Key to genera

1a. Plants aquatic ........................................... Nasturtium

1b. Plants terrestrial:

2a. Plants scapigerous:

3a. Seeds usually winged .............................. Parrya

3b. Seeds not winged:

4a. Petals 2-fid ............................................. Brachyphyllum

4b. Petals entire:

5a. Flowers solitary on each scape ........... Brachyphyllum

5b. Flowers more than one on each scape:

6a. Seeds 1-seriate ................................. Pycnoplinthus

6b. Seeds 2-seriate:

7a. Pods teretely grooved, torulose, bilocular, septate ....................... Arcyosperma

7b. Pods not as above .......................... Brya

2b. Plants non-scapigerous:

8a. Pods with white, shining septum ........ Lunaria

8b. Pods without shining septum:

9a. Pods with two horns at apex ............. Notoceros

9b. Pods without horns:

10a. Pods with winged valves:

11a. Pods dehiscent:

12a. Flowers zygomorphic ....................... Iberis

12b. Flowers actinomorphic:

13a. Style long, persistent, subulate; seeds many .......... Schouwia
13. Style very short; seeds few:
14. Seeds solitary in each cell of the pod ................. Lepidium
14. Seeds usually 2(–4) in each cell of the pod .......... Thlaspi

11. Pods indehiscent:
15. Shrubs ........................................ Dipterygium
15. Herbs or undershrubs:
16. Pods didymous .............................. Megacarpaen
16. Pods not didymous:
17. Pods 1-celled ......................... Isatis
17. Pods 2-celled .............................. Tauscheria

10. Pods without winged valves:
18. Cauline leaves deeply 2-3-pinnatisect:
19. Seeds reniform ............................. Coronopus
19. Seeds not reniform .......................... Descurainia

18. Cauline leaves simple or lobed:
20. Seeds broadly winged:
21. Stigma short, not lobed ............... Farsetia
21. Stigma distinctly 2-lobed, lobes with horned projections on dorsal side ................. Matthiola

20. Seeds not winged (rarely very narrowly winged in Moricandia):
22. Pods distinctly beaked:
23. Pods indehiscent:

24. Pods tetragonal .................. *Goldbachia*

24. Pods not tetragonal:

25. Beak subulate, oblique, stout, mucronate ............ *Euclidium*

25. Beak not as above:

26. Pods few-seeded, constricted between seeds ....... *Raphanus*

26. Pods many-seeded, not constricted between seeds. *Chorispora*

23. Pods dehiscent:

27. Seeds 2-seriate:

28. Pods ovoid-oblong; valves concave; beak long, ensiform .................. *Brassica*

28. Pods linear; valves not concave; beak short, not ensiform .................. *Diplotaxis*

27. Seeds 1-seriate (if 2-seriate, seeds narrowly winged):

29. Median nectariferous glands usually present and large, lateral ones subcubiform or bilobed; pods with articulate style:

30. Valves of the pod 1-nerved; lateral nerves distinct .................. *Brassica*
30. Valves of the pod 3-7-nerved; lateral nerves indistinct ............. **Sinapis**

29. Median nectariferous glands usually absent or if present small, lateral ones semi-circular; pods without articulate style:

31. Seeds distinctly granular. **Corningia**

31. Seeds minutely alveolate:

32. Inner sepals saccate; petals broad; pod compressed; ovary 40-200-ovulate ............. **Nericandia**

32. Inner sepals not saccate, petals narrow; pod terete, furrowed; ovary 20-30-ovulate ............. **Douepia**

22. Pods not distinctly beaked:

33. Valves of the pod gibbous at back, with a double crest ........ **Delophia**

33. Valves of the pod not as above:

34. Stigma 2-lobed; lobes connate or spreading:

35. Stigmatic lobes connate ..... **Malcolmia**

35. Stigmatic lobes spreading ... **Cheiranthus**
34. Stigma simple, if 2-lobed lobes not connate or spreading:
36. Pods 2-jointed, upper joint globose, 1-seeded; lower sterile, tapering into a stalk .................. Crambe
36. Pods not jointed:
37. Herbs 4-7 cm tall ........ Atelanthera
37. Herbs more than 7 cm tall:
38. Pods 4 times as long as broad:
39. Seeds mucilaginous .... Arabidopsis
39. Seeds non-mucilaginous:
40. Seeds large, longitudinally striate; basal leaves + cordate:
41. Valves of the pod trinerved; septum foveolate ........ Alliaria
41. Valves of the pod uninerved; septum fenestrate ........ Antrema
40. Seeds minute, granulato or reticulate; basal leaves not cordate:
52. Nectariferous glands confluent:
43. Pods elongate, linear: 
44. Stigma conspicuous, 
  - bifid ................. Sisymbrium  
44. Stigma minute, 
  - depressed ............... Microsia  
45. Pods short, broad ........ Aphragmus 
42. Nectariferous glands not confluent ................. Terularia 

38. Pods 2-3 times as long as broad: 
43. Pods 2-celled; valves 
  - keeled ..................... Iberidella 
45. Pods many-celled; valves 
  - not keeled:  
46. Seeds 2-seriate: 
47. Pods pubescent ............ Christolea 
47. Pods glabrous ............. Rorippa 
46. Seeds 1-seriate:  
48. Pods 4-angled: 
49. Valves 1-nerved, 
  - glabrous .................... Barbea 
49. Valves 3-nerved, thickly hairy .................. Erysimum 
48. Pods not 4-angled:  
50. Cauline leaves lobed or pinnatifid ............ Cardamine  
50. Cauline leaves entire or toothed: 
51. Pods spreading from
the axis, not crowded... *Arabis*

51. Pods appressed to
the axis, crowded... *Turritis*

58. Pods nearly as long as broad;

52. Stem unbranched:

53. Filaments with broad
appendages ................. *Lepidostemon*

53. Filaments without broad
appendages .................... *Loxostemon*

52. Stem branched:

54. Pods usually triangular-
    obcordate ..................... *Capsella*

54. Pods not as above:

55. Seeds many and 2-seriate:

56. Pods ovoid; valves
    convex, swollen ............ *Cochlearia*

56. Pods elliptic-oblong;
    valves more or less
    flat  ....................... *Draba*

55. Seeds few, 1-8 in each
    pod:

57. Seeds solitary in each
    cell; fruiting style
    long  ....................... *Meslia*

57. Seeds more than one in
    each cell; fruiting
    style very short:
58. Pods swollen in the middle; valves concave in the centre and flat at the margins. *Alyssum*

58. Pods suborbicular; valves slightly inflated ............. *Lobularia*
Annual or biennial, erect herbs, covered with simple hairs. Leaves simple, petiolate, dentate, basal ones undivided. Flowers small, white, pedicellate. Sepals erecto-patent, equal at base, outer ones oblong-obtuse, inner ones oblong-ovate, trinerved. Petals white, obovate, limbs contracted. Stamens 6; filaments linear; anthers obtuse. Pistil cylindrical, sessile; ovary 4-16-ovuled; style short; stigma subcapitate, rarely bilobed. Silica linear or tetragonal, patent or erecto-patent; valves 3-veined with prominent mid-vein. Seeds 1-seriate, large 0.3-0.35 cm long, oblong; testa with longitudinal striations.


*Sisymbrium alliaria* Scop. Fl. Carn.
Brect, annual, branched herbs; stem flat, angular, sparsely hairy below and glabrous above. Leaves radical and cauline; radical ones 7-11 x 3.5-4.5 cm, ovate-reniform, glabrous, toothed; petioles 5-8 cm long, slender, hairy; cauline ones 4-6 x 1-3.5 cm, ovate to oblong-ovate, dentate, glabrous, lower entire, upper lobed, lobes acute; petioles 1-2 cm long, slender. Flowers small, 0.3-0.35 cm across, yellowish-white, in lax racemes; pedicels 0.1-0.2 cm long.

Sepals 0.1-0.2 cm long, equal at base. Petals 0.3-0.35 cm long, yellowish-white, shortly clawed. Stamens free; filaments simple. Ovary 0.2-0.3 cm long, cylindric, linear, glabrous; Style short; stigma erect, subcapitate. Pods 2-5.5 cm long, spreading, cylindrical, straight, with fine hairs. Fl. & Fr. : March to May.

Eng. name : Garlic mustard; Hedge mustard.

Found in Himalayas from J. & K. to Kumaon, altitude 1500-3000 m.

Chromosome no. 2n=36, 32 (Ball in Fl. Europ. 1:267, 1964).

It is eaten as a salad (and mixed with other herbs). The seeds are reported to be diuretic, diaphoretic, expectorant, stimulant, antiscorbutic and vermifuge. The herb yields garlic-scented essential oil (See Wealth of India).
ALYSSUM Tourn. ex Linn.

Annual or biennial herbs or small undershrubs, branched with simple or stellate hairs. Leaves linear, entire or incised. Flowers small, yellow or white, in bractless racemes or corymbose racemes. Sepals short, erect or spreading, equal at base. Petals yellow or yellowish-white, small,
obcordate, shortly clawed, entire or bifid. All or some filaments toothed or appendaged. Pistil sessile, flask-shaped; ovary 2-16-ovuled; style persistent, small. Pod round, orbicular-elliptic, ovate, obovate or oblong, turgid, swollen in the middle; valves concave in the centre and flat at the margins. Seeds 1-2 in each loculus, often winged or margined.

India, Pakistan, Iran, Afghanistan and Europe.


Small, erect, annual, hairy herbs; stem slender, leafy, branched, covered with stellate hairs; branches 4-5 cm long, spreading from base. Leaves 0.5-1.5 x 0.1-0.4 cm, simple, linear-lanceolate, entire, pubescent, sessile, acute at apex. Flowers small, 0.2-0.3 cm across, yellowish-white, in terminal, 1-1.5 cm long racemes. Sepals 0.2 cm long, erect, blunt, green, covered with hairs, inner one saccate at base. Petals 0.2-0.3 cm long, obcordate, slightly clawed.
Pistil sessile, flask-shaped. Ovary 0.15-0.2 cm long, many ovuled; style persistent, small. Pods 0.3-0.5 x 0.25-0.4 cm, ovoid, globose, flat; valves convex in the centre, flat on margin, stalked, glabrous. Seeds ± 0.1 cm long, 3 in each fruit, reddish, glabrous, smooth, broadly-ovate; testa reticulately pitted. Fl. & Fr.: March to April.

J. & K., BIHAR and W.B.; cultivated in gardens in the cold season, but occasionally coming up spontaneously on rubbish-heaps towards the end of rains.

Ornamental plant.

APHRAHNMUS Andrè apud DC.


Dwarf, perennials, glabrous, rarely pubescent, leafless in basal and median regions. Leaves simple, carnose, glabrous, upper ones congested, subflower bearing, ultimately culminating into an involucre. Flowers minute, in shortened racemes. Sepals erecto-patent, caducous, subequal at base with hyaline margins, outer oblong, laterals ovate. Petals white or lilac, obtuse, few-nerved. Stamens 6; filaments slender; anthers cordate-obtuse. Ovary oblong-ovoid, 6-12-
ovulate; style short; stigma depressed-capitate. Pods oblong or ellipsoid, subcompressed, two-celled; valves medially 1-nerved. Seeds 2-seriate, ovoid or subglobose.


Herbs. Leaves linear, entire; carnose; radical ones 1-2 x 0.1-0.15 cm, tapering at base into narrow petiole; cauline ones 0.4-0.6 cm long, uppermost bractiform. Flowers few, in racemes; pedicels 0.2-0.4 cm long. Sepals 0.25 cm long. Petals 0.4-0.45 cm long, more or less obovate, contracted towards base in a short claw. Pods 0.6-0.8 cm long, oblong-ellipsoid, erecto-patent on 0.6 cm long pedicels. Fl.: June.

Tibet at an elevation of 4700 m.

**ARABIDOPSIS** Heynh.

Slender, annual, biennial or perennial herbs, erect, hairy or glabrous; hairs branched or unbranched. Leaves entire to pinnatifid, long petioled in basal part of stem, upper ones entire, dentate or lyrato-pinnatifid or sagittato-amplexicaul. Flowers white, yellow, purple or rose-coloured, small or median sized in bracteate racemes. Sepals erecto-patent, oblong, obtuse, subequal, lateral ones not or slightly saccate. Petals obovate-cuneate or spatulate, rounded or truncate at apex, longer than sepals, sometimes absent. Stamens 6, rarely 5 or 4, suberect; filaments thin; anthers linear, oblong or ovate. Lateral honey glands annular or subannular, rarely sub-globose, median honey glands knobbed, often curved, adnate to the laterals. Pistil sessile; ovary 20-72 ovulate; style short, thick; stigma thick, depressed-capitate, rarely 2-lobed. Pod linear-terete or compressed or not; valves 1-nerved, distinctly reticulate. Seeds small; 1-(2-) seriate, ovoid or globose, glabrous.

India, Afghanistan, and Western Europe.

1. Cauline leaves cuneate at base, sessile
   or shortly petiolate:

2. Stem in upper parts glabrescent;
   cauline leaves simple .................. A. thaliana
2. Stem and sepals stellately pubescent, canescent; cauline leaves pinnatifid. *A. wallichii*

1. Cauline leaves sagittately amplexicaul or broad at base, sessile:

3. Sepals 0.125-0.2 cm long; petals 0.22-0.3 cm long, yellow; pods obtuse at apex; seeds 0.075 cm long, plants annuals, rarely biennials

4. Sepals 0.22-0.25 cm long; petals 0.3-0.4 cm long, white or lilac; seeds 0.05-0.075 cm long; plants biennials or perennials:

4. Racemes ebracteate or only bracteate in the lower part:

5. Pods glabrous:

6. Cauline leaves sagittately amplexicaul at base

6. Cauline leaves not as above

5. Pods densely pubescent

4. Racemes bracteate

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1. Flowers rose-coloured; pods 1.2-2.7 cm long:

2. Pods substellate ....................... var. kunawurensis

2. Pods not as above ....................... var. himalaica

1. Flowers white; pods 2.5-4 cm long.... var. rupestris

 Erect, rigid, biennial, hairy herbs, with numerous, spreading or ascending branches. Leaves radical and cauline, radical ones 1.2-3.5 x 0.6-1.2 cm, petioled, obovate-oblong, pubescent, dentate, cauline ones 0.8-1.4 x 0.3-0.7 cm, oblong, almost entire, pubescent, obtuse and auricled at base. Flowers 0.4-0.5 cm across, white, pedicellate, in bracteate racemes; pedicels 0.3-0.5 cm long, slender. Sepals 0.25-0.3 cm long, erecto-patent, oblong, obtuse. Petals 0.4-0.5 cm long, slightly clawed. Stamens 6; filaments slender; anthers linear. Ovary 0.3-0.4 cm long, 20-72 ovulate; style short; stigma subcapitate. Pods 2.5-4 cm long, terete, straight, linear; valves striate; pedicels 0.4-0.6 cm long, stout, spreading. Seeds 1-seriate, 0.1 cm across, ellipsoid, ovoid or nearly globose, reddish-brown.

var. himalaica forma himalaica

Tibet, southeast SIK. (Ningbil) Kumaon and Garhwal, altitude 3600-4300 m. Fl. & Fr. July.

var. himalaica forma denticulata O.B. Schulz, in Pfreich, 861284. 1924.
This form differs from the typical form in having lower leaves subentire, upper leaves distinctly denticulate and racemes few flowered. Fl. : May.


N.W. India (Royle) and Kutti Yangti valley, 3600-3900 m. Fl. & Fr. : July.


Stem erect, slender, simple or branched, stellately hispido-tomentellus. Leaves small, sinuate-dentate, radical and cauline, radical ones 1-2.5 x 0.4-0.8 cm, obovate-spathulate, very shortly petiolate, cauline ones 0.6-1.2 x 0.2-0.5 cm, obovate-oblong, sessile. Flowers small, lilac, shortly pedicellate. Siliqua small, terete, erect, 1-1.25 cm long, densely stellate or furcate, pubescent; style very small. Fl. & Fr.: July to September.

Eastern Himalaya-Tibet.


1. Leaves cordate-sagittate ..........  var. thomsonii
1. Leaves not as above:

2. Whole plant subglabrous; stem violet;
   leaves subentire .....................  var. glaberrima
2. Plants and stem not as above; leaves
   distinctly prominently dentate...  var. dentata

Perennials, floccosely hairy. Leaves radical and cauline, subglabrous or densely substellately hairy, radical
ones rosette, 2.5-5 cm long, spatulate or oblong, subentire, rarely dentate or runcinato-dentate and narrowly tapering at base into petiole, cauline ones small, narrowly lanceolate, acute, profoundly sagittate at base, auricles amplexicauled. Flowers white or pale-yellow (rose-coloured in Indian varieties) on filiform pedicels, 20-40, in dense racemes, before anthesis, later on, laxly elongate. Sepals suberect, subequal, oblong, obtuse at apex. Petals narrowly spatulate, 0.3-0.4 cm long. Ovary glabrous, 5-8-ovulate; style small, thin. Siliquae erecto-patent, linear 2.8-4 cm long; valves prominently keeled, 1-nerved. Seeds 1-seriate.

var. dentata. O. E. Schulz in Pfreich. 86:281. 1924.
West Tibet, altitude 3000 to 3300 m.

West Tibet, altitude 3000-3300 m.


Siliqua 2.5-4 x 0.5-0.7 cm, narrowly linear, prolonged into 0.05 cm long, attenuate style. Seeds ellipsoid, brown;
Fl. : August.

On moist soil slopes, J. & K., altitude 3000-4500 m and in Deosai Baltistan.


Suberect or decumbent, herbaceous, much branched, annual herbs, with scattered, stellate hairs. Leaves radical and cauline, radical ones soon withering, spatulate, shortly petiolated, cauline ones 2.5-6.3 cm long, oblong-obovate, sessile, auricles long sagittate, stem-clasping, coarsely toothed. Flowers small, white, ebracteate; pedicels 0.6-0.7 cm long, slender, usually spreading sometimes ascending or deflexed. Sepals 0.15-0.2 cm long. Petals 0.22-0.3 cm long, yellow. Pods 2-3.4 x 0.12-0.15 cm, spreading, ascending or the lower sometimes deflexed, straight or curved, obtuse; with a few stellate hairs; valves thin, flattened, straight. Seeds small, 1-seriate, glabrous, 0.075 cm long, Fl. & Fr. : March to May.
J. & K., altitude, 1600-2300 m (Thomson, T.)


Stem erect, 0.3-0.5 m tall, simple, hairy; hairs simple, forked or sub-stellate, mixed. Leaves cauline, densely sub-stellate, lower ones spathulate, obtuse, denticulate towards apex, narrowly cuneate at base, upper ones linear, obscurely dentate or entire, sessile. Flowers rose-coloured, in ebracteate racemes; bracts linear, minute. Pods slender, 2-4 x 0.5-0.75 cm. Fl. & Fr.: June to July.

J. & K., SIK. and West Tibet (Hassora), altitude 1600-3600 m.


Erect, slender, branched, annual or biennial herbs, 10-45 cm tall; stem hispid, with spreading simple hairs, upper part glabrescent. Leaves radical and cauline, pubescent, entire; radical ones in rosettes, 2.5-7.5 cm long, obovate-spathulate, petiolate; cauline ones simple 1-2.2 x 0.5-1 cm, sessile, oblong. Flowers 0.3-0.4 cm across, white, pedicellate, in racemes; pedicels 0.2-0.4 cm long, slender, spreading. Sepals 0.2-0.3 cm long, oblong, obtuse. Petals 0.3-0.4 cm long, hardly clawed. Stamens 6; filaments linear; anthers oblong. Ovary many-ovuled, 0.2-0.3 cm long; style short; stigma subcapitate. Pods 1.5-2.8 x 0.05-0.1 cm, linear, subcompressed, glabrous; valves convex, thinly reticulately veined. Seeds many, ± 0.1 cm across, flattened, ovate-globose, pale-brown, densely and minutely granular. Fl. & Fr. : March to May.

ENG. Name : Thale-Cress.
A common cold-weather annual, found in Upper India and Himalayas from J. & K. to Bhutan up to an altitude of 3300 m.

Chromosome no. 2n=10 (Ball, in Fl. Europ. 1:267, 1964).

The herb is used for the treatment of sores in the mouth. Seeds contain protein and fatty oil (See Wealth of India).

Arabidopsis wallichii (Hook. f. & Thoms.) Busch, in Fl.


Erect, perennial, hairy, branched herbs; hairs simple, forked or stellate. Leaves radical and cauline, hairy, pinnatifid-pinnati-partite with large terminal lobes; radical ones 2-6 cm long, crowded, 0.5-1.2 cm long, petiolate, spreading, petioles cauline ones few, 1-2.5 cm long, linear. Flowers 0.4-0.5 cm across, yellow, pedicellate, in racemes; pedicels 1-1.5 cm long, spreading in fruit. Sepals 0.2-0.3 cm long, oblong, obtuse, pubescent. Petals 0.4-0.5 cm long, slightly clawed. Stamens 6; filaments thin; anthers linear. Ovary 0.3-0.5 cm long, many-ovulate; style
short; stigma subcapitate. Pods 4-7.5 cm long, spreading, curved, linear, glabrous; valves slightly convex, with prominent mid-rib. Seeds 1-seriate, many, 0.1 cm across ovoid or globose, reddish-brown, glabrous. Fl. & Fr. March-April.

J. & K., altitude 1600-2000 m; common in cultivated fields.

ARABIS Linn.


Annual, biennial or perennial herbs; stem often simple, covered with simple, branched or stellate hairs. Radical leaves in rosette, spatulate, more or less petiolated; cauline leaves sessile, entire or toothed, often amplexicaul, auriculate, sometimes small. Flowers white, yellow, lilac or rose-coloured, in ebracteate racemes. Sepals short, erect, lateral saccate. Petals clawed and veined. Stamens 6; filaments linear; anthers long, blunt. Ovary linear, sessile or shortly stipitate, many ovulated; style very short; stigma flat, hardly bilobed. Pod long, slender, linear or flat, compressed; valves smooth, flat, keeled or ribbed; septum linear, membranous. Seeds ovoid or orbicular, compressed, wingless, usually 1-seriate rarely sub 2-seriate.

India, Asia, Australia, Afghanistan, Western Asia, Europe and North America.

1. Leaves only radical ...................... A. nuda

1. Leaves radical and cauline:

2. Cauline leaves auricled at base,
   basal lobes amplexicaul; pods horizontal ......................... A. amplexicaulis

2. Cauline leaves not auricled or amplexicaul at base; pods erect:

3. Flowers 0.5-0.6 cm across ............ A. alpina

3. Flowers 0.2-0.3 cm across:
4. Pods straight:
   5. Style 0.6 cm long .......... A. taraxacifolia
   5. Style absent; stigma sessile .... A. auriculata

4. Pods falcate: .................................. A. tibetica

   Nat. 2:16, 1821 & Prodr. 1:142. 1824; Hook. f. & Thoms. in
   Journ. Linn. Soc. 5:141. 1861; Baker in Oliver, Fl. Trop.
   India 1:135. 1872; Bamber, Fl. Punjab 1:409. 1916; Collett.
   Fl. Simiensis 31. 1921; Bailey, Man. Cult. Fl. 447. 1948;
   1851.

Erect, profusely branched herbs; stem slender, green,
   terete, pubescent. Radical leaves 3-8 x 0.8-2 cm, spreading,
   oblong, petiolate, pubescent, obtuse, margin toothed;
   petioles 1-2 cm long, thick, hairy. Cauline leaves 0.8-2 x
   0.2-1.2 cm, amplexicaul, auricled at base, oblong-obovate,
   pubescent, toothed, obtuse. Flowers 0.3-0.6 across, yellow,
   on 0.3-0.5 cm long, slender, pedicellate. Sepals 0.3-0.5
   cm long, glabrous, erect, oblong, acute. Petals 0.4-0.6 cm
   long, spatulate, white, clawed. Filaments linear; anthers
   blunt, long. Ovary 0.3-0.5 cm long, cylindric, many ovuled,
   glabrous; style short; stigma bilobed. Pods 1.4-7 x 0.05-0.1
   cm, narrow, linear, erect, beakless, acute. Seeds 1-seriate,
Mountain rock-cress.

Eastern Himalayas, PUNJAB, SIK and Western Himalayas from Kumaon to Murrie elevation of 7,000-12000 m.

Chromosome no. 2n=16, 32 (Jones in Fl. Europ. 1:294. 1964).


Small, erect, annual, glabrous herbs; stem slender, flattened, angular, green, hispid towards base, glabrous in upper parts. Leaves radical and cauline, pubescent, coarsely toothed, 0.5-1.5 cm long, hairy, petiolate, radical ones 2.5-7 x 0.2-2 cm, spathulate, rosulate. Cauline ones 0.8-5.5 x 0.2-2 cm, oblong-obovate, amplexicaul, auricled at base. Flowers 0.5-0.6 cm across, yellow, fascicled, in terminal racemes; pedicels 0.4-0.5 cm long, slender, ascending. Sepals 0.4-0.5 cm long, green, glabrous, erect, acute. Petals 0.3-0.6 cm long, clawed, veined. Ovary 0.5-0.6 cm long, linear, many ovuled, glabrous; style short; stigma bilobed. Pods 1-3.8 x 0.1-0.15 cm, narrowly linear,
on 0.8-1.2 cm long pedicels, drooping, glabrous, with distinct median vein. Seeds 1-seriate, ± 0.15 cm, many, reddish, glabrous, ovate-oblong, rugosely reticulately pitted. Fl. & Fr.: April to June.

Western Himalayas J. & K. & PUNJAB, altitude 6500-10,000 m; rare.


Erect, annual herbs; stem slender, angular, simple or branched, covered with stellate hairs. Leaves radical and cauline, radical ones 5-8.5 x 1.1-2.5 cm, spreading, petiolated, ovate-oblong, obtuse, pubescent, cauline ones 1-5 x 0.1-0.2 cm, ovate-oblong, obtuse, toothed, sessile, basal lobes apiculate. Flowers white, 0.4-0.5 cm across, pedicellate, in elongated racemes. Sepals 0.3-0.4 cm long, erect, obovate, lateral saccate at base. Petals white, 0.4-0.5 cm long, linear, sessile, glabrous, many ovuled; style short; stigma flat, more or less bilobed. Pods 1-3.5 x 0.1-0.15 cm, shortly stalked, narrow, straight, slender, glabrous, valves nerveless. Seeds 1-seriate, ± 0.1 cm, ovate-globose, reddish, many, testa reticulately pitted. Fl. & Fr.: April to June.

Small, erect, slender, hairy herbs. Leaves only radical, 0.4-1.2 x 0.2-0.6 cm in rosettes, hairy, obovate-oblong, toothed, obtuse, shortly petiolate. Scapes 4-6 cm long, several, erect, rigid, scarcely hairy at base, slender. Flowers 0.2-0.25 cm across, yellow, pedicellate in racemes. Sepals 0.1-0.15 cm long, green, equal at base, glabrous. Petals 0.2-0.25 cm long, yellow, slightly clawed. Ovary 0.1-0.15 cm long, linear, glabrous, many ovuled; style short; stigma bilobed. Pods 1-3.2 cm long, linear-lanceolate, green, tapering at both ends, much flattened; valves veined with prominent mid-vein; pedicels 0.1-0.2 cm long, thick, slender. Seeds ± 0.1 cm, 1-seriate, reddish, elliptic, not margined; testa reticulately pitted. Fl. & Fr. : March to May.

J. & 'K., PUNJAB, altitude 1800-1900 m.; very rare.

In general look it resembles *Brophiila verna* (L.) Chevall. ex Garcke, but differs from the later by its entire petals and linear-lanceolate, flattened, 1-seriate pods.

Annual, erect, slender, simple or branched herbs, hispid below, glabrous above. Leaves radical and cauline, radical ones 2-3.5 cm long, rough, hairy, lyrately pinnatifid, terminal lobe larger, entire, toothed, lateral ones short narrow, entire, obtuse; 1-1.5 cm long on petioles, cauline ones 0.5-2.3 x 0.1-0.4 cm, few, sessile, oblong-lanceolate, lobed, entire, hispid. Flowers few, 0.3-0.4 cm across, light yellow, pedicellate, in racemes; pedicels 0.3-0.4 cm long, slender. Sepals 0.2-0.25 cm long, glabrous, erect, lateral sepals saccate. Petals 0.3-0.4 cm long, slightly clawed, distinctly nerved. Filaments linear; anthers long, blunt. Ovary cylindrical, 0.3-0.4 cm long, glabrous, many ovulate; style short; stigma capitate. Pods 1.3-5.5 cm long, narrowly linear, erect, spreading, glabrous, stalked; style 0.15-0.2 cm long, acute; stalk 0.5-1 cm long, slender, glabrous. Seeds ± 0.1 cm across, 1-seriate, many, reddish, ovate-oblong, glabrous, rugose; testa reticulately pitted. Fl. & Fr. August to October.

Lahul, Spiti and PUNJAB; rare. This species is chiefly characterised by very narrow pods and long, acute styles.

Erect, perennial, slender, branched herbs, stellately hairy. Leaves radical and cauline; radical ones 1-3 cm long, rosulate, pinnatifid, hairy, shortly petiolate, spatulate, toothed; petioles 0.2-0.4 cm long, thick, hairy, cauline leaves 0.4-1.5 x 0.1-0.5 cm, sessile, oblong-lanceolate, hairy, coarsely toothed, acute. Flowers 0.3-0.6 cm across, light pinkish, numerous, pedicellate in terminal racemes; pedicels 0.4-0.6 cm long, slender. Sepals 0.2-0.4 cm long, acute, sparsely hairy. Petals 0.3-0.6 cm long, much longer than Sepals, pinkish, shortly clawed. Ovary 0.2-0.4 cm long, cylindrical, glabrous; style short; stigma flat, bilobed. Pods 1-5 x 0.1-0.15 cm, on 0.5-1 cm long, slender, glabrous stalks; narrow-linear, erect, acute; valves veined with prominent mid-nerve. Seeds 1-seriate, 0.1 cm across, many, reddish, ovate-oblong; testa reticulately pitted. Fl. & Fr.: June to August.

J. & K., PUNJAB and Western Tibet, elevation 2900-5000 m; rare.

ARCYOSPERMA O.E. Schulz


Sepals erecto-patent, equal at base, oblong, obtuse. Petals narrowly obovate-cuneate, slightly emarginate at apex, tapering into a short, narrow claw. Stamens 6, rarely 3 or 5; filaments linear; anthers oblong, obtuse; glands nectariferous, confluent, laterals horse-shoe-shaped, median one torulose.

Pistil cylindrical, sessile; ovary 36-ovulate; stigma depressed-capitate, sub-sessile. Siliqua broadly linear, terly grooved, torulose, bilocular, septate, dehiscent; valves membranous, septum enerved. Seeds many, 2-seriate, more or less minute, ovoid; testa reticulate.

India, Pakistan and Afghanistan.

Arcyosperma primulaefolium (Thomson apud Hook, f.) O.B. Schulz, in Pflreich. 86:182. 1924. Sisymbrium primulaefolium


Small, glabrous, stemless herbs; root thick and fusiform; rhizome descending, brown, covered on upperside with dried leaf bases. Leaves all radical, 5-15 x 1-3.6 cm, oblong-obovate or broadly spatulate, rosulate, margin toothed, obtuse.
at apex, subserrate, tapering at base, into 0.6-3.5 cm long petiole. Flowers 0.5-0.7 cm across, 10-12, in short racemes, on 5-13 cm long scapes; scapes numerous with few leaf-like, glabrous, obovate bracts. Sepals 0.3-0.4 cm long, oblong, erecto-patent, not saccate at base, persistent. Petals 0.5-0.7 cm long, oblong-obovate. Pods 1.5-3 x 0.1-0.15 cm, linear, cylindric, curved; valves membranous, reticulate; pedicels 0.3-0.5 cm long, thick. Seeds reddish-brown, wingless, 0.1-0.2 cm across, ovate-oblong, glabrous; testa reticulately pitted.

Fl. & Fr. : May to June.

Western Himalaya from Kumaon to Simlipal and J & K., altitude 1,900-3,600 m, extending further in south SIK.; very rare.

ATELANTHERA Hook. f. & Thoms.


India, Pakistan and Western Asia.


Very small, erect, annual, hairy herbs. Leaves few, 0.5-1 x 0.1-0.2 cm, linear-lanceolate, pubescent, entire, sessile. Flowers few, yellow, in 2-2.5 cm long racemes; pedicels slender 0.15-0.25 cm long. Sepals 0.2-0.6 cm long, erect, equal at base. Petals, 0.9-1 cm long, narrowly spatulate, emarginate. Anthers with a short claw at the tip. Ovary 0.7-0.8 cm long, glabrous, many-ovulate; style short; stigma bilobed. Pods 1.5-3.5 x 0.1-0.15 cm, linear, much compressed, erect; sessile; valves faintly nervèd; stigma 2-lobed. Seeds 1-seriate, reddish-brown, oblong, ± 0.1 cm across, flattened.

Fl. : February to April.

Found in West Tibet (Zanskar).

BARBARA R. Br.


Perennial or biennial herbs; stem angular, stout, branched, leafy. Leaves lyrately pinnatifid or pinnatisect, the cauline amplexicaul, glossy conspicuously lobed at base, flowers yellow, small in dense clusters forming elongate racemes. Sepals suberect, inner sepals slightly saccate at base. Petals with a broad claw; Filaments of stamens linear; anthers blunt. Ovary cylindric, glabrous; style distinct; stigma slightly 2-lobed. Pods long, linear, 4-angled, many seeded; valves stout, faintly or prominently veined. Seeds 1-seriate, ovoid, glabrous, rugose.

1. Stem branched; pods strongly keeled ... B. vulgaris
1. Stem unbranched, pods not keeled ...... B. elata


 Erect, biennial, simple herbs; stem stout, simple, angular, glaucous, sparsely hairy. Leaves radical and cauline; radical leaves 6-12 cm long, lyrate-pinnatifid, terminal lobe
1.5-2 x 0.8-1.8 cm, oblong, obtuse, sinuous; lateral lobes 0.3-0.8 x 0.2-0.6 cm, linear, entire; cauline leaves 3.5-5 x 1-2 cm, sessile, auricled at base, obovate, lobed, lobes toothed and acute. Flowers 0.4-0.6 cm across yellow, pedicellate in 20-40 cm long racemes. Sepals 0.3-0.4 cm long, erect, equal at base. Petals 0.4-0.6 cm long, clawed and veined. Ovary 0.3-0.5 cm long, narrow, cylindric. Pods 0.8-2.5 x 0.2-0.5 cm, thick, turgid, on stout pedicels; style short distinct; valves convex with distinct mid rib. Seeds 1-seriate, ± 0.1 cm, ovate-globose, reddish-brown. Fl. & Fr.: May to July.

ENG. name: Yellow rocket

This plant is found in inner ranges of SIK, upto an elevation of 3600-4300 m; very rare, always found near villages.

Erect, annual, glabrous herbs. Leaves radical and cauline; radical leaves 6.5-17 cm long, deeply pinnatifid, terminal lobes 1.5-2.5 x 1-2 cm, subrotund, lateral lobes 0.4-0.9 x 0.3-0.6 cm, oblong; cauline leaves sessile, lower deeply pinnatisect, with terminal lobe 5-6.5 x 3-3.5 cm, entire, obtuse, glabrous and lateral lobes 1-1.8 x 0.5-0.8 cm, narrow-linear, glabrous; upper ones gradually becoming entire, 2-8 x 1.4-2.6 cm, sessile, stem clasping, auricled at base, obtuse, margin toothed. Flowers 0.5-0.9 cm across, yellow, pedicellate, in 4-9 cm long racemes. Sepals 0.4-0.6 cm long, erect. Petals 0.5-0.8 cm long, yellow, clawed, veined. Ovary 0.5-0.8 cm long, cylindric, glabrous; style short; stigma capitate. Pods 1.5-3 x 0.1-0.2 cm, narrow linear, rigid, compressed; valves hard, stout; pedicels 0.3-0.6 cm long, spreading and stout. Seeds 1-seriate, ± 0.1 cm, ovoid or nearly globose, many, reddish-brown; testa reticulately pitted.

Fl. & Fr. : May to August.

ENG. name : Winter-Cress, Yellow-rocket.

Found in temperate and subalpine Himalayas, PUNJAB and Western Tibet up to an elevation of 1900-3200 m; very rare.

Chromosome no. 2n=16 (see Ball in Fl. Europ. 1:281. 1964).

Leaves of this plant are sometimes boiled and eaten.

BRASSICA Tourn. ex. Linn.

Annual or biennial herbs, mostly glabrous, sometimes minutely hispidly hairy; stem slender or stout, at times woody at base, erect, usually branched (in *Brassica oleracea* L. var. *gongylodes* Linn. stem enlarged as tuber). Lower leaves rosulate, upper cauline, all simple, entire or
lyrately pinnatifid to pinnatipartite with toothed or serrate margins, glabrous or hispidly hairy, petiolate or sessile, obtuse or acute at apex, amplexicaul, seldom auricled at base. Inflorescence a simple or compound raceme or corymb. Flowers yellow or white, ebracteate, very rarely bracteate, usually fertile, seldom abortive or sterile mixed with fertile (B. oleracea L. var. botrytis L.). Sepals erect, caducous, glabrous or hairy, outer two obtuse, more or less cuculiformis, inner broader, and some what ovate, acute, subsaccate at base. Petals obovate, long clawed, veined, longer than sepals, cruciform. Stamens 6, 4 long 2 short, outer mostly ascending; anthers blunt or sharp; staminal glands 4, lateral pair blunt, prismatic, sometimes very small, median honey glands semi-globose, oblong or filiform, sometimes larger upto 0.75 mm long. Ovary terete, or cylindrical few to many ovuled (5-45-ovulate); ovules uni-seriate or bi-seriate, style distinct at times slightly flattened or unequal; stigma capitate or sub2-lobed. Fruit narrow or broad, linear or oblong, appressed or spreading away from the axis, straight, sometimes curved, mostly compressed dorsally, glabrous or hairy, often transversely septate between seeds, cylindrical, attenuated into a beak; valves thin, torulose, rounded, truncate or subemarginate at apex, mid-nerve distinct, lateral nerves several, indistinct or conspicuously reticulate, beak conical, cylindrical or filiform, thin or thick, seedless rarely with few seeds. Seeds 1-seriate, globose or ovoid, sometimes oblong; testa reticulately pitted, rugose, or with narrow and circular markings (B. integrifolia), rarely with
a pale spot near the hilum region (*B. campestris* Linn. var. toria).

India, Pakistan, China, Japan, U.S.S.R., Australia, North Africa, Western Asia, Europe and North and Central America.

1. Cauline leaves amplexicaul:

2. Flower buds exceeding or overtapping the open flowers:

3. Sepals erect; petals white or pale-yellow; pods marginally undulate;

   leaves carnose ........................................ *B. oleracea*

4. Sepals half-open; petals deep yellow;

   pods marginally straight; leaves membranous ............................................ *B. napus*

2. Flower buds not exceeding the open flowers:

4. Stem short; root consistently tuberous, napiform; leaves carnose ................ *B. rapa*

4. Stem well developed; roots not as above;

   leaves membranous ................................................... *B. campestris*

1. Cauline leaves sessile or petiolate but not amplexicaul:

5. Flowers large; petals obovate, 0.65–1.2 cm long; sepals 0.35–0.6 cm long:

6. Seeds rugose; testa with distinct, narrow and sharp circular markings........ *B. integrifolia*
6. Seeds not rugose; testa reticulate.
7. Ovary many ovulate (9-45); pods spreading from the axis; beak conical, sometimes as thick as pod, few seeded. B. juncea
7. Ovary few ovulate (4-10); pods appressed to the axis; beak thin, seedless. B. nigra
5. Flowers minute; petals narrowly oblong-obovate, 0.5-0.7 cm long; sepals 0.3 cm long. B. tournefortii


Annual, erect herbs; stem glaucous-green, branched, Leaves 1-14 x 0.1-5.5 cm, ovate-oblong, simple, sessile, stemclasping; basal leaves with toothed margins, upper ones entire. Flowers yellow, 0.5-1.2 cm across in terminal racemes. Sepals 0.4-0.8 cm long, saccate at base. Petals clawed and veined. Ovary 0.5-1.1 cm long, many-ovuled; style distinct; stigma capitate. Pods 1.2-4.2 cm long, glabrous, torulose; valves with distinct mid-nerve; beak 0.1-0.5 cm long. Seeds 0.1-0.2 cm long, 1-seriate, brown; testa smooth, glabrous. Fl. & Fr.: January to June.
**Eng. name:** Sarson.

It is cultivated in BIHAR, W.B., CRIBA, U.P., GUJARAT and MAH.

The seeds are used for cooking purposes.


Annual, erect herbs, 22.5-50 cm tall; stem slightly stiff, angular, sparsely branched, glaucous-green, hairy in lower part. Leaves 1-13.5 x 0.1-9 cm, oblong-ovate, simple, sessile, stem-clasping by auricled base, hairy; basal leaves toothed, upper ones entire. Flowers yellow, 0.6-1.1 cm across in terminal, 3-15 cm long racemes. Sepals 0.4-0.6 cm long, saccate at the base. Petals 0.6-1 cm long, clawed, veined. Ovary 0.6-1 cm long, many-ovuled; style distinct,
stigma capitate. Pods 1.5-4. cm long, glabrous, stalked, 
plumpy, torulose; valves with prominent mid-nerve, beaked; 
beak 0.1-0.4 cm long, slightly flattened, nearly as thick as 
the pod, often containing one or two seeds. Seeds 0.1-0.2 
cm long, 1-seriate, brown, oblong with smooth testa. Fl. & 
Fr. : January to July.

ENG. name : Yellow sarson or Indian Colza.
Local names : ASM.-Sariah; PUNJJ. - Sarson, Saronh; HIND. - 
Sarson, Sarson-Zard, Baralai, Banga Sarson, Fila sarson, Rara 
sarson; BENG. - Shevet-rai; GUJ. - Sarashire, Raira; MAR. - 
Shiras; TEL. - Ava; TAM. - Kadugu; KAN. - Sassve.

It is cultivated in W.B., BIHAR, CRISSA, Upper gangetic 
plains, to a small extent in GUJARAT and MAH. also seen as 
a weed in mustard crop. Probably it has its origin in North-
Eastern India or China.

Chromosome No. 2n=10.

It is easily distinguished from Brassica juncea (Linn.) 
Czern. & Coss. by the stem-clasping leaves. A distinct species 
by fewer branches, greater amount of bloom and plumpy pods 
with stout beaks. A number of forms based on the colour of 
seeds, the number of valves or chambers in the pods (2, 3, or 
4) and the direction of the ripe fruits in relation to the 
stalk are recognised and some have been regarded as distinct 
species. Thus the 3-valved and 4-valved forms are known as 
Brassica trilocularis Hook. f. & Thoms. and Brassica 
quadrivalvis Hook. f. & Thoms, respectively.
The oil obtained from the seeds is used in India for cooking, massage and also medicinally in treatment of bronchitis. The oil is also used for burning purposes and the oil cake as a cattle feed.


An erect, annual herb, stem stout, angular, glabrous, branched. Leaves simple, radical ones 18-20 x 8-8.5 cm, Cabbage leaf-like, thick, mid-vein prominent, glabrous, broadly obovate, deeply sinuous, acute, cauline ones 1-1.2 x 0.5-6.5 cm, oblone-obovate, upper ones linear, linear-lanceolate,
slightly hairy, obtuse, with sinuous margins; petioles 0.5-1.5 cm, long, terete, thick, glabrous. Flowers yellow, 0.7-1.2 cm, across, in 10-16 cm long racemes. Sepals 0.4-0.6 cm long, erect, saccate at the base. Petals 0.6-1 cm long, obovate, long-clawed, prominently nerved. Anthers blunt. Ovary 0.5-0.9 cm long, terete, many ovuled; style distinct; stigma capitate. Pods 1.2-7.2 cm long, stalked, spreading from the axis, glabrous, biconvex, torulose, beaked; beak 0.2-0.3 cm long, thick, conical. Seeds 1-seriate, reddish-brown, ovoid, ± 0.1 cm long, rugose, with prominent narrow, circular markings. Fl. & Fr.: September to January.

Eng. name: Cabbage-leaved Mustard.
Local names: KASH, - Asur; HIND, - Badshahriai, Barirai, Barlai; BENG, - Raisarisha; MAR, - Rai, Rajka, Sarson.

It is grown to a limited extent as a cold weather crop in Western, Central and Eastern Himalayas, N. Oudh, W. B.; and ASSAM. It is common in Nepal and said to have been originally received from Tibet.


In India this plant is cultivated more as a vegetable than as an oil seed-crop. The leaves are dried in the sun, pickled and eaten (See Wealth of India). The seeds are well known to aid digestion. They are much used in internal congestions, in spasmodic neuralgic and rheumatic affections and in morbid states of the cerebro-spinal system. (Kirtikar
This species much resembles *Brassica juncea* Czern. & Coss. However it differs from the latter in the shape of radical leaves and seed ornamentation. The present species has been variously taxonomically treated by different taxonomists but we have adopted the name as given by Schulz (1919) in his monograph on Cruciferae.

*Brassica juncea* (Linn.) Hook. f. & Thoms. var. *agrestis*

Prain, Bengal Fl. 1:145. 1963.

An erect, annual herb, 25-65 cm tall; stem cylindrical, branched, minutely hispid near the base. Leaves 2-13 x 0.4-1.8 cm, oblong-ovate, lyrate lobed, lobes acute or subacute, sparsely hispid, tapering towards base, gradually becoming entire, linear to linear-lanceolate upwards; petiole 0.5-0.7 cm long, terete, slightly grooved on one side, sparsely hispid. Flowers 0.5-0.9 cm across, yellow, in terminal, 8-18 cm long racemes. Sepals 0.2-0.4 cm long, erect, saccate at base. Petals 0.5-0.9 cm long, long-clefted, distinctly nervèd. Ovary 0.4-0.8 cm long, terete, glabrous; style distinct; stigma capitate. Pods 1.2-5.6 cm long, linear-cylindric, torulose with prominent mid-rib; beak 0.1-0.25 cm long, flat, conical. Seeds small, 1-seriate, brown, ovate, ± 0.2 cm long; testa reticulately pitted. Fl. & Fr.: Throughout the year, profuse in winter months.

ENG. name: Indian Mustard

Local names: KASH. - Asur; ASM.-Lai, Lahi; HINDI.-Rai;
BENG.-Rai sarisha, Chanchli- Jhuni, Keelrai, Bilrai; GUJ. - Rai; OR. - Rai; MAR. - Rai, Sarson, Rajika; TEL. - Avalu;
KAN. - Kempu sassive, TAM. - Kadugu; MAL. - Kaduku.
It is a common field crop of BIHAR, U.P. and W.B., and is found in almost all the Brassica cultivating areas of India.

It is cultivated as a crop by itself or as a subordinate crop with wheat, barley or peas. It is also often found as an escape in waste places along roadsides and near human habitation; seldom in dense forests.

*Brassica juncea* is an amphidiploid between *B. campestris* and *B. nigra*.

\[ n = 10 \]
\[ n = 8 \]


The seeds are used as a condiment in culinary. The seeds yield Mustard oil, which is commercially an important economic product, much purer and clearer than rape oil. It is used in many parts of the country as a culinary. Medicinally it is very efficacious in treatment of cold and a paste, antiphlogitinis prepared out of the oil with other gradients to treat bronchitis. It is also used for massage.

Erect, annual herbs; somewhat rigid, 30–75 cm tall; stem profusely branched, terete, pubescent. Leaves simple, 2–13 x 0.5–0.6 cm, ovate-oblong, auricled and stem-clasping at base, margin lobed, pubescent, sometimes covered with pale bloom, acute at apex; petiole slender, 1–3 cm long. Flowers 0.6–1.2 cm across, yellow, in 8–10 cm long racemes. Sepals gibbous at base, 0.3–0.8 cm long. Petals 0.5–1 cm long, broader, overlapping each other along lateral margins, clawed and veined. Ovary cylindrical, many ovuled, glabrous, 0.5–0.8 cm long; style distinct; stigma capitate. Pods 1.2–7 cm long, biconvex, stalked, erect, narrow, torulose, moniliform, with 0.2–0.5 cm long, thick, conical beaks. Seeds
small, many, brownish, oblong 1-seriate, rugose 0.1-0.2 cm long; the seed coat is having narrow and circular markings.

F. & Fr. : November to February.

Eng. name : Rape or cole seed, Indian Mustard.
Local names : HIND. - Kali sarson, Kale-rai, toria; BBNG. - Sursha, Sausi; RAJ. - Sarsu; GUJ. - Sarsawa, Kala-rai;
MAR. - Sherasa, Kala-mohare; TAM. - Karuppu - Kadugu; TBL. - Malla Avalu; KAN. - Sarsive, Kappu-sasoe; MAL. - Karuppa - Katuka.

Cultivated to a large extent in PUNJAB and to a lesser extent in U.P. It was introduced into the PUNJAB from Japan where it is cultivated to a large extent as an oil seed crop.

Chromosome no. n=10.

This plant is distinguished from Brassica juncea (Linn.) Czern. & Coss. by its stem-clasping leaves. It differs from yellow sarson in having smaller and bluish-brown seeds with finely rugose surface and a pale spot at the hilum region.

The seeds of this species form the staple crop in hilly regions of India, yielding an important oil used in culinary. The oil cake is used as cattle feed and manure.

var. chinensis (L.) O.S. Schulz in Pfreich. 70:45. 1919.

Brassica campestris L. var. chinensis (Linn.) Busch, in Fl. Sibir. 166. 1933.

Annual or biennial, erect herb, 45-60 cm tall; stem stout, branched, glabrous, glaucous with scars. Leaves basal and cauline, basal ones 12.5-15.0 x 5.0-6.0 cm, shining, spreading but not forming compact head, obovate-oblong, scarcely hairy, crenate, slightly narrowed towards base into 4-6 cm long, flat, petiole; cauline ones 4-10 x 0.5-1.2 cm, ovate-oblong, pubescent. Flowers yellow, ± 0.5 cm across, in terminal, 12-27 cm long racemes, over topping the unopened buds. Sepals erect, ± 0.3 cm long, petals yellow, clawed, 0.4-0.5 cm long. Ovary 0.3-0.4 cm long, many ovuled; style distinct; stigma capitate. Pods, 0.6-1.0 cm long, glabrous, stalked, beaked; beak 0.1-0.15 cm long, thin. Seeds ± 0.15 cm long, 1-seriate, ovate, reddish-brown. Fl. & Fr.: December to March.

BNG, name: Pak-Choi

This plant is cultivated in W.B.; rare.

The entire plant is antiscorbutic, arthritic, and resolvent. The seeds are considered stimulant, stomachic and laxative. They are used in gleet and in difficult paturition. (Kirtikar and Basu, Indian Medicinal Plants, Vol. 1:163. 1933).

Brassica nigra (Linn.) Koch in Roehl. Deutschl. Fl. 4:713.

1833; Hook. f. & Thoms. in Journ. Linn. Soc. 5:170. 1861; Boiss.
An erect, annual herb, 16-52 cm tall; stem terete, glabrous or sparsely hairy, simple or branched from above, at times tinged purple. Lower leaves 4-9 x 0.6-4.5 cm, lyrate-pinnatifid, sparsely strigose hairy. Upper leaves 1.5-3 x 0.3-0.9 cm, lanceolate, entire; petiole 0.4-3 cm long, slender, angular. Flowers 0.6-1.9 cm across, yellow, in 3-12 cm long racemes. Sepals 0.4-1 cm long, erect, gibbous at base. Petals 0.6-1.9 cm long, clawed, distinctly veined. Ovary 0.6-1.6 cm long, terete, glabrous, many ovuled; style slender, terete; stigma capitate. Pods 1-6 cm long, erect, stalked, appressed to axis, torulose, produced into a short, conical beak, mid-nerve distinct; beak 0.2-0.5 cm long, seedless. Seeds 1-seriate, blackish-brown, sub-globose, 0.05-0.1 cm across; testa reticulately pitted. Fl. & Fr.: Throughout the year, profuse in winter season.
BENG. name: Black Mustard or True Mustard.
Local names: HIND. - Banarasi rai, Kali rai, Alsi rai, Makra rai; BENG. - Rai sarisha; GUJ. - Kalirai; MAR. - Rai, Sarson; TEL. - Nalla Agalu; TAM. - Kadugu; KAN. - Bile nagive, Karisasive.

This species appears to have been introduced comparatively recently in India and is a cold season crop, growing to a limited extent in the PUNJAB, U.P. and T.N., also a weed in cultivated fields, road sides, railway lines etc.


Black mustard is ground with white Mustard for preparing table mustard. The mixture is used in various medicinal mustard preparations such as bath mustard, mustard brown and mustard flour. The expressed oil is used as a luminent. In Europe it is used for making soup, burning and as a lubricant. In India, the seeds of black mustard are used in pickles and curries. It is also used as an adulterant to the seeds of Brassica juncea. The mustard oil is very efficacious as a stimulating liniment in cough, catarrh etc. A few drops of the oil taken after meals promote digestion and act as a mild cholagogue and diuretic.

Brassica oleacea Linn. Sp. Pl. (ed. 1) 2:667. 1753
(excl. var. X); Dalzell & Gibson, Bombay Fl. 214. 1973;
The species is probably a native of Persia and Western parts of Asia and found in India only under cultivated in the form of a few varieties.

1. Stem tuber, globose, covered with prominent leaf-scars. Leaves lyrately pinnatifid to pinnatisect, crowded at the apex of stem ......................... var. gongyloides

1. Stem tuber not present; leaves as above, inflorescence a solid head:

2. Stem long; leaves with inflations on surfaces ........................................ var. bullata

2. Stem short; leaves not bullate:

3. Leaves arranged in large, globose, semiglobose or semiconical, compressed, head with crumpled venation before flowering ................................. var. capitate

3. Leaves not as above; inflorescence a compound corymb appearing as a compressed, fleshy, yellowish-white, solid head ................................. var. botrytis

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var. botrytis Linn. Sp. Pl. 667. 1753; (Cooke, Fl. Pres)

(Bombay, 1937; 1958) Schulz in Pfreih, 7033, f. 12. 1919;

Wealth of India 1:219, Pl. 34 (2); 1948; Bailey, Man. Cult. Pl.


Mill. Dict. 8 (ed. 3). 1968.
An annual herb, 50-75 cm tall; stem stout, glabrous, branched, with white scars, bearing a dense, terminal, tetragonal head. Leaves 2.5-30 x 0.5-11 cm, obovate-oblong, stem-clasping, simple, sessile, lyrate shallowly pinnatifid, covered with bloom, obtuse at apex. Inflorescence a compound corymb, appearing as a compressed fleshy, yellowish-white solid head, 5-10 cm across, at length elongating into a branched raceme; 5-7 cm long peduncles. Flowers 0.8-1.2 cm across yellow. Sepals erect, 0.6-0.8 cm long. Petals clawed, veined, 0.8-1.1 cm long. Ovary 1-1.1 cm long; style inconspicuous; stigma capitate. Pods 1.3-1.6 cm long, on 1.0-2.2 cm long stalks, glabrous, beaked; beak conical, 0.2-0.3 cm long, valves nerved. Seeds 1-seriate, globose or subglobose, brown ± 0.05 cm across; testa reticulately pitted. Fl. & Fr.: November to February.

**BNG.** name: Cauliflower, Broccoli

Local names: HIND. - Phul gobi; PUNJ. - Phul gobi; BENG. - Fulkapi; MAR. - Flower Kobi, Gobe; GUJ. - Fulevar, Kobia; TAM. - Goskira; TEL. - Poogobi; KAN. - Hukosu; MAL. - Cauliflower.

Cauliflower is cultivated in most parts of India, especially in North-West, where it is grown on a large scale as a vegetable crop in cold season. The type called 'Patna' snowball, and 'Forerunner' are popular in India, Broccoli, a late variety of cauliflower with larger leaves and smaller heads is reported to be unsuitable for cultivation in tropics.
The edible portion of cauliflower is the white curd-like mass, composed of a close aggregation of abortive flowers, developed on thick branches of the inflorescence. Cauliflower is used as a vegetable in curries, soup etc. and is also pickled. In places where production is large, it is dried and preserved for use in the off-season. Small seedlings are used as greens.


A biennial or annual herb, 20-30 cm. tall; stem short and thick. Leaves 3-18 x 2-5.8 cm, closely packed into a large bud, petiolate, thick, oblong-lanceolate, glabrous, slightly acute at apex; margin slightly lobed; petioles 2-4.5 cm long, terete. Flowers yellow in very short racemes; floral buds 0.3-0.5 cm across. Fl. Tr. : November to March.

ENG. name : Cabbage.

Local names : ASM. - Bandha Kabl; BENG. - Bandhakapi; PUNJ. - Band gobhi; HIND.- Band gobi; GUJ. - Kobij; OR. - Bandha
There are numerous forms of Cabbage of which the sugar leaf, the ball-head and the Drum head are popular in India.

In India it is cultivated as a vegetable throughout in plains and the hilly parts during the cold season.


Cabbage is an important vegetable and is used in curries, pickles etc. It is used to feed chicken. "Sauerkraut" a favorite food in Russia, Germany and the U.S.A., is made by fermenting chopped, ground or sliced cabbage in its own juice, with a little salt added to it.


This taxon is listed by Maheshwari (1963) from DELHI and Rau (1969) from Upper gangetic plains. It is also reported under cultivation at Bombay and Baroda (See Wealth of India) Pl. & Fr: November to February.
Brassica oleracea Linn. var. gongylodes Linn. Sp. Pl. (ed. 1) 667. 1853; Schulz in Pfreich. 70:32. 1919; Wealth of India 1:221. Pl. 34(4). 1948;


The stem tuber, 5-15 cm across, nearly globose, pale-greenish or bluish-green in colour, with prominent leaf-scar, centrally hard. Leaves 10.3-23.0 x 8-10 cm, oblong-ovate, thick, glabrous, hispidulous, lyrately pinnatifid, serrate, obtuse at apex; petiole 2-5 cm long, slender, minutely hairy. Flowers yellow, 1.0-1.6 cm across, in 10-16 cm long, terminal racemes; pedicels slender, 1-1.6 cm long. Sepals 0.8-0.9 cm long, saccate at the base. Petals clawed, veined, 1.0-1.5 cm long. Ovary many ovuled, 1-1.3 cm long; style short; stigma capitate. Pods 6-7.2 x 0.1-0.2 cm, narrow, biconvex; valves turgid, moniliform, beaked, narrowed, towards the stalk; beak 0.2-0.3 cm long, thick. Seeds 1-seriate, reddish-brown, ovate-oblong, 0.1-0.15 cm long, with reticulate testa.

ENG. names : Kohlrabi, Knol-Kohl, Ganth-gobi.
Local names: HIND. and BENG. - Ganth gobi.

A native of Asia cultivated in many parts of the India in plains and hilly regions. Two types - green and purple are recorded in wealth of India, but I have seen only the green type. Here the stem is modified into spherical tuber for the storage of food material and is edible as vegetable.

The stem is edible as vegetable. The leaves are also used as vegetable.

Brassica rapa Linn. Sp. Pl. 666, 1753; Dalzell & Gibson,


Wealth of India 1:221. Fl. 36 (5) 1948; Bailey, Man. Cult.

Tall, erect, branching, annual herbs; stem glabrous, often tinged reddish-purple. Leaves radical and cauline, radical ones in rosette, ovate-oblong, hairy 2.5-5.2 x 0.5-1.4 cm sessile, cauline ones slightly petiolate, obovate-oblong, hairy, lyrately pinnatifid, 1.5-4 x 0.4-1.2 cm. Flowers pale yellow, 1-1.6 cm across, in terminal racemes; pedicels slender, 0.8-1.2 cm long. Sepals 0.9-1.2 cm long, saccate at base. Petals 1-1.6 cm long, clawed, distinctly
veined. Ovary many ovuled, 1.2-1.5 cm long, glabrous; style short; stigma capitate. Pods 4-5.2 x 0.1-0.15 cm, slender, narrow, beaked. Seeds 1-seriate, reddish-brown, ovate-oblong, 0.15 cm long; testa reticulately pitted. Fl. & Fr.: December to March.

ENG. name: Turnip.

Local names: HIND. - Salgam; BENG. - Salgam.

This species is grown as a cold season crop in the fields of PUNJAB, U.P., sometimes grown in the hills.


Roots largely used as food. Tender leaves are used as greens. Turnips are used in curries, pickles etc. The seeds are commonly used for propagation, but oil is prepared from them.

Brect, annual herbs; stem branched rarely simple, hispid in lower parts, glabrous in upper parts. Leaves radical and cauline, radial ones rosulate, petiolate, lyrate-pinnatisect, 4-12-jugate, terminal lobe obovate or orbicular, obtuse, lateral ones small, ovate, crenate-dentate, auricled at base, cauline ones sessile, oblong-linear, acute, denticate, hispid. Flowers 10-20, pale yellow, in 10-18 cm long racemes; pedicels 0.2-0.6 cm long, suberect. Sepals 0.3 cm long, glabrous suberect, outer ones oblong, rotund, inner oblong-ovate. Petals 0.5-0.7 cm long, oblong-obovate, glabrous, clawed. Anthers 0.1 cm long, oblong. Ovary 14-16 ovulate; style 0.1 cm long; stigma capitate. Pods 3.5-6.5 x 0.25-0.3 cm, torulose, erecto-patent, alternate, cylindrical; valves membranous, apex emarginate. Seeds globose, 0.1-0.12 cm long, pendulous, hilum nigro-punctate; testa reticulately pitted. Fl. & Fr. : October to January.

Local name: Rai

Grown in central districts of PUNJAB, not extending beyond DELHI and A&H.

This is cultivated in India as a medicinal plant. It is reported to be cultivated in Western Tibet as an oil seed crop (See Wealth of India).

This species has 10 chromosomes as the haploid complement, but its genome proved to be quite different from that of B. campestris. It crosses with difficulty with
BRAVA Sterebr. & Hoppe.


Small, clustered, hairy or glabrous, perennial herbs, with branching root-stock. Leaves simple, mostly radical, somewhat coriaceous narrow, spatulate or linear, entire or remotely few-toothed. Flowers small, yellow or white, solitary or in bracteate or ebracteate racemes or corymbbs. Sepals equal at base, erecto-patent, persistent, not saccate at base,
obtuse at apex, outer broader, oblong and somewhat concave below apex; inner oblong-obovate, blunt, often narrowed at base. Petal limb obovate, truncate at apex, cuneate at base. Stamens 6; filaments linear; anthers small, cordate-obtuse; median nectariferous glands inconspicuous. Ovary cylindric, sessile, 4-many ovuled; style short; stigma depressed-capitate, subbilobate. Pod ovate, ovate-oblong or linear, hirtellus; valves convex, medianally 1-nerved. Seeds usually 2-seriate, few or many, ovoid, wingless, small.

India, Turkey & Europe.

1. Racemes ebracteate or somewhat bracteate at base only; pod apex obtuse; style thick; pods linear, oblong-ellipsoid or ovoid:

2. Fruiting racemes lax, elongate; manifestly exserted from calyx:

3. Pods linear ............................................ B. thomsonii

3. Pods oblong-ellipsoid or ovoid .......... B. rosea

2. Fruiting racemes densely capitate; slightly exserted from calyx ............ B. tibetica

1. Racemes bracteate; pods ellipsoid-lanceolate with a attenuate apex ........... B. oxycarpa

Small, tufted, glabrous, perennial herbs, with stout, fleshy roots. Leaves radical, 2.8-3.8 x 0.6-1.2 cm, simple, petiolate, spatulate, lanceolate, entire, glabrous, obtuse; petioles 1-1.5 cm long, slender, green. Scapes 2.5-10 cm long, leafless. Flowers 0.5-0.6 cm across, rose-coloured, in terminal, bracteate racemes; pedicels 0.2-0.3 cm long. Sepals 0.2-0.3 cm long, equal at base, erect, not saccate. Petals 0.5-0.6 cm long, clawed, veined, truncate at apex, cuneate at base. Anthers cordate, obtuse. Ovary 0.4-0.5 cm long, cylindric, sessile, 4-many ovuled; style short; stigma capitate, Pods 0.4-0.6 x 0.1-0.15 cm, erect, elliptic-lanceolate, straigh glabrous, attenuate at apex; valves smooth with distinct middle septum. Seeds 2-seriate, few, ± 0.1 cm, ovoid, glabrous wingless. Fl. & Fr.: July to September.

Found in Western Tibet, altitude 3900-4000 m; rare.


Glabrous or puberulous, perennial, leafy herbs; root-stock thick and branched. Leaves 1.5-2.5 x 0.5-1 cm, narrowly linear-oblong, densely rosulate, coarsely toothed, acute,
narrowed at base; petioles 1-3 cm long. Flowers 0.4-0.5 cm across, white or yellow, 10-20, in short racemes, on leafless 5-10 cm long scapes. Sepals 0.2-0.25 cm long, hispid, not saccate. Petals 0.3-0.35 cm long, yellow or white, shortly clawed. Filaments linear; anthers 0.4 cm long. Ovary 8-14-ovuled, appressed; hispid; style short, thick; stigma capitate. Pods 0.4-0.6 x 0.1-0.15 cm, oblong, ellipsoid, suberect, tapering at apex into thick, 0.05-0.1 cm long style; septum white; margins prominently 1-nerved or nerveless. Seeds few, 2-seriate, ovoid, glabrous, wingless. Fl. & Fr. : June to August.

Found in the Alpine region of the Himalayas, from SIK. to Kunawar and West Tibet, altitude 4900-5600 m.


Small, perennial herbs; stem glabrous, simple. Leaves all radical, densely rosette, narrowly linear, ligulate, 1.5-2 x 0.1-0.2 cm. Flowers 10-20, in racemes on the scape. Sepals 0.2-0.22 cm long, oblong. Petals 0.3-0.35 cm long, spatulate, white. Pods 0.5-0.7 cm long, linear, suberect, glabrous, on 0.3-0.4 cm long pedicels; septum white, nerveless. Seeds 0.7-0.75 cm long, oblong. Fr. : September.

Alpine regions of West-Tibet at Piti at an elevation of 4000 m and Pamira.

Erect or ascending, branched, caespitose, rigid herbs; root-stock much divided, clothed with withered leaf bases, hairy. Scapes hairy or densely tomentose; hairs branched or forked, 5-6 cm long, leafless or 1-(2) leaved. Leaves cuneate, 1.2-2.8 x 0.6-1.2 cm, rosulate, spatulate, sinuato-dentate or subentire, clothed with simple hairs, margins ciliate, rarely glabrous, apex acute, narrowed at base; petioles 0.8-3.2 cm long. Flowers 0.3-0.4 cm across, 15-25, in subcapitate racemes. Sepals 2-2.5 cm long, hairy, edges membranous, rarely purplish, persistent. Petals 0.3-0.5 cm long, oblong-cuneate, white or rose-coloured. Pistil oblong; ovary 4-10-ovuled, covered with short, simple or forked hairs; style short. Pods 0.35-0.4 x 0.1-0.2 cm, erect, ovo-ellipsoid, inflated, on 0.4-0.5 cm long pedicels; valves 1-nerved, pilose; septum hyaline. Seeds pendulous, ovoid, small; funicles long, filiform. Fl. & Fr.: June to July.

Alpine and subalpine regions of the Western Tibet, altitude 4000-5500 m.
CAPSELLA Medic. nom. cons.


Or. 1:20. 1834; Hook. f. & Thoms. in Journ. Linn. Soc. 5:172.

1861; Benth. & Hook. f. Gen. Fl. 1:86. 1862; Boiss. Fl. Or.

1:340. 1867; Baker in Oliver, Fl. Trop. Afr. 1:159. 1868;


1872; Prantl in Engl. & Prantl, Pfam. 3(2):189. 1890.

Collett, Fl. Simulensis 36. 1921; Fyson, Fl. South Ind. Hill stations

1:23. 1932; Schulz in Engl. & Harms, Pfam. 17b:453. 1936;


Prain, Bengal Fl. 1:147. 1963; Chater in Fl. Europ. 1:316.


Bursa (Webb.) Wigg. Prim. Fl. Holsat. 47. 1780. Bursa


Hymenolobus Nutt. ex Torr. & Gray, Fl. N. Amer. 1:117. 1838.

Microlepidium Muell. in Linnaea 25:371. 1852.

Annual, biennial or perennial, branched, often slender

herbs, glabrous or simple hairy. Leaves radical and cauline,

radical ones rosulate, serrate or pinnatifid, petioloed,

cauline ones lanceolate, sagittately amplexicaul. Flowers

small, white, yellow or red, in ebracteate racemes. Sepals

oblique, erect, spreading, equal at base, not saccate.
Petals short, obovate hardly clawed, with few nerves, seldom absent. Stamens free, not toothed; anthers ovate, blunt, pistil sessile; ovary many ovulate; style short, persistent in fruit; stigma capitate. Pods usually triangular-obcordate, laterally much compressed; replum very narrow.

India, Asia, North Africa and Europe.

1. Plants with erect or ascending branches:
   2. Pod triangular ................................. C. bursa-pastoris
   2. Pod ovate-oblong ............................ C. alcicarpa

1. Plants with prostrate branches ........................ C. thomsonii

Erect, annual, glabrous herbs, 30-40 cm tall; stem slender, branched, glabrous, angular, bulbous at base. Leaves radical and cauline, radical ones 4-8 x 0.5-1.2 cm, rosetulate, oblong-lanceolate, fine hairy, lobed, lobes acute on slender, hairy, 0.5-1.5 cm long, petioles. Cauline leaves sessile, 1-4 x 0.2 cm, oblanceolate, hairy, margin wavy, acute at apex, sagittately auricled at base. Flowers small, 0.2-0.4 cm across (excluding pedicels), yellowish-white, pedicellate, in racemes. Sepals 0.1-0.2 cm long, erect, equal at base, obovate, glabrous. Petals 0.3-0.4 cm long, yellowish-white, obovate, slightly clawed. Stamens free, filaments linear; anthers ovate, blunt. Ovary cylindric, 0.2-0.3 cm long, glabrous, many-ovuled; style short, persistent in fruit; stigma capitate. Pods 0.3-0.9 cm long, narrowly septate, triangular-obcordate, laterally compressed, glabrous, on 0.5-1.2 cm long stalks; valves keeled, boat-shaped, reticulately veined. Seeds many, < 0.1 cm across, oblong, reddish, 2-seriate, narrowly margined; testa reticulately pitted. Fl. & Fr. Throughout the year.

ENG. name: Shepherd's purse.

A common weed in cultivated fields in cold season throughout temperate India, particularly abundant in northwestern Himalayas.

Chromosome no. 2n=32 (Chater in Fl. Europ. 1:316, 1964).
The plant is bitter and pungent, given in the form of a liquid extract or administered intravenously or intramuscularly. It exhibits an unquestioned ability to control haemorrhage of diverse origins. It is used as an astringent in diarrhoea and as a diuretic in dropsy. Extracts of dried green plants are used as an antiscorbutic. (See Wealth of India).

Capsella elliptica C. A. Mey. in Ledeb. Fl. Alt. 3:199. 1831

Small, erect, branched herbs; stem slender, hairy. Leaves radical and cauline; radical ones 1-1.3 x 0.6-0.8 cm, petiolate, spatulate, pubescent; cauline ones 0.3-0.6 x 0.2-0.35 cm, obovate-oblong, pubescent, entire, acute at apex, shortly petiolate. Flowers minute, in elongating racemes. Sepals 0.1-0.15 cm long, erect, glabrous. Petals 0.15-0.2 cm long, white, glabrous, not clawed. Pods 0.2-0.3 x 0.1-0.2 cm, obovate-oblong, truncate; valves not winged; mid-vein prominent; style thin, very short (0.05 cm long); fruiting pedicels 0.3-0.5 cm long. Seeds many, small, reddish, ovoid + 0.05 cm across. Fls. & Frs. : September to December.

Western Tibet, altitude, 4100 m.

Prostrate, diffusely branched, perennial, hoary-tomentose herbs; stem slender, hairy. Leaves 2-5 cm long, 2-3-pinnatisect, sessile, hairy, segments linear-lanceolate, entire. Flowers crowded, shortly pedicellate, in the axils of leafy bracts. Sepals 0.1-0.15 cm long, erect, glabrous. Petals 0.15-0.2 cm long, not clawed, white. Pods 0.4-0.7 x 0.2-0.3 cm, glabrous, oblong, truncate at both ends; valves much compressed, obscurely keeled, veined; stigma sessile, minute. Seeds many, reddish, small, ovoid, < 0.1 cm across.

Fl. & Fr. June to October.

Western Tibet (Phari), altitude 5000-5900 m.

CARDAMINE Tourn. ex Linn.


Annual, biennial or perennial, simple or branched herbs, usually leafy, sometimes leafless. Leaves usually compound rarely simple (C. cirioides) entire, lobed, pinnatifid or pinnatisect, alternate, rarely opposite or whorled, with or without auricles. Flowers small, white or purplish, rarely yellow, in bracteate or ebracteate racemes. Sepals short, oblong or ovate, erect or spreading, equal at base. Petals white or purplish, rarely absent, obovate, distinctly clawed. Stamens usually 6, rarely 4 or 2 without staminodes. Pistil sessile; ovary 4-many ovulate, glabrous; style small; stigma flat, more or less 2-lobed. Pods small, linear to linear-lanceolate, tapering at both ends; valves
flat, thick with prominent mid-vein; replum thin, transparent. Seeds 1-seriate, oblong, few, reddish, rugose, glabrous.

India, Pakistan, Ceylon, Asia, Australia and Europe.

1. Stem unbranched .............................................. \( C. \) griffithii
1. Stem branched :
2. Leaves simple .................................................. \( C. \) ciriopoides
2. Leaves compound :
3. Leaflets pelticulate :
4. Cauline leaflets 3 ................................. \( C. \) africana
4. Cauline leaflets 5 or more :
5. Leaflets entire ........................................ \( C. \) pratensis
5. Leaflets lobed or incised .............. \( C. \) macrophylla
3. Leaflets sessile :
6. Petioles with auricles ..................... \( C. \) impatiens
6. Petioles without auricles :
7. Pods broadly linear; 0.8-2 x 1-0.2 cm ................. \( C. \) trichocarpa
7. Pods narrowly linear, 0.6-2.8 x 0.05-0.1 cm ........ \( C. \) hirsuta

Cardamine africana Linn. Sp. Fl. 655, 1753; DC, Reg. Veg.

in Journ. Linn. Soc. 5:145. 1861; Baker in Oliver, Fl. Trop.

Annual, erect, slender, glabrous herbs. Leaves trifoliolate, 3-12 cm long; petioles 1-5 cm long, slender, green. Leaflets 0.2-4.5 x 0.2-2.5 cm, broadly ovate, orbicular, lobed, hispid on 0.1-0.8 cm long petiolules, acute. Flowers small, 0.3-0.4 cm across, few, yellow, pedicellate, in 8-13 cm long racemes. Sepals 0.2-0.3 cm long, linear-oblong, not saccate at base. Petals 0.3-0.4 cm long, obovate, yellow, veined. Ovary cylindric, glabrous, 0.2-0.3 cm long; style short; stigma distinct, more or less bilobed. Pods 1.2-3.8 cm long, few, narrow, tapering at both ends, beakless; valves with prominent mid-vein; pedicels 0.2-2 cm long. Seeds 0.1-0.2 cm long, oblong, 1-seriate, reddish, few, rugose, glabrous. Fl. & Fr. March to May.

In moist waste places in hilly regions of T.N., and KERALA.

Small, erect, slender, annual herbs; roots thin, close together forming a bunch-like structure; stem angular, flattened, glaucous-green, glabrous, branched. Leaves simple radical and cauline, obovate-oblong, wavy or slightly lobed, glabrous obtuse or subacute, radical ones 2.5-10 x 1.5-4.5 cm, with 4-7 cm long, slender, flattened, petioles; cauline ones 2-5.5 x 0.8-2.8 cm, lower petiolate and upper sessile. Flowers white, 0.5-0.8 cm across, distinctly veined. Ovary 0.5-0.6 cm long, cylindrical, glabrous, narrow; style short; stigma more or less bilobed. Pods not seen. Fl. : April to May.

In wet places in SIK, altitude 1500 m.

A very typical species in the genus recognised by its sessile leaves and large deep lilac flowers. The specimens on which the present description is based are without pods. The identification is, therefore, based on the leaf and flower characters.

Small, erect, slender annual herbs; stem angular, glaucous-green, glabrous, unbranched. Leaves 1.5-6.5 cm long, sessile, compound with 3-4-pairs of leaflets; leaflets 0.4-2.1 x 0.4-1.2 cm, glabrous, margins lobed, obtuse at apex, sessile. Flowers 0.5-0.8 cm across, pedicellate in terminal racemes. Sepals 0.4-0.5 cm long, erect, glabrous, ovate. Petals 0.6-0.8 cm long, deep lilac, clawed, glabrous, distinctly veined. Ovary 0.5-0.6 cm long, cylindric, glabrous, narrow; style short; stigma more or less bilobed. Pods not seen. Fl. : May.

SIK., altitude 1500 m in wet places.

The specimens on which the present description is based are without pods. The identification, therefore, based on the leaf and flower characters.

A very typical species in the genus recognised by its sessile leaves and large deep lilac flowers.


Erect, slender, annual, glabrous herbs; stem slender, angular, branched. Leaves 3-12 cm long, compound, 5- or more-foliolate, petiolate; leaflets 0.3-2.5 x 0.4-0.6 cm, ovate, orbicular, marginally lobed; lobes pubescent, obtuse, 0.2-0.5 cm long, petiolulate. Flowers 0.2-0.3 cm across, pedicellate, light-yellow, in terminal, 2.5-8 cm long racemes. Sepals 0.1-0.15 cm long, erect, obovate, glabrous. Petals light yellow, 0.2-0.3 cm long, not clawed, glabrous. Ovary cylindric, 0.1-0.2 cm long; style short; stigma more or less bilobed. Pods 0.6-2.8 x 0.05-0.1 cm, erect, narrowly linear-lanceolate, beakless, tapering at both ends; valves nerveless, smooth with prominent midvein. Seeds oblong, 0.1-0.15 cm long, 1-seriate, reddish-brown, rugose, glabrous, few; testa reticulately pitted. Fl. & Fr.: July to November.

ENG. name: Bitter-cress

J. & K., PUNJAB, U.P.; BIHAR, W.B., MAH., T.N., KAR, and KERALA; usually found in damp place and drying moist ground in hilly regions, river beds etc.
Chromosome no. 2n=16 (Jones in Fl. Europ. 1:289. 1964).

This plant is sometimes allowed to grow on South Indian estates, as check against soil erosion. The leaves and flowers are used as salads. The herb contains traces of etheral oil of uncertain nature.


Erect, slender, annual, branched, glabrous herbs;

Leaves radical and cauline, cauline: ones 1.8-2.4 cm long, compound, 5-9-mer foliolate, on 1-4 cm long, petioles, slender, sagittately auricled at base, leaflets shortly petiolulate, lateral ones 0.8-2 x 0.4-1.2 cm, terminal ones 2-3.5 x 0.8-1.2 cm, all ovate-oblong, minutely hairy, obtuse at apex. Flowers 0.3-0.6 cm across, light yellow, in 2-12.0 cm long,
terminal racemes. Sepals 0.2-0.3 cm long, not saccate at base, linear, glabrous. Petals 0.2-0.3 cm long, light-yellow, linear-erect. Ovary cylindric, 0.2-0.3 cm long, 4-many-ovuled; style short; stigma flat more or less bilobed. Pods 0.6-2.6 x 0.03-0.1 cm, slender, narrow linear, nearly appressed to the axis, beakless; valves nerveless, mid-sein prominent. Seeds 1-serial, oblong, 0.05-0.1 cm long, reddish, few, rugose, glabrous; testa with reticulate ornamentation. Fl. & Fr.: May to August.

ENG. name: Narrow leaved Bitter-cress

J & K., to SIK., altitude 4000 m in moist waste places, stream-beds, on road-sides and hilly places.

Chromosome no. 2n=16 (Jones in Fl. Europ. 1:289, 1964).

Cardamine pectinata Pallas ex DC, is treated as a synonym of C. impatiens L, by Hook, f. & T. Anders., but the two are distinct (See Jones in Fl. Europ. 1:289, 1964).

This plant is considered to be stimulant and diuretic.

Schulz in Engl. Bot. Jahrb. 32:399. 1903; Bamber, Fl. Punjab 1:504. 1916; Collett, Fl. Simlensis 33. 1921; Blatter,

Erect, slender, perennial, pubescent herbs. Leaves compound, 2.5-12.5 cm long or even longer, pubescent, on 0.2-0.5 cm long, slender, petioles; leaflets 1.5-3 x 0.2-1.2 cm, ovate-oblong, crenate, lobed, hairy, sessile, acute at apex, 4-6-paired. Flowers 0.8-1.8 cm across, violet, pedicellate, in short corymbs. Sepals 0.3-0.5 cm long, erect, glabrous, obovate. Petals 1-1.2 cm long, violet, clawed, distinctly veined. Ovary cylindric, glabrous, 0.8-1.1 cm long; style short, stigma more or less bilobed. Pods 2.8-5.2 x 0.1-0.2 cm, erect, spreading from axis, stalked, tapering at both ends; valves nerveless with thick margins, pointed tip portion of the pod appearing like beak. Seeds 0.15-0.25 cm long, oblong, 1-seriate, reddish-brown, 5-10 in each fruit; testa with very small and narrow reticulations. Fl. : May to June.

ENG. name: Large flowered bitter-cress.

Found in temperate Himalayas upto an altitude of 2350 m.

A very distinct species in the genus *Cardamine* easily recognised by its larger, crenately lobed hairy leaflets, larger, violet flowers and long pods.


Slender, erect, glabrous, perennial herbs 25-40 cm tall; stem slender, leafy. Leaves radical and cauline; radical ones compound, 5-12 cm long, on slender, 2-9 cm long petioles; leaflets 0.5-1 x 0.3-1.0 cm, orbicular, ovate, terminal largest, gradually becoming smaller towards base, almost entire, obtuse at apex; cauline leaves linear-oblong, entire, needle-like, 0.5-1.8 x 0.1-0.5 cm. Flowers 0.8-1.1 cm across, in terminal, erect corymb-like racemes, pedicellate. Sepals 0.2-0.3 cm long, ovate, glabrous, not saccate at base. Petals 0.7-0.8 cm long, obovate, clawed. Ovary cylindrical, 0.5-0.6 cm long; style short; stigma distinct, inconspicuous. Pods 0.6-1.2 x 0.05-0.06 cm, linear, tapering at both ends, beakless, stalked; valves with distinct mid-vein. Seeds few, oblong, 0.1-0.15 cm long, reddish, 1-seriate; testa reticulately pitted. *Fl. & Fr.*: March to June.
ENG. name: Lady's smock, Cuckoo-flower.
J. & K., and Western Tibet.


This plant is considered to be stimulant, diaphoretic and diuretic. The plant is used in some parts of Europe in the treatment of nervous affections. In Cornwall, the flowering tops have been employed for the cure of epilepsy. The leaves are bitter, pungent and antiscorbutic (see Welsh & India).


Erect, annual, glabrous herbs; stem slender, glaucous-green, flattened, branched. Leaves 5-mo re-foliolate, 3-12 cm long, on 0.5-2 cm long, slender petioles; leaflets ovate-elliptic, sinuate, irregularly lobed, crenate, narrow towards base, glabrous, obtuse, on 0.1-0.7 cm long petiolules;
lateral ones 0.2-1.8 x 0.1-1.5 cm; terminal ones 0.8-3.2 x
0.4-2 cm. Flowers 0.2-0.5 cm across, yellowish-white, in
short racemes. Sepals 0.2-0.3 cm long, erect, ovate,
glabrous. Petals 0.3-0.5 cm long, white, obovate, clawed,
distinctly veined. Ovary cylindric, 0.3-0.4 cm long;
style short; stigma distinct or inconspicuous. Pods 0.8-2 x
0.1-0.2 cm, broadly linear, tapering at both ends, beakless,
compressed, stalked; valves nerveless, mid-vein distinct.
Seeds few, oblong, 0.1-0.15 cm long, reddish-1-seriate, with
reticulately pitted testa. Fl. & Fr.: March to October.
Local names: GUJ. - Abdu rai.

In hills of Nilgiris and Pulneys, above 2000 m
altitude; also in moist waste places in plains of W.B., MAH.,
GUJARAT and South India.

This species is often confused and wrongly identified
because of its resemblance with Rorippa indica (L.) Hiern.
but it differs from the latter in 1-seriate seeds. Gamble
(1958) states that petals are absent in C. trichocarpa but
this observation is not confirmed during the present study.

This plant is said to be used in pharmacognosy; as a
stimulant and diuretic.

CHEIRANTHUS Linn.

Sp. PI. (ed. 1) 2:661, 1753 & Gen. PI. (ed. 5) 297, 1754;

Perennial, appressedly hairy; herbs or undershrubs; hairs bipartite. Leaves oblong-linear, entire or toothed, simple. Flowers large, yellow or purple, in terminal racemes or spikes. Sepals erect, the inner saccate at base. Petals long clawed, yellow or purple. Stamens without median nectary glands. Ovary cylindric, linear, style short; stigma with 2-short spreading lobes. Pods 4-angled, compressed, valves 1-nerved with a distinct median vein; septum membranous; Seeds in 1-2 rows, flattened, not winged or margined.

India, Pakistan and Europe.
1. Pods hairy ........................................................ C. himalayensis

1. Pods glabrous :

2. Flowers 2-2.3 cm across ...................... C. cheiri

2. Flowers 0.5-0.6 cm across ...................... C. stewartii


Erect, perennial, slender herbs, finely downy. Leaves 3-7.5 x 0.4-1.4 cm, simple, sessile, linear-lanceolate, acute, entire, pubescent, upper leaves amplexicaul, auricled at base. Flowers yellowish-brown, pedicellate, in terminal racemes; pedicels 0.5-0.8 cm long, thick. Sepals 1.0-1.2 cm long, saccate at base, obovate, covered with finely appressed-hairs. Petals 1.3-1.5 cm long clawed, much exceeding the sepals, distinctly veined. Anthers flat, blunt; median nectary glands absent. Ovary cylindric, 1.2-1.4 cm long, glabrous; style short; stigma with two short spreading lobes. Fruit a siliqua, 1.6 = 0.1 cm, erect, narrowly linear, 4-angled, compressed; valves with a prominent mid-vein, stalked; stigmatic lobes short, spreading. Seeds 1-seriate, 0.2 cm long, oblong, not winged, brown, glabrous, rugose; testa reticulately pitted. Fl. & Fr. : May to June.
Cultivated in Indian gardens for its attractive yellow flowers.

Chromosome no. $2n=14$ (Ball in Fl. Europ. 1:279. 1964).

Jeretzy (1928), Manton (1932) and Sakai (1935) reported that the chromosome number in *Cheiranthus* is $2n=14$ (cheiri Linna) on account of normal meiosis, the plants produce viable pollen and set abundant seeds indicating that the plants are amphimicts. This, therefore, creates the possibility of a second base no. $x=6$, not only for this species but for the genus as a whole. Koul & Wakhlu (Curr. Sci. 43(22):729. 1974), in a survey of chromosome number in cultivated plants, reported that the two cultivated populations of *Cheiranthus cheiri* L. were $2n=12$ and that the plants were stable in their behaviour.

The flowers yield an essential oil of yellow colour, which shows a blue fluorescence in alcoholic solution. From the leaves, two substances, cheiranthin and cheirinin have been isolated. The flowers are considered cardiac and emmenagogue and the dried petals are stimulants. The seeds are tonic, diuretic, expectorant and stomachic.


Erect, slender, perennial, tomentose herbs. Leaves 0.8-2 x 0.2-0.4 cm, linear-spathulate, lobed at the apex, fleshy, pubescent, simple, sessile. Flowers 0.7-0.8 cm across, pinkish, few, in terminal racemes. Sepals 0.4-0.5 cm long, lanceolate, finely hairy. Petals clawed, spathulate, reticulately veined. Ovary cylindrical, glabrous, 0.6-0.8 cm long; style short; stigma with two short spreading lobes. Pods 1.3-1.8 x 0.1-0.3 cm, hairy, linear, compressed; valves with thickened margins; stalk 0.4-0.6 cm long, thick, hairy. Seeds 0.1-0.2 cm long, oblong, 2-seriate, many, reddish-brown; testa reticulately pitted. Fl. & Fr.: April to June.

Chromosome no. 2n=14 (See Ball in Fl. Europ. 18:191 (1946)).

West Tibet: very rare.


Erect, annual, subfleshy, hairy herbs. Leaves 1-4 x 0.1-0.6 cm, spathulate, slightly lobed, pubescent, obtuse, narrowed at base. Flowers pedicellate, in terminal, short racemes. Sepals oblong, 0.3-0.35 cm long, pubescent. Petals clawed, broadly spathulate. Anthers flat, obtuse, median nectary glands absent. Ovary cylindrical, glabrous, 0.4-0.5 cm long; stigma sessile, bilobed. Pods 1.5-4.5 x 0.2-0.5 cm,
on 0.4-0.6 cm long, thick, pubescent stalk; erect, glabrous, tapering at both ends; valves flat, mid-nerve distinct; stigma broad and bilobed. Seeds 0.1-0.2 cm long, ovate-oblong, 2-seriate, many, reddish-brown, glabrous, rugose; testa reticulately pitted. Fl. & Fr.: April to June.

J. & K., West Tibet, altitude 4900-5400 m; very rare.

CHRISPERMA R. Br. ex DC.


Slender, branching or tufted, glandular or hairy herbs, with angular, flattened stem. Leaves entire or pinnatisect, simple, hairy. Flowers yellow or purple, few, in ebracteate racemes. Sepals erect, saccate at base. Petals purple, clawed and veined. Ovary narrow, cylindric; style short; stigma erect, 2-lobed. Fruit articulated, breaking into 2-seeded segments, transversely jointed, not constricted between seeds, indehiscent, beaked, torulose, cells numerous,
2-seriate. Seeds solitary in each loculus, reddish-yellow, oblong.

India, Northern China, Central Asia, Afghanistan and Europe.

1. Lower leaves pinnatifid, upper leaves simple; pods slightly constricted between seeds ............................... Chorispora tenella

1. Leaves lyrately pinnatisect; pods deeply constricted between seeds ...... Chorispora sabulosa


Small, tufted, perennial, glandular-hairy herbs; root thick, fleshy, spindle-shaped. Leaves all radical 5-6.3 cm long, tufted, petioled, hairy lyrately pinnatifid with terminal lobes; petioles 2-3 cm long, hairy. Flowers 1-1.2 cm across, yellowish, in 7-18 cm long, leafless, glandular-hairy scapes. Sepals erect, glabrous, 0.8-1 cm long, lateral ones slightly saccate at base. Petals 1-1.2 cm long, spreading, glabrous, narrowed to a slender claw, limb emarginate. Stamens 6. Ovary cylindric, glabrous, many ovulata. Pods 1.8-2.2 cm long, indehiscent, constricted between seeds;
beak thin, slender; mid-rib prominent. Seeds solitary in each cell, oblong-ovate, 0.1 cm across. Fl.: July to August.

Western Himalayas from J. & K., to Kunawur and West Tibet.


Erect annual, simple or branched, slender, hairy herbs. Leaves simple, lower ones 4-7 x 0.7-1.7 cm, pinnatifid, oblong, peltate, upper ones. 1.5-4 x 0.4-0.8 cm, obovate-oblong, hairy, acute, sessile. Flowers 0.8-1 cm across purple, pedicellate, in ebracteate racemes; pedicels 0.3-0.5 cm long. Sepals 0.5-0.6 cm long, erect, acute, saccate at base. Petals 0.8-1 cm long. Ovary 0.8-0.9 cm long, narrowly cylindrical, glabrous; style long; stigma bilobed. Pods 2-3.2 cm long, ascending, slender, curved, jointed, but not constricted between seeds, torulose, indehiscent, beaked; beak 0.3-1.2 cm long, subulate, slender, thin. Seed one, in each loculus, reddish-yellow, 0.1-0.15 cm long, oblong, glabrous; testa reticulately pitted. Fl.: July.

Western Himalayas and PUNJAB, extending to J. & K., elevation 1600-2300 m; very rare.
CHRISTOLEA Cambess.

Glabrous or pubescent, stout, erect, perennial herbs. Leaves fleshy, simple, entire or coarsely toothed. Flowers yellow, in lax, ebracteate racemes. Sepals short, suberect, lateral slightly saccate at base. Petals yellow, shortly clawed. Pods erect, linear-lanceolate, flattened, acute at both ends, pubescent; valves smooth, 1-nerved; stigma minute, conical. Seeds 2-seriate, oblong, few, reddish, glabrous.

India, Pakistan, Afghanistan.

sessile. Flowers 0.7-0.8 cm across, yellow, pedicellate, in racemes. Sepals 0.4-0.5 cm long, suberect, lateral saccate at base. Petals 0.7-0.8 cm long, yellow, clawed, base purple, veined. Ovary 0.6-0.65 cm long, narrow, cylindric; style short; stigma minute, conical. Pods 1-3 x 0.2-0.3 cm, erect, linear-lanceolate, flattened, tapering at both ends, pubescent, beakless, shortly stalked; valves smooth, 1-nerved. Seeds 0.1-0.15 cm long, few, 2-seriate, flattened, oblong, slightly pointed towards one end, reddish, glabrous, smooth. Fl. & Fr.: July to September.

Western Tibet, elevation 3900-4900 m; very rare.

COCHLEARIA Tourn. ex Linn. - t.1

Sp. Pl. (ed. 1) 640. 1753 & Gen. Pl. (ed. 5) 289. 1754;
Hook. f. Gen. Pl. 1:75. 1862; Boiss. Fl. Or. 1:245. 1867;
Prantl in Engl. & Prantl, Pfam. 3(2):167. 1890;
Kernera Medic. Pflanzenz. 71. 1794. Raphanis Dod. ex Moench,
Annual or perennial glabrous, seldom hairy, often fleshy herbs, leafy and branched at base. Leaves simple, pinnatifid or pinnatipartite, toothed, rarely entire. Flowers yellow, lilac or violet, corymbose or in short racemes, rarely solitary. Sepals spreading, obovate, obtuse. Petals with distinct nerves, shortly clawed, elliptic. Stamens 6, tetradynamous; anthers ovate, blunt. Ovary ovate-globose, 2-many ovuled; style short; stigma inconspicuous. Pods globose, ovoid, ellipsoid or oblong, laterally compressed; valves convex, swollen, with distinct mid-nerve and reticulations. Seeds numerous, 2-seriate, compressed, wingless.
Erect, annual, glabrous herbs; stem leafy with ascending branches, angular, pale-greenish yellow. Leaves radical and cauline, radical ones 4-11 x 0.8-3.4 cm, glabrous, obtuse, lyrately deeply pinnatifid to pinnatipartite, lobes sinuate, 2-4 cm long petiolate, cauline ones sessile, 1-2.2 x 0.4-1.5 cm, glabrous, pinnatifid to pinnatipartite. Flowers small, 0.2-0.3 cm across, yellow, in 4-14 cm long racemes; pedicels 0.1-0.2 cm long, filiform, glabrous, terete. Sepals 0.1-0.15 cm long, spreading, equal at base, oblique, obovate, blunt. Petals 0.15-0.25 cm long, elliptic, shortly clawed, with very distinct nerves. Stamens tetradynamous; anthers ovate, blunt. Pistil sessile; ovary 0.2-0.3 cm long, ovoid-globose, glabrous. Pods 0.3-0.5 x 0.2-0.4 cm, ovoid, globose, glabrous, laterally compressed; valves convex, swollen with distinct mid-nerve and reticulations. Seeds numerous, ↑ 0.1 cm, 2-seriate, sub-reniform, glabrous, rugose, wingless. Fl. & Fr.: December to January.

Eng. name: Survey grass.

An occasional weed in cultivated fields, in moist places, in upper and lower gangetic valley, BIHAR, W.B. and ORISSA, extending further into GUJARAT and MAH.
CONRINGIA Adans.


Glabrous, slender, glaucous annuals, with angular stems. Leaves simple, glaucous, entire, oblong, amplexicaul, auricled. Flowers yellow, in ebracteate racemes. Sepals elongate, equal at base or lateral saccate. Petals pale yellow, elongate, clawed, veined. Ovary cylindrical, many ovuled, glabrous; style short; stigma slightly 2-lobed. Pod linear, compressed or tetragonal, elongated; valves 1-3-veined; style short; stigma 2-lobed. Seeds 1-seriate, not margined, oblong, reddish-brown, glabrous, rugose.

India, Asia minor, Central Asia, Iran and Afghanistan.

Glabrous, glaucous annuals, with angular, branched, slender stems. Leaves radical and cauline, radical ones few, 5-7.5 cm long, ovate-oblong, glabrous, obtuse, cauline ones amplexicaul, cordate at base, entire, glabrous, acute, lower ones 4.4-7.5 x 2.4-4.5 cm, upper ones 1.4-2.5 x 0.5-1.4 cm. Flowers yellow, 0.4-0.5 cm across in racemes; pedicels 0.2-0.5 cm long, slender. Sepals 0.3-0.4 cm long, elongate, equal at base. Petals 0.4-0.5 cm long, yellow, clawed and veined. Ovary cylindric, 0.3-0.4 cm long, many-ovuled, glabrous. Fruit 3.5-8.0 x 0.1-0.15 cm, erect, narrow-linear, stalked; valves smooth; stigma simple; pedicels 0.5-1 cm long. Seeds 1-seriate, many, 0.1-0.15 cm long, oblong, reddish-brown, glabrous, rugose, not margined. Fl.: March to April.

Western Tibet, altitude 3000-4100 m; very rare.


CORONOPUS J.G. Zinn.

Annual, biennial or perennial, slender, erect, branched herbs, glabrous or sometimes sparsely hairy. Leaves once or twice pinnately divided, wedge-shaped or linear, sometimes toothed or cauline. Flowers in short, bractless, leaf-opposed racemes, minute, white, rarely purple. Sepals patent, short, spreading, equal at base, oblique, erect, slightly obovate or oblong, not saccate. Petals small, minute, white, broad, ovate, hardly clawed, rarely absent. Stamens free, 6, rarely 2; filaments slender, rarely broad winged; anthers round. Ovary sessile, 2-ovuled, ovate or globose; style short or absent. Pods short, nearly globose, vertically constricted, indehiscent or breaking into 2-halves; valves subglobose, verrucose or reticulate. Seeds one in each cell, reniform.

India, Western Asia, Europe and North America.

Annuals, prostrate or suberect, 20-45 cm tall, slender, glabrous, branched herbs, bulbous at base. Leaves radical and cauline, radical ones 4-15 cm long, variously lobed, lobes wedge-shaped, on 1-5 cm long, flattened, green petioles, cauline ones 0.6-2.5 cm long, alternate, lobed, lobes 0.3-0.6 x 0.1-0.15 cm, linear-lanceolate, entire, glabrous acute at apex. Flowers 0.1-0.15 cm across, white or yellow, in leaf-opposed, 1.4-4.5 cm long racemes. Sepals 0.05-0.1 cm long, erect, oblique. Petals 0.1-0.15 cm long, white, or yellow, ovate, not clawed. Filaments slender, anthers round. Ovary sessile, 2-ovuled, globose; style short; stigma inconspicuous. Fruits 1-1.5 x 0.05-0.1 cm, indehiscent, globose, beakless, rugose, didymous, green, striated; valves reticulate. Seeds one in each cell, 0.1-0.15 cm long, reniform, yellowish-brown; testa reticulately pitted. Fl. & Fr.: Throughout the year.
ENG., name: Lesser Swine's Cress, Wart Cress.

Throughout India, extending to an elevation of 1400 m in hills; abundant often in patches in moist ground along roads, cultivated fields, grass lands and on moist walls.

**Crambe Tournefort ex Linn.**

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Annual to perennial, stout herbs or undershrubs, glabrous or with unbranched hairs. Leaves large, lower ones lyrately-pinnatifid, toothed; upper ones minute linear, entire. Flowers conspicuous, white, in long, corymbose racemes. Sepals oblong, inner ones saccate at base, erecto-patent, obtuse. Petals white with a short claw or cuneate at base, obovate. Stamens 6; filaments of inner stamens usually with a tooth-like appendage; lateral nectariferous glands conspicuous, median ones bigger, semiglobose; anthers oblong obtuse. Ovary 1-ovulate, subglobose, glabrous;
stigma depressed, capitate, sessile or rarely with short style. Pods indehiscent, transversely articulate, the upper joint globose, 1-celled, 1-seeded; lower short, sterile, forming a stalk together with the gynophore. Seeds large, globose, pendulous from the incurved tip of the funicle, which raises from the base of the cell; testa rugos.

India, Pakistan, Afghanistan & Persia.


1. Pods 0.45-0.55 cm in diameter; pedicels of flower 0.6-0.7 cm long. var. cordifolia

1. Pods 0.1-0.3 cm in diameter; pedicels of flower 1-2 cm long. var. kotschyana

1. Pods 0.45-0.55 cm in diameter; pedicels of flower 0.6-0.7 cm long. var. cordifolia

Erect, tall, stout, bristly hairy, branched, perennial, herbs. Leaves large, radical and cauline; radical leaves 2.5-5.1 cm long, ovate, lobed, dentate; on stout petioles; petiole striate, dilate and cordate at base, cauline leaves not distinctly cordate, 0.9-1.5 cm long, linear, erect,
sessile, glabrous. Flowers 10-25, white, 0.6-0.7 cm across, in loosely panicled racemes; pedicels 0.6-0.7 cm long. Sepals 0.25-0.3 cm long, outer oblong, inner ones ovate. Petals 0.6-0.7 cm long, white, lamina obovate, apex rotund. Stamens 0.25-0.35 cm long; filaments subcurved; anthers 0.1 cm long. Pistil articulate, 0.2 cm long; inferior 0.05 cm long, 1-ovulate. Pods 0.44-0.55 cm diameter, globose, upper part pisiform, crustaceous; valves quadricostate, reticulately nerved. Seeds compressed, globose, 0.4 cm long; testa rugose. Fl.: April.

Occurs in North-West Himalayas, J., K., and Western Tibet at an altitude of 2600-4600 m.

Leaves are eaten as pot-herb. The root is said to be edible. The plant is sometimes used as a cure for itch (See Wealth of India).

var. kotschyan a (Boiss.) O.E. Schulz in Ffreich, 70:236.

Pedicels of flower elongate, 1-2 cm long. Sepals 0.4-0.5 cm long. Petals 0.75-1.1 cm long. Stamens 4-5, 0.5-0.6 cm long; filaments of inner stamens dentate, 0.06-0.1 cm long; anthers 0.12-0.15 cm long. Pedicels of upper pods 2-4 cm long,
articulate, those of inner pods short, 0.1-0.3 cm in diameter. Pod 0.55-0.6 cm diam. Seeds 0.45-0.5 cm long.

Schulz cited the locality as West-Tibet on the authority of collection of T. Thomson.

DESCURAINIA Webb. & Berthot.


Annual or biennial, hairy, erect or ascending, suffruticose, herbs; hairs branched or unbranched. Leaves 2-3-pinnatisect, petiolate, lobes linear or oblong. Flowers small, pedicellate in ebracteate racemes. Sepals erecto-Patent, outer narrowly oblong, inner obtuse, not saccate at base, rarely long, persistent. Petals greenish-yellow or whitish with yellow tinge, spatulate as long as or shorter than sepals, ovate. Stamens 6, erect; anthers oblong, obtuse; nectariferous glands small, torulose, laterals semilunar or ring-like, conjoint with median ones. Pistil cylindric, sessile, ovary many ovulate; style short.
unequally thick; stigma subcapitate. Pod erecto-patent, torulose, 2-celled; valves with prominent and vein- and lateral ones reticulate. Seeds small, 1-seriate rarely biseriate, oblong or ellipsoidal; testa reticulately pitted, not mucilaginous when moistened.

India, North Africa, Europe, North & South America.

Descurainia sophia (Linn.) Webb. ex Prantl. in Engler & Prantl, Phan. 3(2):192. 1890; Schulz in Freieh. 86:309. 1924; Wealth of India 3:41. 1952; Ball in Fl. Europ. 1:256. 1964.


Erect, annual herbs; stem slender, terete, finely tomentose, glauous, generally branched above, rarely from base or unbranched. Leaves radical and cauline; radical ones shortly petiolate, primarily 3-lobed, terminal lobe narrowly obovate, laterals oblong-elliptic; cauline ones subsessile, pinnatisect; segments 0.2-0.4 x 0.1-0.2 cm, subopposite, linear, entire, acute. Flowers 0.2-0.3 cm across, pale-yellow, in terminal racemes; pedicels 0.2-0.3 cm long, slender. Sepals 0.1-0.2 cm long, not saccate at base, persistent. Petals 0.2-0.3 cm long, pale yellow,
hardly clawed. Stamens 6, erect; anthers oblong, obtuse.
Ovary 0.15-0.25 cm long; style short; stigma subcapitate.
Pods 1.2 x 0.05 x 0.1 cm, linear, spreading, cylindric,
curved, subtorulose; valves with prominent mid-vein; pedicels
1-1.4 cm long, slender. Seeds 1-seriate, ± 0.1 cm, ovate-
oblance, compressed, light-brown, testa reticulately pitted.
Fl. : June to August.

ENG. name: Flix weed; Fine leaved Hedge Mustard.

J. & K., and PUNJAB.

Chromosome no. 2n = 28 (Ball in Fl. Europ. 1:266. 1964).

The plant has been used externally for ulcers. The
flowers and leaves are astringent and antiscorbutic. Seeds
are reported to be useful in fevers, bronchitis and dysentery,
they are also given for worms and calculous complaints (See
Wealth of India).

DILOPHIA T. Thoms.

India 1:160. 1872.

Dwarf, glabrous, fleshy, perennial herbs. Leaves
spathulate or linear, tufted, entire or toothed. Flowers
small, numerous, white in densely contracted, subumbellate
racemes. Sepals not saccate, equal at base. Petals
spathulate retuse or toothed. Anthers purple. Pods compressed
on 4 sides, obcordate, short; valves gibbous at back, with a double crest; septum broad, perforated. Seeds 2-5 in each cell, oblong, wingless, on short thickened cords.

India.

Dilophia salsa T. Thoms. in Hook. Rev. Journ. 5:20. 1853;

Small, dwarf, glabrous herbs, with many, stout spreading stems, each surrounded at base by a whorl of basal cauline leaves, which soon wither. Upper cauline leaves persistent, 0.4-0.8 x 0.1-0.15 cm, small, linear-lanceolate, entire, glabrous. Flowers numerous, white in short, subumbellate, terminal racemes. Sepals 0.2-0.3 cm long, glabrous, ovate, fleshy. Petals 0.3-0.4 cm long, slightly recurved at top. Stamens 8, free, very slender; anthers purple. Ovaries 2, connate in the lower half, each half with a five pointed viscid cap. Pods 0.25-0.35 x 0.2-0.25 cm, obcordate, compressed, valves gibbous at back, with a double crest. Seeds 4-5 in each cell, < 0.1 cm across, oblong, wingless, glabrous, smooth. Fl. & Fr.: July to September.

Tibet, in marshy places.

DILOTAXIS DC.

Annual or biennial, erect, simple or branched, sparsely hairy, herbs, often with flattened stems. Leaves pinnatifid; lower leaves oblong-obovate, upper linear-lanceolate. Flowers yellow, pink or purple. Sepals oblong, spreading, equal at base. Petals oblong-obovate, yellow, pink or purple, clawed and veined. Stamens usually 6; anthers oblong, obtuse. Ovary cylindric, many ovulate; style short; stigma bilobed. Pods linear, compressed, 3-nerved; valves truncate or emarginate, membranous, sometimes with short beak. Seeds 2-seriate, numerous, oblong, compressed or subglobose.

India, Afghanistan, Western Asia, U.S.S.R. and Australia.


Erect, annual, glabrous herbs. Leaves 2.5-7.2 x 0.8-2.8 cm, oblong-obovate, scarcely hairy, narrowed at base, acute at apex, margins wavy; petioles 0.1-0.4 cm long, slender, hairy. Flowers lilac, across, pedicellate, in terminal racemes. Sepals 0.6-0.8 cm long, glabrous, equal at base. Petals 1.1-1.3 cm long, clawed, glabrous, veined, rotund at apex. Stamens 0.75-0.9 cm long; anthers oblong, obtuse. Ovary many-ovulate, glabrous, linear; style short; stigma bilobed. Pods 3.6-6.4 cm long, linear, flattened, glabrous; valves prominently 3-nerved; beak 0.2-0.25 cm long, thick, fruiting pedicel 0.1-0.2 cm long, slender, glabrous. Seeds 2-seriate, many ± 0.15 cm across, ovate, glabrous, reddish-brown; testa reticulately pitted. Fl. & Fr.: January to April.

ENG. name: Wall-Rocket

Local names: PUNJ.-Buranimuli, Sizgoi.

Occurs in PUNJAB.

Dontostemon Andr. ex DC.

Prodr. 1:190. 1824; Ledeb. Fl. Alt. 3(h):118. 1831; Benth & Hook. f. Gen. Fl. 1:68. 1862; O.E. Schulz in Engl. & Harms,
Annual or perennial, hairy herbs; hairs simple or branched. Leaves simple, lobed or entire. Flowers small in ebracteate racemes. Sepals erect, caducous, inner slightly saccate. Petals reddish or white, Anthers long, blunt; filaments of the inner stamens united in pairs, sometimes with wide wings. Lateral honey glands 4, pyramidal or conical at each side of short stamens. Ovary thin, slender; style short, thickened upwards; stigma compressed, capitate, more or less 2-lobed. Pod linear, valves swollen, with distinct mid-nerve. Seeds 1-seriate, somewhat flattened, smooth, slightly winged below.

India, Pakistan, Central Asia and Western Asia.


Small, prostrate, annual, glabrous herbs. Leaves radical and cauline, radical ones 0.3-1 cm long, much pinnatifid, glandular, lobes acute, more or less entire,
cauline ones 0.8-2 cm long, sessile, pinnatifid, glabrous.

Flowers minute whitish-yellow, in short racemes. Sepals 0.2-0.25 cm long, acute, erect, lateral saccate at base.

Petals 0.3-0.4 cm long, slightly clawed, veined. Ovary 0.2-0.3 cm long, linear, cylindric, many-ovuled, glabrous; style short; stigma capitate. Pods 0.8-2.4 cm long, glabdular, suberect, tapering at both ends, linear, on 0.1-0.2 cm long, thick pedicels; valves concave, veined with faint mid-nerve. Seeds 1-seriate, ± 0.1 cm across, reddish, many, ovate-oblong, glabrous, rugose; testa reticulately pitted.

Fl. & Fr. • March to May.

SIK., elevation 4600-5000 m; very rare.

**Doubtia** Cambess.


Erect, suffruticose, glabrescent herbs. Leaves simple; lower leaves shortly petiolate, upper ones sessile, fleshy.

Flowers large, in lax racemes, pedicels spreading. Sepals erecto-patent, outer linear, attenuate, inner oblong, acute, not saccate at base. Petals rose-coloured, oblong-cuneate, apex rounded, reticulately veined. Median nectariferous
glands larger, oblong-ovoid; lateral semicircular. Stamens 6, free; anthers linear, acute; pistil cylindrical, sessile; Ovary 20-30 ovulate; style short; stigma bilobed, lobes 0.15 cm long, decurrent. Pods linear, septate, dehiscent, bivalved; valves with prominent mid-vein, reticulately nerved. Seeds 1-seriate, ellipsoidal, on filiform funicles.


Suffruticose, glabrescent herbs. Leaves entire, glabrous; lower ones elliptic-oblong, 1.2-1.5 cm long, obtuse and mucronate at apex, entire or crenately-sinuate, narrowed into short petiole; upper ones oblong-linear, sessile, entire. Flowers 10-20, rose-coloured, in lax racemes; pedicels 0.5-0.7 cm long. Sepals erecto-patent, outer 0.8-1 cm long, linear, inner fleshy, obovate, not saccate. Petals 1.2-1.4 cm long. Filaments 0.4-0.5 cm long; anthers ± 0.4 mm long, sagitate at base. Pistil 0.6 cm long; style short, conical, pointed. Pods 6.5 x 0.15-0.2 cm, linear, elongate; valves flat, 1-nerved. Seeds subglobose, ± 0.2 cm across, glabrous, on 0.2 cm long funicles. Fl. & Fr.: February to March.

Found in salt pans of PUNJAB, West of the Indus.
Dipterygium Decne.


India, Pakistan, North Africa and Arabia.

Virgate, rigid, much branched shrubs. Leaves 0.5-1.8 x 0.1-0.6 cm, oblong entire, acute, on 0.1-0.2 cm long petioles. Flowers 0.2-0.3 cm across, few, white, in elongated racemes, pedicellate; pedicels 0.2-0.3 cm long, slender. Sepals 0.1-0.15 cm long, equal at base. Petals 0.2-0.3 cm long, white, not clawed. Stamens free, filaments entire. Ovary 0.15-0.25 cm long, cylindric, narrow; style short; stigma erect. Pods 0.2-0.6 x 0.1-0.3 cm, ellipsoidal, indehiscent, compressed laterally, coriaceous; valves nerveless, with thin membranous wings. Seeds solitary, 0.1 cm across, ovo-oblance, reddish, glabrous, not margined. Fll. & Fr. : March to May.

Found in RAJAS; very rare.

DRABA Linn.

Annual, biennial or perennial, small herbs with simple or branched hairs; stem mostly creeping, often tufted or clustered, scapose or leaf-bearing. Leaves simple, radical ones densely rosulate, more or less prominently petioled, cauline ones sessile, entire or shortly toothed. Flowers white or yellow, rarely purple, in short, ebracteate racemes or corymbs. Sepals erecto-patent, round or blunt at tips, hyaline or margined, outer oblong or elliptic, inner broader, somewhat ovate. Petals white or yellow, entire or emarginate. Stamens often 4, outer erect or ascending; filaments linear, slender or broad at base, outer stamens often reduced to toothed filaments. Anthers oval, oblong, nectariferous glands usually 2, laterals rarely 4 and by the side of smaller stamens, free rarely confluent, appended. Pistil sessile; ovary flat, rarely cylindrical, 4-many-ovulate; style long or short, persistent on fruit. Pods compressed or turgid, elliptic-oblong or ovoid, rarely linear, straight or curved; valves more or less flat, with a median vein.
in the lower half; replum slender and the epidermal cells of the replum small, irregularly polygonal. Seeds 2-seriate, pendulous from short funiculus, ovoid, compressed, not margined.

1. Plants scapigerous; leafless..... (Section - Chrysodraba):

2. Pods compressed :

3. Racemes in flowering and fruiting stage, always congested.... D. alpina

3. Racemes at the time of fruiting lax ......................D. setosa

2. Pods inflated ................. D. oreades

1. Plants with well developed stems :

4. Stem densely leafy; leaves many ......................... D. elata

4. Stem remotely few leaved :

5. Plants biennial or perennials;
 siluca with long styles..... (Section - Leucodraba)

6. Plants very small, few-leaved;
 basal leaves minute, less than 1 cm long :

7. Pods acute at apex .......... D. altaica

7. Pods rotund or obtuse at apex :

8. Basal leaves long petiolate. D. sikkimensis

8. Basal leaves shortly petiolate or almost sessile ............... D. winterbottomii
6. Plants medium or large
sized, many-leaved; basal
leaves large, more than 1 cm
long:

9. Fruit ellipsoid:

10. Stem minutely, stellately
hairy or glabrescent:

11. Racemes dense; pods
0.5-1 cm long; style
0.05 cm long, coriaceous. *D. lasiophylla*

11. Racemes lax at
anthesis; pods 0.3 cm
long; style terminal,
0.1 cm long ............ *D. oerocarpa*

10. Stem hairy; hairs large,
simple, branched or
stellate:

12. Leaves stellately hairy,
more or less tomentose;
racemes bractless below. *D. stenobotrys*

12. Leaves hispidly hairy;
hairs simple; racemes
bracteate at least in
apical part ............. *D. nubigena*

9. Fruit oblong or linear:

13. Pods stellately hairy,
pubescent or glabrous,
but not scabrid:
14. Fruiting pedicel 0.2-0.6 cm long; ovary 36-48 ovulate; leaves more than 2 ................... * D. lanceolata

14. Fruiting pedicel 0.5-2 cm long; ovary 16-36 ovulate; leaves 1-2 ................... * D. tibetica

13. Pods scabridly hairy ........... * D. falconeri

5. Plants mainly annuals, sometimes perennials; siliqua hardly style bearing: ...................... (Section - Drabella)

15. Plants erect or ascending:

16. Cauline leaves semi-amplexicaul; petals white; pods glabrous ................... * D. muralis

16. Cauline leaves sessile; petals yellow; pods hairy:

17. Pods linear ................... * D. stenocarpa

17. Pods oblong or ovoid ..... * D. eriopoda

15. Plants prostrate:

18. Sepals 0.2 cm; petals 0.25-0.3 cm long; pods linear, glabrous; style coronate.... * D. gracillima

18. Sepals 0.15 cm; petals 0.1-0.2 cm long; pods ellipsoid, hirsute; style absent ....... * D. ellipsoidea

Small, perennial, caespitose, tufted, short, hairy herbs. Leaves mostly radical, rarely cauline ones also present, all hairy, acute, radical ones 1-2.5 x 0.3-0.6 cm, densely rosulate, elliptic-lanceolate, hairy, narrowed into 0.3-0.8 cm long petioles; cauline leaves 1-2 x 0.3-0.6 cm, sessile, oblanceolate, hairy. Scapes 1.5-15 cm long. Flowers 4-10 yellow, in dense clusters, elongating later on in lax racemes; pedicels 0.1-0.4 cm long, slender, hairy. Sepals 0.25-0.3 cm long, inner saccate, oblong, or oblanceolate, obtuse dorsally, sparsely hairy. Petals 0.4-0.5 cm long, yellow, limb obovate shortly clawed or almost sessile, veined. Filaments linear; anthers subquadrate; nectariferous glands present. Pistil pedicellate; ovary ellipsoid, 0.4-0.45 cm long, 12-20-ovuled; style short; stigma depressedly capitate. Pods 0.4-0.8 x 0.2-0.4 cm, hairy, ellipsoid-ovoid, slightly
acute at apex, compressed, on 0.2-0.5 cm long hairy pedicels; valves flat with prominent mid-vein. Seeds oblong, ± 0.05 cm across, ovoid, pendulous, few, reddish-brown, glabrous; testa reticulately pitted. Fl. : July.

In alpine Himalayas from SIK, to J. & K. and Western Tibet, altitude 3900-5000 m.

Chromosome no. 2n = 62-64, 80 (Walters in Fl. Europ. 1:310, 1964).


Small, glabrous or pilose, perennial herbs. Leaves radical and cauline, acute, hairy, margins wavy, radical ones 0.8-2 x 0.3-0.5 cm, forming dense rosette, oblong-lanceolate, narrowed at base, into 0.4-0.8 cm long petioles, cauline ones 0.5-1 x 0.1-0.3 cm, sessile, few, linear-lanceolate, entire. Flowers 2-12, yellow, on 2-10 cm long scapes; pedicels 0.1-0.2 cm long, slender. Sepals 0.15-0.2 cm long, subequal, obovate, rounded at apex. Petals 0.2-0.25 cm long, yellow, obovate, truncate at apex, not clawed. Filaments linear; anthers ovoid. Ovary 10-20
ovulate, ellipsoid, glabrous; style short; stigma sub-capitate. Pods 0.3-0.6 x 0.15-0.25 cm, oblong-ellipsoid, compressed, straight, glabrous; pedicels 0.2-0.5 cm long. Seeds 2-seriate, ovoid, pendulous, ± 0.15 cm across, reddish-brown, ovate, many, glabrous; testa reticulately pitted. Fl. & Fr.: July to August.

Western Himalayas, Kumaon and Kunawur extending in Western Tibet, elevation 4000-5900 m.

Chromosome no. 2n=16 (Walters in Fl. Europ. 1:131. 1964).


Erect, perennial, hairy, herbs, 30-45 cm, rarely 60 cm tall herbs; stem flattened, simple or branched, simple or stellate hairy. Leaves radical and cauline, hairy, hairs simple or forked, radical ones 1.5-3.6 x 0.4-0.8 cm, resulate, spatulate, obscurely dentate, on margin, narrowed at base into 0.5-1 cm long petioles, cauline ones 1.2-2.5 x 0.3-0.6 cm, sessile, amplexicaul or subamplexicaul, oblong-ovate, dentate or entire. Flowers 10-30 yellow, pedicellate, at first in dense corymbs, at length elongating in 10-18 cm long racemes; pedicels 0.3-0.5 cm long, hairy. Sepals
0.2-0.3 cm long, outer glabrous, oblong-elliptic, rounded at apex, inner ovate, slightly saccate at base. Petals 0.4-0.5 cm long, ovate-oblong, narrowly clawed. Filaments subdilated; anthers ovoid. Ovary 12-16 ovuled, hairy; style inconspicuous; stigma semicapitate. Pods 0.7-1.2 x 0.3-0.35 cm, ovate to oblong-lanceolate, acute, twisted, compressed, glabrous, on 0.8-1.2 cm long, spreading pedicels. Seeds 2-seriate, 0.2-0.23 cm long, ovate-oblong, compressed, reddish-brown, many, glabrous; testa reticulately pitted.

Fl. & Fr.: July to August.

Subalpine inner ranges of SIK., altitude 4650-5300 m.


Annuals with slender stem, branched from base, minutely stellately hairy. Leaves radical and cauline, membranous, forked or stellately hairy, radical ones 0.8-2 cm long, narrowly spatulate, obtuse, somewhat tapering at base into 0.5-1 cm long, slender petiole; cauline leaves 1.5-2 x 0.2-0.3 cm, narrowly obovate-cuneate, entire or rarely 1-3 dentate, sessile. Flowers small, white, 3-6, in lax racemes; pedicels 0.3-0.5 cm long, densely hairy. Sepals narrowly oblong, obtuse, dorsally hispid, hairs simple and forked. Petals 0.1-0.2 cm long, narrowly
spathulate, not clawed. Filaments 0.1-0.15 cm long, slender; anthers 0.2 cm long, ovoid. Ovary densely hirsute; stigma sessile. Pod 0.6-0.7 x 0.3-0.35 cm, ellipsoid, compressed, rounded at apex, on 0.4-0.9 cm long, erect or recurved pedicels; valves membranous, reticulately nerved, hispid. Seeds biseriate, ovoid, brown with nigropunctate hilum. Fl. & Fr. : July to September.

In SIK. Himalaya as a weed in radish fields, altitude 4900-5000 m.


Biennial herbs, erect, 6-25, rarely 50 cm tall, simple or branched, hairy; hairs simple or minutely stellate. Leaves radical and cauline, hairy, radical ones lanceolate acute at apex, entire, narrowed at base, cauline ones numerous, lower oblong-ovate, upper ovate, broad, sessile or subamplexicaul at base, margins 1-4 toothed. Flowers orange-coloured, more or less large, 20-52, in congested racemes, lax on elongation. Pedicel 0.2-0.3 cm long, densely hirsute. Sepals ± 0.2 cm long, outer elliptic, inner ovate, all rounded at apex and dorsally simple hairy. Petals 0.3-0.4 cm long, obovate, emarginate contracted into a claw at base. Filaments 0.18-0.2 cm long, dilated at base.
Pistil ovoid, glabrous. Ovary 12-24 ovuled; stigma minute, sessile. Pods 0.5-1 x 0.25-0.3 cm, ovoid, acute, green, on 0.3-1 cm long, erecto-patent pedicels; valves reticulately nerved. Seeds ovoid, brown. Fl. & Fr.: July to August.


Draba falconeri O.E. Schulz in Preich. 89:300, 1927.

Perennial, 20-30 cm long when flowering, fruiting specimens up to 60 cm long; stem simple or branched, forked hairy; branches manifestly hirsute. Leaves radical and cauline, oblong-ovate, hairy; hairs simple and stellate mixed, radical ones shortly pitiolate, cauline ones sessile, upper 2-5-dentate. Flowers 15-40, in congested corymbbs, at length elongating into 20-25 cm long; lax racemes. Pedicels 0.4-0.8 cm long, manifestly hirsute. Sepals 0.2-0.3 cm long, dorsally hirsute; hairs simple. Petals 0.4-0.6 cm long, obovate, cuneate. Filaments 0.2-0.25 cm long, slender; anthers 0.4-0.5 cm long. Ovary densely hirsute, 20-28 ovulate; style 0.4-0.5 cm long; fruiting pedicels 0.6-0.8 cm long, ascending. Pods
0.9-2.2 x 0.2-0.3 cm, more or less contorted; valves scabrid, hairy; hairs furcate and stellate. Seeds ovoid, brown. Fl. & Fr. May to August.

Schulz gives the locality. Provinces of Alpine Himalayas, U. & K., Perpangal, Hazara Khagan valley and Sarumkhagan valley, altitude 2500-3350 m.

Draba gracillima Hook. f. & Thoms. in Journ. Linn. Soc.


Erect, hoary-caespitose, annual herbs; stem short, slender, tufted at base, pubescent. Leaves radical and cauline; radical ones 0.6-1.2 x 0.1-0.3 cm, rosulate, obovate-spathulate, pubescent, acute, entire; cauline ones 0.4-1 x 0.2-0.4 cm, ovate, sessile, acute, stem-clasping, slightly toothed, pubescent. Flowers yellow, 0.3-0.4 cm across, pedicellate, in 5-8 cm long, racemes; pedicels 0.2-0.5 cm long, glabrous, slender. Sepals 0.2-0.25 cm long, oblong, obtuse, pilose. Petals 0.3-0.4 cm long, obovate-cuneate, emarginate. Pistil oblong-ovate, glabrous;
ovary 12-20 ovuled; style short; stigma inconspicuous.

Pods 0.5-1.2 x 0.15-0.2 cm, erecto-patent, linear, tapering at both ends, compressed; valves flat, enerved.

Seeds 2-seriate, many, 0.05-0.1 cm long, ovoid, glabrous, reddish-yellow; hilum nigro-punctate. Fl. & Fr.: April to May.

Temperate SIK. Himalayas elevation 3000-4000 m.


Small, erect, leafe, hairy, perennial herbs. Leaves radical and cauline, radical ones 1-1.5 x 0.3-0.6 cm, ovate-oblong, tomentose, coarsely toothed, acute, cauline ones 0.5-1.2 x 0.2-0.4 cm, oblong-lanceolate, stem-clasping, hairy, almost entire. Flowers yellow, 0.1-0.4 cm across, in 4-8 cm long, terminal racemes; pedicels 0.1-0.25 cm long, slender. Sepals 0.15-0.2 cm long, hairy, oblong, obtuse. Petals 0.3-0.4 cm long, slightly clawed. Ovary hairy, 36-48 ovuled; style inconspicuous; stigma subcapitate. Pods 0.6-1.2 x 0.15-0.2 cm, hairy, narrowly linear-lanceolate; valves smooth with prominent mid-vein;
fruiting pedicels 0.3-0.5 cm long, slender. Seeds 2-seriate, + 0.1 cm across, ovate-elliptic, reddish-yellow, many, glabrous with reticulately pitted testa. Fl. & Fr. July to August.

J. & K. and Lahul, altitude 3900-4000 m.


Erect, annual, hairy herbs; stem sparsely leafy, slender, filiform. Leaves radical and cauline, entire, white-tomentose, acute radical ones 0.5-1.3 x 0.3-0.5 cm, ovate-oblong, crowded at base, shortly petiolate, cauline ones 0.5-1 x 0.2-0.4 cm, oblong-lanceolate, sessile. Flowers 10-12, white, in subcapitate racemes, at length lax; pedicels 0.3-0.4 cm long. Sepals 0.15-0.2 cm long, green, hairy. Petals 0.3-0.4 cm long, hardly clawed, limb ovate. Ovary 10-18-ovuled, hairy; style inconspicuous; stigma subcapitate. Pods 0.7-0.8 x 0.1-0.15 cm, oblong-ellipsoid, much twisted, acute at apex, pubescent, on 0.2-0.4 cm long pedicels. Seeds 2-seriate, reddish-yellow, ovate-ellipsoid, + 0.1 cm across, glabrous; testa reticulately pitted, Fl. & Fr. July to August.
Alpina Himalayas and Western Tibet from SIK. to Kunawur and Ladak, altitude 3900-5900 m.

This plant much resembles *D. incana* Hook. f. & Thoms., but it differs from the latter by its shorter sparsely-leafy hairy stems and densely close-tufted radical leaves. It may also be confused with *D. mongolica* Turcz. in white tomentose, leaves, basal ones ciliate, and fruiting racemes lax.


Erect, simple, very slender, annual or biennial, pubescent herbs; root-stock thick. Leaves radical and cauline, radical ones 0.6-1.2 x 0.3-0.5 cm, rosulate, oblong-obovate, sessile, pubescent, wavy, acute at apex, cauline ones 0.4-0.9 x 0.2-0.4 cm, few, sessile, amplexicaul, auricled at base, margin coarsely toothed, pubescent, acute. Flowers white, 30-80, in 4-6 cm long racemes. Sepals 0.1-0.15 cm long, oblong, pilose. Petals 0.15-0.2 cm long, obovate-cuneate, rounded at apex. Pistil cylindric; Ovary 12-20 ovuled; style inconspicuous; stigma minute. Pods 0.3-0.6 x 0.15-0.2 cm, oblong-ellipsoid, compressed, rounded at base,
acute at apex; valves flat with median vein, on 0.6-1 cm long pedicels. Seeds ovoid, 2-seriate, 0.05-0.07 cm long, glabrous, reddish-brown, 10-12; testa reticulately pitted.

Fl. & Fr.: July to September.

J. & K., elevation of 1900 m.

Chromosome no. 2n=32 (Walters in Fl. Europ. 1:312. 1964).

The plant is used in Spain as an antiscorbutic (See Wealth of India).


1. Pods hairy .......................... var. nubigenea
1. Pods glabrous ......................... var. leiocarpa

var. nubigenea

Perennials, 12-24 cm tall; stem erect, simple or branched, 4-8 leaved, hairy; hairs simple, forked or sub-stellate. Leaves radical and cauline, radical ones rosulate, narrowly lanceolate, hairy above and on margin, cauline ones oblong-ovate, entire, or unidentate. Flowers 10-30, in dense, bracteate racemes; pedicels 0.1-0.2 cm long, hairy. Sepals 0.15-0.2 cm long, hairy. Petals 0.25-0.3 cm long, glabrous. Ovary 20-24 ovulate. Pods oblong-ovoid, 0.4-0.8 x 0.15-0.2 cm, on 0.1-0.3 cm long pedicels; valves hairy; hairs simple, furcate. Fl. & Fr.: August to September.

Schulz gives the locality as Provinces of Himalayas, J. & K. (between Kanipatri Jagila, elevation 4000 m and Kumaon, elevation, 4600-5600 m).
var. leiocarpa O.E. Schulz in Pfreich. 89:292. 1927.

Schulz gives the locality as Kumaun, Jolinka and Kutti Yangti valley. Fl. & Fr.: August.


Small, hairy, erect, perennial herbs; root-stock slender, covered with persistent petioles. Leaves radical and cauline, radical ones 0.8-2.8 x 0.4-0.6 cm, densely rosulate, oblong-cuneate at base and obtuse at apex, unidenticulate, cauline ones 0.4-1.5 x 0.2-0.4 cm long, oblong-linear, sessile, pubescent, acute, almost entire. Flowers 8-12 yellow, in 8-12 cm long, terminal racemes; pedicels 0.1-0.3 cm long, hairy. Sepals 0.15-0.25 cm long, simple, hirsute. Petals 0.3-0.4 cm long. Ovary 6-12 ovulate, glabrous. Pod 0.4-0.6 x 0.3-0.4 cm, ovoid, tapering at apex into 0.05-0.075 cm long, style. Seeds 2-seriate; ± 0.1 cm long, glabrous. Fl. & Fr.: June to September.

Schulz gives the locality Provinces of extra tropical Himalayas—J. & K. to Kumaon, SIK.


Small, erect, prostrately branched herbs. Leaves 0.8-1.8 x 0.2-0.4 cm, linear, rosulate, rigid, entire, hispid on margins. Scapes leafless, 4-10 cm long, numerous, erect,
Flowers yellow, 3-10, pedicels 0.2-0.4 cm long, longer in fruits, hairy. Sepals 0.2-0.25 cm long, glabrous; petals 0.3-0.4 cm long, obovate-cuneate, emarginate. Ovary 12-16 ovulate; style short (0.05 cm long); stigma inconspicuous. Pods 0.7-0.9 x 0.3-0.35 cm, oblong, ellipsoid, compressed, subtorse, obtuse at base, acute at apex; style 0.05-0.1 cm long; stigma inconspicuous. Seeds 2-seriate, many, ovate-ellipsoid, 0.1-0.15 cm long, reddish-brown, glabrous; testa reticulately pitted. Fl. & Fr. July to September.

Alpine Himalayas from J. & K. to SIK., elevation 3000-5600 m.


Loosely tufted, woolly or hoary herbs. Leaves all radical, 0.8-2.5 x 0.3-0.5 cm, spatulate-lanceolate, entire, pubescent, closely tufted. Scapes 6-20 cm long, numerous, erect, flowers few, white in subcapitate racemes at the ends of scapes; pedicels 0.5-0.6 cm long, slender, erect. Sepals 0.2-0.3 cm long, pubescent, oblong. Petals 0.5-0.6 cm
long, white, slightly clawed and veined. Ovary 20-24 ovulate, pubescent; style long; stigma inconspicuous. Pods 0.6-1.8 x 0.15-0.25 cm, pubescent, elliptic or linear-lanceolate, flat, slender; style 0.2-0.25 cm long; pedicels 0.5-0.8 cm long, pubescent. Seeds 2-seriate, reddish-yellow, 0.1-0.15 cm long, ovoid-elliptic, few, glabrous; testa reticulately pitted.

Fl. & Fr.: August to September.

It is found in J. & K., West Tibet and inner ranges of SIK, Himalayas, altitude 4000-4900 m.


1. Pods hirsute ..................... var. stenobotrys
2. Pods glabrous ..................... var. leiocarpa

var. stenobotrys

Perennials, 10-30 cm tall, erect or ascending, simple or rarely branched, prominently zig-zag, hairy; branches slender. Leaves radical and cauline, stellately white tomentose, radical ones narrowly-lanceolate, 1-1.5 cm long, entire or ascending, obscurely-dentate, narrowed at base, into a slender petiole, cauline ones small, ovoid, acute, sessile, 0.5-0.8 cm long, entire or slightly dentate. Flowers 30-50, bracteate, dense racemed, very shortly pedicellate.
Sepals 0.1-0.15 cm long. Petals 0.2-0.5 cm long. Filaments 0.15-0.18 cm long; anthers 0.2-0.25 cm long, all parts of flower long persistent. Ovary 10-60 ovulate, pilose; style very small. Pods oblong-ovoid, 0.4-0.5 x 0.1-0.15 cm, somewhat contorted, hirsute. Fl. & Fr.: July - September.

Schulz gives the locality Provinces of Eastern Himalayas- SIK., altitude 4000-5000 m.

var. leiocarpa O.E. Schulz in Pfreich. 89:291. 1927.

Fl. & Fr.: July.

Schulz gives the locality, SIK. - Zemu valley.


Erect, simple, scaberulous herbs. Leaves radical and cauline, radical ones rosulate, 1.2-2.8 x 0.3-0.6 cm, oblong-elliptic, densely furcately hairy; cauline ones lanceolate, sessile, acute, 1-3-dentate, erect, strigose-pilose.

Flowers yellow, 20-60, 0.35-0.4 cm across, in lax corymb; pedicels 0.15-0.5 cm long. Sepals 0.2 cm long, oblong, obtuse, hirsute. Petals 0.35-0.4 cm long, obcuneate, emarginate. Stamens 0.2-0.22 cm long; anthers 0.05 cm long, subquadrate. Pistil oblong; ovary 40-44 ovulate; style short.
stigma sub-bilobed. Pods 1-1.9 x 0.1-1.5 cm, erect, linear, tapering at both ends; valves membranous, enerved; fruiting pedicels 0.18-0.5 cm long, slender, smooth, ascending. Seeds many, 2-seriate, ovoid, ± 0.075 cm across. Fl. & Fr.: July.

J. & K. and Western Tibet.

Draba tibetica Hook. f. & Thoms. in Journ. Linn. Soc. 5:152.


1. Pods hirsute ......................... var. tibetica

1. Pods glabrous ......................... var. Duthiei

var. tibetica

Stem simple, glabrous, erect. Leaves narrowly oblong-linear, glabrous, entire, acute. Flowers large laxly corymbose; pedicels 0.3-0.7 cm long. Sepals 0.2-0.25 cm long, dorsally hirsute with simple, forked hairs. Petals 0.4-0.5 cm long. Filaments 0.25-0.28 cm long, slender.

Ovary 20-24 ovulate. Pods linear, 0.6-1.8 x 0.15-0.18 cm, acute at apex, prolonged into 0.05-0.15 cm long style; valves minutely furcate or stellately hirsute. Fl.: July.

Schulz gives the locality Western Tibet, Zanskar, altitude 4000-4600 m, Sulkuchella, altitude 3600 m and Kardang.
var. Duthie O. E. Schulz. in Pfreich. 89:300. 1927.

J. & K., Tibet, Baltistan, Karpuchu Valley, altitude 4300-4600 m.

Draba winterbottmii (Hook. f. & Thoms.) Pohle, Drab. Asiat.
in Fedde, Repert. Beih. 32:138. 1925; Schulz in Pfreich. 89: 266. 1927. Draba tibetica Hook. f. & Thoms. var. winterbottmii
Hook. f. & Thoms. in Journ. Linn. Soc. 5:152. 1861. Draba

Small, tomentose, perennial herbs; stem slender with
short naked branches from the crown of the root, ending in
tufts of leaves. Leaves 0.6-1.3 x 0.2-0.4 cm tufted, oblong,
hairy, acute. Scapes 0.6-1.5 cm long, pubescent. Flowers
6-20, on 0.2-0.4 cm long pedicels; in short racemes. Sepals
0.2-0.25 cm long, oblong-elliptic. Petals 0.35-0.4 cm long,
white, obovate-cuneate, emarginate at apex. Ovary 20-
ovulate, glabrous; style short, straight; stigma inconspicuous.
Pods 0.5-0.7 x 0.15-0.2 cm, erecto-patent, oblong-ellipsoid,
slightly curved, not twisted, glabrous, on 0.3-0.5 cm long
pedicels; style 0.1-0.15 cm long, straight. Seeds 2-seriate,
many, reddish-brown, ± 0.1 cm, ovate-oblong, glabrous. Fr.:
August.

In Western Tibet elevation 3600-4000 m.

PROPHILA DC.

Small, delicate herbs. Leaves all radical, in rosette, spathulate-lanceolate, obtuse or acute, entire or distinctly toothed, simple or stellate hairy. Flowers small, white on slender scapes. Sepals erect, equal at base. Petals ovate, 2-fid. Ovary cylindric, narrow; style short; stigma entire. Pod small, oblong, elliptic, linear or suborbicular, glabrous, compressed; valves convex, turgid. Seeds 2-seriate, many, small, without wings; funicles filiform.

India, Afghanistan, Western Asia & Europe.


Small delicate, annual herbs. Leaves 0.5-1.4 x 0.3-0.6 cm, spreading on the ground in rosettes, spathulate, ovate-oblong, entire, hairy, sessile. Scapes 4-9 cm long. Flowers
0.25-0.3 cm across, white, pedicellate. Sepals 0.1-0.15 cm long, erect, equal at base. Petals 0.25-0.3 cm long, obovate, 2-fid. Ovary cylindrical, 0.2-0.25 cm long, narrow, glabrous; style short; stigma erect. Pods 0.4-0.8 x 0.15-0.4 cm, elliptic-oblong, glabrous, compressed; valves convex, turgid, membranous with prominent midvein; pedicels 0.5-1 cm long, slender spreading. Seeds many + 0.15 cm, elliptic, 2-seriate, reddish, glabrous, smooth; testa reticulately pitted. Fl. & Fr. : March to June.

ENG. name : Whitlow grass.

J. & K., elevation 1500-1900 m; rare.

Chromosome no. 2n=64 (Walter in Fl. Europ. 1:312. 1964).

This species is closely resembling Arabia nuda Belang, in general morphology, but the pod and bifid petals are distinctive.

This plant contains mustard oil, which is considered astringent and vulnerary. It is used in Spain as a remedy for whitlow (See Wealth of India).
Annual or biennial, erect, branching, hispid herbs. Leaves lyrate-pinnatifid. Flowers large lilac or yellowish, veined with violet. Sepals erect, lateral saccate at base. Petals clawed. Stamens free, not toothed. Pods povid-oblong, closely appressed to the axis, turgid, terete with large, ensiform seedless beak; valves concave, 3-nerved; septum membranous. Seeds many 2-seriate, globose.

India, Pakistan, Central Asia, Afghanistan and Europe.


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Brassica eruca Linn. Sp. Pl. 932. 1753; Brassica erucoides Roxb.
Hort. Beng. 48. 1814. Erysimum vesicaria Cav. var. sativa

Erect, branching, annual or biennial, hispid herbs.
Lower leaues petiolate, 6 cm long, lyrate-pinnatifid,
glaucous, irregularly, pinnately lobed; upper leaves sessile,
1-3 x 0.2-0.25 cm, linear-lanceolate. Flowers large,
greenish-yellow, pedicellate in short, bractless racemes.
Sepals 0.6-0.8 cm long, erect, lateral saccate at the base,
outer ones hooded. Petals 1-1.2 cm long, with purple veins,
obovate, long-clawed. Ovary 0.7-0.8 cm long, hairy, many-
ovuled; style long; stigma inconspicuous. Pods 2-2.8 cm
long, turgid, elliptic, terete, hairy, closely appressed to
the axis; valves convex, 3-nerved. Seeds 2-seriato, globose,
reddish-brown, ± 0.2 cm across, Fl. & Fr. : January to March.

ENG. name : Rocket-salad, Taramira.
Local name : ASM. - Salad; BENG. - Horio or Horiho;
PUNJ. - Taramira; MAR. - Tarmira, Jambo.
Grown in PUNJAB, Delhi, U.P., BIHAR, W.B., ASSAM, GUJARAT and MAH., seldom an escape as a weed in gardens and cultivated fields.

The oil from the seeds is used for burning purpose as a substitute for Sarson. The oil cake is used as a cattle-feed. The tender plant parts are relished as salad and vegetables in some places; also as a green fodder for cattle, sheep and camels.

ERYSIMUM Tourn. ex Linn.

Annual to perennial herbs or undershrubs, clothed with variously branched hairs. Leaves linear or oblong, entire or sinuate-toothed. Flowers yellow, rarely purple, ebracteate. Sepals erect, the inner ones saccate at base, the outer ones apically horned. Petals reticulately nerved and long clawed. Filaments simple, those of the inner whorl broader; anthers long, linear, more or less blunt. Lateral honey glands ring-shaped or triangular, median ones trifoliate. Ovary terete, cylindric, many-ovuled; style short; stigma capitate. Pods long, linear, compressed or acutely tetragonal; valves 1-3-nerved, smooth or torulose, thickly hairy. Seeds 1-seriate, oblong, not margined.

India, Siberia, Western Asia and Europe.

1. Herbs 5-15 cm tall:
   2. Pods subsessile; pedicels stout........ *B. repandum*
   2. Pods pedicellate; pedicels slender:
      3. Pods 0.05-0.1 cm broad, deflexed;
         valves with spongy septum .......... *B. deflexum*
      3. Pods 0.1-0.2 cm broad, fascicled;
         valves obscurely keeled ............ *B. funiculosum*

1. Herbs more than 15 cm tall:
   4. Radical leaves much pinnatifid ..... *B. altaicum*
   4. Radical leaves not pinnatifid:
      5. Stem profusely branched; pods
         1.3-7.5 cm long:
6. Pods hairy .......................... E. hieracifolium
6. Pods glabrous:

7. Pods stout, spreading; style thick .......................... E. pachycarpum
7. Pods terete, linear; style very short .......................... E. wioratum

5. Stem 1-8.5 cm long; pods

3.5-8.5 cm long:

8. Pods 4-8.5 cm long .......................... E. longisiliquum
8. Pods 3.5-6.5 cm long .......................... E. thomsonii

Erysimum altaicum C.A. Mey. in Ledeb. Fl. Alt. 3:153. 1831;
Hook. f. & Thoms. in Journ. Linn. Soc. 5:157. 1861; Boiss.
Brit. India 1:154. 1872; Blatter, Beautiful Fls. Kashmir
1:37. 1928.

Small, erect, annual herbs; stem stout, short, sub-
simple, leafy, appressed-hairy. Leaves radical and cauline,
very shortly petiolate, appressed-hairy; radical ones
2.5-3.8 x 0.4-0.8 cm, pinnately divided, with a triangular
terminal, lobe and small lateral lobes, cauline ones
1.3-2 x 0.2-0.5 cm, linear-lanceolate, sinuate-toothed to
to entire. Flowers pale-yellow, 1-1.3 cm across, pedicellate,
in 5-7 cm long racemes. Sepals 0.6-0.8 cm long, erect,
slightly saccate at base, glabrous. Petals 1-1.3 cm long,
long-clawed, glabrous and veined. Filaments simple, linear;
anthers blunt. Ovary 0.8-1 cm long, cylindric, glabrous many-ovulate; style short; stigma capitate. Pods 3.5-5.5 x 0.15-0.2 cm, narrow, glabrous, linear, erect, on 0.2-0.4 cm long, stout pedicels; valves smooth. Seeds 1-seriate, 0.1-0.2 cm long, oblong, brown, glabrous. Fl. & Fr.: June to August.

J. & K. near Shirazia bagh, on hill, towards top of Hayan pass above 2900 m: found in open stony pastures at Lolat valley; also in West Tibet.


Dwarf, hoary annual herbs, with thick root-stock. Leaves 1.2-1.9 x 0.2-0.5 cm, linear-spathulate, slightly toothed, pubescent, acute. Flowers yellow, 0.6-0.8 cm across, pedicellate, in 3-6 cm long, terminal racemes; pedicels hoary, 0.3-0.5 cm long. Sepals 0.4-0.6 cm long, glabrous, erect, slightly saccate at base. Petals 0.6-0.8 cm long, glabrous, clawed and reticulately veined. Anthers linear, obtuse. Ovary glabrous 0.5-0.6 cm long, terete, many-ovulate; style short; stigma capitate. Pods 3.5-5.2 x 0.05-0.1 cm, glabrous, narrowly linear, erect, tetragonal, acute, tapering into 0.25 cm long style; septum spongy. Seeds 0.1-0.15 cm long, oblong, brown, 1-seriate, many, glabrous. Fl. & Fr.: July to August.
In Alpine SIK. Himalaya at Kongra Lama, altitude 4000-4900 m.


Erect, glabrous, branched herbs; stem stout, erect, leafy, appressed-hairy. Leaves 1.2-4.8 x 0.4-1 cm, linear-spathulate, slightly toothed, pubescent, acute, narrowed into 0.4-0.8 cm long petiole. Flowers pedicellate, yellow, in 6-9 cm long racemes. Sepals 0.5-0.6 cm long, erect, petals 0.7-0.85 cm long, clawed and distinctly veined.

Filaments linear, simple; anthers obtuse. Ovary 0.6-0.7 cm long, terete, many-ovuled; style short; stigma capitate.

Pods 1.5-5.2 x 0.15-0.2 cm, fascicled, erect, linear-lanceolate, compressed; valves membranous, obscurely keeled; fruiting pedicels 0.2-0.4 cm long. Seeds 1-seriate, 0.1-0.15 cm long, oblong, brown, many, Fl. & Fr.: July to September.

Alpine SIK. Himalaya at Kangra Lama, altitude 4600-5000 m.


Rect, tall, slender, branched herbs, covered with 2-forked, appressed hairs. Leaves radical and cauline; radical ones 3-5 x 0.5-1 cm, oblong-ovate, sinuate-dentate, pubescent, acute, tapering at base into 0.4-0.8 cm long petioles, cauline leaves 1.5-4.5 x 0.3-0.6 cm, sessile, corasely toothed, oblong-linear, acute. Flowers 0.8-1 cm across, yellow, in 6-9 cm long racemes; pedicels 0.3-0.6 cm long, slender. Sepals 0.4-0.6 cm long, glabrous, erect, inner saccate at base. Petals 0.8-1 cm long, glabrous, clawed and veined. Anthers linear, obtuse; lateral and median nectary glands present. Ovary 0.6-0.8 cm long, terete, pubescent, many ovuled; style short, stigma capitate. Pods 3-5 x 0.1-0.15 cm, slender, erect, narrow, linear; valves pubescent, mid-vein prominent; fruiting pedicels 0.4-0.8 cm long, stout, upcurved. Seeds 1-seriate, 0.1-0.15 cm long, oblong, brown, many, not winged, glabrous. Fl. & Fr.: July to August.

Central and Western Himalaya from J. & K. to Murri, altitude 1900-4000 m.

Chromosome no. 2n=32 (Ball in Fl. Bur op. 1:274. 1964).

Erect, tall glabrous, annual herbs; stem acutely angled, branched. Leaves 1.5-7 x 0.4-0.8 cm, sessile, toothed, glabrous, acute, oblong-obovate, upper ones becoming linear. Flowers 1.2-1.6 cm across, yellow, pedicellate, in 5-8 cm long racemes; pedicels 0.3-0.5 cm long. Sepals 0.5-0.8 cm long, oblong, glabrous. Petals 1.2-1.6 cm long, yellow, long clawed. Ovary 1.1-1.5 cm long, many ovulate, glabrous; style short; stigma capitate. Pods 4-8.5 x 0.1-0.2 cm, spreading, glabrous, erect, on 0.6-1 cm long pedicels; valves prominently keeled. Seeds 1-seriate, many, 0.1-0.2 cm long, oblong, brown, not margined. Fl. & Fr. July to August.

SIK., altitude 3000-4000 m.


Erect, robust, biennial herbs; stem angular, appressed hairy. Leaves radical and cauline, radical ones 2-3.5 cm long, lanceolate or oblanceolate, sinuate, hairy; cauline ones 1.5-3 x 0.3-0.5 cm, simple, linear-oblong to lanceolate, pubescent, acute, lower dentate, upper ones entire. Flowers 1-1.6 cm across, yellow, pedicellate, in 6-10 cm long racemes; pedicels 0.3-0.5 cm long. Sepals 0.5-0.8 cm long, erect, inner saccate at base. Petals 1-1.6 cm long.
reticulately veined, long clawed. Ovary 0.9-1.3 cm long, terete, many ovuled; style short; stigma capitate. Pods 1.5-6.5 x 0.1-0.15 cm, erect, terete, linear, compressed, on 0.3-0.5 cm long pedicels; valves 1-nerved. Seeds numerous, 0.1-0.15 cm long, 1-seriate, oblong, reddish-brown. Fl. & Fr.: July to September.

J. & K., Western Himalaya and Western Tibet, altitude 2900 m.

Chromosome no. 2n=24 (Ball in Fl. Europ. 1:273. 1964).


Erect, robust, branched, appressed-hairy, 3-forked herbs; Leaves 2.5-6.5 x 0.4-1 cm, lanceolate, sinuate-toothed, pubescent, acute, on 0.5-1 cm long petioles. Flowers 0.7-0.9 cm across, yellow, in 8-12 cm long, terminal racemes; pedicels 0.3-0.5 cm long, slender. Sepals 0.4-0.6 cm long, erect, glabrous, inner saccate at base. Petals 0.7-0.9 cm long, glabrous, clawed, reticulately veined. Anthers linear, obtuse. Ovary 0.6-0.7 cm long, cylindrical, glabrous, many ovuled; style short; stigma capitate. Pods 4.5-6.2 x 0.1-0.2 cm, spreading, stout, 4-angled, on 0.4-0.1 cm long, thick pedicels; valves glabrous, slightly keeled, obtuse at both ends. Seeds
0.1-0.15 cm long, oblong, 1-seriate, brown, many, glabrous.
Fl. & Fr. : July to August.

Thoms. in Journ. Linn. Soc. 5:164. 1861; Boiss. Fl. Or. 1:189.
1:153. 1872; Bamber. Fl. Punjab 1:321. 1916; Blatter,
Beautiful Fls. Kashmir 1:38. 1928; Wealth of India 3:194. 1952;

Erect, much branched, dwarf, annual hairy herbs; root
stock much divided. Leaves 1-3.6 x 0.3-0.7 cm, linear-
lanceolate, repand-toothed or entire, pubescent, narrowed at
base; petiole 0.8-1 cm long. Flowers pale-yellow, 0.6-1 cm
across, pedicellate in 0.6-0.9 cm long racemes. Sepals
0.3-0.6 cm long, erect, slightly saccate at base. Petals 0.6-1
cm long, pubescent, clawed and veined. Filaments linear;
anthers obtuse. Ovary 0.5-0.8 cm long, cylindric, many
ovulate; style short; stigma capitate. Pods 2.5-5.2 x
0.1-0.15 cm, obtusely 4-angled, glabrous, patent, torulose,
on 0.3-0.6 cm long, stout pedicels. Seeds 0.1-0.15 cm long,
oblong, 1-seriate, brown, glabrous, not margined. Fl. & Fr.
July to September.

J. & K. at an elevation of 1600-2000 m. in sandy places
and wheat fields.
Chromosome no. 2n=16 (Ball in Fl. Europ. 1:274. 1964).

In Persia the seeds are given in fever; also applied in the form of a poultice to relieve pains in the stomach. It is used in Spain as an antiscorbutic fodder for sheep; but its economic importance is not known in India (See Wealth of India).


Erect herbs, with angular, forked-hairy, branched stem. Cauline leaves 0.6-1.3 x 0.1-0.2 cm, linear-lanceolate, obscurely toothed, pubescent, sessile, acute. Flowers 0.8-1.2 cm across, yellow, pedicellate, in 8-12 cm long racemes; pedicels 0.2-0.4 cm long, slender. Sepals 0.5-0.6 cm long, erect, glabrous. Petals 0.8-1.2 cm long, yellow, long clawed, glabrous, reticulately veined. Ovary 0.8-0.9 cm long, glabrous, terete, many-ovuled; style short; stigma capitate. Pods 3.5-6.5 x 0.05-0.1 cm, narrow, linear, spreading, glabrous, with keeled valves, glabrous, on 0.8-1.1 cm long pedicels. Seeds 1-seriate, 0.1-0.2 cm long, oblong, brown, not margined. Fl. & Fr. : July to September.

Western Himalayas from J. & K. to Tibet, Zoejila and Kunawur, altitude - 2600-3900 m.
Euclydium R. Br. nom. cons.


Erect, annual, hairy herbs. Leaves simple, entire, coarsely toothed or pinnatifid, petiolate or sessile, pubescent. Flowers small, white in terminal or lateral racemes. Sepals erect, equal at base. Petals white, hardly clawed, oblong. Ovary narrow linear; style short; stigma inconspicuous. Pods small, subglobeose, hairy, erect, subsessile; indehiscent rarely dehiscent, 2-celled with thick septum; beak subulate, oblique, stout, mucronate. Seeds two, oblong, pendulous.

India, Western Asia and Europe.

Erect, rigid, branched hairy herbs. Leaves simple, pubescent, coarsely toothed, on margins, lower 4.5-9 x 1-1.8 cm, oblong with 0.5-1.6 cm long, slender, petioles; upper ones 1-3 x 0.3-1 cm, sessile, stem-clasping, oblong-ovate. Flowers 0.1-0.15 cm across, white, in terminal 5-12 cm long racemes. Sepals 0.05-0.1 cm long, erect, spreading, equal at base. Petals 0.1-0.15 cm long, not clawed. Ovary 0.1-0.15 cm long, narrow; style short; stigma inconspicuous. Pods 0.3-0.5 cm long, erect, subsessile, subglobose, pitted, hairy, indehiscent, beaked; beak 0.1-0.2 cm long, stout, subulate, obliquely reflexed, mucronate, acute. Seeds 2 in each loculus, oblong, pendulous, reddish, glabrous, ± 0.1 cm across, with ridges and furrows. Fl. & Fr.: April to May.

J. & K., altitude 1600-1900 m and PUNJAB; very rare.

EUTREMA R. Br.

Glabrous or hairy, biennial or perennial herbs with leafy stems. Leaves radical or radical and cauline, entire or serrate, radical ones with long sheathing petioles, cauline ones sessile or shortly petiolate. Flowers corymbose. Sepals short, erect, not saccate at base. Petals white, rarely rose, obovate or oblong-obovate with short claw. Filaments broader at base, entire; anthers blunt; lateral honey glands semilunar. Pistil flask-shaped, sometimes stipitate. Ovary 3-10-ovuled; style mostly short but distinct; stigma more or less bilobed. Pods linear-oblanceolate, terete; valves keeled, convex, one nerved. Seeds few, large, irregularly 1-2 seriate, ellipsoid, winged.

India, Pakistan and Western Asia.

1. Cauline leaves ovate-lanceolate,
   sessile, amplexicaul at base ............ E. himalaicum
1. Cauline leaves oblong-deltoid
   petiolate, not amplexicaul ............ E. deltoides


Erect, stout, somewhat branched, annual, glabrous herbs, stem somewhat flattened in upper parts. Leaves radical and cauline, deltoid, ovate, glabrous, toothed, petiolate;
radical ones 3-4.5 x 2.5-4 cm, on 8-18 cm long petioles, 
cauline ones 3-5 x 1-3.5 cm, on 1-7 cm long petioles.

Flowers yellow, 0.6-0.8 cm across, pedicellate, 30-45, in 
terminal, 8-14 cm long racemes; pedicels slender, 0.4-0.6 
cm long. Sepals 0.5-0.6 cm long, broadly oblong-ovate, inner
not saccate. Petals 0.6-0.8 cm long, yellowish-white, obovate
with short claws. Pistil flask-shaped; ovary 3-10 ovuled,
0.5-0.6 cm long, glabrous; style short; stigma bilobed. Pods
1.2-2.4 x 0.1-0.15 cm, spreading, suberect, linear, valves
convex, strongly keeled; septum flat. Seeds 0.15-0.2 cm,
linear-oblong or ellipsoid, smooth, reddish-brown, 1-seriate,
few; testa reticulately pitted. Fl. & Fr.: July to September.

Eastern Himalayas in the inner ranges of SIK, and
Tibet, altitude, 3600-4600 m.

1872; Schulz in Przech. 86:34. 1924; Sarkar & Mitra
Fourn. Research. Crucif. 120. 1865. Hesperis spectabilis
O. Kuntze, Rev. Gen. 2:935. 1891.

Stout, erect, annual, branched glabrous herbs. Leaves
radical and cauline; radical leaves 3-8 x 0.5-1.5 cm,
petiolated, entire, glabrous, ovate-oblong; petioles 2-4.5 cm
long. Cauline leaves 2-7.5 x 1-3 cm, ovate-lanceolate, sessile,
auricled at base, entire, acute. Flowers 0.6-0.8 cm across,
yellowish-white, pedicellate in terminal racemes; pedicels slender, spreading, 0.3-0.6 cm long, in fruits 1-1.8 cm long. Sepals 0.4-0.5 cm long, oblong, erect, not saccate at base. Petals 0.6-0.8 cm long, shortly clawed. Filaments broader at base; anthers blunt. Ovary 0.5-0.6 cm long, 3-10-ovuled; style short; stigma bilobed. Pods 1.2-2.5 x 0.2-0.3 cm, suberect, linear-oblong, glabrous, spreading from the axis; valves membranous. Seeds irregularly 1-2-seriate, 0.3-0.35 cm long, oblong, acute at ends, reddish-brown, glabrous; testa reticulately pitted. Fl. & Fr. : July to August.

In temperate SIK, Himalayas altitude 3900-4000 m; rare.

**FARSETIA** Turra


Hoary-tomentose, much branched, rigid, twigy undershrubs or shrubs. Leaves simple, usually linear-lanceolate, oblong, rarely ovate-oblong, entire, covered with fine, dense, white tomentum. Flowers white, pink or yellow, large, in spicate racemes, pedicellate. Sepals erect, lateral sa£cate at base, pubescent, ovate-oblong. Petals with long claws. Ovary cylindrical; style slender, short; stigma short, suberect. Pods sessile, linear or elliptic, oblong, pointed, pubescent, much flattened; valves convex with inconspicuous mid-rib. Seeds 1 or 2 seriate, suborbicular, broadly winged, brown, few.

India, Pakistan, Afghanistan, Arabia, North Africa and North America.

1. Leaves ovate-oblong.................. \( F. \) \( \text{macrantha} \)

1. Leaves linear-lanceolate:

2. Flowers 0.8-1.2 cm across; seeds
   biseriate:

3. Plants erect; flowers 0.8-1 cm across ......................... \( F. \) \( \text{jacquemontii} \)

3. Plants bushy; flowers 1-1.2 cm across ......................... \( F. \) \( \text{aegyptiaca} \)

2. Flowers 0.4-0.6 cm across; seeds
   uniseriate ................................. \( F. \) \( \text{hamiltonii} \)

\( F. \) \( \text{aegyptiaca} \) Turra, \( \text{Fars. Gen. 1} \) t. \( 1 \) 1765; DC. Reg. Veg. Syst. Nat. 2:287, 1821 & Prodr. 1:1157, 1824; Hook \( f. \) & Thoms, in Journ. Linn. Soc. 5:147, 1861; Boiss. Fl. Or. 1:158, 1867; Baker in Oliver, Fl. Trop. Afr. 1:61, 1868;
Farsetia edgeworthii

Rigid, hoary undershrubs, profusely branched from the base. Leaves 1-2.5 x 0.1-0.2 cm, linear-lanceolate, entire, appressed-white hairy, sessile. Flowers pinkish, pedicellate, in spicate racemes. Sepals 0.7-0.8 cm long, hoary, linear, green, pubescent. Petals 1-1.2 cm long, distinctly clawed, veined. Filaments simple, slender. Ovary cylindrical, glabrous, 0.8-1 cm long; style short; stigma suberect. Pods 2-4.2 x 0.4-1 cm, shortly stalked, much flattened, elliptic-oblong; valves convex, mid-rib distinct. Seeds many, 0.3-0.4 cm across, suborbicular, 2-seriate, reddish-brown, with broad membranous wing. Fl. & Fr.: November to December.

Erect or ascending, stout, twiggy, branched, hoary shrubs; branches glaucous-green, densely appressed-hairy. Leaves 0.5-4.5 x 0.1-0.5 cm, linear-lanceolate, entire, simple sessile, hairy. Flowers pinkish, pedicellate, in 5-10 cm long, spicate racemes. Sepals 0.3-0.4 cm long, erect, green, pubescent, oblong, obtuse. Petals obovate, 0.4-0.5 cm long, clawed. Ovary cylindric, 0.3-0.4 cm long, glabrous; style short; stigma short, suberect. Pods 0.8-2.1 x 0.2-0.4 cm, linear-oblong, much-flattened, pubescent, pointed towards the tip; valves nerveless, flat, mid-rib, indistinct. Seeds suborbicular, 0.2-0.3 cm long, brown, 1-seriate with broad membranous wing. Fl. & Fr.: April - October.

Local names: DELHI-Bui; PUNJ.-Faridbuti.

It is frequent in the arid and semiarid regions of PUNJAB, banks of Jammu between DELHI and Agra, RAJAS, and MAH.

The plant is pounded and taken as a cooling medicine. It is considered efficacious for rheumatism in Punjab.


Erect, rigid, stout shrubs, densely appressed-hairy, Leaves 1-3.8 x 0.1-0.25 cm, linear-lanceolate, entire,
densely appressed-hairy, shortly petiolate, acute at apex.

Flowers 0.8-1 cm across, light-violet to purple, in 4-9 cm long, slender, lax racemes; floral buds ellipsoid. Sepals 0.6-0.8 cm long, erect, green, pubescent, linear-oblong strigose, acute. Petals 0.8-1 cm long, distinctly clawed, glabrous, veined. Stamens with simple filaments. Ovary cylindric, 0.6-0.7 cm long, glabrous; style as long as ovary; stigma small, inconspicuous. Pods 1-3 x 0.1-0.2 cm, stalked, much flattened, linear-oblong, faintly 1-nerved, compressed; valves flat. Seeds 0.2-0.3 cm long, suborbicular, brown with broad membranous wing. Fl. & Fr. : July to September.

ENG. name : Hoary-cress.

Local names : PUNJ. - Faridbuti.

It is found along with the previous species from North-Western India to GUJARAT. This species appears to be more frequent than F. hamiltonii.

The species has a pungent taste and the ground powder is taken as a cooling agent. In Punjab, it is considered specific for rheumatism. Tender twigs are eaten raw as tonic and a chutney is prepared out of them.

Erect, profusely branched, appressed-hoary herbs. Leaves 1-6 x 0.3-1.9 cm, oblong-ovate, entire, pubescent, acute, sessile. Flowers 1-1.4 cm across, pinkish, pedicellate in elongated 6-14 cm long, racemes. Sepals 0.7-0.8 cm long, erect, pubescent, linear. Petals 1-1.4 cm long, pinkish, distinctly clawed, veined. Ovary cylindric, 0.9-1.2 cm long, glabrous; style long; stigma short, suberect. Pods 0.9-4.5 x 0.1-0.5 cm, elliptic, much flattened; valves convex, septum membranous with narrow, short, persistent style. Seeds 2-seriate, reddish, with broad membranous wing. Fl. & Fr.: June to October.

Only found in dry arid regions of RAJAS. It grows scattered or gregarious on rocks.

It is a distinct species of the genus, by its leaves and pods.

In India this plant is not reported to be useful medicinally or otherwise.

GOLDBACHIA DC. nom. cons.

Erect, glabrous, glaucous, annual herbs. Leaves petioled in basal parts gradually becoming sessile, auricled at base, entire or sinuate. Flowers small, pale-rose coloured, in elongate racemes. Sepals erect, equal at base. Petals slightly clawed. Ovary narrow, cylindric; style short; stigma indistinct. Pods indehiscent, coriaceous, tetragonal, constricted between seeds, tapering into a broad, flattened beak, 2 or 3 segmented, sometimes with one segment only, superimposed in one row, each 1-seeded. Seeds one in each cell, oblong, reddish-yellow, pendulous, glabrous.


Erect, annual, slender, glabrous, glaucous herbs. Lower leaves petiolate, 1.5-4.8 x 0.4-1 cm, oblong-obovate, entire, glabrous; petiole 0.3-0.7 cm long; upper leaves 1.5-4 x 0.2-0.7 cm, sessile, stem-clasping, auricled at base, oblong-lanceolate, entire, glabrous, acute. Flowers 0.2-0.25 cm across, pale-rose coloured, in 8-14 cm long racemes; pedicels 0.4-0.5 cm long, slender. Sepals 0.1-0.15 cm long.
Petals 0.2-0.25 cm long, slightly clawed. Ovary 0.15-0.2 cm long, cylindric, style short; stigma indistinct. Pods 0.4-1.2 cm long, indehiscent, coriaceous, tetragonal, slightly constricted between seeds, tapering above into a broad, flattened beak; pedicel 0.6-1 cm long, slender, reflexed. Seeds one in each cell, oblong, 0.1-0.15 cm long reddish-yellow, pendulous, glabrous. Fl. & Fr. April to May.

J. & K. at an elevation of 1600 m, also in PUNJAB; rare. Used as fodder grass for camels etc.

IBERIDELIA Boiss.


Erect, glabrous herbs or undershrubs, branching from base. Leaves radical and cauline; cauline alternate, rarely opposite, stem-clasping with sagittate auricles at base. Flowers larger, white or rose-coloured, in terminal racemes. Sepals short, erect, lateral saccate at base. Petals much longer than sepals, slightly clawed. Ovary cylindric; stigma semicapitate. Pods oblong-lanceolate, acute; valves keeled, wingless, septum narrow, membranous; style elongate. Seeds oblong, 2-6, in each cell, not margined.
India and Persia

Iberidella andersonii Hook. f. & Thoms. in Journ. Linn. Soc.

Erect, slender, glabrous herbs, branched from base. Leaves radical and cauline; radical ones 1-1.4 x 0.3-0.6 cm, shortly petiolated, ovate-oblong, glabrous, obtuse, margin wavy; cauline leaves, 0.5-1.2 x 0.3-0.6 cm, oblong-ovate, obtuse, margin wavy, amplexicaul, with sagittate auricles. Flowers 0.4-0.5 cm across, rose-coloured, pedicellate, 6-10 cm long, in terminal racemes. Sepals 0.2-0.25 cm long, erect, lateral saccate at base. Petals 0.4-0.5 cm long, slightly clawed, equal. Ovary 0.3-0.4 cm long, cylindric, glabrous, many ovuled; stigma subcapitate. Pods 0.4-0.7 x 0.1-0.15 cm, flattened, compressed, narrow, curved, pointed, shortly stalked, with keeled valves. Seeds 4-6 in each cell, 0.1 cm across, globose, reddish-yellow, glabrous, smooth, Fl. July.

Western Himalayas from J. & K. to Kumaon, altitude 3900-5000 m in wet grassy places; rare.
**Iberis Dill. ex Linn.**


Annual or perennials, herbs, rarely dwarf shrubs, glabrous or with branched or unbranched hairs, stem simple or branched, angular, densely leafy. Leaves entire, toothed or pinnatisect, sometimes fleshy. Flowers white to purple, zygomorphic, in congested corymbs or racemes, elongating in fruits. Sepals oblique, obovate with wide membranous margins. Petals white or purple, two outer longer than inner, obovate, shortly clawed. Filaments not appendaged, free; anthers blunt. Pistil sessile; ovary ovate, 2-ovuled; style distinct; stigma subcapitate, sometimes bilobed. Pods orbicular or ovate, laterally compressed, margined upwards; style persistent; valves keeled and usually winged at the apex, caducous, boat-shaped. Seeds solitary in each loculus, often winged, with broad funiculus.
India and Southern Europe.

1. Leaves oblanceolate to spathulate, pinnatifid to dentate; flowers white; siliculae 0.3-0.5 cm long in racemes. *I. amara*

1. Leaves linear-lanceolate, entire; flowers usually purple; siliculae 0.7-1 cm long in corymbs. *I. umbellata*


Erect stout, pubescent annuals. Leaves 1.5-4.5 x 0.2-0.7 cm, oblanceolate-spatulate, pubescent, sessile, dentate. Flowers white, 0.3-0.35 cm across, pedicellate, in 3-6 cm long racemes. Sepals 0.15-0.2 cm long, erect, oblique, not saccate. Petals 0.3-0.35 cm long, obovate, slightly clawed. Filaments small, not appendaged, free. Pistil sessile; ovary 0.2-0.25 cm long, ovate, 2-ovuled; style short; stigma semicapitate. Pods 0.3-0.5 cm long, orbicular-ovate, margined upwards, compressed laterally with apical notch; valves boat-shaped, winged with a prominent septum in the middle; stalk of the pod 0.5-1 cm long. Seeds 2, one in each compartment, not margined, reddish-brown, 0.2-0.3 cm long, ovate-oblong; testa reticulately pitted. Fl. & Fr.: July to October.
ENG. name: Candy tuft, Rocket candytuft.

Cultivated in gardens throughout India; ornamental.

Silva and Franco (1964) recognised two subspecies of which the specimens examined fit in with the subs. emera, following the key given by these authors.

The plant is reported to have been employed in rheumatism and gout; it is used in the preparation of homeopathic tinctures. The seeds are also used in asthma and bronchitis (See Wealth of India).


Small, slender, pubescent, erect annuals. Leaves 1-5 x 0.1-0.4 cm, simple, linear-lanceolate, entire, pubescent, acute. Flowers 0.2-0.3 cm across, rose to purple, pedicellate, in 0.3-0.4 cm long, umbellate racemes; pedicels slender, 0.3-0.6 cm long. Sepals 0.1-0.2 cm long, erect, oblique. Petals 0.2-0.3 cm long. Filaments of stamens not appendaged; anthers blunt. Ovary 0.15-0.2 cm long, ovate; style short; stigma semicapitate. Pods 0.1-0.4 x 0.1-0.2 cm, orbicular, long stalked, very slender, apiculate at the apex; valves boat-shaped, keeled with prominent middle...
septum; stalk of the pod 0.6-1 cm long. Seeds 2 in each fruit, ovate-oblong, 0.1 cm, yellow, glabrous; testa reticulately pitted. Fl. : July to September.

ENG. name: Globe candytuft.

Grown in gardens throughout India as an ornamental.

Annual to perennial, erect, tall, glabrous or with unbranched hairy herbs. Radical leaves petioled; cauline leaves sessile, sagittate, simple, entire. Flowers small, yellow, in loose terminal racemes. Sepals not saccate, spreading, equal at base. Petals yellow, shortly clawed. Fruit indehiscent, 1-celled, 1-seeded, flat, linear-oblong to obovate or orbicular, often depressed, at centre; valves glabrescent or pubescent, more or less winged; wing surrounding the loculus; locules usually with a distinct longitudinal mid-rib; stigma sessile. Seeds pendulous, solitary, oblong. Cotyledons mostly incumbent.

ISATIS Linn.

India, Afghanistan, Western Asia and South Eastern Europe.


Erect, somewhat glaucous, glabrous herbs, with branched, stout scarcely hairy stem. Leaves radical and cauline, radical ones 6-10.5 x 3.5-4.5 cm, petiolate, simple ovate-oblong, glabrous, cauline ones 1.4-2.5 x 0.2-0.6 cm, oblong-lanceolate, entire, acute, sagittately auricled at base. Flowers 0.3-0.4 cm across, yellow in terminal racemes; pedicels 0.2-0.3 cm long, glabrous, slender, recurved after flowering. Sepals 0.2-0.3 cm long, not saccate at base. Petals 0.3-0.4 cm long, slightly clawed. Ovary cylindric, many-ovulate; stigma sessile. Pods 0.8-1.2 x 0.35-0.45 cm, many, oblong, narrowed to the base and broader at apex, glabrous, mid-rib thickened at the centre of the pod; valves boat-shaped, winged, with prominent mid-vein. Fruiting pedicels slender, 0.4-0.6 cm long, drooping. Seeds solitary in each locule, oblong, reddish brown, ± 0.2 cm across.

ENG. Name: Dyer's wood.

J. & K., also reported to be cultivated in Indian gardens.
Chromosome no. 2n=28 (See Ball in Fl. Europ. 1:269, 1964).

The dye is prepared from the leaves. In combination with other natural dyes, woad gives a variety of shades.
The roots of this plant contain a glycoside and the enzyme myrosin. (See Wealth of India).

**LEPIDIUM Linn.**

Annual or perennial herbs, undershrubs or shrubs, diffuse or erect, usually hairy. Leaves simple, membranous to somewhat coriaceous linear or awl-shaped, sometimes broadly elliptic, entire to deeply pinnatisect, cordate and amplexicaul at base. Flowers small, in dense, ebracteate racemes. Sepals short, equal at base, not saccate. Petals white or rarely yellow, very rarely absent. Stamens 6, occasionally 4 or 2; filaments filiform; anthers round, blunt. Ovary sessile, flat, 2-ovuled; style distinct, but short or absent; stigma capitulate. Pods narrowly septate, elliptic or orbicular, laterally much compressed, tip notched or entire; valves boat-shaped, keeled or winged. Seeds solitary in each cell, pendulous from apex of each loculus, ovate-elliptic, slimy with moisture.

India, Pakistan, Central Asia, North Africa, Afghanistan and Europe.

1. Pods with winged valves:

2. Lower leaves lyrate with toothed lobes; petals longer than sepals; pods 0.3-0.6 cm long

*Lepidiberis sativum*
2. Leaves all linear, entire; petals quite inconspicuous, much shorter than sepals or absent; pods 0.2-0.3 cm long ......................... \textit{L. ruderalé}

1. Pods without winged valves :

3. Pods 0.2-0.4 x 0.2-0.3 cm, scarcely notched ..................... \textit{L. capitatum}

3. Pods 0.15-0.25 x 0.15-0.2 cm, not notched ...................... \textit{L. latifolium}


Small, annual, slender, glabrous herbs. Leaves 1.5 - 4.8 x 0.5-1.2 cm, sessile, simple, oblong-obovate, amplexicaul, pubescent, margin dentate. Flowers 0.15-0.2 cm across white, in terminal racemes; pedicels 0.3-0.4 cm long, slender. Sepals 0.1-0.15 cm long, not saccate. Petals 0.15-0.2 cm long, not clawed, white. Ovary sessile, 0.1-0.15 cm long, 2-ovuled; style short; stigma capitate. Pods 0.2-0.4 x 0.2-0.3 cm, ovate-oblong, scarcely notched, diverging; valves keeled, wingless. Seeds two in each fruit, compressed, 0.1-0.15 cm long, reddish-brown. Fl. & Fr.: May to August.
Temperate and subalpine Himalayas, from SIK. to Kumaon, altitude 3000-4400 m; very rare.


Brect, glabrous, perennial herbs, branched from above. Leaves radical and cauline; radical ones 6-10 x 1-2 cm, petiolate, ovate-oblong, toothed; cauline ones 1.5-7 x 0.5-1.5 cm, sessile, amplexicaul, auricled at base, ovate-lanceolate, toothed, acute. Flowers 0.2-0.3 cm across, pedicellate, yellowish-white, in densely panicled corymbs; pedicels 0.4-0.6 cm long, slender. Sepals 0.1-0.2 cm long, oblique, not saccate. Petals 0.2-0.3 cm long, not clawed. Anthers round and blunt; filaments filiform. Ovary 0.15-0.25 cm long, sessile, linear, glabrous, 2-ovuled; style distinct; stigma capitate. Pods 0.15-0.25 cm long, almost spherical or elliptic, ovoid, not winged not notched. Seed one in each cell, ± 0.1 cm across, ovate-oblong, reddish-brown, glabrous; testa reticulately pitted. Fl. & Fr. : July to September.

ENG. name : Broad leaved pepper-wort.

J. & K. westwards, abundant in W. Tibet.
It is considered depurative and antiscorbutic and used as a resolvent in skin affections; an infusion of the plant is given for liver and kidney diseases. The plant is said to be browsed by sheep and goats (See Wealth of India).


Erect, slender, glabrous herbs. Leaves various, lower ones 3-6 cm long, lyrately pinnatisect, petiolate,
lobes glabrous acute, upper ones 1-3 x 0.1-0.3 cm, linear-lanceolate, sessile, glabrous, entire, acute. Flowers white, 0.15-0.2 cm across, in racemes. Sepals 0.1-0.15 cm long, oblique, not saccate. Petals 0.15-0.2 cm long, white, not clawed. Stamens 6; honey glands present; anthers round and blunt. Ovary sessile, flat, 0.15-0.2 cm long, 2-ovuled; style short; stigma capitate. Pods 0.3-0.6 x 0.1-0.4 cm, broadly elliptic-oblong, glabrous, notched at apex, dorsally compressed, valves keeled and winged; pedicels 0.2-0.4 cm long. Seed solitary in each cell, pendulous, + 0.1 cm across, ovate-elliptic, reddish-brown; testa reticulately pitted. Fl. & Fr.: November to April.

ENG. name: Garden cress.

Local names: HIND. - Halim, hurf; BENG. - Alevari; PUNJ. - Halim, Shargundi, GUJ. - Asalio, Halim; MAR. - Afilva; TEL. - Adalavitulum Adityalu; TAM. - Aliverari; KAN. - Allibija.

Cultivated throughout India; also as escape in waste places and cultivated fields.

Leaves are consumed raw in salads. They are also cooked with vegetable curries and used as garnish. The plant is used as a fodder for horses, camels etc. and used in the treatment of asthma, coughs and bleeding piles. The seeds are rubefacient, galactagogue, emmergogue, laxative, tonic, aphrodisia and diuretic (See Wealth of India).

Erect, annual, much branched, slender pubescent herbs. Leaves radical and cauline, pubescent; radical ones 4-7 x 0.8-2.1 cm, petiolate, deeply pinnatisect, segments narrow, acute; petioles 3-6 cm long; cauline one 2-4.5 x 0.5-1.5 cm, linear, erect. Flowers yellowish-white, 0.1-0.15 cm across, in terminal and lateral corymbs; pedicels 0.2-0.4 cm long, slender. Sepals 0.05-0.1 cm long, oblique, not saccate. Petals absent. Filaments filiform; anthers blunt and round. Ovary linear, sessile; style short; stigma capitate. Pods 0.2-0.3 x 0.1-0.2 cm, orbicular-oblong, flat; valves winged above, apical notch shallow and narrow; style very short. Seeds 2 in each pod, < 0.1 cm across, ovate-oblong, reddish-brown, glabrous; testa reticulately pitted. Fl. & Fr.: June to September.

ENG. name: Small flowered pepper-wort.

Found in J. & K. and Tibet at an altitude of 2100-3900 m; rare.
Chromosome no. 2n=32 (Carvalho & Vesconcellas, Fl.).

The herb and pounded seeds yield volatile oils similar to those of other species. Aqueous extracts of the herb cause a brief drop in blood pressure and depress respiration. The plant is used in impetigo (See Wealth of India).

**Lepidostemon** Hook. f. & Thoms.


India, Afghanistan and Western Asia.

Dwarf annuals; stem simple, erect, covered with soft, forked hairs. Leaves 0.5-3.5 x 0.2-0.8 cm, oblong-obovate, sharply toothed, pubescent, acute, sessile. Flowers 0.5-0.6 cm across, yellow, in corymbose racemes; pedicels 0.2-0.4 cm long, slender. Sepals 0.2-0.3 cm long, short, equal at base, inner saccate. Petals 0.5-0.6 cm long, obovate, distinctly clawed. Stamens free; filaments with broad appendages. Pistil sessile, oblong. Pods 0.5-1 cm long, erect, downy, linear, elongate; valves smooth; septum linear, hyaline, nerveless; stigma 2-lobed. Fl. & Fr.: June to July.

Rocky hills at Tungu, at an altitude of 4600-4900 m.


Annual or perennial, hairy herbs; hairs simple forked, or medifixed. Leaves entire or incised, simple, linear-lanceolate. Flowers yellow, purple or white, in short racemes. Sepals erecto-patent not saccate at base. Petals entire. Filaments of stamens not winged and without appendages. Pistil sessile; ovary cylindric; style distinct; stigma capitate. Pods small, rotund, flattened, suborbicular or obovate, tipped with short beak; valves slightly inflated, with more or less distinct median-vein. Seeds 1-5 in each loculus.

India, extending westwards to S. Europe.


Erect, annual, slender greyish-white, pubescent or glabrescent herbs, branched at base. Leaves 1.6-4.2 x 0.1-0.7 cm, linear-lanceolate, entire, acute, sessile, simple, pubescent, narrowed at base. Flowers 0.3-0.4 cm across, creamy-yellow or nearly white, in 8-14 cm long racemes; pedicels 0.5-0.7 cm long, slender. Sepals 0.1-0.15
cm long, green, erect, obtuse. Petals 0.3-0.4 cm long, slightly clawed. Pistil sessile; ovary cylindric, 0.2-0.3 cm long, glabrous; style short; stigma capitate. Silicula 0.3-0.4 cm long obovate or suborbicular, shortly beaked; valves convex, nerveless. Seeds solitary in each loculus, ± 0.1 cm across, globose, glabrous, reddish-brown. Fl. & Fr. April to July.

**ENG. name**: Sweet Alyssum

Grown in gardens as an ornamental in North West India, W.B. and BIHAR, during the cold season.

Chromosome no. 2n=24 (See Ball, in Fl. Europe 1:307. 1964).

The plant is considered antiscorbutic and diuretic in Spain (See Wealth of India).

**LOXOSTEMON** Hook. f. & Thoms.


Perennial or annual, small herbs with slender creeping rhizomes covered with white scales or bristles; stem simple, leafless at base. Radical leaves with bulbils in axils,

Filiform, tender, flexuous perennial herbs, covered with white scales. Radical leaves oblong-obovate with bulbils at base, on 2.5-3 cm long petioles. Cauline leaves 1-3 cm long; leaflets 0.6-2 x 0.2-0.4 cm, linear-oblong, entire, glabrous, obtuse, on 0.5-1 cm long petioles. Flowers 0.5-0.6 cm across, lilac, in corymbose racemes. Sepals 0.2-0.3 cm long, spreading. Petals 0.5-0.6 cm long, clawed, distinctly veined. Pods 0.5-1.2 x 0.05-0.1 cm, linear, erect, tapering at both ends; valves smooth with distinct mid-vein; pedicels 0.6-0.8 cm long, slender. Seeds: 1-seriate, few, reddish-brown, oblong; testa reticulately pitted. Fl. & Fl.: July to August.
SIK., in moist grassy places, altitude 3000-4000 m.

**LUNARIA** Tourn. ex Linn.


Biennial or perennial, erect, branched herbs, sparingly hairy; hairs simple. Leaves simple, ovate-deltoid or ovate-toothed. Flowers violet or purple, rarely white, in terminal racemes. Sepals erect, lateral ones saccate at base. Petals long clawed. Anthers obtuse. Ovary 4-6-ovuled, narrow, cylindric; style short; stigma minute, connate into an obtuse, blunt apex. Siliculae compressed, equal or unequal, broadly elliptic, slightly oblong or almost circular; valves flat, transulcuent, thin-walled, septate, septum thin, white, shining; beak slender, long. Seeds few, large flat, winged.

India, Asia and Europe.

Erect, small, slender hairy annuals. Leaves 2-5 x 1.4-2.5 cm, ovate, acuminate, coarsely and irregularly toothed, hairy, lower petiolate, upper sessile or nearly so. Flowers 2-2.5 cm across, reddish-purple, in 6-12 cm long racemes; pedicels 0.4-0.8 cm long, slender. Sepals 1.5-2 cm long, erect, inner saccate at base. Petals 2-2.5 cm long, long-clawed. Ovary 1.8-2.2 cm long, 4-6 ovuled, narrowly cylindric; style short; stigma minute, connate, slightly lobed. Pods 1-3.5 x 0.2-1.5 cm, thin, flat, broadly elliptic with unequal sides, tapering towards the ends, reticulately nerved; valves flat, thin-walled, translucent; septum thin, white, shiny; style beak 0.3-0.6 cm long, slender. Seeds 0.2-0.3 cm long, suborbicular, flat, attached to the periphery of the fruit by 0.1-0.3 cm long funicle. Fl. & Fr.: November to February.

The species is rare, collected from T.N., Ooty at an elevation of 2500 m, where it is certainly an escape. The plant is quite attractive in full bloom. It is so far not reported from any other part of India. The white shining septum of the silicula is rather typical.

Dried plants bearing silver septa are used for floral decorations. The root is said to be edible before the development of flowers (See Maming, Systematic guide to flowering plants of the World, 1965).
Annual or perennial, simple or branched, stellate-pubescent herbs. Leaves entire or pinnatifid, hairy, acute. Flowers pink, purple or violet rarely white, in lax racemes. Sepals erect, equal at base, inner saccate. Petals linear, long-clawed. Stamens 6; filaments generally free, sometimes longer, united in pairs. Ovary cylindric; style short; stigma erect, two-lobed, lobes connate. Pods elongate, cylindric; valves 3-nerved; septum membranous. Seeds 1-seriate, sometimes in two rows at the base of the pod, ovate-oblong, not margined.

India, Western Asia and Europe.
1824; Hook. f. & Thoms. in Journ. Linn. Soc. 5:155. 1861;

Erect, stout, annual, stellate-pubescent herbs. Leaves
oblong to oblong-lanceolate, entire, hairy, radical ones
3-4.5 cm long, cauline ones 0.2-2.8 x 0.2-0.6 cm. Flowers
pinkish, in 8-15 cm long racemes. Sepals 0.4-0.5 cm long,
green, hairy, equal at base, inner saccate. Petals linear,
long-clawed, reticulately veined. Ovary 0.6-0.7 cm long,
cylindric, hairy. Pods 1-2 x 0.1-0.15 cm, erect, narrow,
hairy, acute; valves 3-nerved; septum membranous. Seeds
± 0.1 cm across, globose, 1-seriate, not margined, glabrous.
Fl. & Fr. : April to May.

J. & K., PUNJAB and W. Tibet, altitude 3900 m.

It affords a good fodder for goats and sheep (See
Wealth of India).
Malcolmia maritima (Linn.) R. Br. in Ait. Hort. Kew. (ed. II)

Diffuse, annual, pubescent herbs. Leaves 1-3.5 x 0.2-0.8 cm, oblong, lanceolate, entire, pubescent, obtuse, narrower towards base. Flowers pink to violet, in 7-14 cm long racemes; pedicels 0.2-0.3 cm long. Sepals 0.9-1 cm long, erect, lateral saccate at base, green, pubescent, acute. Petals long clawed, reticulately veined. Ovary 0.9-1.1 cm long, hairy, narrowly linear; style short; stigma erect, 2-lobed. Pods 3-6 cm long, erect, slender, linear-lanceolate, stalked, torulose, sharp-pointed. Seeds reddish, 0.1-0.15 cm long, oblong, 1-seriate, glabrous. Fl. & Fr.: December to January.

A cultigen in gardens in J. & K., PUNJAB and MAH.; seldom an escape.

MATTHIOLA R. Br.

Annual to perennial herbs or undershrubs, with hoary tomentum of branched or stellate hairs. Leaves entire, sinuate-toothed. Flowers large, purple, white, yellowish or maroon in ebracteate racemes. Sepals erect, saccate at base. Petals spreading long clawed. Ovary linear; style absent; stigma usually sessile, distinctly 2-lobed and lobes either spreading or thickened on sides and decurrent, with swollen gibbosity or horned projections usually present on dorsal side. Silicula long, narrow, cylindric or flattened; valves one-veined with thick septum. Seeds numerous, 1-seriate in each loculus, flattened, with a narrow, membranous wing.

India, Africa, Western Asia and Europe.

1. Plants not densely white-tomentose; leaves entire, rarely sinuate-pinnatifid; stigma narrower than silicula. 

2. Plants densely white-tomentose; leaves sinuate to sinuate-pinnatisect; stigmas as thick as or wider than silicula. 

1. M. incana

2. M. odoratissima


Erect, branched, stout, pubescent, perennial herbs, woody at base. Leaves 3-3.5 x 0.6-1.5 cm, oblong-oblancoleate, narrowed to the base, densely hairy, entire, obtuse. Flowers pink or purple, 1.5-2.5 cm across, pedicellate, in terminal racemes; pedicels 0.5-1.2 cm long, stout, sepals 0.9-1.5 cm long, unequal at base, erect. Petals 1.5-2.5 cm long, pinkish-purple, long clawed, distinctly veined. Ovary linear, 1.2-1.6 cm long, hairy; style inconspicuous; stigma distinctly 2-lobed. Pods 3.5-9.5 x 0.2-0.4 cm, compressed, hairy, erecto-patent; stigma narrower than pod, without conspicuous horns. Seeds 1-seriate, many, 0.1-0.2 cm long, oblong, dark-brown, narrowly winged; testa reticulately pitted. Fl. & Fr.: May to July.

ENG. name: Common stock, Gilliflower.
Local names: PUNJ. - Todrilila, Todri safed.
Grown in gardens throughout India, as an ornamental.

Chromosome no. 2n=14 (Ball in Fl. Europ. 1:280, 1964).

Seeds are slightly bitter and possess tonic, diuretic, expectorant and stomachic properties (See Wealth of India).

Matthiola odoratissima R. Br. in Ait. Hort. Kew. (ed. II)

Matthewia ovalifolia Boiss. Diagn. (Ser. 1)

Erect, perennial, branched, stout herbs, woody at base, densely white-tomentose. Lower leaves 3-4 x 0.7-1.2 cm, obovate, pubescent, shortly petiolate; upper ones 1.5-3.5 x 0.2-0.4 cm, linear-lanceolate, pubescent, acute. Flowers purple, 1.3-1.5 cm across, few, in terminal racemes; pedicels 0.4-0.6 cm long, slender. Sepals 0.8-1 cm long, not equal at base, saccate. Petals 1.3-1.5 cm long, long-clawed, distinctly veined. Ovary 1-1.2 cm long, linear, hairy. Pods 2-8 x 0.2-0.3 cm, erecto-patent, rigid, compressed, hairy. Stigma 2-lobed as wide as or wider than Siliqua, without conspicuous horns. Seeds 1-seriate, 0.1-0.15 cm long, ovate-oblange, brown many; testa reticulately pitted. Fl. & Fr. : May to August.

Very rare in dry stony places in West Tibet at an elevation of 3900 m.
MEGACARPA BENTH.


Perennial, coarse herbs, with thick, fleshy root and stem covered with stiff or crisped, simple hairs. Radical leaves large, 2-pinnate, cauline leaves smaller, pinnatisect, sessile. Flowers racemosed or subcorymbose, yellow, white or violet. Sepals not saccate, equal at base. Petals oblong, entire. Stamens 6 or more; filaments not toothed. Fruit deeply 2-lobed indehiscent, much flattened at sides; valves orbicular, broadly winged; stigma sessile. Seeds solitary in each cell, much flattened, not winged.

India, Pakistan, Nepal, Bhutan and Europe.

1. Leaf-segments incised and toothed; stamens
   10-16 ................................................. M. polyandra

1. Leaf-segments lanceolate, entire stamens
   7-11 ................................................. M. bifida

Megacarpa bidentata Benth. in Hook, Kew. Journ. 7:357. 1855;

Megacarpa bidentata Benth. in Hook, Kew. Journ. 7:357. 1855;

Megacarpa bidentata Benth. in Hook, Kew. Journ. 7:357. 1855;

Megacarpa bidentata Benth. in Hook, Kew. Journ. 7:357. 1855;

Megacarpa bidentata Benth. in Hook, Kew. Journ. 7:357. 1855;
Erect, stout, glabrous herbs. Leaves 5-7.8 cm long, pinnately lobed, lobes entire, decurrent, glabrous, acute or acuminate. Flowers yellow, many in racemes. Sepals 0.4-0.6 cm long, glabrous not saccate. Petals 0.5-0.7 cm long, glabrous, entire, oblong. Stamens 7-11, filaments stout. Ovary broadly obovate, glabrous, many-ovulate; stigma disc-shaped. Pods 3-4.2 x 2.5-4.3 cm, suborbicular with broad membranous, reticulately nerved wings; Seeds solitary in each fruit, reniform. $0.15$ cm across, reddish-brown, glabrous. Fl. & Fr.: May to August.

Western Tibet altitude 2900 m.


Stout, erect, tall, glabrous, perennial herbs; root fleshy, as thick as the wrist. Leaves radical and cauline, radical ones 10-18 cm long, sessile lyrate lyrate pinnatisect, segments irregularly, sharply toothed, acute, cauline leaves pinnately divided, 5-9.5 cm long, sessile, segments slightly toothed, acute. Flowers yellow, in closed panicked racemes. Sepals 0.5-0.7 cm long, glabrous, equal at base. Petals 0.6-0.9 cm long, glabrous, oblong, entire. Stamens 10-16; filaments, stout, awl-shaped. Ovary broadly ovate, glabrous, many-ovulate; style inconspicuous; stigma
entire, discoid. Pods 3-4.1 x 2.8-4 cm, suborbicular, much flattened inflated in the middle, with broad membranous, reticulately nerved wings; fruiting pedicels 2.0-2.6 cm long, slender. Seeds solitary in each fruit, reniform, \(+0.2 cm across, brownish, glabrous, smooth. Fl. : June.

J. & K. to Kumaon, upto an elevation of 4200 m.

MICROSISYMBRIUM O.B. Schulz.


(Onne p.p.).

Erect or decumbent, branched, glabrous or floccosely hairy, annual herbs. Leaves lyrate, pinnatifid, rundinate, dentate, petiolate or sub sessile amplexicaul. Flowers minute, white or yellow, in axillary racemes. Sepals suberect or erecto-patent, subequal, oblong, obtuse, inner ones not saccate. Petals narrowly spatulate, few-nerved, rounded at apex. Stamens 6, erect; filaments filiform; anthers, oblong, obtuse, nectariferous glands minute, lateral ones subannular or ring-like, median ones torulose. Pistil cylindric, sessile; ovary 10-42-ovulate; style short; stigma inconspicuous. Pod linear, slightly curved, glabrous, terete; septum membranous; valves reticulately nerved with prominent mid-vein. Seeds uniseriate, oblong-ellipsoid, 0.07-0.01 cm long.
India, Nepal, Pakistan, Afghanistan.

1. Decumbent herbs; flowers in axils of upper leaves .................. *M. axillare*

1. Erect herbs; racemes ebracteate ....... *M. minutiflorum*


1. Pods glabrous ......................... var. *axillare*

1. Pods hispid, covered with short, forked hairs .................... var. *dasycarpa*

var. *axillare*

Decumbent, branched, hairy annual herbs, with short, leafy stems; hairs simple, long. Leaves radical and cauline; radical ones 0.8-2.2 x 0.4-0.8 cm, densely rosulate, oblong-obovate or spatulate, sinuate-dentate or pinnately pinnati-partite, terminal lobe obovate, peltate; cauline leaves 0.5-2 x 0.3-0.6 cm, obovate or broadly oblong, sessile, dentate, entire. Flowers rarely white or yellow, 0.3-0.4 cm across, pedicellate, 6-10, in 6-12 cm long racemes; pedicels 0.2-0.3 cm long, slender. Sepals 0.1-0.2 cm long, narrowly oblong, obtuse, hirsute. Petals 0.3-0.4
cm long, spathulate, not clawed. Stamens 6, erect; anthers oblong-obtuse. Ovary 0.2-0.3 cm long, 10-42 ovulate; style short, slender, erect; stigma inconspicuous. Pods 1-2.2 x 0.04-0.06 cm, narrowly linear, glabrous; septum membranous; pedicels 0.4-0.8 cm long, slender, erecto-patent or curved. Seeds 0.07-0.1 cm long, uniseriate, oblong-ellipsoid, brown.

Fl. & Fr.: June to July.

Inner ranges of SIK., altitude 2500-4000 m; on dry rocks and walls.

var. dasycarpum O.E. Schulz in Pfreich. 86:160. 1924.

SIK., altitude 2600 m, along the track between Felsen and Mauren in Chupcha.


Erect, puberulous, much branched, annual, slender herbbs. Leaves radical and cauline; peticulate, pinnatisect 1-2-jugate; lobes linear to linear-oblong, hairy, obtuse. Flowers minute, 0.2-0.25 cm across, 5-10, white, in terminal racemes. Sepals 1-1.2 cm long, suberect, oblong, obtuse. Petals 0.15-0.2 cm long, white, elliptic, not clawed. Anthers ovate. Pistil cylindric; ovary 10-ovuled; style
short. Pods 1-1.4 x \( \frac{5}{2} - \frac{1}{2} \) cm, straight or slightly curved, erecto-patent, linear, compressed; valves 1-nerved, obtuse. Seeds minute, oblong-ellipsoid, \( \pm \frac{0.1}{2} \) cm across. Fl. & Fr.: May to June.

Western Tibet (Zanskar).

**Moricandia DC.**


Glabrous, smooth, annual or perennial, branched herbs, often woody at base. Leaves simple, fleshy; lower sessile; upper ones amplexicaul, entire rarely pinnatisect, ovate. Flowers large, violet, purple or rose-coloured, in corymbose inflorescence. Sepals erect, outer ones linear, obtuse, inner ones oblong, erect, saccate at base. Petals clawed; limbs obovate, truncate at apex. Stamens 6, free; anthers linear, acute at apex. Pistil cylindric, sessile; ovary multiovulate; style short; stigma bilobed, lobes united.
into a short cone. Pods linear, compressed, 4-angled, biloculed with or without a flattened, 1-seeded beak; valves flat or bluntly keeled, one nerved, rarely many nerved. Seeds in 1 or 2 rows in each loculus, ellipsoid, many, compressed sometimes winged.

India, Persia, Arabia and Europe.


Short lived, perennial or biennial, branched, glabrous herbs. Leaves simple, fleshy; lower ones 5-10.2 cm long, shortly petiolate, obovate, repand-crenate, obtuse at apex, upper ones 2.5-5.2 cm long, cordate or oblong with large, clasping basal auricle. Flowers 10-20, rose-coloured, 2-2.3 cm across, in loose racemes; pedicels 0.2-0.4 cm long. Sepals 0.8-1.1 cm long, outer ones linear, obtuse at apex; inner ones oblong, acute, saccate at base. Petals 2 cm long, long-clawed, distinctly reticulately nerved. Stamens 1.2-1.4 cm long; anthers linear, acute. Median nectariferous
glands absent, lateral ones semilunar. Pistil 1 cm long, sessile, cylindric, quadrangular; ovary many ovulate; style 0.25-0.3 cm long; stigma bilobed, lobes confluent. Pods 3-7 x 0.2-0.3 cm, linear, compressed, tetragonal; valves flat with prominent mid-vein. Seeds many, brown, 2-seriate, ovoid, ± 0.1 cm across.

West Tibet.

NASTURTIUM R. Br.

Kanjilal et al. Fl. Assam 1:70. 1934; Bailey, Man. Cult.
Valentine in Fl. Europ. 1:284. 1964; Wealth of India, 7:5.

Terrestrial or aquatic, perennial, glabrous or hairy branched herbs, rooting at nodes, often forming floating mats. Leaves lobed or pinnatifid, rarely entire. Flowers small, yellow rarely white in racemes. Sepals short, spreading, oblique, equal, with membranous margins. Petals white, short, narrowed at base, scarcely clawed or not, much larger than sepals. Filaments of stamens linear; anthers ovate. Ovary sessile or hardly stipitate, linear to oblong; style very short; stigma entire or two lobed. Pod elongated, cylindrical terete, valves convex, faintly 1-nerved, mid-nerve inconspicuous; septum hyaline. Seeds 2-seriate, flattened, more or less round, many, turgid.

India, Western Asia, Europe, North Africa.

Nasturtium officinale R. Br. in Ait. Hort. Kew. (ed. II) 4:
Erect, annual, aquatic herbs; stem slender, angular, glaucous, glabrous, branched. Leaves 5-8 cm long, pinnatifid; segments 0.4-1.2 x 0.3-1.1 cm ovate, orbicular, pubescent, margin wavy, obtuse at apex, sessile; petioles 0.2-1 cm long, slender. Flowers 0.2-0.25 cm across, white, pedicellate, in 4-11 cm long racemes. Sepals 0.1-0.15 cm long, erect, equal. Petals 0.2-0.25 cm long, slightly clawed, white. Ovary cylindric, many ovulate, glabrous; style short; stigma distinct and bilobed. Pods 0.5-1.9 x 0.1-0.2 cm, narrow, linear, small, stalked, beakless; valves smooth, nerveless. Seeds 0.1-0.15 cm long, obovate, 2-seriate, reddish, many; testa reticulately pitted. Fl. & Fr. : April to November.

ENG, name : Water-cress.

Local name : FUNJ. - Piriya halim.

Throughout India, in moist ground, commonly found in ditches, pools and margins of shallow streams up to an altitude of 2100 m.

It is consumed raw as salad, cooked as vegetable. It is believed to improve appetite and also as a good source of vitamins and minerals (See Wealth of India).

**NESLIA** Desv.


Annual, erect, hairy herbs. Leaves entire or sinuate-toothed, simple; cauline leaves amplexicaul with sagittate auricles. Flowers yellow, small, in ebracteate racemes.

Sepals erect, not saccate, equal at base. Petals entire.

Stamens without appendages. Pod indehiscent, latiseptate subglobose, slightly flattened, coriaceous. Seeds 1-3, solitary in each cell, reddish.

India, Pakistan, Afghanistan, Central Asia, North Africa and South Europe.

Small, erect, slender hairy herbs, branched above. Leaves radical and cauline, radical ones 1.5-2.5 x 0.4-1.2 cm, spathulate, entire, pubescent, on 0.3-1 cm long petioles; cauline leaves 1-2.4 x 0.2-0.8 cm amplexicaul, oblong-lanceolate, pubescent, auricled at base, entire, acute at apex. Flowers 0.3-0.35 cm across, yellow, pedicellate, in terminal racemes; pedicels 0.3-0.8 cm long, slender, spreading. Sepals 0.2-0.25 cm long, spreading, equal at base. Petals 0.3-0.35 cm long, yellow, slightly clawed. Ovary 0.3-0.35 cm long, narrow, cylindrical; style short; stigma capitate. Pods 0.2-0.35 cm long, subglobose, slightly flattened, indehiscent, reticulately nerved with sharp, slender style; pedicel 0.8-1.1 cm long, slender, spreading from the axis. Seeds solitary in each cell, reddish, ovate-oblong, 0.1 cm across, glabrous, smooth; testa reticulately pitted. Fl. & Fr. : February to April.

J. & K., PUNJAB, altitude 1600-1900 m.

Chromosome no. 2n=14 (See Ball in Fl. Europ. 1:316. 1964).
**NOTOCEROS R. Br.**

Annual, small, stiff, branched, hoary herbs, with bipartite medifixed hairs. Leaves lanceolate or linear-lanceolate, entire. Flowers white, in short dense, leaf-opposed racemes. Sepals erecto-patent, not saccate, equal at base. Petals small, linear-oblong, not clawed. Pods rigid, tardily dehiscent or indehiscent, linear, oblong, terete, with two horns at apex; valves keeled or narrowly winged, internally pitted opposite the seeds. Seeds linear-seriate, small, compressed, wingless.

India, North Africa, Arabia & Europe.

**Notoceras bicorne** (Ait.) Amo. Fl. Iber. 6:536. 1873; DC.

**Notoceras canariense** R. Br. in Ait. Hort. Kew. (ed. 2) 4:117. 1812;
Procumbent or erect, annual, branched herbs. Leaves 1-3 x 0.2-0.7 cm, linear-oblong to lanceolate, entire, obtuse, pubescent. Flowers white, 0.2-0.3 cm across in 2-6 cm long, dense, leaf-opposed racemes. Sepals 0.1-0.2 cm long, erecto-patent, not saccate, equal at base. Petals 0.2-0.3 cm long, linear-oblong. Style short; stigma capitate. Pods 0.4-0.9 x 0.15-0.25 cm, erect, rigid, indehiscent, linear-oblong, terete; valves with a prominent keel, prolonged at the tip into 2 horns. Seeds 1-seriate, few, oblong-ovate, ± 0.1 cm across, compressed, wingless, reddish-brown, glabrous. F1. & Fr.: January to March.

Found in fields and sandy places in PUNJAB.
Small, tufted, perennial herbs; glabrous or covered with various types of hairs; root-stock thick. Leaves radical, linear or spatulate, entire, sinuate or pinnatifid. Flowers large, white or purple, in terminal racemes. Sepals erect, lateral sometimes saccate. Petals long clawed, reticulately veined. Filaments of stamens of inner whorl broader than those of the outer. Lateral honey glands ring-like. Ovary 10-many ovuled, linear, sessile; style short; stigma bilobed, lobes erect, distinct, connate. Siliqua linear, long or short, much compressed; valves reticulately veined, smooth with prominent mid-vein; septum entire or divided, membranous or hyaline. Seeds 2-seriate, in each loculus, much flattened with a membranous wing or wingless.

India, Pakistan, Afghanistan, Asia, America, and Arctic Europe.

1. Seeds winged:
   2. Scapes 15-28 cm long, many flowered... P. nudicaulis
   2. Scapes 3-5 cm long, 1-flowered ...... P. exscapa

1. Seeds not winged:
   3. Pods ovate-oblong, 0.6-1.2 cm broad... P. platycarpa
   3. Pods ovate-lanceolate, 0.3-0.6 cm broad ........................................... P. lanuginosa
Parrya exscapa C.A. May* in Ledeb. Fl. Alt. 3:28. 1831;
Hook. f. & Thoms. in Journ. Linn. Soc. 5:135. 1861; Hook. f.

Small, scapigerous, glabrous herbs. Leaves 3-5 x
0.4-0.8 cm, spatulate, obtuse, entire, petiolate; petioles
0.5-1.5 cm long, slender. Scapes 3-5 cm long, 1-flowered,
slender. Flowers 1-1.4 cm across, purple. Sepals 0.8-1 cm
long, erect, the inner saccate. Petals 1-1.4 cm long,
long clawed, prominently veined. Ovary 0.8-1.2 cm long,
linear, sessile, 10-many ovuled; style short; stigma bilobed.
Pods 2-5.5 x 0.2-0.3 cm, narrow, linear, drooping; valves
nerved. Seeds 2-seriate, suborbicular, 0.4 cm across
(including wings); wing broad and membranous.

West Tibet, altitude, 4900-5900 m; rare.

Parrya lanuginosa Hook. f. & Thoms. in Journ. Linn. Soc.
India 1:132. 1872.

Densely woolly, acaulescent herbs; root-stock thick.
Leaves 2-3.5 x 0.5-1 cm, simple, in rosettes, spatulate,
toothed, pubescent, obtuse, petiolate; petioles 0.5-1.4 cm
long, slender. Scapes 3-5 cm long, woolly, many-flowered.
Flowers 0.5-0.6 cm across, yellow, pedicellate; pedicels
0.3-0.4 cm long, slender. Sepals 0.3-0.4 cm long, erect,
not saccate at base. Petals 0.5-0.6 cm long, clawed, veined.
Ovary 0.4-0.6 cm long, linear, 10-many ovuled, glabrous; style short; stigma bilobed. Pods ovate-lanceolate, 3-4.5 x 0.3-0.6 cm. Seeds not winged, few, oblong, 0.2-0.3 cm long, acute at ends, 2-seriate.

West Tibet in Guge, altitude, 5700 m; rare.


Glabrous, erect, perennial herbs; root stock thick. Leaves 4-10 x 0.5-0.8 cm, tufted, thick, petioled, spatulate-lanceolate, pubescent, usually entire, rarely sinuate; petioles 0.8-4 cm long. Scapes 15-28 cm long, rigid, many-flowered. Flowers 0.8-1 cm across, yellow, pedicellate, in corymbs; pedicels 0.2-0.5 cm long, slender. Sepals 0.5-0.6 cm long, erect, inner ones saccate at base. Petals 0.8-1 cm long, long clawed, distinctly veined. Ovary 0.6-0.8 cm long, 1-many ovuled, linear, sessile; style short; stigma bilobed. Pods 4-5.5 x 0.3-0.4 cm, erect, linear-lanceolate, tapering into a thin, 0.2-0.3 cm long style; valves strongly nerved. Seeds many, 2-seriate, much flattened, suborbicular, 0.3-0.4 cm across, wing broad and membranous. *Fl. & Fr.* 1 February to April.
Found in Alpine region of West Tibet, altitude 4900-5900 m; rare.


Small, tufted herbs; root-stock thick, covered with spongy old petioles. Leaves 1-2.5 x 0.3-0.7 cm, leathery, pubescent, entire, petiolate; petioles 0.6-1.2 cm long, with sheathing base. Scapes 4-5 cm long, pilose, thick, bearing few, small leaves. Flowers 0.6-0.8 cm across, white, pedicellate on scapes; pedicels 0.2-0.5 cm long. Sepals 0.5-0.7 cm long, erect, the inner ones saccate. Petals 0.6-0.8 cm long, clawed, reticulately veined. Ovary 0.5-0.6 cm long, 10-many ovuled, linear, glabrous; style short; stigma bilobed. Pods 1.6-2.8 x 0.6-1.2 cm, linear-oblong, tapering into a thick, short style; valves thin, convex with prominent mid-vein. Seeds few, 0.15-0.25 cm long, ovate-oblong, much flattened, wingless, glabrous, smooth. Fl. & Fr. : July to August.

Eastern Himalaya in the Tibetan region of SIK., altitude 4500-5000 m; rare.

PEGAEOPHYTON Hayek & Haud.-Mazz.

Perennial, glabrous herbs, with short stem or stemless. Radical leaves in rosette, simple, somewhat fleshy. Flowers solitary, white or yellow on scapes, arising from the axils of radical leaves. Sepals ovate, round at apex, not saccate at base. Petals shortly clawed with purplish nerves. Stamens erect; filaments broad at the base; anthers long, blunt. Lateral honey glands semianular, adnate to the median honey glands. Ovary sessile, obovate; style short; stigma flat. Pod much flattened, linear-oblong or ellipsoid, somewhat fleshy, green; valves with slender mid-nerve and indistinct lateral nerves. Seeds large, flat or round; testa smooth.

India.

Paeaeophyton scapiflorum (Hook. f. & Thoms.) Marq. & Shaw


Stemless, perennial, scapigerous, glabrous herbs. Leaves 3-6 x 0.1-0.3 cm, ovate-oblong to linear-lanceolate, glossy, entire, glabrous. Flowers 0.5-0.6 cm across, yellowish, on scapes 5-8 cm long. Sepals 0.3-0.4 cm long,
glabrous, not saccate. Petals 0.5-0.6 cm long, clawed, glabrous. Anthers yellow, blunt. Ovary sessile, few ovuled glabrous. Pods 0.4-0.6 x 0.05-0.1 cm, much flattened, linear-oblong, greenish; valves with slender mid-nerve. Seeds 1-seriate, ovate, glabrous, ± 0.15 cm across; testa smooth. Fl. & Fr.: July to August.

On moist soil slopes at SIK., altitude 4000 m.

PYCNOPLINTHUS O.E. Schulz

in Pfreich, 86:197, 1924.

Densely caespitose, glabrous herbs. Leaves radical, carnose, 1.5-2 cm long, linear-lanceolate, entire, obtuse at apex, narrowed at base, petiolate. Scape one-flowered. Sepals 0.3-0.5 cm long, erecto-patent or coherent, caducous, outer oblong, laterals elliptic-oblong, saccate at base. Petals ± 0.6 cm long, white with violet claws, obovate-cuneate, much veined. Stems 6, erect; filaments linear; anthers oblong. Lateral nectariferous glands semiannular, median torulose. Ovary 12-ovulate; style short, thickly grooved; stigma capitate or bilobed. Pods 1-1.4 cm long, oblong, rarely curved; valves strongly keeled, faintly reticulate. Seeds 1-seriate, ovoid, reddish-brown, testa reticulate.

Characters as above.

Temperate Himalayas - Tibet, 3500-5000 m elevation.

RAPHANUS Linn.

Annual or biennial, glabrous or hispid herbs, with fusiform, fleshy roots, rarely tuberous roots absent (R. caudatus). Leaves lyrate-pinnatifid to pinnatisect. Flowers large, yellow, white or lilac with purple veins, in long, ebracteate racemes. Sepals erect, laterals saccate at base. Petals white, yellow or lilac, limb of petals obovate, long clawed, reticulately nerved. Ovary awl-shaped, 2-many ovuled; stigma small, bilobed. Pod indehiscent, flattened, very long, linear or short, terete and ovate, constricted between seeds; beak long, tapering. Seeds pendulous, globose; testa reticulate or smooth.

India, Western Asia and Europe.

1. Pods 2.5-10 cm long, ovate-lanceolate, bright green when fresh, septate within... R. sativus
1. Pods 30-40 cm long, linear, dark-purple, not septate within ..................... R. caudatus


Erect, annual, hairy herbs. Lower leaves 6-10.5 x 2.5-4.5 cm, lyrately pinnatifid to pinnatisect, coarsely toothed, upper leaves 2-6 x 0.4-0.8 cm, simple, linear; petioles 1-3.5 cm long, sparsely hairy. Flowers purple, 1.2-2 cm across, purple veined, in ebracteate, 3-7 cm long racemes, at length much spreading upto 30 cm long. Sepals 1-1.4 cm long, erect. Petals 1.2-2 cm long, clawed, reticulately nervetl. Ovary 1-1.4 cm long, awl-shaped; stigma small, inconspicuous. Pods 10-45 cm long, soft, slender, irregularly beaded, one chambered inside. Seeds few, glabrous, smooth, pendulous, 0.2-0.3 cm long, obovate, widely spaced, brown; testa reticulately pitted. Fl. & Fr. : December to June.

ENG. name : Rat-tail radish
Local names : HIND. - Sungra, Singri, Mungra; GUJ. - Mogri

Cultivated in Western India and PUNJAB for the pods used as vegetables; sparingly a road side weed in waste places as an escape.

Chromosome no. 2n=18 (Wealth of India).

The pods are used as salad. They contain proteins, fats and other carbohydrates and minerals. They contain the pigment Malvidin chloride glucoside (See Wealth of India).

Erect, annual, hispidly hairy herbs, with fusiform fleshy roots. Leaves both radical and cauline; radical ones 20-30 x 7-10 cm; petiolate, lyrately pinnatifid, with terminal lobe largest, lower lobes gradually becoming smaller; cauline leaves 3-6 x 1.5-2.5 cm, linear-lanceolate, sessile or subsessile, glabrous or sparsely hairy. Flowers 1.2-2.2 cm across, violet with dark-purple veins, sometimes pure white, in 4-6.5 cm long, ebracteate racemes. Sepals 1-1.5 cm long, spreading, the inner saccate at base,
oblong, acute at apex. Petals 1.2-2.2 cm long, clawed, reticulately nerved, limbs of petals obovate. Ovary 1-1.6 cm long, glabrous, awl-shaped, 2-many ovuled; stigma more or less bilobed. Pods 2-6 x 0.2-1 cm, indehiscent, terete, cylindric, the lower portion empty, persistent, upper portion caducous, 1-many-seeded, constricted between seeds, beaked; beak 0.5-1 cm long, flat, pointed, tapering. Seeds pendulous, 0.2-0.3 cm long, obovate, brown, funicle short; testa reticulately pitted. Fl. & Fr. : December to June.

ENG. name : Radish
Local names : ASM.- Mula; PUNJ. - Muli; BENG. - Mula; GUJ. - Mula; TEL., TAM., KAN., and MAL. - Mullangi.

Cultivated throughout India upto an altitude of 3000 m in Himalayas and other hilly regions for its edible roots; also an escape in waste places.

Chromosome no. 2n=18.

The plant is largely self-incomptible. It crosses easily with Raphanus raphanistrum. This has been crossed with Brassica oleracea, B. carinera, B. chinensis and B. rapa and the hybrids are characterised by varying degrees of sterility (See Wealth of India).

The roots are edible. Radish preparations are useful in liver and gall bladder troubles. Roots, leaves, flowers and pods are active against gram-positive bacteria. The roots are said to be useful in urinary complaints, piles
and in gastrodynia. The seed cake or meal is rich in proteins and appears to be suitable for use as a manure (See Wealth of India).

**RORIPA Scop.**


Annual to perennial, glabrous or hairy, slender, erect, herbs; hairs simple. Leaves ovate-oblong, pinnatifid-pinnatisect, toothed or entire on margins, acute at apex. Flowers small, yellow, rarely white, pedicellate, in racemes. Sepals short, spreading, not
saccate. Petals longer or shorter than sepals. Stamens 6, tetradynamous; lateral honey glands differently disposed, median honey glands conical. Ovary cylindrical, glabrous, many ovulate; style short; stigma distinct. Siliqua long or short, nearly terete, linear, tapering towards the ends of linear-ellipsoidal or globose; valves nerveless, smooth, mid-vein distinct. Seeds many 2-seriate, oblong or globose, reddish, rugose, glabrous; testa reticulately pitted.

India, Burma, China, Japan, U.S.S.R., Java, Malesia and North America.

1. Pods compressed, linear-oblong or linear-lanceolate:

2. Pods 0.4-1.6 x 0.1-0.25 cm ............. R. indica

2. Pods 0.5-2.2 x 0.05-0.1 cm ............ R. pusilla

1. Pods turgid, globose ..................... R. islandica


Small, erect, slender, annual, glabrous herbs, 13.5-27.5 cm tall. Leaves radical and cauline, petiolate, glabrous, with toothed margins, acute at apex; radical ones forming rosette, 6-13.5 cm long, cauline ones 2-11.5 cm long. Flowers 0.15-0.3 cm across, small, yellow, in 4.5-13.5 cm long racemes; pedicels slender, glabrous. Sepals 0.1-0.15 cm long, glabrous, erect not saccate at the base. Petals 0.15-0.3 cm long, longer than sepals, not clawed; lateral glands variously disposed, annular or minute. Ovary cylindrical, 0.15-0.25 cm long; glabrous; style short; stigma capitate. Pods 0.4-1.6 x 0.1-0.3 cm, narrow, linear-oblong, stalked, tapering towards ends, valves convex with obscure mid-nerve, beakless, but with persistent style; pedicel slender, glabrous, 0.2-0.6 cm long. Seeds 2-seriate, rugose, reddish, many, minute, ovate-oblong, 0.1-0.2 cm long; testa reticulately pitted.

Fl. & Fr.: May to October.

BNG. name: Cress.

Local names: DELHI - Khubkalau; TAM. - Kattu-Kadugu.
Found in damp places, often gregarious in small or large patches throughout India, ascending up to 2100 m in the Himalayas.

In Malaysia, it is used in salads, soups and curries. In Indo-China, it is considered to be diuretic, stimulant and antiscorbutic. It is also given in diarrhoea, and fever. The seeds are laxative and are prescribed in the treatment of asthma. But no such economic importance of it is known in India.


Annual or biennial, slender, glabrous herbs. 21-50 cm long. Leaves radical and cauline pinnatifid, glabrous petiolate, lobes acute, ovate-oblong, radical ones rosette

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Annual or biennial, slender, glabrous herbs. 21-50 cm long. Leaves radical and cauline pinnatifid, glabrous petiolate, lobes acute, ovate-oblong, radical ones rosette
form, 3-7.5 cm long, cauline ones 2-8.5 x 0.5-2 cm toothed.

Flowers yellow, 0.2-0.6 cm across, pedicellate, in 10-15 cm long, terminal racemes. Sepals 0.2-0.4 cm long, not saccate, equalling the petals. Petals 0.3-0.6 cm long, not clawed, veined. Ovary 0.3-0.5 cm long, cylindrical, glabrous, many ovulate; style short; stigma distinct. Pods 0.3-1 x 0.1-0.4 cm, short, broader, bottle-shaped, glabrous, curved when ripe, on 0.3-0.6 cm long stalks; valves convex with prominent mid-vein. Seeds small, many 0.1-0.15 cm long, oblong, pinkish, 2-seriate, rugose; testa reticulately pitted. Fl.: June to October.

ENG. name: Marsh-yellow cress.

Throughout in damp places in plains and hilly regions of India from temperate-Himalayas, ASSAM, BIHAR, W. B. to KERALA, upto an elevation of 3000 m.


Leaves are eaten in some parts of France as water cress. The plant possesses antiscorbutic, tonic, stimulant and diuretic properties. They are considered detergent, deobstruent, hepatic and stomatic. Unfortunately no such uses of this plant are known in India.

Rorippa pusilla (Roxb.) Danaiah & Shah (comb. nov.)


Ind. 3:125, 1872. Nasturtium montanum Wall. Cat. 4778.
1831 pro parte nomen ex Hook. f. & T. Anders. in Hook. f.
1916. Rorippa montana (Small, Fl. S.B. U.S. 1336. 1913;
Collett, Fl. Simlensis 30. 1921; Maheshwari, Fl. Delhi 58.

Annual or biennial, slender, glabrous, simple or branched herbs, erect, 15-50 cm tall. Leaves radical and cauline, sessile or very shortly petiolate, pinnatifid, glabrous, lobes ovate-oblong, with wavy margins, radical ones 2.5-12 x 0.5-2.5 cm, cauline ones 3-6 x 1-4 cm long. Flowers yellow, 0.2-0.4 cm across, pedicellate, in 8-14 cm long, terminal racemes. Sepals 0.2-0.3 cm long, erect, not gibbous, glabrous, oblong. Petals yellow, 0.2-0.4 cm long, glabrous, slightly clawed. Ovary cylindrical, 0.2-0.3 cm long, many ovulate, glabrous; style short; stigma capitate. Pods 0.5-2.2 cm long, linear-lanceolate, tapering towards both ends, spreading from the axis, not beaked, on 0.2-0.7 cm long pedicels; valves convex with inconspicuous mid-nerve. Seeds 0.05-0.1 cm long, many, 2-seriate, pinkish, rugose; testa reticulately pitted.
Fl. & Fr. : February to July.

Common in damp places and sometimes as a garden weed.
In North Western India from FUNJAB to SIH, ascending up to an elevation of 3000 m in the Himalayas and in Khasi and Aka hills.
The plant is antiscorbutic and is used as a digestive
(Kirt. & Basu, 1:147, 364).

SCHOUWIA DC.


Erect, glabrous, stout annuals or biennials. Leaves simple, amplexicaul, auricled at base. Flowers light purple or pink, in long, ebracteate racemes. Sepals 4 suberect, laterals broader. Petals 4, clawed, ovary hairy, ovate-oblong; style long, persistent, subulate; stigma capitate. Pods elliptic or ellipsoidal, laterally much compressed, winged, notched or cordate at base; septum narrow, membranous. Seeds many, brown ovate-oblong.


Erect, glabrous, stout herbs. Leaves 1.5-5 x 0.7-3.4 cm, simple, oblong-obovate, fleshy, broadly pointed at apex, sessile, amplexicaul, auricled at base. Flowers 0.8-1 cm across, pedicellate, pink, in 6-11 cm long, terminal racemes; pedicels 0.3-0.6 cm long, slender. Sepals 0.5-0.7 cm long. Petals longer than sepals, veined. Stamens 6; filaments free. Ovary 0.5-0.6 cm long. Pods 2.0-3.5 x 1.5-2 cm, elliptic, with prominent mid-rib, on 0.5-0.8 cm long stalk. Seeds 0.15-0.2 cm long, ovate-oblong, brown, glabrous, smooth, with circular markings. Fl. & Fr.: January to March.

The occurrence of this taxon is only from MAH., Poona district, certainly rare.

SINAPIS Linn.

Annual or biennial herbs; stem slender, profusely branched. Leaves radical and cauline, pinnatifid, pinnatifid-partite or ovate-oblong. Flowers yellow, large. Sepals patent, equal or subequal. Petals clawed. Pod long beaked; valves distinctly 3-7-nerved. Seeds 1-seri ate, globose.

India, Western Asia and Southern Europe.


Small, erect annual herbs, 30-40 cm tall; stem slender, terete, profusely branched, hairy. Leaves radical and cauline; radical ones 3-4 cm long, ovate-oblong with
short petioles, hairy, lyrately pinnatifid into 3-5 lobes with toothed margins, lobes acute, cauline ones 1-3 cm long, sessile, oblong, margin slightly wavy, acute. Flowers large, yellow 1.4-1.7 cm across in long, terminal racemes. Sepals 0.9-1.1 cm long, saccate at base. Petals 1.3-1.4 cm long, oblong, clawed, nerved. Ovary 1.1-1.3 cm long, many ovulate; style short, stigma capitate. Pods 1.5-3 cm long, linear-cylindrical, ovate-oblong spreading, few-seeded, hairy, on 0.2-0.3 cm long stout pedicels; beaks 0.4-0.8 cm long, stout. Seeds 1-seriate, white, oblong 0.2-0.3 cm long, obscurely pitted. Fl. & Fr. : February to May.

ENG. name : White Mustard

Local names : HIND. - Sufed-rai, Sufed - rayan; BENG. - Sweet rai, Dhop-rai; GUJ. - Dholirai; MAR.- Pandhora - Mohare; TEL. - Tellu avalu; KAN. - Bilisasive; MAL. - Kaduatu.

This species is grown during winter as a garden crop in temperate Upper India. It is also cultivated in W.B., U.P. and other parts of the country as a green manure.

In most of our Indian floras, this species is included under Brassica; however, following the generic circumscription in various monographs on Cruciferae. I have retained the genus Sinapis to include S. alba Linn.
Chromosome no. n = 12.

The seeds are used as an adulterant to black mustard whereas the young leaves and tender shoots are used as pot-herbs. The oil-cake is much used in Europe to feed sheep.

Annual, biennial or perennial, glabrous hairy, or hoary herbs. Leaves entire, toothed, pinnatifid, lyrately pinnatisect, rarely simple or runcinate, petiolate, middle ones amplexicaul. Flowers white, yellow, or violet-purple in lax, often bracteate or ebracteate racemes. Sepals erecto-patent, rarely suberect equal at base, rarely lateral saccate. Petals clawed. Stamens 6, free; filaments simple; anthers oblong, obtuse, lateral nectariferous glands present. Pistil cylindrical, sessile; ovary many-ovulate; style short; stigma capitate. Pods elongate, cylindric, compressed or terete, rarely tetragonal; valves convex, usually 3-nerved, septum membranous; style short; stigma 2-lobed. Seeds numerous 1-seriate, sometimes 2-seriate, oblong or ellipsoidal with short free funicles.

India, Pakistan, China, Central Asia, North Africa, Western Asia and E Europe.

1. Pedicel of fruit about as thick as Siliqua; Siliqua straight; placenta enlarged; septa spongy ................. S. orientale

1. Pedicel thinner than Siliqua; almost filiform, or slightly thickened towards apex; siliqua mostly curved; placenta small or enlarged at base; septa not as above :

2. Lower leaves much pinnatifid :
3. Inflorescence very contracted; leaves pinnatifid with large terminal lobes; radical leaves 5-9 cm long; cauline leaves 1.5-6 cm long, segments lobed, not auricled, pubescent. Flowers 0.2-0.3 cm across yellow, in terminal racemes; pedicels 0.1-0.2 cm long, slender. Sepals 0.1-0.2 cm long, equal at base. Petals...
0.2-0.3 cm long, shortly clawed. Stamens 6, free; anthers oblong, obtuse. Ovary 0.15-0.25 cm long, many ovuled; style short; stigma capitate. Pods 1.5-3.5 x 0.1 cm, linear, slender, erect, glabrous, subtorulose; valves 3-nerved; pedicels 0.3-0.6 cm long, slender. Seeds 2-seriate, ellipsoid, many, 0.1-0.15 cm long, reddish-brown. Fl. & Fr.: July to September.

ENG. name: London-rocket.

Local names: HIND. - Khubkalan; PUNJ. - Maktrusa, Janglisarson; RAJ. - Parjau; MAR. - Ram-tikhi.


Chromosome no. 2n=42 (Ball in Fl., Burp. 1:264, 1964). Besides diploids, triploid, tetraploid and hexaploid forms also exist (See Wealth of India).

Leaves are eaten either raw or cooked. They are rich in proteins, vitamins and minerals. Seeds are given in asthma. Externally they are employed in the preparation of a stimulating poultice (See Wealth of India).


Erect, annual, tall glabrous, hispid, much branched herbs. Leaves radical and cauline; radical ones, 4.5-8.5 cm long, sublyrately pinnatipartite to pinnatisect, long petiolate, the terminal lobe triangular-ovate to triangular oblong, hairy; petioles 0.5-1.5 cm, hairy; cauline leaves 2.5-4 cm long, shortly petiolate, more or less strigose-pilose and densely ciliate, lobed, terminal lobe narrow, lanceolate, lateral lobes linear. Flowers 0.5-0.6 cm across, pale-yellow in racemes; pedicels 0.2-0.5 cm long, slender. Sepals 0.4-0.5 cm long, equal at base, not saccate. Petals 0.5-0.6 cm long, slightly clawed. Filaments simple; anthers blunt, obtuse. Ovary cylindric, 0.5-0.6 cm long, many ovulate; style short; stigma capitate. Pods 1.5-7.5 x 0.1-0.15 cm, slender, terete, slightly curved, glabrous; septum hyaline; pedicels 0.4-0.6 cm long, ascending. Seeds 2-seriate, many, reddish-brown, ellipsoid, 0.1-0.5 cm long; testa reticulately pitted.

forma loeselii.

J. & K., ascending to an elevation of 2600 m.
The seeds and flowers are reported to be employed in the treatment of scurvy and scrofula (See Wealth of India).


Of the several forms of this species, recognised by O.R. Schulz (1923), *Forma glabrescens* occurs in Western Himalayas. This form differs from the typical form i.e. *Forma loeselii* in having the stem sparsely pilose, upper leaves glabrous or subglabrous and style 1–2 mm long.


Leaves variable, lower mostly subrosulate, petiolate, 2.5-4.8 cm long, oblong, elliptic, slightly lobed at base, pinnatisect; terminal lobe triangular, ovate, gradually upper ones becoming simple; 2.5-4.8 x 0.4-1.2 cm, oblong-ovate, pubescent, amplexicaul, shortly petiolate or almost sessile. Flowers yellow, 0.8-1 cm across, pedicellate in 6-10 cm long racemes; pedicels 0.4-0.6 cm long; slender. Sepals 0.6-0.8 cm long, equal at base. Petals 0.8-1 cm long, clawed. Anthers blunt and obtuse. Ovary 0.7-0.9 cm long, many ovulate; style short; stigma 2-lobed. Pods 3-6.5 x 0.1-0.15 cm, spreading, slender, curved, glabrous; valves striated, indistinctly costate, style thick; pedicels 0.8-1.5 cm long. Seeds 2-seriate, many, reddish-brown, ellipsoid, 0.1-0.2 cm long, glabrous. Fl. & Fr.: July to September.

ENG. name: Easternrocket. Western Himalaya from Kumaon to Kashmir, extending to West Tibet.

Chromosome no. 2n=14 (Ball in fl. Europ. 1:265. 1964).

The specimens examined by me are with flowers and fruits and a few cauline leaves but Schulz has described the basal leaves. That information is incorporated here.
TAUSCHERIA Fischer.

Erect, glabrous, branching, annual herbs, covered with unbranched hairs. Leaves simple, entire; cauline amplexicaul. Flowers small, yellow, in corymbose pedicles. Sepals erect; not saccate. Petals not clawed. Pods indehiscent, boat-shaped or hemispherical, concave above, convex below, centre crustaceous, with a broad wing; style short, triangular. Seeds solitary, pendulous, 2-seeds in each pod.

India, Northern & Central Asia, U.S.S.R. and Europe.


Erect, herbs, branching from below. Leaves 5-11 x 0.5-1.4 cm, amplexicaul, auricled at base. Oblong-ovate, entire, pubescent. Panicles corymbose, lax. Sepals erect, glabrous, not saccate, 0.2-0.3 cm long. Petals 0.3-0.4 cm long, glabrous, yellow, not clawed. Ovary cylindrical, hairy, many-ovulate. Pods 0.6-0.9 x 0.3-0.4 cm, indehiscent, hairy, ovoid-globose, terminated into a short conical beak; fruiting pedicel slender 0.3-0.6 cm long. Seeds two in each fruit, pendulous, reddish-brown.

Western Himalaya and Western Tibet up to an altitude of 3100-4000 m.

**THLASPI (Tourn.) Linn.**

Annual or perennial, sometimes biennial herbs, usually glabrous, very rarely hairy. Radical leaves rosulate, entire, lobed or pinnatifid; cauline leaves sessile, amplexicaul, entire or toothed. Flowers small, white or rarely pink, in ebracteate racemes. Sepals erect, not saccate at base. Petals small, shortly clawed. Stamens free; filaments without appendages, not toothed. Ovary ellipsoid or obovate, 2-many ovuled; stigma capitate. Pods narrowly septate with or without apical notch, obcordate, obovate or globose, much compressed laterally; valves boat-shaped, keeled or winged; replum narrow, membranous. Seeds usually two rarely more in each cell, not winged; funicles broader at base.


1. Flowers 0.2-0.3 cm across, white;
   pods not triangular-shaped,
   prominently winged:

2. Pod heart-shaped ...................... T. cardiocarpum

2. Pod not heart-shaped:
3. Pods oblong, emarginate, narrowly winged ........................................... T. cochlearioides

1. Flowers 0.4-0.5 cm across, pinkish; pod triangular-obcordate, narrowed at the base, wing very narrow below and broader above ...................... T. alpestre


Thlaspi griffithia Boiss. Fl. Or. 1:329. 1867.

Small, erect, biennial or perennial, glabrous herbs; stem bulbous at base, stiff, glabrous, glaucous, branched.

Leaves radical and cauline; radical ones 3-4.5 x 0.5-1.5 cm, oblong, orbicular, narrowed to the base; cauline ones 0.8-1.8 x 0.2-1 cm, ovate-cordate, sessile, amplexicaul, auricled at base; margins wavy, glabrous, slightly acute at apex. Flowers 0.4-0.5 cm across, pinkish, pedicellate, in 2-6 cm long racemes; pedicels 0.15-0.3 cm long, green, erect, glabrous, oblong. Petals 0.4-0.5 cm long, slightly clawed. Ovary 0.2-0.3 cm long, elliptic-oblong; style
short; stigma subcapitate. Pods 0.4-0.7 cm long, triangular-obcordate, broadly shallowly notched; valves compressed; wing very narrow below and broader above; style projecting beyond the notch. Seeds 0.15-0.2 cm long, elliptic, reddish, 5-6 seeds in each loculus; testa reticulately ridged. Fl. & Fr.: June to August.

In temperate and subalpine Himalayas and Western Tibet to J. & K., at an elevation of 2300-4000 m; also in SIK, only in the dry inner ranges; found as a weed in cultivated lands.

ENG. Name: Alpine Penny-Cress.


Erect, annual, glabrous, stout, branched herbs. Leaves radical and cauline; radical ones petiolate, soon
withering; cauline ones 1-3.5 x 0.4-0.7 cm, simple, oblong-ovate, with sagittate, amplexicaul base, margin wavy, acute at apex. Flowers white, 0.2-0.3 cm across, white, pedicellate, in 6-32 cm long racemes; pedicels slender, 0.2-0.3 cm long. Sepals 0.1-0.2 cm long, erect, narrowly oblong, glabrous. Petals 0.2-0.3 cm long, slightly clawed, glabrous. Ovary 0.2-0.3 cm long, elliptic, glabrous; style very short; stigma capitate. Pods 0.8-1.6 x 0.3-1.5 cm ovoid, globose, flattened, broadly winged, deeply notched, pedicels longer than pods. Seeds 0.15-0.2 cm long, dark, broadly elliptic, 4-5-seeded in each loculus; testa reticulately pitted. Fl. & Fr.: May to September.

ENG. name: Field Penny-cress.

J. & K. to Alpine SIK, Himalayas upto an altitude of 2000-3500 m, also in PUNJAB, B'Har, W.B., a weed of cultivation in the cold season.


Erect, annual, glaucous herbs; stem slender, glabrous, usually unbranched, rarely branched at base. Leaves radical and cauline; radical ones 2-3.5 cm long, oblong spathulate shortly petiolate; cauline ones 0.6-2 x 0.2-0.8
cm, glabrous, sessile, oblong, amplexicaul and sagittate, auricled at base, margins wavy. Flowers 0.2-0.25 cm across, white, pedicellate, in 1-2.5 cm long racemes. Pods 0.3-0.8 cm long, heart-shaped, broadly notched at apex; velvets reticulate, winged; wings membranous, narrow at base, broader and rounded at apex. Seeds 0.1-0.15 cm long, elliptic, 4-5 in each cell, reddish, rugose; tests reticulately pitted. Fl. & Fr.: April to June.

ENG. name: Perfoliate penny-cress.

Kashmir and Punjab, altitude 1600-2900.

J. & K. and PUNJAB, altitude 1600-2900 m; very rare.


Small, decumbent, glabrous, slender, perennial herbs. Leaves radical and cauline; radical ones 0.7-1.5 cm long, loosely tufted, or bicurc-ovate, toothed, glabrous; cauline ones 0.4-1 x 0.2-0.5 cm, amplexicaul, obovate-oblong, glabrous, entire, auricled at base. Flowers 0.3-0.4 cm across, white, pedicellate, in 1-1.2 cm long corymbs. Sepals short, 0.15-0.2 cm long, erect, equal at base, glabrous. Petals 0.3-0.4 cm long, equal, glabrous.
mary-ovulate; style short; stigma capitate. Pods 0.4-0.9 cm long, oblong, racemose, emarginate; valves much compressed, narrowly bordered, notch not distinct, fruiting pedicel 0.3-0.6 cm long. Seeds 0.1-0.15 cm long, elliptic, reddish, 4-6 in each compartment; testa reticulately pitted. Fl. & Fr.: June to August.

In moist grassy slopes, in interior of Sikkim Himalaya at an altitude of 4600-5000 m, extending to North east frontiers; rare.

**TORULARIA** O.E. Schulz


Annual or biennial, rarely perennial herbs with generally branched, rarely unbranched or forked hairs. Leaves oblong, runcinate-pinnatifid, dentate, entire. Flowers large, white, rose-coloured or violet in racemes. Sepals suberect or erecto-patent, caducous, exterior oblong, laterals not saccate at base. Petals spathulate or
or obovate, not clawed, truncate or rarely absent. Stamens 6; filaments slender, oblong or ovoid, obtuse. Lateral nectriferous glands near filaments of exterior stamens semiglobose or semi-ovoid, free, rarely confluent at base, median ones absent. Pistil cylindric, sessile; ovary 5-34-ovuled; style very short or nearly absent; stigma depressed, sub bilobed. Pod linear, terete, straight rarely compressed, curved or contorted, two-celled, 2-valved; valves rigid with prominent mid-vein and lateral nerves faintly reticulate. Seeds 1-seriate, small, many, ellipsoid, glabrous.

India, China, North Africa and Syria.

1. Erect, annual or biennial herbs
(20-30 cm tall); racemes ebracteate; fruiting pedicel thick; style unequally thickened .................... T. torulosa

1. Perennial, dwarf, hoary, diffuse herbs
(10-15 cm tall); racemes bracteate; fruiting pedicel not thick; style thickened at apex ................ T. humilis var. piasezkii

Torularia humilis (C.A. Mey.) O.E. Schulz apud Limpricht, var. piasezkii (Maxim.) O.E. Schulz in Pfreich. 86:226. 1924.
Perennial, dwarf, diffuse, glabrous herbs; root stock woody. Leaves radical and cauline; radical ones 0.6-2.6 cm long, many, crowded, oblong, sinuate-toothed, rarely entire; cauline leaves 0.5-1.5 x 0.3-0.6 cm, shortly petioled, linear, obtuse, glabrous. Flowers 0.3-0.4 cm across, 10-12, white or violet, on 0.1-0.2 cm long pedicels, in 6-12 cm long racemes. Sepals 0.2-0.25 cm long, oblong, obtuse, erect, glabrous. Petals 0.3-0.4 cm long, limb oblong-elliptic, sub-truncate at apex. Anthers ovoid; filaments linear, violet. Ovary 20-33-ovuled, densely hairy; stigma bilobed. Pods 1.2-2.4 x 0.05-0.1 cm, linear, straight, rarely curved or coiled; valves 1-nerved. Seeds 1-seriate, ovoid or oblong-ellipsoid, brown. Fl. & Fr.: June.

Found in Western Tibet in subalpine region, altitude 3900-4900 m.

Erect, annual, hairy, branched, rarely simple herbs; stem upto 30 cm tall, hispid with unbranched, and forked hairs mixed. Leaves radical and cauline; radical ones densely rosulate, oblong, obtuse, margin dentate or lobed, 4-6-lobed; lobes sinuate-dentate or subpinnatifid, cuneate at base, tapering in a narrow petiole; cauline leaves small, sublinear, distinctly dentate or subentire, rarely pinnatifid-pectinate, sessile. Flowers minute, 0.25-0.3 cm across, white, very shortly pedicellate, 8-50 in racemes. Sepals 0.15-0.2 cm long, oblong, obtuse, persistently hispid. Petals 0.25-0.3 cm long, white, spatulate, truncate at apex. Stamens 0.2-0.25 cm long; anthers ovoid-oblong. Ovary 14-34 ovuled, hispid; style short; stigma sub-bilobed. Pods 1-2.5 x ± 0.1 cm, erect, suberect, straight, curved or torulose; valves rigid, obscure, longitudinally 3-nerved, truncate at base, acute at apex, covered with simple or forked hairs. Seeds oblong-ovoid, compressed, pale-brown.

Fl. : February to April.

Found in PUNJAB.

TURRITIS Linn. [Sp. Fl. (ed. 1)]


Perennial, tall, herbs, hairs simple and branched, hairy near base. Radical leaves rosulate, lyrate-pinnate, cauline ones sagittate or cordate at base. Flowers numerous, in ebracteate racemes. Inner sepals saccate. Petals white or yellowish. Stamens free, without appendages. Ovary cylindric, glabrous; style short; stigma capitate or slightly 2-lobed. Fruit dehiscent siliqua, terete or tetragonous; valves convex, with distinct mid-rib; septum thick. Seeds ovoid, in 1-2-rows in each cell.

India, Australia, Western Asia, Europe and North America.


Erect, annual, glabrous herbs; stem slightly hard, hairy at base and glabrous above, branched. Leaves radical and cauline, radical ones 3.5-9.3 x 0.8-1.8 cm, spathulate,
obovate-oblong, shortly petioled, hispid with stellate hairs, obtuse, margin wavy; cauline leaves 1.5-5 x 0.2-1.2 cm, amplexicaul, auricled at base, oblong-obovate, scarcely hairy, more or less entire, acute. Flowers few, whitish-yellow, in 3-10 cm long racemes; Pedicels 0.2-0.25 cm long, thick, slender. Sepals 0.4-0.5 cm long, erect, narrow, lateral saccate at base. Petals 0.5-0.8 cm long, whitish-yellow, slightly clawed, veined. Ovary 0.4-0.5 cm long, linear, many ovulate; style short; stigma flat, more or less bilobed. Pods 1.5-9 x 0.2-0.4 cm, slender, narrowly linear, tapering at both ends, crowded, glabrous. Seeds + 0.15 cm across, 2-seriate, rugose; testa reticulately pitted. Fl. & Fr.: May to July.

In Western Himalayas, PUNJAB, Kumaon to J. & K., elevation 1900-3000 m; very rare.

Chromosome no. 2n=12, 16, 32 (Jones in Fl. Europ. 1:291. 1964.).
INVENTORY OF THE HERBARIUM SPECIMENS ON WHICH THE THESIS IS BASED

Alliaria officinale (L.) R. Br.
W.C. Poona: Futwagadh - Janurar, Gamble: 25410

Alyssum minimum Wild.

Arabidopsis himalica (Bigew.) O.E. Schulz

Arabidopsis lasiocarpa (Hook. f. & Thoms.) O.E. Schulz
CNH: Bhutan, Griffithii: 1384; Tassichodong, Bhutan, White: 213.

Arabidopsis mollissima (C.A. Mey.) O.E. Schulz
CNH: Sikkim, R.S. Rao: 886; Selazang, R.S. Rao: 7793; Masjud valley above Aro, Duthie: 13205; Lower lashkot, Koebel: 9; Satrundi, Harsukh: 23761; Jansho, Bsr: 15137

Arabidopsis pumila (Steph.) Busch.

Arabidopsis stricta (Cambess.) Busch.
Arabidopsis thaliana (L.) Heynh.

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Arabidopsis wallichii (Hook. f. & Thoms.) Busch.

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Arabis alpina Linn.

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Arabis amplexicaulis Edgew.

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Arabis auricula Lam.
N.C., Dehra Dun: Govindghat, Sharma: 2137

Arabis glabra Bernh.
CNH: Between Theog & Muthains, Johnson Acc. No. 23107.
N.C., Dehra Dun: Bhuyundar valley, Bhattacharyya: 39131;
Ferozepurnatha, T.A. Rao: 371 (2 sheets); Sissu, M.A. Rao:
9743; Hamumanulchi, T.A. Rao: 2852; Martoli/Milam, T.A.
Rao: 6930 (2 sheets); Pedukeshwar, T.A. Rao: 2798;
Pahalgam valley, T.A. Rao: 540.

Arabis glandulosa Kar & Kir
CNH: Sikkim, Smith & Cave: 1902; Above Gigong, Smith & Cave
2397.
N.C., Dehra Dun: Sera Indus Valley, Bhattacharyya: 41123;
Maran pass, N.C. Nair: 16750a.

Arabis nudica Belan.

Arabis taraxacifolia T. Anders.
N.C. Dehra Dun: Maran pass, N.C. Nair: 16746;

Arabis tibetica Hook. f. & Thoms.
CNH: Choto-Deosan - Kashmir, Stewart: 9953; Thaffeela -
Baltistan, Stewart: 20678.
N.C. Dehra Dun: On way to Amarnath, N.C. Nair: 37027;
Seshang, N.C. Nair: 36937; Keshun, Bhattacharyya: 40862
(2 sheets); Khoksr, M.A. Rao: 5853; Rabla forest, Singh:
22982; Tandi-Kydang, Bhattacharyya: 40895; Kunjan pass,
Arcyosperma primulifolium (Thomson apud Hook.) O.E. Schulz

C/NH : Cansil range, Duthie : 14545; Bhatyar-saram valley,

Inayet : Acc. No. 24314; Lachung valley, Smith : 3331;

Thankala, Ribu & Rhomoo : 4716.

W.C., Poona : Chandharthach - Bashhr, Gamble : 24917

Atelanthera perpusilla Hook, f. & Thoms.

C/NH : Shelabagh-khojak pass, Duthie : 8571

Barbarea elata Hook, f. & Thoms.

C/NH : Above Tangu, Smith & Cave : 2472 (3 sheets), 21247.

Barbarea vulgaris R. Br.


W.C. Poona : Palgam, 4233.

Brassica campestris L. var. sarson Prain

C/NH : Shibpur expt. farm, 25075.

B.C., Shillong : Garovvillage, Panigrah : 4508; Phoobari, Verma : 46414.


Blatter herbarium : Matheran nerel road, G.S.P: : 14111:

Bombay presidency, 18111.
Brassica integrifolia O.E. Schulz


Brassica juncea (L.) Czern. & Coss.

CNH: Shibpur, 25171; Between Kurseong and Sureil in fields, King: 25143.

B.C., Shillong: Demali-parbat, G.V.S. Rao: 29941;
Jaori Bashahr, N.C. Nair: 30021.


C.C., Allahabad: Near Allahabad, 14827; Shivkote, Rajagopal: 4679; Chathan lines, Prasad: 3230, 3231, 3232; Genda, Panigrahi: 2710, 13912, 9029, 2264.

V.V. Nagar, herbarium: V.V. Nagar, Danaiah: 10, 17;
Khedbrahma, Yogi: 2550, 2527; Kadi, Yogi: 2710, 2550, 2579, 1747; Tuwa, Deshpande: 1808, 3514, 1814, 3516A; Dangs, Suryanarayana: 2066 BS.

W.C., Poona: Best colony parcel, Almadi: 304; Bomiali, Herbert: SH 1429; Churchgate - Bombay, Santepau: 11292, 426, 7346, 14111, 6921; Shenagiri estate, Subramaniam: 71029;
Pokhari-ghat, Puri: 7346.

S.C., Coimbatore: Lammasinghaghat (Vizag), Wagh: SKW 2798;
Pudamund, Swami: 4238, 19552A, 1266; Agri. College - Coimbatore, Bose: 28831; Panthanthode, Vajravelu: 32144.
Santapau : 15087, 14391, 14402.
W.C., Poona : Marve road - Malad, Shah : 7713, 9157, 7714;
Khandala, Santapau : 27972; Vicinity of Cenmry dairy,
Tavakari : T 2075, T 2076; Sion hall - Bombay, Almida : 42.1H;
Poona, Subramanian : 64515; Poona, Kulkarni : 176, 177, 178.
S.C., Coimbatore : Shober, Sharma : 35783; Coonoor, Sebastian : 978.
Brassica oleracea Linn. var. botrytis Linn.
CNH : Agartala, Debbarman : 1039
N.C., Dehra Dun : Ferogpore, N.C. Nair : 36380; Risappana, 
Babu : 34974.
V.V. Nagar herbarium : Kadi, Yoggi : 2632; V.V. Nagar, Danaiah : 6, 7, 9; Dangs, Santapau : 18415, 18414.
W.C., Poona : College farm - Poona, Jameoker : 1.
Brassica oleracea Linn. var. capitata Linn.
W.C., Poona : Nr. Coonoor along road, Mo. Cann : without no.
V.V. Nagar herbarium : V.V. Nagar, Danaiah : 28.
S.C., Coimbatore : Bose : 31158.
Brassica oleracea Linn. var. gongylodes Linn.
CNH : Shillong, R.S. Rao : 51260.
Brassica tournefortii Gouan
CNH : Punjab, Hooker : 25107
Braya oxyarpa Hook, f. & Thoms.
CNH : Rupchu, Stolizka : Acc. No. 24823; Damdar valley,
Duthie : 923.
Brava rosea (Turcz.) Bunge
CNH: Zemu valley, Smith & Cave: 1512 (2 sheets); Nachegoh, Smith & Cave: 1719.

Braya tibetica Steb. & Hopp.
CNH: Ladak, Stewart: Acc. No. 24832; Chhotinemala-Sikkim, Smith & Cave: 16500.

Capsella bursa-pastoris (L.) Medik.
CNH: Darjeeling, Gamble: 7534.

B.C., Shillong: Rupa surrounding on way to Jigan, Joseph: 4045; Kataktang, Panigrahi: 15578.

W.C., Poona: Darjeeling, Talbot: 3301; Dilwara roadside, Jain: 62175; Mt. Abu -nursery, Puri: 56748; Wular lake, Talbot: 5293.


Cardamine africana Linn.
CNH: Periakanal, Meabold: 542.

Blatter herbarium: Kodaikanal, Fyson: 32862.

Cardamine circaeoides Hook. f. & Thoms.
CNH: Toong, Smith & Cave: 869.

Cardamine griffithii Hook. f. & Thoms.
CNH: Melathang, King: 21800; Changu, Smith: 3515 (2 sheets), 4234.

Cardamine hirsuta Linn.
Blatter herbarium: Kodaikanal-palni hills, Saldhana: 5151 (2 sheets), 5152.
S.C., Coimbatore: Herb. R. Wight, Prop. 1248; Nilgiris, Sebastian: 2145.

Cardamine impatiens Linn.
CNH: Mussorie, MacKinnon: 21773; Ganja, Gill: 542 (2 sheets); Meeru hill, Rawal thand: 21772.
Cardamine macropfaylla Willd.

CNH : Chokrau-Kagan valley, Inayet : 21135; Chachpur valley, Duthie : 21080; Phari, Gonve : 5; Lachung valley, Gammie : 768.

W.C. Dehra Dun : Gulmarg forest, T.A. Rao : 261

Blatter herbarium : Ternet east of Bangdwari Thach Kalu valley, Haekney : 50.

Cardamine trichocarpa Hochst. ex Rich.

CNH : Mahableshwar, Cooke : 41; Tiger shola, Mumbai : 42.

V.V. Nagar herbarium : Dangs-Malegaon, Suryanarayana : 1217, 1193 (2 sheets), 1356.

Blatter herbarium : Khandala, Santapau : 6796, 9797; West of Poona - Wilson point, Balannari : 311; Khandala, Santapau : 4609, 4688, 4818, 4667, 27971, 2230, 642; Guest house compound M'War, Bote : 1747, 2010, 2267.

W.C., Poona : Mahableshwar, Talbot : 5; Matheran to water point station, Yadhwa : 109812, 109445, 109708; Phugali forest, Rillore : 110566, 111603, 116245; Hill slopes near Bushi village, Reddy : 98658, 99237, 99269; Donaje, Ansari : 97561; Purandhar, R.S. Rao : 98611 (2 sheets); Ahwa, Jain : 43053; Ratangarh, Wadhwa : 128009.


Cheiranthus cheiri Linn.


Cheiranthus himalayensis Camb.

C.C. Allahabad : Ralam glacier, Pant & Naithani : 39684.
Cheiranthus stewartii T. Anders.

C.C. Allahabad : La Darcha, Bhattacharyya : 49128.

Chorispora tenella DC.

CNH : Chamba - N.W. Himalaya, Robert Ellis : 131; Punjab,
Aitchison : 55.
W.C., Poona : Wular lake, Talbot : 4213.

Christolea crassifolia Cambess.

CNH : Nulera - Kashmir, Abro : 4526; Thumala - Himachal Pradesh,
Bhattacharyya : 49212.

Cochlearia cochlearioides (Roth) Santapau & Mahesh.

C.C. Allahabad : Kuraoni, Panigrahi : 11224; Near Bina river,
Subramanyam : 10143; Majhauli, Panigrahi : 2133; Chambal
river bed, Majumdar : 10133; Mandla, Joseph : 13529; Near
Roopsagar lake, Mukerjee : 693; Sebastine : 7657; Chitrangi,
Gupta : 14498; River Kutloil, Sebastine : 7710; Ludhiana,
Panigrahi : 6284; Khari, Joseph : 13967; Hamirpur, Bhattacharyya:
20932.

V.V. Nagar herbarium : Kevadia, Patel : 2610; Broach, Vyas : 5000, 6078; Kabirdad, Vyas : 1695; Hampeshwar, Karatela :
820; Nareswar, Vyas : 4674.
W.C., Poona : N.W.P., Bell : 98.

Conringia planisiliqua Fisch. & Mey.

CNH : Gustoi, Harndh : 20450; Lamayuru - Ladakh, Fisch, A
Mey. : 3740.

Coronopus didymus (L.) Sm.
CNH s Horto Botanico, Calcuttensis, 26162; Sabour, Sinha : 356457; Lahore Wheat fields, Prain : 26158; Coimbatore, Fischer : 1068; Saharanpur, 26155
N.C., Dehra Dun : On the bed of the ditch, Bhattacharyya : 12591; Gulaeti, Singh : 27407; Bahraich, Malhotra : 2660; Lambi-Perozpur Dt., N.C. Nair : 26239; Tirsa, N.C. Nair : 32981; Bhatinda, N.C. Nair : 27762; Nijibabad, Sarin : 5114; Niranjanaipur, Singh : 31675; Hisar, V.J. Nair : 36606; Amhera, V.J. Nair : 14740
Blatter herbarium : Mahabaleshwar, Santapau : 22285, 22284, 23586; way to Loowica, Bole : 1902; Mahabaleshwar - Bus stand, Bole : 1611.
W.C., Poona : Belgaum-Dharwar road, Kisti : 29669; Mt. Abu, Puri : 56741; Jain : 62091 (2 sheets); Mercara, Arora : 47595; Dharwar, Talbot : 2905; Berghibetta - Devaraya, R.S. Rao : 73385.
Descurainia sophia (Linn.) Webb.

CNH: Killa-Abdulla, Duthie: 8582; Tibet, Griffithii:

Acc. No. 23897; Kashmir valley, Hunter & Weston: 10168;

Farbugarivalley - Kashmir, Inayet: 24236.

W.C., Poona: Valley of Kashmir, Talbot: 4215.

Diaphia salsa T. Anders.

CNH: Slonakh, Smith & Cave: 1839 (2 sheets); Chhortenma La valley, Smith & Cave: 2348; Slonokh, Ribu: 1922; Barbung Khola, Sykes & Williams: 1129.

Diplotaxis griffithii (Hook. f. & Thoms.) Boiss.

CNH: Jhelum - Punjab, Hitchinson: 110.

Dipterygium glaucum Decne.

CNH: Mohangarh, Wadhwa: 5055.


Douepia tortuosa Cambess.

CNH: Punjab - salt range, Hooker & Thomson: without No.

Draba alpina Linn.

CNH: Jongrâ to Ailektong, Anders: 373; Nosay-sandong,

Gammie: 856; Zeuna valley, Smith & Cave: 1648; Thangu,

Prain: Acc. No. 22751.

Draba alata (C.A. Mey.) Bunge
var. leiocarpa O.B. Schulz

CNH: Kumaon-Jolinkakutti valley, Duthie: 5336.

Draba cariocarpa O.B. Schulz

CNH: Lhonak-Sikkim, Smith & Cave: 4042.

Draba creads Schrenk.


Draba setosa Royle


Draba sikkimensis (Hook. f. & Thoms.) Pohle


Draba stenobotrytis Gilg & Schulz


Draba stenocarpa Hook. f. & Thoms.

CNH: Dr'a's valley-Kashmir, Duthie: 11638; Lahul-upper Bhage valley on mesomorphic, Slotizke: Acc. No. 22935; Serchu, Boro: 15111.

Draba tibetica Hook. f. & Thoms.
Draba winterbotWttii (Hook. f, & Thoms.) Pohle
CNH : Burjila-Kashmir, Clarke : 29847.

Erophila verna (Linn.) Chevall.
W.C., Poona : Kashmir, Talbot : 4236.

Eruca sativa Mill.
CNH : Srinagar, Kaul : 6462; Nubra, Abrol : 4542; Basala -
Amristar, Walt : 14451; Ferozpur-Punjab, Walt : 17475; Assam,
Chatterjee : Acc. No. 25792.

Erysimum altaicum C.A. Mey.
CNH : Above Singma Khangchung, Chapman : 978; Kashmir, T.A.
Rao : 619 (3 sheets), 540 (3 sheets).

Erysimum deflexum Hook. f, & Thoms.
CNH : Giagong, Smith & Cave : 2439; Sagirmalak, Inayat :
Acc. No. 24374

Erysimum funiculosum Hook, f. & Thoms.
CNH : Suhlay valley, Brandis : 1291; Nakucha, Smith & Cave :
1937.

Erysimum hieracifolium Linn.
CNH : N.W. Himalaya, Lace : 1600; Barungalli-Kashmir,
Clarke : 28509; Sonamans, M.A. Rau : 50236; Ledger valley,
Duthie : 13447; Jankichatti, M.A. Rau : 15694, 15683.

Erysimum longisiliquum Hook. f, & Thoms.
Erysimum odoratum Bhrh.

CNH : Sangh, Brandis : 3285; Urni-Saran-range, Inayat : Acc. No. 24427; Chathaninala West of Dejas, Duthie : 11383; South of Bhabesh, Slolivska : 24426; Below Sunbliali, Duthie : 11500; N.W. Himalaya, St. Bris. & Vermoton : 4144.

Erysimum pachycarpum Hook. f. & Thoms.

CNH : Sikkim Himalaya, King : Acc. No. 24419, 24417; Byajha, White : 117

Erysimum repandum Linn.

CNH : Towards the Nuer, near Choky in sandy places, 1432; Harbui hills, Hughes-suller, 19528.

Erysimum thomsonii Hook. f.

CNH : Zoejila from Kashmir to Tibet, Slolivska : Acc. No. 24431.

Buclidium syriacum H. Br.

W.C., Poona : Kashmir valley, Talbot : 4291.

Butrema deltoideum (Hook. f. & Thoms.) O.S. Schulz


Butrema himalaicam Hook. f. & Thoms.

*Farsetia aegyptiaca* Desv.


*Farsetia hamiltonii* Royle


Jodhpur university herbarium : Phalodi in a field on sand, 925.

W.C., Poona : Ajmer-pachleund, Jain : 49681; Sambhar lake, Jain : 47889; 2 miles away of east of Molisar, Stower : A73; Sikar, Stower : A21; Barmer, Jain : 40266.

*Farsetia jacquemontii* Hook, f. & Thoms.


V.V. Nagar herbarium : Padhardam, Shah : 214; Anjar, Kothari : 283.


*Farsetia macroantha* Blatt. & Hallb.

CNH : Barmer-Rajasthan, Shandari : 507.

Jodhpur University herbarium : Barmer, Blatt. & Hallb. : 1866 (2 sheets).

W.C., Poona : Barmer-back hills of Maleji temple, R.S. Rao : 66981; 66864.
Goldbachia laevigata DC.
CNH: Srinagar, Javeid & Biswas: 522; Rajasthan, 3468.
W.C., Poona: Kashmir, Talbot: 4214.

Iberidella andersonii Hook. f. & Thoms.
W.C., Poona: Potang Saidh, Duthie: 5336.

Iberis amara Linn.
W.C., Poona: BSI Garden-Poona, Deshpande: 49715.

Iberis umbellata Linn.
V.V. Nagar herbarium, Danahiah: 13, 14, 15.

Isatis tinctoria Linn.

Lepidium capitatum Hook. f. & Thoms.
Lepcha: 2738; Gyantse, Walton: 64.
W.C., Poona: Sikkim Himalaya, Prain: Acc. No. 43.

Lepidium latifolium Linn.
CNH: Royal garden - Kew., Robert Ellis: R119; Rangrik, Bhattacharyya: 49351; Dras valley, Duthie: 13688.

Lepidium sativum Linn.
C.C., Allahabad: Parlaba, Majumdar: 10328; Kabirchabutra, Panigrahi: 15256; Maslana, Majumdar & Misra: 10154;
Amerlake, Wadhwa: 8418A; Barkadol village, Gupta: 14152;
Sariha village, Gupta: 14191; Chandrapura, Verma: 1801.
V.V. Nagar herbarium: Shuklatirth, Vyas: 1821; Chottadayapur,
Karatla: 2205; Kabirvad, Vyas: 5231; Khedbrahma, Yogi: 2528;
Kadi, Yogi: 2587; Tuwa: Dashpande: 1782, 718, 3472, 1997, 691;
Brench, Vyas: 2127, 2114, 4370; Suklatirth, Vyas: 2441.
W.C., Poona: Nakhatrana village, Jain: 11501; Tirupati,
V.S. Rao: 49200; Nagar Dt, 45, 44; Poona along river Dhond,
Bhide: 1331; Sikkim, Prain: Acc. No. 43.

Lepidium ruderale Linn.
CNH: Kashmir, T.A. Rao: 198 (4 sheets); Company Bagh,
Santapau: 28557; Konwagar-Hooghly, Biswas: 12; West Tibet,
Smith & Cave: 24399.

Lepidostemon pedunculosus Hook. f. & Thoms.
CNH: Bhutan, Gould: 465

Lobularia maritima (L.) Desv.

Losostemon pulchellus Hook. f. & Thoms.
CNH: Chumbi, King: 314; Above Changu, Smith: 3173; W.
Jongni, King: Acc. No. 22242; Sikkim Himalaya, Gamme:
Acc. No. 22236; Zemu, Smith & Cave: 1577, 2756; Putang-bi,
King: 4192.

Lunaria annua Linn.

V.V. Nagar herbarium: Ooty, Danaiah: 19.
Malcolmia africana (L.) R. Br. Srinagar, Javeid & Biswas: 509; Srinagar, Gamraie: 23606; Punjab, Hooker: 23602.
W.C., Poona: Falgam, Talbot: 4292.

Malcolmia maritima (L.) R. Br.
W.C., Poona: Kotah gardens-Poona, without No.

Matthiola incana (L.) R. Br.
N.C., Dehra Dun: Kargu, Singh: 526.

Matthiola odoratissima (Bieb.) R. Br.
N.C., Dehra Dun: Between Kargu and Leh, Singh: without no.

Magacarpaea polyandra Benth.

Microsymbrium axillare (Hook. f. & Thoms.) O.E. Schulz
CNH: Bhitrikani, east Nepal, Mey: 688.

Microsymbrium minutiflorum (Hook. f. & Thoms.) O.E. Schulz

Moricandia arvensis (L.) DC.

Nasturtium officinale R. Br.
CNH: Inungpoo, Goussines: 110; Kothi-Punjab, Singh: 22953; Dolakko, Kass: 28582
Blatter herbarium: Igatpuri, Shah: 10211.

Neslia paniculata (L.) Desv.
CNH : Punjab, Clark : Acc. No. 27397; Salt-range fields -
Punjab, Aitchinson : 60.
W.C., Poona : Kashmir, 4274.

Notocereus bicorne (Ait.) Amo.

22252; Hert Balol : Acc. No. 22257; 22256; Sphenjulani,
Presi : 788, 732.

Parraya exscapa C.A. Mey.

CNH : Kunturuk jilga, KennethlMason : 39; Upper Chambi Valley,
Walshe Esque : 139.

Parraya lanuginosa Hook. f. & Thom.

CNH : Cahmabi valley on the way to Phari, Younghusband : 139.

Parraya nudicaulis (L.) Boiss.

CNH : N. West of Pensi la in Zanskar, Sleviska : Acc. No.
20784; Tibet; Hook, f. & Thomson : Acc. No. 20786.

Parraya platycarpa Hook. f. & Thom.

CNH : Lungma chu, Smith & Cave : 2233.

Raphanus caudatus Linn.

CNH : Ferozpur-Punjab, 17476; Kailuka village near Delhi.
Watt : 14971; Saharampur, Gollan : 27792.

Raphanus sativus Linn.

CNH : Jammu & Kashmir, Giles : 167; Kashmir-Kagan street
valley, Gammie : Acc. No. 27747; Shahpur near Kangra -
Himachal Pradesh, Brandis : 3271; Punjab, Clarke : 108;
Satala near Amristar, Watt : 14427; Saharampur, Gollan :
without No., Bhedia-Bengal, Dutt : 669; Bhola-Huogly, Malick
A Hazra : 269; Kononea, Prain : 27721; Agartala, Debbarman :
282.
V.V. Nagar herbarium : Narkot, Karatela : 2356A; Tuwa,
Deshpande : 1899 (3 sheets), 1878 (3 sheets), 1804, 1753,
3556, 3562, 1810; Dangs-Bhavandagad, Suryanarayana : 2613
(3 sheets), 237; Kadi, Yogi : 2676, 2677; Rajpipla -
Dedrappa. Singh : 1278, 621; Kevadia, Patel : 1080; V.V.
Nagar, Danaiah : 1, 2, 3.

Rorippa indica (L.) Hiern.

CNH : Dacca, 6741; Himalaya, King : 20953; N.W.P., Mrs.
Bell : 14; Brahmaputra Plains, 133; Pagu E. slopes, Kurz :
1791.
C.C., Allahabad : Near Bina river, Subramanya : 10126;
Ghantala-Banswara Dt., Majumdar : 10217; Road to Bagraji,
Sebastine : 13909; Ratanpur, Panigrahi : 16764; Mandla,
Joseph : 12281; Simrol village, South of Indore, R.S. Rao :
79087; Betanal, Bhattacharyya : 21046; Rampura, Verma : 1798;
Birichath-gaon, Panigrahi : 6268; Ghantala, Majumdar : 10217.
V.V. Nagar herbarium : Shuklaterth, Vyas : 5886; Narkot,
Karatela : 2531, 2558; Kabirvadi, Vyas : 1651.
Blatter herbarium : Waghai-Dangs, Asrani : RA 5232 (2 sheets).
W.C., Poona : Kalamuddi, Talbot : 953; Hahaetank, Talbot :
2075.

Rorippa islandica (Oedar) Barbas
Rorippa pusilla Danaiah & Shah

CNH : Darjeeling, Cave : 20952; Tsuru, 7280; Imphal, Nebold : 6377; Shillong, Clarke : 43312.

N.C., Dehra Dun : Rispana, Babu : 35281; Manali-Vashistha, Bhattacharyya : 40441; Niranjanpur, Singh : 33557; Kothi, Singh : 22968; Nissar, V, J. Nair : 19810; Rajpur-Bindal bank, Bhattacharyya : 13832; Pithoragarh, Bhattacharyya : 15165.

**Sisymbrium orientale** Torner ex Linn.


**Sisymbrium irie** Linn.


N.C., Poona : Mt. Abu, Jain : 62174

**Sisymbrium loeselli** Linn.

Schouwia purpurea (Forsk.) Schweinf.


Sinapis alba Linn.


Tauschiera lasiocarpa Fisch.


Thlaspi alpestre Linn.

CNH: Masjid valley - Kashmir, Duthie: 1320W, 13120; Kainpatrina-near Gopi La, Duthie: 13665; Huttanpur - Kashmir, Clarke: 28289; South slopes of Cheru, Burkill: 26980; Dhanolti, Mackinnon: Acc. No. 26852; Bora Lachala, Bor: 15065; Near the Lebung glacier, Duthie: 5345; Slouck, Smith & Cave: 2145.

W.C., Poona: Mundali, Gamble: 24093.

Thlaspi arvense Linn.

CNH: Nopolia-Sikkim, Wallich: 4786; Abrahal-Kashmir, 251; Jamunatri, Mitra: 9518; On way to Tunnachi, M.A. Rau: 15815; Sikkim, R.S. Rao: 227, 320 (3 sheets); Sikkim, Panigrahi: 15579.

W.C., Poona: Cornfield-Kashmir, Behara: 4212.
Thlaspi cardiocarpum Hook. f. & Thoms.

W.C., Poona: Valley of Kashmir, date 25-4-72

Thlaspi cochlearioides Hook. f. & Thoms.

CNH: Near TankaLa, Smith: 4220; Gaomia, Smith: 4004.
B.C., Shillong: Sela-zang, R.S. Rao: 7799.