically confused by back-crossing with cultivated forms. Sometimes the root crops appear as short-lived escapes, not really introductions. Cabbages, kohlrabi, kale, Brussel sprouts, broccoli and cauliflower are all races of *Brassica oleraceus*, apparent in flower and fruit structure.

Typically they have irregularly lobed and toothed leaves, ascending sepals, yellow clawed petals and elongated angular fruit. Each valve contains a single row of seeds.



Caution should be shown, as the handling of some plants may cause a contact dermatitis.

Key to species

A. Upper leaves sessile and clasping.

Brassica rapa

aa. Upper leaves petiolate, not clasping.

B

B. Mature fruits and pedicels ascending; fruit round.

B. juncea

bb. Mature fruits and pedicels erect or appressed; fruit 4-angled.

B. nigra

***Brassica juncea* (L.) Czernj. Chinese Mustard; moutarde d'Indie**



With oblanceolate or elliptic leaves on stems 1.5m tall or more, this mustard is distinctive. Lower leaves are petiolate; cauline leaves are sessile. Conspicuous when it is in flower.

Flowers throughout the summer.

Disturbed ground and compacted soils. Probably introduced in dirty grains.

Scattered throughout.

Across Canada and south to CA, and FL.

Photo by Martin Thomas



Photo by Martin Thomas

***Brassica nigra* L.**
Black Mustard; moutarde noire



Photo by Martin Thomas

Leaves are variable but usually elliptic in outline. Lower leaves may be lobed; cauline leaves are merely toothed, or entire. All are petiolate. Fruit erect; 4-angled and 1–2cm long.

Flowers through until October.

Fields, waste places, disturbed soils as in dooryards.

Throughout Nova Scotia.

Introduced to most of Canada and US.



Photo by Martin Thomas

***Brassica rapa* L.**
Moutarde des oiseaux



Photo by Martin Thomas

An annual species, it ranges to 80cm in height. Lower leaves are petiolate; cauline leaves are sessile, cordate at the base. Margins are coarsely villous. Flowers usually spread to 1cm across.

Probably a parent species of rapeseed and rutabaga, both crop plants widely introduced.

Grows on loose disturbed soils.

Throughout NS and the North American continent.



Photo by Martin Thomas

***Cakile* Miller** **sea-rocket**

Only a single sea-rocket species reaches Nova Scotia. There are seven worldwide. An annual plant, it is succulent, prostrate or weakly ascending from coastal sands. Flowers have pink or purple petals, obovate. Fruit is divided transversely into two unequal valves. Lower one is persistent, with one or no seeds. The upper, deciduous portion contains a seed with 2–8 angles.

***Cakile edentula* (Bigelow) Hook.** **Sea-rocket; caquillier édentulé**



Photo by Martin Thomas

Freely branching and sprawling, this plant bears succulent leaves, with irregular lobes on the edges, tapering to the stem. Flowers are purple, borne in dense racemes.

Flowers July to September.

Dunes, cliffs, sandy or shingly beaches along the coast.



Photo by Martin Thomas

Common around the coast. Grows luxuriantly on seaweed wrack piles.

From Greenland to FL; AK to CA.



Photo by David Mazerolle

Camelina Crantz
false flax

Two of these European species have been introduced into Nova Scotia. Both are coarsely branched annuals with small yellow flowers. Ovoid fruits are smooth. Leaves are narrowly spatulate at the base of the plant; cauline leaves are clasping and linear or lanceolate in outline and auriculate.

Key to species

Plant hirsute; pubescence of simple hairs and shorter stellate ones.

Camelina microcarpa

Plant sparsely pubescent; with only simple hairs.

C. sativa

Camelina microcarpa Andrz.
caméline à petits fruits



A roughly hairy annual, it produces tiny seeds about 1mm in length.

May flower from April until September.

Casual weed in disturbed soils of yards and grain fields.

Scattered collections. Probably introduced here from the west.

Across the continent from NF to YT, south to CA, TX and GA.

Camelina sativa (L.) Crantz
False Flax; caméline cultivée

A mostly smooth plant, it produces larger seeds, at 2mm in length.

Flowers to August.

A weed of disturbed soils.

A short-lived introduction and possibly not thriving here. Our collections should be examined to see if in fact both species are present.

Across Canada and variously south to AZ, LA and SC.

Capsella Medikus
Shepherd's Purse

A monotypic genus, owing its descriptive English vernacular name to the shape of the seeds. White flowers are subtended by short, erect sepals borne in a terminal raceme. Lightly pubescent, the hairs are bifurcate. Leaves are generally basal, resembling those of dandelion. Some plants have alternate cauline leaves, reducing in size up the stem.

***Capsella bursa-pastoris* (L.) Medikus**
Shepherd's Purse; bourse-à-pasteur



Photo by Martin Thomas

As above. The leaves are pinnately cleft. Seeds are cordate, much like a purse.

Flowers from April to early November, even as a winter annual.

Gardens, fields, compact disturbed soils.

Common.

Found throughout North America, after introduction from Europe.



Photo by Martin Thomas

***Cardamine* L.**

Annuals or perennials, their leaves may be lobed or compound. Flowers are usually white and sometimes with purple or pink highlights. Fruits are long and slender, with the seeds in a single row.

Worldwide there are nearly 200 species.

Key to species

- | | |
|--|---------------------------|
| A. Basal leaves palmately lobed or compound. | B |
| B. Cauline leaves 2; leaves with appressed hairs along the margins. | <i>Cardamine diphylla</i> |
| bb. Cauline leaves 3 (2–3); leaves with spreading hairs along the margins. | <i>C. maxima</i> |
| aa. Basal leaves simple or pinnately compound. | C |
| C. Perennial; flowers to 16mm wide; petals 8–13mm. | <i>C. pratensis</i> |
| cc. Annual or biennial; flowers only to 4mm wide; petals to 3mm. | D |
| D. Cauline leaves 4–8cm long. | <i>C. pennsylvanica</i> |
| dd. Cauline leaves 2–4cm long. | <i>C. parviflora</i> |

***Cardamine diphylla* (Michx.) A. Wood**

Toothwort; dentaire à deux feuilles



Photo by Martin Thomas

A smooth plant with slender stems which may reach 20–40cm tall. The pair of opposite cauline leaves, is further divided into three toothed leaflets each. Petals are purple or white, 1–2cm long. Rhizomes have no annual constrictions. This mustard is one of our few native Brassicaceae species.

Flowers April to June.

Moist fertile mucky soils in low ground in mixed forests.



Photo by Martin Thomas

Never common nor abundant, but found from Annapolis to northern Cape Breton.

Ranges from NS to ON, south to AR, MS and GA.

***Cardamine maxima* A. Wood**
dentaire géante

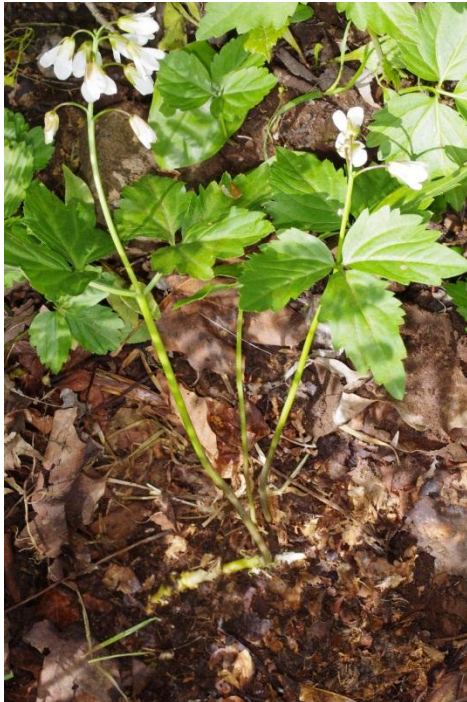


Photo by Martin Thomas

Differing from the previous species by having 2–3 alternate stem leaves and a rhizome marked by annual constrictions.

Flowers in May.

Along woodland streams, even in calcareous sols.

Known from Isle Haute, Cumberland Co. and Cape Split, Kings Co.; Margaretsville, Annapolis Co.

Found in NS to ON south to KY.



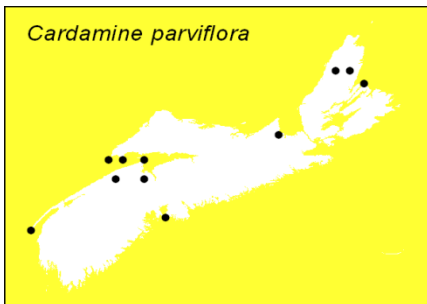
Photo by Martin Thomas



Photo by Martin Thomas



***Cardamine parviflora* L.**
cardamine à petites fleurs



Stem stands 10–30cm, the lower leaves divided into 10 tiny obovate leaflets. Terminal leaflet of the cauline leaves is of similar size to the lateral ones. Leaflets of the cauline leaves are sessile and nearly linear. Fruits are slender, barely wider than the pedicels. Our material belongs to var. *arenicola* (Britt.) OE Schulz.

Flowers early, from April to August.

Dry, shady ledges, exposed soils; sandy substrates.

Bay of Fundy counties, from Brier Island to Cape d'Or.
Central and northern Cape Breton.

NS to BC, south to OR, TX and FL

STATUS: YELLOW-listed

***Cardamine pensylvanica* Muhl.**
Bitter Cress; cardamine de Pennsylvanie



Photo by Martin Thomas

Tiny flowers and larger terminal leaflets relative to the size of the lateral leaflets separate this species from the preceding one.

Flowers from May until July.

Grows on mucky, wet soils as in swamps, streamsides and may even be emergent.

Common throughout.

Continental North America, absent only from AZ and the high arctic.

***Cardamine pratensis* L.**
Cuckoo Flower; cardamine des prés



Photo by Martin Thomas

Leaves are pinnately divided, the terminal leaflet larger than the lateral ones. Basal leaves are long-petiolate, the divisions nearly round. Cauline leaves are nearly sessile, the lobes linear. Flowers pinkish or violet, forming erect fruits, a few cm long.

Two varieties are mentioned, the typical variety, and var. *angustifolia* Hook. which would be rare in Nova Scotia. Its distribution here is unknown.

Flowers late May and early June.

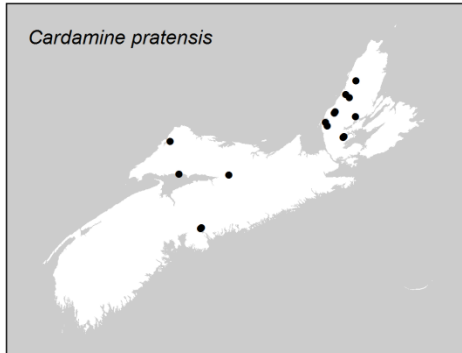
Moist soil as in meadows, damp fields and other low ground.

Scattered in the province, frequent along the Annapolis River and even spreading into roadsides ditches, north to Cape Breton.

NF to AK, south to BC, MN and VA. Introduced.



Photo by Andy Dean



***Cardaria* Desv.**

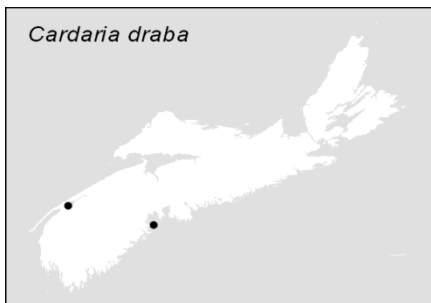
Hoary cress

A small genus of three weedy perennials, they are native to Eurasia. A single species is found in Nova Scotia. It is typified by white petals, twice as long as blunt outer sepals. The fruit is almost round and inflated, although flattened against the septum. Leaves are entire or lobed; plants may be pubescent.

***Cardaria draba* (L.) Desv.**

Hoary Cress; White-top; cranson dravier

A perennial, plants may reach 60cm, arising from creeping rhizomes. They are densely pubescent towards the base, becoming smoother towards the top. Cauline leaves are clasping, auriculate at the base. Basal leaves are densely pubescent, toothed or entire, narrowing to the petiole.



Racemes comprise densely packed white flowers, each tiny flower with petals 3–4mm long. Sepals are shorter, their margins white. The indehiscent capsules are cordate, smooth and inflated, constricting at the valve. The reddish brown ovoid seeds are flattened; there are two per capsule.

Flowers late June until August.

Frequents roadsides, ditches and former ballast piles.

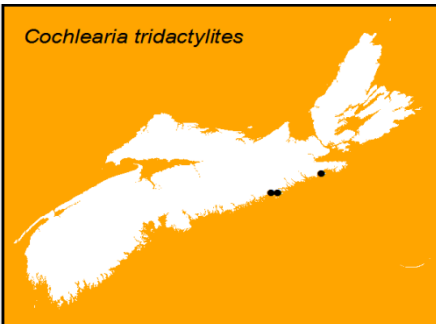
From Yarmouth to Lunenburg and Annapolis.

Ranges from NS to BC, south CA, TX and VA; considered a problematic weed in the west.

***Cochlearia* L**

It is a small genus of only three species; two of them are Canadian arctic endemics. Succulent plants, they are biennial in habit, having white or pink flowers. Fruits are rounded capsules bearing two series of seeds. Leaves are variable in shape, and toothed or entire.

***Cochlearia tridactylites* Banks cranson tridactyle**



Our single species has deltate leaves, their margins toothed and with 3–5 teeth distally. Flowers are arranged in umbels of pale pink or white flowers.

Summer-flowering.

Brackish or calcareous soils.

Little White Island and Big White Island, Halifax County represent the only confirmed localities yet.

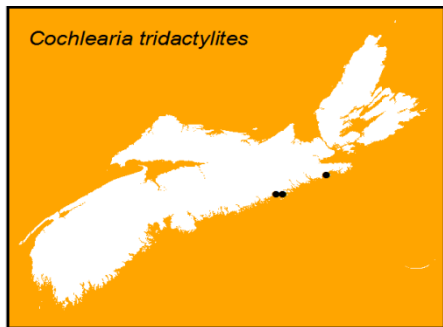
Reported from NL, NS, QC and Saint Pierre et Miquelon.

STATUS: ORANGE-listed for NS.

***Conringia* Heister** **hare's-ear mustards**

The genus is a small one, of six Eurasian species. The flowers have four white or bright yellow, clawed petals. Seeds are arranged in a single row within each locule of the slender angular fruit. Plants are smooth and glaucous.

***Conringia orientalis* (L.) Andrz.** **Hare's-ear Mustard; vélar d'Orient**



The leaves are entire, the upper ones cordate at the base and clasping the stem. Pedicels and fruit are widely spreading, with the fruit barely wider than the pedicel, 8–12cm in length.

Flowers June to August.

Weed of railroads and dooryards, not often reported and perhaps not persisting.

Scattered localities from Colchester and Cumberland counties westward.

Ranges from NS to AK and southward. To CA, TX and FL.

***Descurainia* Webb. And Berth.**

Annuals or biennials, only two reach Nova Scotia. They have yellow flowers subtended by ovate sepals. Fruits have persistent styles; their valves marked by a prominent rib.

Key to species

Fruit clavate; seeds in two rows; inflorescence glandular pubescent.
Fruit linear; seeds in a single row; inflorescence not glandular.

Descurainia sophia
D. pinnata

***Descurainia pinnata* (Walt.) Britt.**

Little is known of the species in Nova Scotia, with only a single report. Mainly differs in the linear shape of the fruit, carrying seeds in a single row. The inflorescence is smooth. Our plants belong to ssp. *brachycarpa* (Richardson) Dettling.

Flowers elsewhere from May to August.

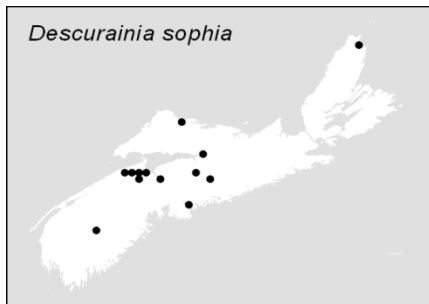
Limited to sandy or stony soils.

Known from Halifax.

Elsewhere from NS; QC to YT south to CA, TX and FL.

***Descurainia sophia* (L.) Webb.**

Tansy Mustard; sagesse-des-chirurgiens



Generally these plants are strongly fragrant annual or winter annuals which may reach 1m in height. They are freely branching at the summit. They may be minutely pubescent with greyish green bifurcate hairs. Leaves are alternate and finely divided into linear segments. Flowers are clustered at the top, with yellow petals 2–2.5mm long, exceeded by the sepals. Siliques are erect, carried on short pedicels, sharply angled to the peduncle. Seeds are bright orange, 10–20 per locule. Plants resemble *Sisymbrium* but for the pubescence and larger flowers.

Flowers late May until August.

Dryish soils in waste places, compact and disturbed.

Uncommon and only occasionally seen as a single plant, from Queens Co. to Cape Breton.

Found throughout the continent, from NF to AK, south to CA, TX and GA. Introduced in unclean grain.

***Diplotaxis* DC**

European natives, the genus includes 25 species, Nova Scotia has received two adventives. Flowers are white or yellow, petals reduced to a claw. Fruits are slender, long and flattened with a single midvein in the valves. Two rows of seeds occupy each locule. Leaves are smooth or pubescent, toothed or lobed.

Key to species

Leaves basal or mostly so.

Diplotaxis muralis

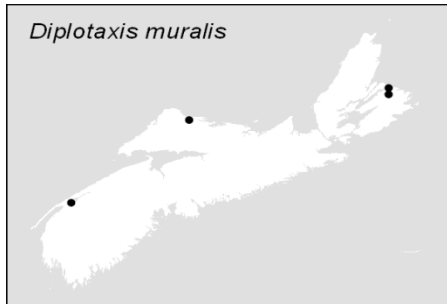
Leaves cauline, or mostly so.

D. tenuifolia

***Diplotaxis muralis* (L.) DC**
Sand Rocket; diplotaxe des murs



Photo by Sean Blaney



An annual species, the leaves are basal, oblanceolate, irregularly lobed and tapering to the petiole. Flowers are yellow, 5–15mm long. Fruits are smooth, 2–3cm long, erect.

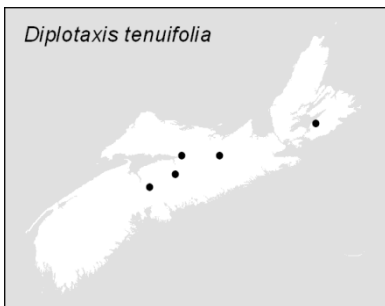
Summer flowering, June to August.

Dry soils about wharves and in ports on waste ground and in old ballast.

Infrequently seen now, Digby to Cape Breton.

Naturalized from Europe in North America, across Canada to AB, variously south to CA and FL.

***Diplotaxis tenuifolia* (L.) DC**
diplotaxe à feuilles ténues



This species is perennial from a taproot, reaching 80cm in height. Leaves are somewhat succulent, bluish green and of foul scent when crushed.

Also found in waste ground.

Central Nova Scotia.

Introduced from Eurasia to west coast and east coast of North America. Not found in the interior.

***Draba* L.**

A larger genus than other mustards, it includes about 350 species, mostly of the northern hemisphere. Five reach Nova Scotia. All are herbaceous, producing a basal rosette of leaves and white flowers.

Key to species

- A. Dwarf annual; leaves in a tight basal rosette; flowers on scapes; petals deeply cleft. *Draba verna*
- aa. Perennial; peduncles with at least one cauline leaf; petals round, or notched only at the summit. B
 - B. Basal rosettes pubescent; each hair forked but irregularly. *D. norvegica*
 - bb. Basal rosettes with stellate hairs, regular and even. C
 - C. Fruit plump and smooth; sepals <2mm long; seeds imbricate *D. pycnosperma*
 - cc. Fruit compressed; sepals >2mm long; seeds not imbricate. D
 - D. Cauline leaves round at the base; fruit with distinct veins, straight. *D. glabella*
 - dd. Cauline leaves tapered at the base, fruit faintly veined, twisted. *D. arabisans*

***Draba arabisans* Michx. drave arabette**



Photo by Sean Blaney

Stems are simple or loosely branching, 10–40cm tall. Profuse basal leaves are oblanceolate, narrowing to a long petiole. Cauline leaves are several, ovate to oblong and often prominently toothed. Flowers are arranged in narrow racemes, to 10cm long. Oblong fruits may be 1cm in length.

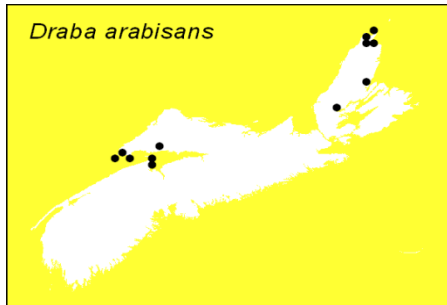
Flowers early, May to July.

In muddy soils, often in calcareous rock crevices or ledges.

Localized in Cumberland County and Kings Co. and in northern Cape Breton.

NF to ON, south to MN and NY.

STATUS: YELLOW-listed.



***Draba glabella* Pursh**
Smooth Draba; drave glabre



Somewhat resembling the previous species, it is best separated in fruit. This species has its fruit straight rather than twisted, and clearly marked with prominent veins. The cauline leaves are rounded at the base.

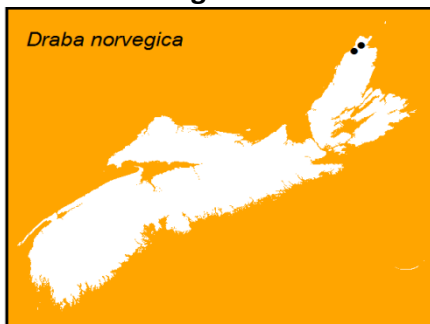
Limited to rock ledges and crevices, talus slopes.

Rare; known from Cape Blomidon and several Cumberland County sites across the Bay. Also in Cape Breton.

Found from NF to AK, south to BC and NY;WY; Eurasia.

STATUS: ORANGE-listed.

***Draba norvegica* Gunnerus**
drave de Norvège



This small species may reach 20cm in height. Cauline leaves present, 1–5 in number. Basal leaves are variably and irregularly pubescent.

Var. *clivicola* (Fern.) Boivin has been reported from Big Southwest Brook based on Smith and Schofield collections in 1952. Var. *norvegica* was collected at Corney Brook first by the Gray Herbarium expedition of the 1920s.

They may be distinguished on the basis of “predominantly branched, appressed trichomes on stems proximally, lanceolate, glabrous fruits, and slender, erect-appressed pedicels. By contrast, var. *norvegica* is said to have

predominantly simple, spreading trichomes on stems proximally, narrowly ovate to elliptical, glabrous or pubescent fruits, and stout, divaricately ascending pedicels. " (Flora of North America Ed. Committee, 2010.)

Flowers June to early August.

Calcareous gravels, ledges and turf.

Locally abundant at Big Southwest Brook and on Big Intervale, both in Inverness Co.

Eastern, NF to NT, south to MN, ON and NS.

STATUS: ORANGE-listed.

***Draba pycnosperma* Fern. & CH Knowlt.**
drave à graines imbriquées



A sprawling plant, it sometimes forms mats to 25cm wide. Basal rosettes are persistent on the plant. Young leaves may be shallowly toothed towards the tip.

Flowers June and July.

Dry limestone ledges.

In NS only known from Lockhart Brook, Salmon River.

Limited to QC, NF and NS

STATUS: ORANGE-listed.

***Draba verna* L.**
(=*Erophilla verna* (L.) Chevall)
Whitlow-grass; drave printanière

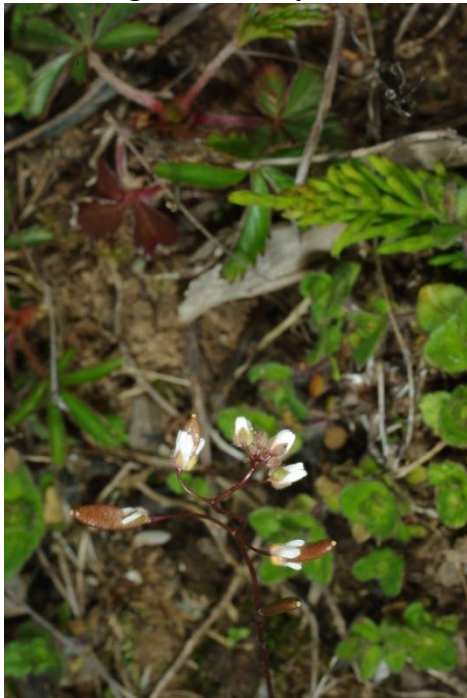


Photo by Martin Thomas

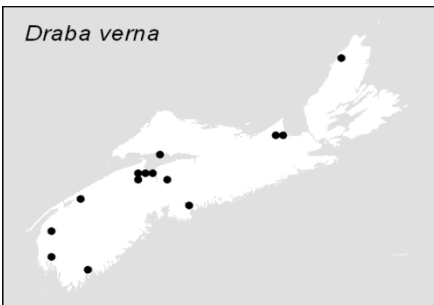
An annual herb, it arises from a compact basal rosette of leaves. Softly pubescent, the hairs are with simple or bifurcate. Petals are cleft to the base. The fruit are small and ovate.

Flowers very early, from March to early June.

Compacted soils as in campgrounds, roadsides, parking lots.

Becoming more common as soils are moved about the province by vehicles.

Distinctly eastern and western: NS to ON, south to GA and AR. Also AB and BC south to CA and UT. Introduced.



***Eruscastrum* C. Presl.**
Dog mustard

Native to the Mediterranean region, the dog mustards number 17 species. Only one is found in Nova Scotia. With but a single vein on the fruit valves, this is its distinguishing character from other mustards.

***Erucastrum gallicum* (Willd.) OE Schulz**
Common Dog-mustard; moutarde des chiens



Photo by Sean Blaney

Leaves are ovate, deeply divided into many lobes. Stems are freely-branching. The cauline leaves reduce in size towards the top of the plant on progressively shorter petioles.

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Flowers from June until frost.

Roadsides, fields, and railroad beds.

Scattered in the Annapolis Valley to Colchester Co.

NF to AK south to FL and CA; sparingly introduced.

***Erysimum* L.**

Another north-temperate genus of herbs with only three known in Nova Scotia. Our plants tend to have densely pubescent leaves, stems and fruits. Petals range in colour from cream to bright yellow. The angular fruits are long and narrow, each valve prominently marked with a midrib. Seeds are borne in a single row. Conspicuous in fruit as the pedicels are at right angles to the peduncle and the erect fruit.

Key to species

A. Annual, common; sepals 2–3.5mm; petals 2.5–5.5mm.

Erysimum cheiranthoides

aa. Perennial, uncommon; sepals and petals exceeding 5.5mm.

B

B. With stellate hairs on upper leaf surfaces.

E. hieraciifolium

bb. Stellate hairs absent; pubescence of 2–3 pronged hairs.

E. inconspicuum

***Erysimum cheiranthoides* L.**
Wormseed Mustard; vélar fausse-giroflée



Photo by Martin Thomas

Softly pubescent on stems that may be branched towards the top of the plant. Lanceolate or elliptic leaves bear shallow teeth along the wavy margins. Flowers are small and bright yellow, arranged in one or more racemes. Erect fruits are 1–2cm long, on slender divergent pedicels.

Flowers from June to September.

Disturbed soils, especially in farmyards and in garden soil.

Very common throughout.

Common throughout the continent after its introduction from Europe.



Photo by Martin Thomas

***Erysimum hieraciifolium* L.**
vélar à feuilles d'épervière

This species is similar to the next but for copious amounts of four-pronged hairs on the leaf surfaces.

Little-known in NS.

Calcareous soil.

A single known locality, at Heatherdale, Victoria Co.

NF to SK, south to KY and IA. European native.

***Erysimum inconspicuum* (S. Wats.) MacM.**
vélar à petites fleurs

An erect, simple-stemmed perennial, it has appressed leaves, with 2–3 pronged hairs on their upper surfaces. Flowers have pale yellow petals.

Summer-flowering.

Dry localities on open soils.

The only collection is at the Gray Herbarium (GH), from Springhill, Cumberland Co.

BC to NS, south to AZ and MD.

***Hesperis* L.**
dame's rocket

There are around 25 species of these Eurasian natives. One commonly planted ornamental has escaped and is thriving as an introduction in Nova Scotia. Robust plants, they are nearly 1m tall, with sweetly fragrant flowers, ranging in colour from white to purple. Sepals are arranged in two whorls. The inner whorl has individuals broad and pouchlike at the base; those of the outer whorl are narrow and crested distally. Fruits are marked faintly; seeds aligned in a single row.

***Hesperis matronalis* L.**
Dame's Rocket; "phlox" — a misnomer; julienne des dames



Photo by David Mazerolle

Coarsely pubescent, the stems are simple, bearing broadly lanceolate leaves on short petioles. Their margins are toothed, the teeth scattered along the edges. Plants rarely found singly, as small colonies form readily. Fruits 5–10cm long, with distinct constrictions between the seeds.

Flowers June and July.

Roadside, waste soils, and invasive in riparian zones.
 Persistent.



Photo by Martin Thomas

Throughout.

NF to AK, south to CA and GA; European.

***Lepidium* L.** **peppergrasses, pepperweeds**

A worldwide genus, it comprises 175 species of annuals or biennials. The minute flowers are crowded in densely packed racemes, erect and often numerous. The flat and round fruits are often winged and bear a narrow septum between the seeds. Leaves are various, linear to elliptic and may be entire or lobed.

Key to species

- A. Racemes carried laterally from the leaf axils; silicles reticulated. *Lepidium didymium*
- aa. Racemes terminal, arising from the tips of the branches; silicles smooth. B
 - B. Cauline leaves sessile, clasping at the base; plant pubescent, with short stiff hairs. *L. campestre*
 - bb. Cauline leaves tapering to the base and not clasping; plant only sparsely pubescent or smooth. C
 - C. Stamens 6; fruits exceeding 5mm in length, on thick erect pedicels; widely winged. *L. sativum*
 - cc. Stamens 2, rarely 4; fruits to 3.5mm long on divergent pedicels. D
 - D. Petals present, to 2mm long, at least as long as the sepals; radicle in seed reflexed along the edges of cotyledons. *L. virginicum*
 - dd. Petals absent or shorter than the sepals; radicle in seed reflexed along flat side of 1 cotyledon. E
 - E. Lower leaves divided with 2 leaflets; upper cauline leaves blunt; fruits without wings, narrowed at the tip. *L. ruderale*
 - ee. Lower leaves coarsely toothed or lobed; upper cauline leaves pointed; fruits round at the tip and winged only slightly, above. *L. densiflorum*

***Lepidium campestre* (L.) R. Br.**
Field Pepperweed; lépidie des champs

Basal leaves are entire, oblanceolate, and carried on long petioles. Cauline leaves are deltate, sagittate at the base. Racemes are several; fruit are borne on stiffly perpendicular pedicels, oblong to ovate. The entire plant is densely pubescent.

Flowers from May to September.

Disturbed and compacted soils.

Scattered throughout the province.

NF to BC, south to CA, NM and FL.

***Lepidium densiflorum* Schrader**
lépidie densiflore



Photo by David Mazerolle

Easily confused with *L. virginicum* and the only certain difference is in the position of the radicle in relation to the cotyledons in the seed. In this species, it lies along the flat surface of a single seedleaf. Stem is 20–50cm in height, branching only at the top. Oblanceolate leaves bear small teeth on the margins; the leaves sharply reduce in size towards the crowded racemes. Fruit is slightly notched at the tip.

Fruiting from June through September throughout its range.

Disturbed areas.

A common weed in the Annapolis Valley, scattered elsewhere in the province.

Introduced to North America, occurring from NS to BC and further south .

Lepidium didymum
 (= *Coronopus didymus* (L.) JE Smith)

Swine-cress; Carpet-cress; corne-de-cerf didyne



Photo by Alain Belliveau



Photo by David Mazerolle

Freely branching from the base, this tangled plant may be prostrate or erect. Leaves are finely pinnate, cleft nearly to the midvein. Flowers are borne in racemes. Fruit bears a notch at the summit, separating the pairs. Flowers and fruits profusely.

Flowers in August.

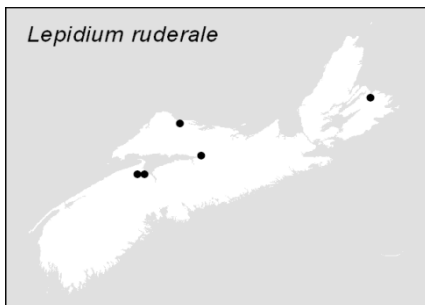
Disturbed or compacted soils, often near the coast.

Especially frequent in Yarmouth and Digby counties, to Halifax and northeastern Cape Breton.

Ranges from NF to ON, south to FL and TX; BC south to NM. Eurasian origin.

***Lepidium ruderale* L.**

Narrow-leaved Pepperweed; lépidie rudérale



Easily separated from other *Lepidium* on the basis of wingless fruit. Lower leaves have two leaflets; upper leaves are linear but rounded at the tip.

Flowers from May to September.

Like others, found in dryish infertile soils as along roads and railbeds.

Long known from Windsor, Pictou and Sydney.

Uncommonly introduced from Europe and thriving from NF to SK, south to LA.

***Lepidium sativum* L.**

Garden Cress; cresson alénois

Leaf segments are very narrow and smooth on the margins. Plant branches only at the top, the branches bearing numerous racemes. Fruits are ovate or elliptic, borne on erect pedicels.

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Flowers from July until September.

A cultivated species that may persist in gardens and adjacent disturbed soils, although not spreading to native habitats. Our collections are from cultivated plants.

Casual escape throughout the continent.

***Lepidium virginicum* L.**

Virginia Pepperweed; lépidie de Virginie



Photo by Martin Thomas

Resembles *L. densiflorum*, but for the radicle's position in relation to the seed leaves. Cross section is required of the seed to confirm the bend in the radicle and its position.

Flowers from May to September.

Light soils where it may become troublesome.

Scattered throughout NS and across Canada. Introduced from Europe.



Photo by Sean Blaney

Nasturtium R. Br.
watercress

A small genus, it has been included with *Rorippa* by various authors. Molecular evidence supports retention of this earlier separation. White obovate petals are subtended by erect sepals, with one pair swollen at the base. Stamens are flanked by glands. Linear fruits are nearly terete. Seeds number several, arranged in two rows. An obligate aquatic genus, it has been introduced for culinary uses.

Nasturtium officinale R. Br.
Watercress; cresson de fontaine



Photo by Sean Blaney

A submersed or partially floating succulent plant, it grows in flowing streams, arising from copious roots. Leaves are pinnate with 3–9 divisions. Slender fruit may be up to 2.5cm long.

Clear flowing streams.

Scattered from Kings Co. to Truro and northern Inverness Co.

Native to Eurasia and widely established in North America.



***Neslia* Desv.**
ball mustard

A small genus with only two species, they are native to the Mediterranean and Middle Eastern region. A single annual species has been introduced to Nova Scotia. Typically *Neslia* species have tiny yellow flowers, subtended by oblong sepals. Fruit is rounded, and the surfaces are pitted. Leaves are sessile and halberd-shaped at the base, clasping the stem.

***Neslia paniculata* (L.) Desv.**
Ball Mustard; neslie paniculée

Erect plants, arising on puberulent stems bearing lanceolate leaves. Leaves have basal pointed lobes and are rugose. Fruits resemble peppercorns, only smaller, with persistent styles.

Flowers June to September.

Grain fields, about railyards and other disturbed sites.

Annapolis Valley, southeastward. Also collected from Truro and in Cape Breton.

Ranges across Canada to AK and south to OR, MO and NJ. May have been introduced here in western grain. Native to Europe.

***Raphanus* L.**

A Mediterranean genus totalling a mere three species. Flowers have large yellow petals, fading to white with age, subtended by blunt, erect sepals. Fruit are elongated, divided horizontally into an upper fertile segment and a lower seedless, abortive segment. As many as 10 large seeds are produced, separated by septa.

Raphanus raphanistrum* L.*Wild Radish; radis sauvage**

Photo by Alain Belliveau



Photo by Martin Thomas

Plants may be hirsute or smooth, branched or unbranched and with variably shaped leaves. Commonly the leaf outline is obovate, with several lobes at the base, cleft nearly to the midvein. Flowers borne in small corymbs. Similar to *Sinapsis*, but that species has darker yellow flowers, unmarked by purple nectar guides found on *Raphanus* flowers. Sepals are erect. The fruit of *Raphanus* are transversely divided, with constrictions between the seeds.

Flowers June to October.

Weedy in disturbed soils and on shorelines and beaches.

Common throughout, although sometimes controlled in agricultural areas as it becomes troublesome on croplands.

Across the continent; Greenland. Introduction.

***Rorippa* Scop.
yellowcresses**

Cresses number about 80 species of cosmopolitan herbs. They may be annual or perennial in growth form. Some species are pubescent, many are not. Flowers have the petals white or yellow, barely exceeding the sepals in length. Fruit are slender or globose, with short persistent styles. Valves are thin, marked by a faint midrib. Seeds may be arranged in one or two rows within the locules.

Key to species

Perennial; petals exceeding sepals in length.

Rorippa sylvestris

Annual, sometimes biennial, with taproots; petals of equal length to sepals.

R. palustris

***Rorippa palustris* (L.) Besser**
Rorippe des marais



Photo by Sean Blaney

Petiolate leaves, the petioles are winged. Leaves are irregularly toothed and lobed, the larger upper ones ovate or oblong, rounded at the tip. Stems are sparsely hispid towards the base of the plant. Fruits globose, 3–8mm long. Three subspecies are present in Nova Scotia.

Typical ssp. *palustris* has all leaves pinnate or pinnatifid, while ssp. *hispida* (Desv.) Jonsell has the upper leaves simply toothed. It differs from the next subspecies by having hirsute leaves and the stem hispid. Ssp. *fernaldiana* (Butters & Abbe) Jonsell is similar but with the leaves smooth on the lower surfaces and the stems smooth below or just hispid.

Flowers from July until September.

Wet ditches, streamsides, fields and disturbed soils elsewhere.

Uncommon or local from Kings and Cumberland Cos. to Cape Breton.

Partly naturalized or adventive from Europe.

***Rorippa sylvestris* (L.) Besser**
Creeping Yellowcress ; rorippe sylvestre



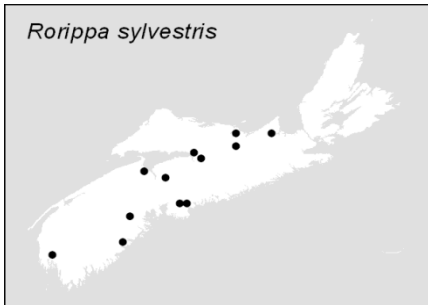
Photo by Sean Blaney

Freely branching from the base, this species, may reach 50cm in height. Leaves are pinnate, with many divisions, cleft nearly to the middle, toothed on the margins. Flowers are borne in short racemes. Fruits are less than 1cm long, carried perpendicular to the stems.

Flowers in July and August.

Frequents meadows, streamsides, roadsides, often a nuisance weed.

Queens County to Truro, Colchester Co.



NF, NS, south to NC, LA and CA. Introduced.

Sinapis L.

Numbering seven Mediterranean species, two have inadvertently reached Nova Scotia. Both have stems marked with stiff retrorsely pointing hairs. While *Sinapis arvensis* (Charlock) is commonly found on disturbed soil about fields, orchards and ports throughout the province, *Sinapis alba* (White Mustard) is only reported from Morrystown. Sinapsis may be distinguished from other mustards by the presence of a single seed in the angular beak of the silique.

Sisymbrium L.

Freely branching annual weeds, they produce small yellow flowers and long, slender fruit. Worldwide, there are about 90 species.

Key to species

Leaves coarsely pinnatifid, lobes wide; fruits 1–2cm on pedicels 1–3mm long, closely appressed.

Sisymbrium officinale

Leaves finely divided into linear lobes; fruits 5-10cm on ascending pedicels.

S. altissimum

***Sisymbrium altissimum* L.**
Tumble Mustard; sisymbre élevé



Photo by Martin Thomas

A much taller plant, it may reach 1 m, taller than the next and more diffuse. Leaves are pinnatifid, the leaflets strictly linear. Fruit is very long and slender, barely exceeding width of pedicels, to 10cm long.

Flowers during July and August.

Frequents fields, roadsides and ditches on light soils.

Common around settlements throughout, especially so in the Annapolis Valley.

One of our most common weeds and brought eastward with western grains. Throughout the continent.



Photo by Martin Thomas

***Sisymbrium officinale* (L.) Scop.**
Hedge Mustard; sisymbre officinal



Leaves are deeply cleft, the lobes broader than linear. Lower leaves are long-petiolate. Leaf divisions are deeply toothed. Plants may be puberulent or smooth.

Flowers from early summer through October.

Light, disturbed soils.

Common throughout.

Photo by Martin Thomas



Photo by Martin Thomas

Widespread and native to Eurasia.

***Subularia* L.**

Awlwort

Only two species comprise the genus, one native to Africa and one native to North America. Small plants, they have a basal rosette of spatulate or linear leaves. Racemes with few flowers, petals white. Within the calyx is a row of glands, circling the ovary.

***Subularia aquatica* L.**

Awlwort



Photo by Sean Blaney

Leaves are stiffly erect, arising from the base. They are awlshaped and circular in cross-section. Several racemes bear a few minute white flowers.

Flowers from July until October.

Submerged aquatic, on gravelly substrates of slow-moving streams or lakes. Mat-forming.

Most common in southern NS, scattered elsewhere.

Found from Greenland to AK, south to northern NY and CA; Eurasia.

***Thlaspi* L.**

Pennycress

Eurasian in origin, of the 75 species only one is found in NS to date. Ours has flowers with white ovate petals, tapering towards attachment. Sepals are erect. Fruit is globose and compressed to the septum, seemingly swollen over the seeds. They are strongly keeled or winged on the margins. Each locule produces at least four seeds. Plant is smooth.

***Thlaspi arvense* L.**

Stinkweed; Pennycress; tabouret des champs



Photo by Sean Blaney

Noticeable strong odour exudes from the entire plant. An annual, the stems arise from a tight rosette at flowering, reaching a height of 80cm. Leaves are glabrous, mostly entire or slightly toothed. Lowermost leaves are quickly deciduous. Cauline leaves auriculate, clasping the stem. Raceme is terminal, bearing white flowers. Capsules are orange or yellow at maturity, borne on slender arcuate pedicels. Capsules are deeply notched distally. Two locules, each produce 5–8 seeds.

Flowers July to September.

Frequently seen as individual plants in disturbed soils as on roadsides, ditches and fallow fields.

Scattered throughout the arable land base of the province.

Introduced with western grain. Widely distributed throughout the province and the continent. Eurasian.



Photo by Martin Thomas

***Turritis* L.**

tower-mustards

Historically included in the genus *Arabis*, this genus of two species is segregated on the basis of base chromosome numbers and fruit or trichome morphology, rather than the leaf and flower characters. Nova Scotia hosts a single species.

***Turritis glabra* (L.) Bernh.
(=*Arabis glabra* (L.) Bernh.)
Tower-mustard; arabelle glabre**

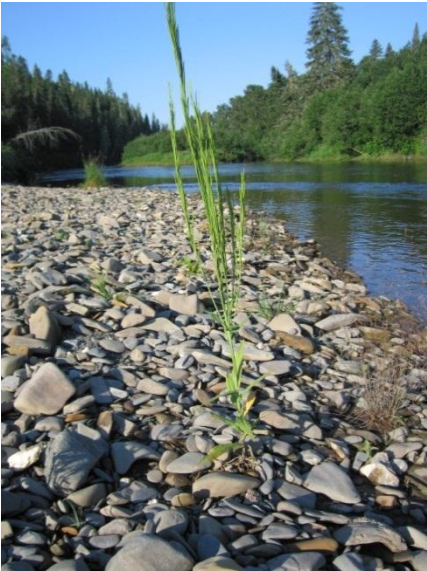


Photo by Sean Blaney

A tall species, its height stretches to 1.5m. It is often pubescent at the base of the stem, which is smooth and glaucous above. Lower leaves may also be hirsute. They overlap at the base along the stem, becoming more distant towards the top.

Flowers in May and June.

Usually on drier sites.

Located in Lunenburg Co., the Forties.; very recently found on gravel of Tupper Brook Trail, a former railroad bed, Coldbrook, Kings Co.

Circumboreal, south to NJ, NM and CA.



Photo by David Mazerolle

