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FASCICLE 12
VIOLACEAE
S. P. Banerjee and B. B. Pramanik

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CONTENTS

VIOLACEAE 1-87

(S. P. Banerjee and B. B. Pramanik)

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VIOLACEAE


S. P. Banerjee and B. B. Pramanik*

Annual or perennial herbs, shrubs or undershrubs or rarely trees. Leaves alternate, rarely opposite, simple, entire or lobed, stipulate. Flowers bisexual, hypogynous or slightly perigynous, medianly zygomorphic or actinomorphic, solitary or inflorescence various. Sepals 5, free or slightly connate, usually persistent, imbricate. Petals 5, free, imbricate, usually the lower most spurred and larger than others. Stamens 5, alternate with petals, closely connivent around the pistil, anthers 2-celled, introrse, one of them often spurred. Ovary superior, unilocular, carpels 3-5, placentas parietal with 1-2 or numerous ovules on each; style 1 with stigma of varying shapes. Fruit usually a loculicidal capsule. Seeds with copious fleshy endosperm, embryo straight.

16 genera and about 900 species. Cosmopolitan, tropical and temperate in distribution. Three genera and 40 species are reported from India.

1a. Herbs, sometimes suffruginose. Flowers irregular:

2a. Sepals produced at base; anthers connate ... 3. Viola

2b. Sepals not produced at base; anthers free ... 1. Hybanthus

1b. Shrubs or small trees. Flowers regular ... 2. Rinorea

1. HYBANTHUS


Herbs or undershrubs. Leaves alternate or rarely sub-opposite to opposite. Stipules persistent, rarely deciduous. Peduncles articulate.

† Editor for the family Violaceae: G. Panigrahi, Botanical Survey of India, Howrah-711 103.
* Botanical Survey of India. Howrah-711 103.
Flowers white to orange or purple, single or several in the leaf axil or racemose. Sepals sub-equal. Petals unequal, the anterior petal sometime small or much enlarged than the rest with prolongation beyond the base, umbonate or somewhat pouch-like, spurred. Stamens free or coherent, anthers free or more or less united, 2 (rarely 4) of them gibbous or spurred. Style clavate, incurved; stigma oblique, anteriorly directed. Capsules elastic, 3-valved.

**Distrib.** ca. 150 species, distributed chiefly in the tropical or subtropical areas of America, Africa, Asia and Australia, 2 species in India.

1a. Seeds conspicuously longitudinally ribbed. Capsules about 5 mm long. Sepals keeled
   ... 1. **H. enneaspermus**

1b. Seeds obscurely ribbed. Capsules about 10 mm long. Sepals not keeled
   ... 2. **H. travancoricus**


Figs. 1-6

**Ratnapuras** (Hind.); **Nunbora** (Beng.); **Tondi-sol, Bir-Surajmukhi** (Sant.).

Annual or perennial herbs, spreading or half erect, very variable in habits and in leaf form. Stems pubescent, branched near the base, branches nearly simple. Leaves 2.5-5 (-7) cm × 0.3-0.8 (-1.2) cm, variable, sub-sessile, oblong-lanceolate, mucronate, crenate or serrate, lower leaves broader than upper ones. Stipules 1-2 mm, subulate, peduncles 1-2.5 cm, shorter than the leaves, bi-bracteolate. Flowers red, axillary, solitary. Sepals 2-4 mm, sub-equal, triangular, acuminate. Petals variable, 4 oblong acute or mucronate 2-4 mm the lower petal nearly orbicular, obtuse, reticulate 6-18 mm.

**Type**: Sri Lanka, **Hermann** s. n. in Vol. 1 : 19 of Hb. Hermann (BM-holo, Photo !).
Hybanthus enneaspermus (L.) F. v. Muell.

Figs. 1-6: 1. Habit of the plant. 2. Flower. 3. Flower split open.
Fls. & Frts. : Throughout the year.

Distrib. : India : Andhra Pradesh, Assam, Bihar, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal ; Tropical Asia, Africa, Australia, America.


Notes : Tennant (l. c.) pointed out that Dalzell and Gibson (1861) were the first to unite V. enneasperma L. and V. suffruticosa L. and adopted the epithet enneasperma for the combined species. Grey-Wilson (1951) who recognises 6 varieties in East Africa, considers it as a polymorphic species.


Shrubs, up to 1.5 m high. Branches erect, woody, glabrous, terete below, angled towards the apex. Leaves 6-9 cm × 1.2-2.5 cm, linear lanceolate, sub-sessile, distantly serrated, acuminate, glabrous. Stipules subulate, glandular-puberulous. Peduncles 1-2 cm long, hi-bracteolate towards the apex. Sepals long subulate, recurved. Petals 5, variable, the lower petal with long claw, saeate and furnished with 2-spurs, the others falcate, the upper 2 only ciliate. Stamens 5, the 2 anthers nearest the large petal furnished with a round gibbous spur at the base.

Type : India : Hills of Tinnevelly, Travancore, Beddome s. n. (K-holo, MH-iso!).


Distrib. : India : Kerala (endemic).


2. RINOREA


Shrubs or small trees. Leaves alternate or rarely opposite, entire or serrate; stipules deciduous. Peduncles articulate. Flowers regular, solitary or usually racemose, cymose or paniculate, rarely arranged in axillary or terminal cymes. Sepals almost equal, rigid, ciliate. Petals, isomorphic or sub-equal, free, sessile. Stamens inserted on the margin of an annular disc; connective produced into a long or short, often broad membranous appendage. Ovary tricarpellary; ovules 1-2, rarely numerous; style straight; stigma terminal. Capsules 3-valved, few seeded. Seeds glabrous, rarely woolly with leather-like testa.

ca. 200 species, distributed in Sri Lanka, Bangladesh, Burma, Malaysia, Indonesia to N. Australia, Tropical America, Africa, Madagascar. 4 species in India.

1a. Leaves 2-5 cm long; sub-sessile. Stamens exerted, anthers cohering into a cone ... 2. R. hetrocelata

1b. Leaves 5-25 cm long; petiole. Stamens inserted, anthers free:

2a. Flowers fascicled:

3a. Stipules 4-16 mm, distinctly striate. Fruits glabrous ... 1. R. bengalensis

3b. Stipules 1.5-6 mm, scarcely striate. Fruits sparsely hairy ... 4. R. macrophylla

2b. Flowers racemose ... 3. R. longiracemosa


Figs. 7-13

Branchlets glabrous to puberulous. Leaves elliptic-lanceolate, serrate to somewhat crenate, glabrous except bearded nerve axils beneath, obtuse; petioles up to 1 cm long. Stipules lanceolate to subulate, 1 cm long. Peduncles up to 1 cm long, bracts basal, acute. Flowers 3 mm in

3
diam., white. Sepals 2 mm long, broadly ovate, sub-equal. Petals 5 mm long, oblong. Stamens on a thick 5-lobed disc; filaments short expanded at the base, cohering into a tube; anthers oblong, appendage sub-apical, broad hooded. Capsule up to 1 cm in diam., globose.

*Rhoreia bengalensis* (Wall.) O. Ktze.

Type: Bangladesh: Silhet, Wallich Num. List. no. 4896 (K-holo, Photo 1).

Fls. & Frts.: Apr.-Nov.

Distrib.: India: Andaman & Nicobar Islands, Assam, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh (Saharanpur, cult.), West Bengal (H. B. C. cult.); Sri Lanka, Bangladesh, Burma to Malaysia, Australia and Pacific Islands.

Notes: Abundant in the leaf-shedding forests of the Andamans. The leaves, which somewhat resemble those of the tea plant, are said to be used to adulterate tea.


Branchiers fulvous-puberulous. Leaves 2.5-6 x 1.5-2 cm, sub-sessile, elliptic lanceolate, cuneate at base, obtuse to apiculate, more or less crenate, glabrous, perforate at nerve axils beneath, tertiary nerves obsolete. Stipules 2-4 mm, subulate, keeled, acute. Flowers 2-3 mm, white, sub-sessile, axillary, fascicled. Sepals 2 mm, unequal, obtuse. Petals 4-5 mm, lanceolate, revolute above. Capsules 5 mm long, sub-globose, tapering towards apex.

Type: India: Lucknow, Martin s. n. [Grown in Calcutta Botanic Garden—(?)]

Fls. & Frts.: Mar.-Apr., extending up to October.

Distrib.: India: Andaman & Nicobar Islands, Assam, Bihar, Uttar Pradesh, West Bengal; Bangladesh, Burma, Thailand, Indonesia.

Notes: The occurrence of this species in different localities could not be confirmed due to scanty materials. Kanjilal et al. (l. c.) noted it from Bihar although not mentioned in Haine's work. They say: "appears to have spread from Bengal into South Sylhet, Wallich." In Wallich's Numerical list the place of collection is not mentioned. On a sheet in Cambridge, Jacobs (l. c.) found W. Gr. (W. Griffith), Serampore. No other collection is available in K & BM except the type.


Branchlets glabrous. Leaves 5-16 cm × 2.5-5 cm, oblong-lanceolate to elliptic-ovate, acuminate, serrate, glabrous; petioles up to 7 mm, puberulous. Stipules 5 mm, subulate, scarioso. Peduncles up to 5 mm bi-bracteolate at the base. Flowers yellowish-white, 3-4 mm in diam. Sepals about 2 mm, ovate, puberulous. Petals 2-3 mm, oblong-obtuse. Stamens filaments connate at the base, forming a cup with the disc. Capsules up to 1.5 cm long, sub-globose.

Type : Martaban. S. Kurz 41, (NEOTYPE-CAL!).


Distrib. : India : Andaman & Nicobar Islands, Assam; Burma, Malaya, Thailand, Cambodia, Vietnam.

Notes : The type of R. longiracemosa Kurz viz. Brandis s. n. from Martaban could not be traced in K, BM or in any of the Indian Herbaria, although Jacobs (l. c., 1967) suspected its presence in CAL. However, in CAL there is a collection (S. Kurz 41) from Martaban annotated by Kurz. Hence, in absence of the original material this has been designated as the NEOTYPE. (Banerjee & Pramanik, l. c.). We could trace no other herbarium specimen from Assam, the type locality of A. racemosa. Recently, this species has been collected from Katchal Island in Nicobar (Chokrabarty 2548 CAL., PBL).


Branchlets velvety brown to sparsely puberulous. Leaves : obovate, ellipsoid oblong, glabrous to sparsely hairy on the midrib and veins mainly beneath; petiole up to 2 cm long. Stipules up to 6 mm, subulate. Peduncles up to 1 cm, bracts minute triangular. Flowers 2-4 mm in diam., greenish yellow. Sepals sub-equal 2-3 mm bluntly triangular to elliptic. Petals 3-5 mm long, hairy outside. Stamens 3-4 mm; filaments cohering into a tube; anthers with broad dorsal appendage. Ovary hairy; style glabrous. Capsule up to 1.5 cm, sub-globose, purplish brown.

Type : Lesser Sundas Islands, Timor, Riedle (P).

Fls. & Frts. : Apr.-Nov.

Distrib. : India : Andaman & Nicobar Islands; Thailand, Malaya.
3. VIOLA


Herbs, often suffrutescent, rarely shrubby. Leaves alternate, entire to pinnatisect. Stipules persistent, free or adnate to petiole. Flowers irregular, 1-2 on long axillary bi-bracteolate, non-articulate peduncles, often dimorphic, normal and cleistogamous. Sepals persistent. Petals erect or spreading, the lowest usually largest, spurred, the other 4 flat, sub-equal. Anthers 2-celled, sub-sessile, connivent around the gynoecium, each tipped with a small triangular appendage, the connectives of the lower 2 often produced into spures within the spur of the corolla. Style straight or curved, often geniculate at base, filiform to clavate. Stigma obtuse, lobed or triangular marginate, ± truncate, often ± beaked. Fruit 3-valved loculicidal capsule.

Figs. 14-31

c. 500 species, distributed chiefly in the temperate regions throughout the world. 35 species in India.

Pollen grains: Spheroidal, furrow generally three, occasionally 4 to 6, long tapering to pointed ends; furrow membrane smooth, easily ruptured; germ pore circular or more or less irregular. Exine nearly or quite smooth. (Wodehouse, R. P. in Pollen Grains, 442-444. 1939).

1a. Style globose at top. Lateral petals directed towards the top of the flower. Stipules pinnatifid to palmatifid. Sect. Melanium DC.

... 33 V. tricolor

1b. Style not as above. Lateral petals spreading horizontally. Stipules entire to fimbriate:

2a. Stigma beaked, triangular marginate, truncate or sub-truncate. Sect. Viola (Syn. Nominium Ging.)

3a. Plants with superterranean, decumbent or ascending stems or stolons. Stipules free from petioles:

4a. Stipules entire or with a few short teeth. Top of style with two laterally patent lobes:

5a. Leaves cordate-reniform, petioles not or scarcely winged:

4
Style and stigma of Indian taxa of Viola.

6a. Stems with underground tubers  ... 3. V. bulbosa  
    ssp. tuberifera  

6b. Stems without underground tubers  
    ... 10. V. hamiltoniana  

5b. Leaves elliptic-ovate to oblanceolate, petioles conspicuously winged:  

7a. Peduncles bi-bracteolate at the middle  
    ... 7. V. diffusa  

7b. Peduncles bi-bracteolate at the top  
    ... 6. V. cinerea var. stocksii  

4b. Stipules with long acute teeth or fimbriate. Top of style without laterally patent lobes:  

8a. Leaves ovate or ovate-oblong, from a deeply cordate base:  

9a. Flowers up to 1 cm in diam. Stipules foliaceous, up to 3.5 cm long  ... 17. V. jordani var. falconeri  

9b. Flowers up to 2 cm in diam. Stipules membranaceous, up to 1.5 cm long:  

10a. Style swollen upwards, erect:  

11a. Peduncles bi-bracteolate at or below the middle:  

12a. Sepals acute:  

13a. Leaves canescent, obtuse  
    ... 5. V. canescens  

13b. Leaves pilose or glabrous, acute to prolonged acuminate:  

14a. Spur 5 mm. Leaves acute to acuminate, deeply cordate at base  
    ... 24. V. pilosa  

14b. Spur 2-3 mm. Leaves prolonged acuminate, widely cordate at base  
    ... 26. V. pogonantha
12b. Sepals obtuse  ...  30. V. suavis

11b. Peduncles bi-bracteolate above the middle:

15a. Spur up to 2 mm:

16a. Lateral petals bearded at base  ...  25. V. placida

16b. Lateral petals not bearded at base:

17a. Petioles shorter than the lamina  
     ...  35. V. yunnanensis

17b. Petioles more than twice longer than the lamina  
     ...  13. V. hossei

15b. Spur 3-5 mm:

18a. Stigma margined, not papillose hairy  
     ...  32. V. thomsonii

18b. Stigma beaked, not margined, papillose hairy  
     ...  27. V. reichenbachiana

10b. Styles not swollen upwards, decurved:

19a. Sepals acute  ...  15. V. indica

19b. Sepals obtuse  ...  21. V. odorata

8b. Leaves ovate-orbicular, base weakly cordate:

20a. Peduncles bi-bracteolate at or below the middle:

21a. Sepals acute  ...  9. V. glaucescens

21b. Sepals obtuse  ...  20. V. moupinensis

20b. Peduncles bi-bracteolate above the middle:

22a. Spur 3-5 mm:

23a. Stipules fimbriate  
     ...  31. V. sylvatica

12
23b. Stipules ± lobed at the apex with a few lateral narrow teeth
   ... 28. V. rupestris

22b. Spur 1-2 mm:

24a. Lamina silvery white beneath, veins raised below   ... 29. V. sikkimensis

24b. Lamina not silvery white beneath, veins not raised below
   ... 12. V. hookeri

3b. Plant without superterranean stems or stolons. Stipules ± adnate to the petioles:

25a. Leaves deltoid or deltoid-ovate, rather acute usually with a truncate, shallowly cordate base and widely divergent basal lobes:

26a. Flowers up to 1.5 cm across:

27a. Calycine appendages up to 5 mm, incised, often ½ as long as sepals
   ... 14. V. inconspicua

27b. Calycine appendages up to 2 mm, rounded, nearly ½ as long as sepals
   ... 1. V. betonicifolia

26b. Flowers up to 6 mm across   ... 16. V. jangiensis

25b. Leaves ovate-oblong to orbicular, often broadly rounded at apex with ± deeply cordate base and little divergent or sub-converging basal lobes:

28a. Sepals ovate, ovate-lanceolate, obtuse:

29a. Capsules 1 cm long:

30a. Lateral petals bearded at base
   ... 19. V. macroceras

30b. Lateral petals not bearded at base:

31a. Spur curving downwards
   ... 23. V. philippica

31b. Spur curving upwards
   ... 22. V. paravaginata

13
29b. Capsules 3 mm long
   ... 18. V. kunawarensis

29b. Sepals linear-lanceolate, acute to acuminate
   ... 5. V. fedtschenkoana

2b. Stigma not beaked, of two laterally patent lobes. Sect. Dischidium
   Ging. :

32a. Leaves reniform to rotundate :

33a. Spur 2 mm. Sepals linear-oblong, obtuse
   ... 2. V. biflora

33b. Spur 5-6 mm. Sepals subulate, acute
   ... 34. V. wallichiana

32b. Leaves ovate-lanceolate :

34a. Sepals 3 mm, linear, obtuse
   ... 4. V. cameleo

34b. Sepals 5 mm, ovate-oblong, acute
   ... 11. V. hediniana

1. V. betonicifolia J. Sm. in Rees. Cyclop. 37 : Viola n. 7. 1819.

Leaves in rosette, variable : lamina 1.5-8 × 0.5-3 cm, roundish obtuse
to ± sub-acuminate, crenate with rounded or blunt teeth or rarely ± ser-
rrate; petioles 2-10.5 cm, ± winged above. Stipules 0.5-1.5 cm, ovate-lanceo-
late, acuminate, adnate up to the middle point. Peduncles equalling or
exceeding leaves. Flowers white to purple with darker veins. Sepals
4-8 mm, ovate to ovate-lanceolate, acute or acuminate. Petals up to 1.5
cm, obovate-oblong, laterals usually bearded at the base; spur 2-6 mm,
cylindrical, straight or slightly upcurved. Style 3 mm, ± geniculate at
base, clavate above. Capsules up to 1 cm, ellipsoid to oblong, glabrous.

Notes : The holotype of V. patrini DC. from Siberia (G) has been
examined. It is restricted to Siberia, Manchuria and N. Japan and is dis-
tinguished from V. betonicifolia by its deep violet to dark coloured rhi-
zomes, fairly small, white to yellowish flowers with purple striations and
smaller spurs.

The plant occurring in the Western Himalayas with larger flowers,
longer spurs and ovate-oblong to lanceolate leaves is V. betonicifolia ssp.
jaunsarensis (W. Beck.) Hara. It may be distinguished from ssp. betonicifolia as follows:

1a. Lamina linear-lanceolate to triangular-ovate. Flowers up to 1.5 cm across. Sepals 8 mm, oblong. Spur 2-4 mm ... ssp. betonicifolia

1b. Lamina ovate-oblong to broadly lanceolate. Flowers 2 cm across. Sepals 4-6 mm, lanceolate. Spur 5-6 mm ... ssp. jaunsarensis


Lamina 2-8 x 1-3 cm, glabrous to more or less pubescent; petioles 4-10 cm, usually winged above. Stipules 0.5-1 cm, ovate-lanceolate, acuminate, sparsely short-fimbriate. Peduncles 5-15 cm, bi-bracteolate at the middle. Flowers lilac. Petals up to 1 cm.

Type: Australia, Botany Bay, Port Jackson, N. S. Wales, Dr. White? (n. v.).

Fls.: Jan.-Apr.; Frts.: Mar.-June; often extending throughout the year.

Distrib.: India: Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnata, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and W. Bengal; Afghanistan, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh, China to S. Japan, Burma, Malaysia to Australia.

Uses: Plants bruised and applied to ulcers and foul sores. Flowers—in China, Indo-China and Malaya are said to purify blood.

Chr. No.: 2n = 48, 72 (Moore in Fedde, Rep. 68: 84. 1963); 2n = 24 (Miyaji in Cytologia 1: 28-58. 1929).


Figs. 32-39
Viola betonicifolia J. Sm. ssp. jaunsarensis
(W. Beck.) Hara

Lamina 2.5-5 × 1-3 cm, ± hirsute, petiole 2-8 (-12) cm. Stipules 1-1.5 cm, oblong-acuminate, shortly dentate. Peduncles up to 8 (-12) cm, bi-bracteolate at or slightly below the middle. Petals 1.5 cm.

**Type**: India: Konain, Jaunsar, J. F. Duthie 12963 (CAL-holo!, BM-iso!).

**Fls. & Frts.**: Apr.-July.

**Distrib.**: India: Himachal Pradesh, Jammu & Kashmir and Uttar Pradesh; Afghanistan, Pakistan.

**Notes**: The type sheet of *V. patrinii* var. *suaveolens* Watt in Herb. BSIS Calcutta with G. Watt’s annotations consists of specimens under three different field numbers—686, 970 & 2097, collected at different times from Nag Kona forests, Chamba, N. W. Himalaya mounted on single sheet. Of these, G. Watt 2097 with field notes is chosen here as the lectotype of var. *suaveolens*. This same specimen (viz. Watt 2097) was described as *V. kashmiriana* by W. Becker.


Herbs, glabrous or pubescent. Stem 6-30 cm, erect or decumbent. Leaves: lamina 1-6 × 0.8-4 cm, reniform to broadly ovate cordate, crenate, glabrous to hirsute; petioles 1-6 (-10) cm, slender. Stipules up to 8 mm, ovate denticulate, sometimes leafy. Peduncles 1-10 cm, bi-bracteolate above the middle. Flowers 1.5 cm across, spreading, yellow. Sepals up to 7 mm. Petals 1.5 cm long, elliptic-obovate, the lower petal streaked with black and brown purple nerves. Capsules up to 1 cm, oblong.

**Type**: L. appd. 1052. 16/17 (LINN-holo, photo!)

**Fls.**: Apr.-Aug. **Frts.**: July-Oct.


Chr. No.: $2n = 12$ (Clausen in Hereditus 8:1. 1926); $2n = 48$
(Taylor & Mulligan, Queen’s Printer, Ottowa. 148. 1968); 
$2n = 12$
(Miyaji in Cytologia 1: 28-58. 1929); $2n = 12$

Pollen grains: 3(4) zonocolporate, prolate spheroidal $(34 \times 32 \mu)$. 
Endocolpium very faintly demarcated. Exine $1 \mu$ thick, psilate. (Nair,

Notes: W. Becker (1918) included most of the himalayan materials
having reniform leaves, much broader than long under V. biflora
var. platyphylo. We have examined these materials and also materials from
type locality and considered this as intergrading character of the species
and does not warrant the erection of a varietal status.

3. V. bulbosa Maxim. ssp. tuberifera (Franch.) W. Beck. in Beih. Bot.
Bot. France 33: 410. 1896 et in Pl. Dalavay. 70 t. 19a. 1889; Hara

Stems 1.6 cm, stoloniferous. Leaves: lamina 1-3 cm broad, orbicu-
cular reniform, rounded obtuse, or broadly ovate-cordate, crenate:
petioles 1-4 cm long, ± winged above. Stipules up to 1 cm, oblong-
acuminate, entire, ± adnate at base. Peduncles up to 6 cm, bi-bracteo-
late above the middle. Flowers 7 mm, across, white with purple veins.
Sepals 4 mm, acute, lanceolate. Petals 7 mm, lower spurred, spur 2 mm.
Style clavate, narrowed downwards from a shortly winged, minutely
beaked stigma. Capsules 4 mm in diam., sub-globose.

Type: China; Mount Hsie-chan-men, Yunnan, Delavay 40, 249,
1095 (P-syntype).

Fls. & Frts.: May-June.

Distrib.: India: Himachal Pradesh, Sikkim; Nepal, Bhutan,
China.

Notes: An examination of the iso-type of V. bulbosa Maxim. ssp.
bulbosa in CAL, collected from Kansu, China by Przewalski reveals that
ssp. bulbosa is distinguished from ssp. tuberifera by its ovate-cordate
leaves with leaf-base attenuated to a wing ± as long as the petiole.

The unique feature of both the sub-species is production of small
bulbs and suprabulbous 1-5 cm long stems.

Rhizome slender, scaly. Stolons 20-40 cm long. Leaves: lamina 1.5-2.5 cm x 1.2-3 cm, ovate-cordate, crenate-serrate, prolonged acute to ± acuminate, sparsely strigose above. Petioles up to 7 cm in basal leaves, much smaller in upper cauline ones. Stipules 3 mm long, ovate-acute, ± foliaceous. Peduncles 2.5 cm, bi-bracteolate above the middle. Flowers 1.5-2 cm across, deep or pale yellow with slight violet tinge or entirely violet. Petals 1 cm, obovate-oblong, striate; spur 4 mm, erect. Stigma bi-lamellate ± oblique. Lobes dilated. Fruit not seen.

*Type:* China, Tachen-Kou-lin. R. P. Farges s. n. (P-holo !).

*Fls.*: Apr.-May.

*Distrib.*: INDIA: Sikkim; CHINA.

*Notes:* This species allied to *V. hedinianna* W. Beck. is first recorded from Eastern Himalaya by Hara (*l.c.*). but there is a collection from Lachen, Sikkim in May 1885 by King's Collector s. n. Acc. no. 31233 in CAL.


Stems often none, or producing runners instead of leafy stolons. Leaves: lamina 1.5-4 x 1.5-5 cm, ovate-cordate to sub-reniform, obtuse, serrate-crenate, petioles 2-10 cm, retrorse-pubescent. Stipules up to 1 cm, lanceolate, deeply fimbriate. Peduncles up to 10 cm, bi-bracteolate at about the middle. Flowers 1.5 cm in diam., pale violet. Sepals 6 mm, oblong-acute, pubescent, trinerved. Petals up to 1.6 cm, obovate-oblong, the lowermost shorter than the rest, terminating in a 3 mm long spur. Ovary villous; style clavate; stigma truncate, oblique. Capsule 4 mm in diam., sub-globose, pubescent.

*Type:* Nepal, Wallich Num. List. no. 1442 (K-holo. CAL-iso !).

*Fls. & Frts.*: Mar.-June, extending up to Sept.-Oct.

*Distrib.*: INDIA: Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal; NEPAL, BHUTAN, BURMA, EASTERN ASIA.

*Notes:* This taxon is readily distinguished from *V. serpens* Wall.
(= V. pilosa Bl.) by its glaucous pubescence, broadly ovate-cordate to sub-reniform obtuse leaves and deeply fimbriate stipules.


Banafsha. Zinkobanaphsha (Punj. & Guj.).

Herbs, suffruticose. Stems 3-15 cm, much branched. Leaves including petioles 1-3.5 × 0.5-11 cm, ovate, oblong-obovate to elliptic lanceolate or ± spathulate, acute, apiculate. Lamina decurrent into the petiole. Glabrous, crenulate to sub-dentate. Stipules 2.6 (-10) mm, subulate, mostly denticulate to more or less fimbriate. Peduncles up to 4.5 cm long. Flowers 5 mm in diam., pale violet or white. Sepals 4 mm, lanceolate, aristate, glabrous. Petals 6 mm long, the lower petal spurred, spur very short, rounded. Style clavate, compressed; stigma lateral, of 2 oblong parallel discs. Capsules 4-6 mm long, cylindric, acute. Seeds 1 mm in diam., ovoid, white, shining.

**Type**: Afghanistan: Bolan Pass, Griffith s. n. and Pakistan: Baluchistan, Stocks 468, (syntypes K, photo 1).

**Fls. & Frts.**: Apr.-Oct.

**Distrib.**: INDIA: Gujarat, Punjab, Rajasthan; PAKISTAN, AFGHANISTAN.

**Uses**: The root is a powerful emetic; the flowers are emollient and demulcent; the whole plant is considered as an useful febrifuge.

**Notes**: V. cinerea var. cinerea differs from var. stocksii in its cinereous habit, smaller, more or less shortly dentate stipules; shortly cartilaginous acuminate leaves and tomentulose capsules.

Since forma stocksii and f. kathiawarenensis show overlapping characters, they are merged here.

Rhizome fibrillose. Stolons up to 15 cm long, producing dense rosettes of leaves and flowers. Leaves: lamina 1.5-5 cm × 0.8-2 cm, hirsute, obtuse to acute, decurrent; petioles 1.5-7 cm long; stipules 6-10 mm long, lanceolate, acute, dentate to fimbriate. Peduncles 1.5-6 cm long. Flowers 0.8 cm across, pale-purple to nearly white. Sepals 5 mm long, lanceolate, sparsely hairy. Petals 1 cm long, ovate-oblong, laterals not bearded, spurs 1-2 mm. Style clavate, geniculate at base; stigma with two lateral lobes. Capsules 4-6 mm, ellipsoid.

Type: Nepal, Wallich Num. List no. 1444 (K-holo, photo !).

Fls. & Frts.: Feb.-Aug.

Distrib.: INDIA: Arunachal Pradesh, Assam, Meghalaya, Nagaland, Sikkim; NEPAL, BHUTAN, BURMA, CHINA, INDO-CHINA, JAPAN, FORMOSA, PHILIPPINES, NEW GUINEA.


Chr. No. 2n = 26 (Miyaji in Cytologia 1: 28. 1929).


Branches few, decumbent. Stolons absent. Leaves: lamina 1.5-2.5 × 1.5-2 cm, sub-cordate at base, margin entire below, crenate-serrate upwards, obtuse, glandular-punctate; petioles 2-4 cm glabrous. Stipules ovate-lanceolate, glandulose ciliate. Peduncles 2-6(-8) cm, bi-bracteolate little above the middle or near the tip. Flowers up to 2 cm in diam, pale-violet, much above the leaves. Sepals up to 8 mm, appendage elongated. Petals up to 1.5 cm, obovate-oblong, lateral petals bearded at base; spurs up to 6 mm, slender, slightly curved upwards. Style swollen upwards, hooked above; stigma ± papillose hairy. Fruit not seen.

1a. Root-stock non-articulated. Peduncles bi-bracteolate little above the middle. Spur elongated up to 6 mm. Style papillose hairy above ... var. fedtschenkoana

1b. Root-stock articulated. Peduncles bi-bracteolate near the tip. Spur short, up to 3 mm. Style non-papillose hairy ... var. muzaffarabadensis

var. fedtschenkoana

Fls. : May-July.

Distrib. : India : Himachal Pradesh, Jammu & Kashmir ; Central Asia.


Lamina 1-2 × 1-1.5 cm, ovate-orbicular. Stipules 8 mm, scarcely limbiatre. Peduncles up to 7 cm. Flowers 1.5 cm across. Style-swollened upwards, hooked above, stigma sub-truncate, obscurely beaked. Fruit not seen.

Type : India : Jammu & Kashmir. Muzaffarabad. Inayat 21166 (CAL-holo !).

Fls. : July.

Distrib. : India : Jammu & Kashmir.


Root stock articulated. Stolons up to 20 cm long. Leaves : lamina 2.4-5 × 1.3-3.5 cm, acute to sub-acuminate, basal sinus moderately wide, margin broadly and evenly crenate, glabrous or sparsely hispid above ; petioles up to 10 cm long. Stipules up to 1.5 cm long, ovate-oblong, lacerate or fimbriate. Peduncles up to 8 cm long. Flowers 1.5 cm across, white or rose-purple. Sepals 5 mm long lanceolate. Petals 1 cm long, orbicular-obovate, laterals barbate ; spur 3 mm, saccate. Capsules 8 mm oblong, apicate. Seeds globose, light brown.

Type : India : Sikkim, J. D. Hooker s. n. (Herb. Ind. Or. Hook. f. et Thoms. sub n. 8—L-holo, photo ! CAL-iso !).

Fls. & Frts. : Throughout the year.

Distrib. : India : Arunachal Pradesh, Assam, Manipur, Mizoram, Nagaland, Sikkim, West Bengal ; Nepal, Bhutan, Malaysia.

Notes : This species is distinguished from V. pilosa Bl. by its orbicular-cordate, acute, more or less glabrous leaves, marginate and shortly beaked stigma and elongate-oblong capsules. The purple-flowered
materials have been described as a variety (var. rubella) by W. Becker, subsequently reduced to a forma by Hara. In all other essential characters they are similar. Authentic sheets of *V. distans* var. *fimbriatu* in CAL, verified at Kew also lead to the same conclusion.


Stems or stolons trailing up to 30 cm. Leaves : lamina 1.5 × 1.4-5 (-6) cm, usually as broad as long, ovate to reniform-cordate, basal sinus broad, obtuse or rather acute, crenate-serrate, glabrous to hirsute; petioles 1-8 cm long, glabrous. Stipules up to 2 cm, sub-entire to fimbriate. Peduncles 1-8 (-12) cm, bi-bracteolate above the middle. Flowers 1-1.5 cm in diam., white to light violet. Sepals 5 mm, ovate-lanceolate, acute. Petals 1 cm, obovate-oblong; spur 4 mm, saccate. Style more or less geniculate at base, sub-clavate; stigma of 2 small laterally patent lobes. Capsules 1 cm long.

*Type*: Java, *Blume* s. n. (L-holo, photo !).

*Fls. & Frts.*: Mar.-June, often throughout the year.

*Distrib.*: India : Arunachal Pradesh, Himachal Pradesh (BM), Manipur, Meghalaya, Nagaland, Sikkim, Tamil Nadu, West Bengal ; Nepal, Bhutan, Bangladesh, Burma, China, Malaysia, Philippines.


Herbs pubescent to glabrous. Rhizomes slender, horizontal. Stolons up to 20 cm long, ascending. Leaves : lamina 3-7 cm × 1.8-2.5 cm, smaller above, cordate at base, remotely crenate, sub-acuminate, sparsely pubescent above to glabrous; up to 1 cm long in basal leaves, shorter to sessile in upper cauline leaves. Stipules 5 mm long, ovate-lanceolate. Peduncles 7 cm long, bi-bracteolate at or above the middle. Flowers 1 cm across, yellow. Sepals 3-nerved, shortly appendiculate. Petals oblong-ovate, 1 cm long, laterals ebarbate, spur 5 mm long. Stigma bilobed. Fruit not seen.
Type: West China, E. H. Wilson 3220 (HBG-holo I & K-iso, photo !).

Fls.: May.

Distrib.: India: Arunachal Pradesh; China.

Notes: This species, originally described from China is reported from Arunachal Pradesh, India based on a collection from Mishmi, Delei Valley by Kingdon Ward (Cf. Spare and Fischer, l. c.), but we have however not seen this collection.


Herbs glabrous or younger parts pilose. Root stock warted. Stems and stolons short. Leaves: lamina 1.5-4 cm × 1.5-3.5 cm, apex rounded rarely sub-acute, broadly crenate, basal sinus deep, lobes touching or overlapping, glabrous; petioles up to 10 cm, not winged. Stipules up to 1.2 cm, lanceolate, acuminate, toothed or lacerate, tips glandular. Peduncles up to 7 cm. Flowers 1 cm across, white with purple veins. Sepals 5 mm, lanceolate, obtuse. Petals 1 cm oblong-ovate, minutely puberulous. Style sub-clavate, narrowed downwards from the obscurely beaked stigma. Capsules 5 mm long, valves apiculate, glandular.

Type: At Kew a sheet (V. griffithii Hook. f. et Thoms. nomen) from Bhutan.—Griffith EIC 233 is labelled as type specimen of V. hookeri Thoms.

Fls.: Apr.-June; Frts.: July-Aug.

Distrib.: India: Arunachal Pradesh, Sikkim, West Bengal; Bhutan, China.


Thomson described V. hookeri based on two collections (i) from Bhutan Griffith and (ii) from Sikkim J. D. Hooker, as mentioned in the protologue, although he was not un-aware of there being two species mixed up and if so they occur in both Sikkim and Bhutan collections.

The one with ovate-rotundate, deeply cordate, or overlapping basal auricles, rounded, crenate, glabrous, obtuse, silvery grey beneath and minutely gland-dotted leaves and acute sepals has been described as V. sikkimensis by W. Becker (1916).
13. V. hossei W. Beck. in Beih. Bot. Centralbl. Abt. 2, 34 : 257. 1916. Stoloniferous, stolons up to 18 cm long. Leaves: lamina 2-4(-5) × 1.5-3 cm, crenate-serrate, acute, sparsely white hispid to glabrous. Stipules up to 1 cm, lanceolate, reddish brown. Peduncles 2.5-3.5 cm. Flowers violet, wide open. Sepals up to 5 mm, linear, acute, glabrous. Petals ± 1 cm long, obovate-oblong. Style clavate, slightly curved. Capsules up to 8 mm, sub-globose, ± papillose.

*Type*: China: Yunnan. *Henry* 11768 (K-holo. photo! CAL-iso!).


*Distrib.*: India: Meghalaya; Burma, S. W. China, Malayan Peninsula, Malesian Islands, Thailand.


Root-stock densely articulated. Leaves in rosette; lamina 1.5-6 × 1-4.5 cm, crenulate or serrate, apex acute or roundish obtuse. Petioles 1-10(-13) cm. Stipules 7-9 mm, lanceolate, acuminate, sparsely dentate. Peduncles 1-10(-15) cm, 1-flowered bi-bracteolate above the middle. Flowers generally apetalous and cleistogamous, rarely perfect, pale purple. Sepals 5 mm, ovate-lanceolate, acuminate, glabrous. Petals when present up to 1.2 cm long; obovate-oblong, laterals bearded at the base; spur 3 mm, cylindrical, obtuse. Style geniculate at base, clavate. Capsules up to 1 cm, ellipsoid to oblong glabrous.

*Type*: Java, *Blume* (L-photo!).

*Fls. & Frts.*: Jan.-June.

*Distrib.*: India: Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Nagaland, Sikkim, West Bengal; S. W. China, Burma, Malaysia, Indonesia, Philippines.

*Notes*: This species is often confused with *V. betonicifolia*. However, it can be distinguished by its triangular hastate leaves, sub-cordate and attenuate at the base, and generally apetalous flowers.


Root-stock long up to 12 cm., densely articulated. Stoloniferous, stolons up to 20 cm, leafy and flowering. Leaves: lamina 2-6 × 1.5-4 cm.
crenate-serrate, sub-acuminate; petioles up to 10 cm, retrose-hispid. Stipules ovate-lanceolate, acute, 'ciliate. Peduncles 3-10 cm, bi-bracteolate at about the middle. Flowers lilac, sweet scented. Sepals 6 mm, lanceolate, glabrous, appendage shortly triangular. Petals 1.5 cm, obovate-oblong, lateral petals smooth, ± bearded; spur stout, up to 8 mm, curved upwards. Stigma shortly beaked. Fruit not seen.

Showing similarities with V. pilosa Bl, but distinguished by its densely articulated root stock, larger flowers and curved style.

1a. Lateral petals not bearded at base  ... f. indica

1b. Lateral petals bearded at base  ... f. barbata

f. indica

*f. et Thoms.* s. n. (sub V. odorata)—B (n. v.).

*Fls.*: Mar.-July.

*Distrib.*: INDIA: Himachal Pradesh, Jammu & Kashmir, Meghalaya, Punjab, Uttar Pradesh; PAKISTAN, AFGHANISTAN.


*Type*: India: Matiana, 2700 m, Simla Hill State, I. H. *Burkill* 28658 (CAL-holo !).

*Fls.*: Apr.

*Distrib.*: INDIA: Himachal Pradesh.


Rhizome ascending, 2-3 mm thick, shortly articulated. Acaulescent. Leaves: lamina 1-2 × 1-2 cm obtuse, entire or remotely crenate to partly repand-crenate, ± pubescent, specially on the lower surface; young leaves narrower; petioles up to 8 cm. Stipules about 1 cm long. Peduncles 5-7 cm long, bi-bracteolate at the middle. Flowers pale violet; sepals 2 mm, ovate-lanceolate, lateral sepals 3 mm, narrower, slightly appendix. Lateral petals minutely hairy at the base; spur acute, 1 mm. Ovary conical; style geniculate at base, ± clavate, not curved at apex, passing directly upwards to a ± uncovered orifice.

*Type*: India: Jangi, Kunawar, 3350 m. Punjab, *Nanning* 2003 (K-holo, photo !).
Fls.: July.

Distrib.: INDIA: Punjab.


Stems or branches 15-30 cm, erect, internodes long. Leaves: lamina 2-4.5 × 3-6.5 cm, very broadly crenate, obtuse, gland-dotted, glabrate to sparsely strigose; petioles up to 5 cm. Stipules 1-3 cm, foliaceous, smaller below, gland-dotted. Peduncles 5-7 cm, bi-bracteolate above the middle. Flowers blue throat with white markings. Sepals up to 8 mm, subulate-lanceolate, appendage elongate. Petals orbicular-ovate; spur saccate. Style inflated above; stigma decurved, oblique. Capsules 1 cm, glabrous, apiculate.

Type: INDIA: Kashmir, Falconer s. n. EIC 193 (K-holo, CAL-iso!).

Fls. & Frts.: May-Oct.

Distrib.: INDIA: Jammu & Kashmir.


Herbs up to 7 cm tall, glabrous. Root-stock slender, branched, Acaulescent, stolons absent. Leaves tufted: lamina 1-2 × 0.5-1 cm, sub-entire, base cuneate attenuated into the petiole, glabrous; petioles 2-6 cm. Stipules 2-3 mm, adnate up to a point above the middle, lanceolate, acuminate, shortly glandulose-fimbriate, membranaceous. Peduncles up to 8 cm, bi-bracteolate at the middle. Flowers spreading, 1 cm in diam., purple. Sepals 3 mm. Petals up to 1 cm, obovate-oblong, spur short, 2 mm, obtuse, Style clavate, shortly incurved; stigma sub-horizontal, hardly beaked. Capsule elliptic, acute, glabrous.

Type: N. W. India, Hb. Royle s. n. (K-holo, photo ! CAL-iso!).

Fls. & Frts.: May-Sept.

Distrib.: INDIA: Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttar Pradesh; NEPAL, AFGHANISTAN, PAKISTAN, CHINA.

Notes: W. Becker (l. c. 397) described V. kunawarensis var. angus-
*tifolia* from Kambajong in Tibet, based on oblong-lanceolate leaves, long attenuated at the base. This is not a distinctive feature and found in materials from the area under study.


Rhizome short, indistinctly articulated at apex. Leaves in rosette: lamina 2.5-5 × 2-4 cm, obtuse, basal parts entire, crenate above, glabrous to pubescent; petioles 5-16 cm, ± winged above. Stipules 1 cm, adnate to a point above the middle, fimbriate. Peduncles 12 cm bi-bracteolate above the middle. Flowers ± 1 cm across, purple to white. Sepals 4 mm, appendage short, rotundate. Petals 1 cm, obovate-oblong, spur 4-6 mm. Ovary glabrous, style clavate; stigma marginate and shortly beaked. Seeds purple.

*Type*: Bucktorminsk, Altai. *Ledebour s. n. (LE-holo !).*

*Fls. & Frts.*: Apr.-Sept.

*Distrib.*: INDIA: Uttar Pradesh; EUROPE, RUSSIA, CHINA.


Rhizomes thick, articulated, giving rise to a few ascending floriferous stolons. Leaves radical and cauline: lamina 2-3.5 × 2-4 cm, ± broader than length, crenate-serrate, acute; petioles up to 10 cm. Stipules up to 1 cm ovate-acuminate, sub-entire to shortly glabulose-fimbriate. Peduncles ± equaling the leaves in the flowering stage, bi-bracteolate below the middle. Flowers 1 cm across, white or pale-violet, striate. Sepals up to 5 mm, obovate-oblong. Petals up to 1 cm, obovate-oblong, laterals hairy at the base, lower petal conspicuously striate, spur saccate, 2-3 mm. Style sub-clavate, stigma marginate, shortly beaked. Capsules 1.5 cm, obovate-oblong.


*Fls.*: Apr.-June; *Frts.*: June-Aug.

*Distrib.*: INDIA: Arunachal Pradesh; BURMA, CHINA.

*Notes*: This species, is also reported from Arunachal Pradesh,
based on a collection from Mishmi, Dei Valley by Kingdon Ward (cf. Spare and Fischer l.c.).


*Banafsha* (Hindi & Beng.); *Vayilettu* (Tel.); *Sweet Violet* (Eng.).

Root-stock stout, articulated. Stems short; stolons 15-20 cm, slender. Leaves: lamina 1.5-3.5 × 2.4 cm, broadly ovate-cordate, obtuse, crenate, glabrous to strigose; petioles 4-8 cm. Stipules subulate-lanceolate, glandular toothed. Peduncles 4-10 cm, bi-bracteolate, at the middle. Flowers violet or white, tinged with purple. Sepals up to 7 mm. Petals obovate-orbicular, spur 5 mm, cylindric-obtuse. Stamens 5, lower two spurred. Ovary strigose. Capsules 5 mm in diam., globose, hirsute.

*Type*: Amman, 1052.11 (LINN-holo, photo !).

*Fls.*: Mar.-May; *Frts.*: June-Aug.


Root-stock 3.7 (-12) cm long, 4-7 mm thick, articulated. Stems or stolons 0. Leaves: lamina 2.5-5.5 (-9) cm × 2-4 (-7) cm, rotundate to ovate-cordate, deeply cordate at base, pilose above, at the nerves only beneath; petioles 3-12 (-10) cm. Stipules 6-10 mm, oblong-ovate, long-attenuate, glanduloso-ciliate, brown. Peduncles 5-8 (-13) cm, bi-bracteolate below the middle. Flowers 1 cm across, white to purplish. Sepals 3-4 mm. Petals up to 1 cm, oblong-ovate, spur 2 mm. Stigma beaked. Capsules oblong-ovate, apiculate, glabrous, purple spotted. Seeds yellowish brown.
Type: India: Phalut-Chia Bhanjang, 3300 m, 11.5.1960, Collector ? 196 (TI-holo!).

Fls.: Apr.-June; Frts.: June-Oct.

Distrib.: India: Sikkim, West Bengal; Nepal, Bhutan.

Notes: This species is related to V. moupinensis Franch. from which it is distinguished by ebarbate lateral petals and absence of stolons.


Root-stock ± articulated. Stems or stolons 0. Leaves in rosette: lamina 1-4 × 0.5-3 cm, ± crenate, usually long decurrent on petiole, glabrous or puberulent beneath, petioles 1-6 cm. Stipules up to 1 cm, ovate-lanceolate, acute, shortly dentate, adnate to the petiole up to above the middle. Peduncles 5-8 cm, bi-bracteolate at the middle. Flowers 1-1.5 cm, pale to dark violet. Sepals 3-5 mm. ovate to ovate-lanceolate, acute. Petals up to 1.5 cm, spur up to 6 mm. Style geniculate at base, clavate distally: stigma of 3-partially fused lobes with anterior beak. Capsules up to 1 cm, elliptic-oblong.

Type: Philippines, Cavanilles s. n. (MA-holo, photo!).

Fls. & Frts.: Oct.-July often extending throughout the year.

Distrib.: India: Manipur, Uttar Pradesh; Eastern Asia, Burma, Malaysia.

Chr. No.: 2n = 12 (Kishore in Ind. J. Genet. & Plt. Breed. 11: 217. 1951).

Notes: An examination of type materials of V. philippica ssp. munda and ssp. munda var. garhwalensis reveals that they can be considered synonymous with ssp. philippica.


_Banafsha_ (Hind. & Punj.); _Thungtu_ (Garh.).

Stems or stolons usually long, leafy and flowering ± prostrate. Leaves: lamina 1.5-8 cm × 1-6 cm, ovate to deltoid, serrate, mostly hirsute or pilose to glabrous, petioles 2-10 cm, pubescent. Stipules 6-15 mm, ovate-acuminate, sub-entire to ± dentate. Peduncles 3-8 cm, pilose. Flowers white or pale violet. Sepals 5 mm, linear-lanceolate, appendage 3 mm, pointed. Petals 1.5 cm, ovate-oblong, laterals bearded at base. Style sub-clavate, sub-truncate and shortly beaked at the apex. Capsules 5 mm in diam., ellipsoid.

_Type_: Java, _Bhume_ (I.-holo, photo !).

_Fls._: Mar.-May; _Frts._: May-July, often throughout the year.

_Distrib._: _INDIA_: Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal; _AFGHANISTAN_, _PAKISTAN_, _SRI LANKA_, _NEPAL_, _BHUTAN_, _BURMA_, _CHINA_, _MALAYSIA_, _THAILAND_, _JAVA_.

_Chr. No._: 2n = 18, 48 [Chatterjee & Sharma in J. Genet. 61 (1) : 52-63. 1973].

_Uses_: Plant medicinal: febrifuge, flowers used in lung troubles, petals made into a syrup used as a remedy for infantile disorders; root emetic (Chopra et al. in Gloss. Med. Pl. 255. 1956—as _V. serpens_ Wall.)

_Notes_: A variable species. Taller forms grow in shady humid places and shorter forms grow in rock-crevices. _V. serpens_ ssp. _serpens_ var. _deltoida_ W. Beck. and _V. serpens_ ssp. _garhwalensis_ W. Beck. are considered synonymous with _V. pilosa_, being smaller form of the same species. This is clear from a study of the specimens from Garhwal and other places in CAL.


_Herbs_, acaulescent, hirsute-pilose. Rhizome thick, densely articulated. Stoloniferous. Leaves radical: lamina ± 1-1.5 cm across, rotundate-ovate, margin rotundate crenate, acuminate, densely hirsute; petioles ± 3 cm long, retrorsely hirsute-pilose. Stipules 6-8 mm, free, lanceolate to triangular ovate, hairy in both sides, margin glandulose-fimbriate to ciliate. Peduncles scarcely exceeding the leaves, retrorse-hirsut,
Flowers small, lilac. Sepals narrow oblong, appendages sub-rotundate. Petals up to 5 mm oblong, lowest petal ± boat shaped. Ovary glabrous; style geniculate at base, sub-clavate, horizontal, passing into a sub-marginate shortly beaked stigma. Fruit not seen.

**Type**: India: Chiabanjan, Sikkim, *Lacaita* 26 (n. v.).

**Fls.**: May.

**Distrib.**: INDIA: Sikkim.

**Notes**: This species is related to *V. hookeri* Thoms. in general, in hairiness of leaves to *V. alba* Bess. and in the form of leaves to *V. odorata* L.


Herbs, 10-15 cm high. Root-stock articulated. Leaves: lamina 6-8 cm × 3-4 cm, margin serrate-crenate, setose with white hairs; petioles 8-12 cm. Stipules 1.5 cm, linear-lanceolate, sub-entire to glandular-fimbriate. Peduncles 6-8 cm. Flowers 1.5 cm across, white to pink with purple striations. Sepals 7 mm, linear-oblong; spur quadrate, pilose. Petals 1 cm, oblong-obovate, laterals bearded at base, spur 3 mm, obtuse. Ovary villous, stigma terminate, truncate. Capsule globose, villous.

**Type**: China: Yunnan, 2135 m, *G. Forrest* 9925 (E-holo, K-iso, photo !).

**Fls.**: Apr.-May.

**Distrib.**: INDIA: Arunachal Pradesh (K-photo !); CHINA.

**Notes**: This species is reported from Arunachal Pradesh, India, based on a collection from Mishmi, Delei Valley by Kingdom Ward (*Cf.* Spare et Fischer *l. c.*).


**Wood Dog-Violet** (Eng.).

Root-stock articulated. Caulescent. Leaves in rosette: lamina 1.5-3 cm × 1.5-2 cm, crenate, obtuse, glabrous; petioles up to 2.5 cm. Stipules 1 cm, narrowly lanceolate, fimbriate. Peduncles 5 cm. Flowers 1.5 cm across, violet. Sepals 5 mm, lanceolate, acute, appendage short truncate. Petals obovate-oblong; spur 5 mm. Stamens 5, lower two spurred. Ovary glabrous; style clavate; stigma beaked. Capsule 1 cm, ovate-acute.
Type: None designated. (Ccode et Cullen l.c.).

Fls. & Frts. : ?

Distrib.: INDIA: Jammu & Kashmir; EUROPE, N.W. AFRICA, CENTRAL, ASIA.


Herbs, grey papillose hairy to ± glabrous, caulescent. Leaves: lamina 1-2 cm × 0.5-1.5 (-2) cm, truncate, obtuse, crenulate, glandular punctate, ± shortly pilose; petioles 1.5-3 cm. Stipules up to 1 cm, lanceolate. Peduncles up to 4.5 cm, bi-bracteolate near the apex. Flowers 1.5 cm across, violet or white. Sepals 5-7 mm, oblong-lanceolate, acute. Petals 1 cm, obovate-oblong; spur 4 mm, cylindric. Style clavate; stigma beaked.

1a. Plant covered all over with grey papillose hairs. Lamina ovate-orbicular, weakly cordate at base ... var. rupestris

1b. Plant ± glabrous. Lamina rotundate ovate, deeply cordate at base ... var. himalayensis

var. rupestris—V. rupestris F. W. Schmidt; Coode et Cullen in Fl. Turkey 1: 527. 1965.

Stems up to 4 cm, simple. Lamina 1-2 × 0.5-1.5 (-2) cm. Lateral petals bearded at base. Capsule 8 mm, elliptic-oblong, acute, hairy.

Type: “many syntypes from C. Europe”—Coode et Cullen l.c.

Fls. & Frts.: Apr.-Aug.

Distrib.: INDIA: Jammu & Kashmir; ASIA, EUROPE & AMERICA.


Herbs, acaulescent, caespitose. Leaves in rosette; lamina 1-1.8 × 1-2 cm, crenulate; petioles up to 2.5 cm; stipules up to 1 cm, lanceolate, deeply fimbriate. Flowers 1.5 cm across. Sepals 7 mm, lanceolate. Petals 1 cm, obovate-oblong, laterals not hairy, spur 4 mm, slightly recurved. Style clavate; stigma shortly beaked. Fruit not seen.
Type: India: Kashmir, Falconer s. n. sub. EIC 191, (CAL-holo!).

Fls.: ?

Distrib.: India: Jammu & Kashmir.

Notes: V. himalayensis W. Beck. represented only by the holotype in CAL, resembles V. rupestris in general characters and it is difficult to maintain it as a distinct species. Therefore, it is reduced to a variety under it, differing in the characters given in the Key.


Root-stock densely articulated. Stolons up to 18 cm with leaves distantly placed. Leaves: lamina 1.5-5 × 1.5-3.5 cm, rotundate-crenate, glabrous; petioles up to 8 cm long, not winged. Stipules up to 1 cm, scariosus, lanceolate, acuminate, long fimbriate. Peduncles up to 9 cm. Flowers 1 cm across. Sepals 5 mm lanceolate, acute. Petals 1 cm, oblong obovate, lower spurred, spur 2 mm. Style sub-clavate, narrowed downwards from the marginate, obscurely 3-lobed beaked stigma. Capsules up to 5 mm, oblong, valves apiculate.

Type: Sonada, 2500 m, J. S. Gumble 10318 (CAL. 1).

Fls.: Mar.-June; Frts.: July-Oct.

Distrib.: India: Meghalaya, Nagaland, Sikkim, West Bengal; China, Indonesia.


Herbs, acaulescent, ± glabrous. Rhizome thick, densely articulated. Stoloniferous. Leaves radical: lamina 1.3-5 × 1.2-3 cm, rotundate crenulate ± hirsute, especially on the nerves beneath; petioles up to 7 cm, retrorse-hirsute. Stipules lanceolate, acuminate, glandulose fimbriate to ± ciliate. Peduncles up to 10 cm, bi-bracteolate below the middle. Flowers 1.5 cm across, violet, centre white. Sepals 5 mm. Petals 1.2 cm, laterals not hairy, spur 4 mm, saccate. Ovary glabrous; style horizontal, stigma beaked. Capsules globose, ± adpressed pubescent.

Type: none designated (Coode & Cullen l. c.).

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Fls. & Frts.: Mar.-Apr.


Notes: It differs from V. odorata L., in its broadly lanceolate, distinctly fimbriate stipules, ovate cordate leaves, light blue-violet flowers with a white centre and non-uncinate style.


Root-stock short or absent. Stems arising from a short central axis. Leaves: lamina 1.5-4 x 1.5-3 cm, crenate-serrate, glabrous; petioles 1-5.5 cm. Stipules leafy up to 1 cm, fimbriate. Peduncles 2.5-7 cm, equalling or exceeding the leaves, 1-flowered. Flowers up to 2 cm across, violet. Sepals lanceolate, acute, appendage 2 mm, sub-truncate. Petals orbicular, obovate; spur 5 mm straight or curved. Style inflated above; stigma decurved, ending in a uncovered orifice. Capsules 5 mm, ovate-acute, glabrous.

Type: Not designated.

Fls. & Frts.: June-Sept.

Distrib.: India: Jammu & Kashmir; Europe, Central Asia.

Uses: Plant is used in chest troubles. Stems, leaves and flowers—bruised and applied to wounds.


Root-stock articulated. Stolons up to 20 cm long. Leaves: lamina 2-7 x 1.5-4 cm, acute, serrate-crenate, glabrous to ± sparsely strigose; petioles 2-12 cm, glabrous. Stipules up to 1.5 cm, lanceolate, deeply fimbriate. Peduncles up to 13 cm, not extending leaves, bracteoles up to 1.5 cm, linear, acuminate with a few teeth at the margin. Flowers 1.5 cm long. Sepals 6 mm lanceolate, acute. Petals 1.5 cm, pale violet, obovate-oblong, lower petal spurred, spur 3-4 mm, saccate. Style geniculate at base; shortly beaked. Capsules 1 cm, oblong, apiculate.
Type: India: Sikkim, J. D. Hooker s. n. (CAL-iso!).

Fls. & Frts.: Mar.-Sept. often throughout the year.

Distrib.: India: Arunachal Pradesh, Manipur, Nagaland, Sikkim, West Bengal; Nepal, Bhutan, Burma.

Notes: This species shows some similarities with V. pilosa Bl. but can be distinguished by its ovate cordate, acute, ± glabrous leaves, glabrous petioles, deeply fimbriated stipules and peduncles bi-bracteolate above the middle with longer bracteoles, teethed at the margin.


Pansy, Heartsease (Eng.).

Caulescent, annual, glabrous to ± puberulous. Root-stock nil. Stem 15-30 cm high, diffusely branched. Leaves: lamina 1.5-4 × 0.5-1.5 cm, variable, basal leaves ovate, sub-cordate, those of the stem becoming ovate, obovate-oblong or lanceolate, broadly crenate-dentate, obtuse; petiole 1-2.5 cm, often winged above. Stipules up to 2.5 cm. Peduncles up to 6 cm, bi-bracteolate above the middle. Flowers up to 4.5 cm in diam., smaller in feral forms, violet or purplish to greenish-yellow. Sepals up to 1.5 cm, subulate, mucronate. Petals orbicular-ovolate, laterals bearded at base, spur 5 mm. Style geniculate at base, stigma hairy, laterally beaked. Capsule 1 cm, ovate-acute.

Type: 1052.21 (LINN-holo, photo!).

Fls.: Feb.-May; Frts.: Apr.-June.

Distrib.: Cultivated in India, rarely as an escape from cultivation; Europe, America.


Uses: Plants medicinal: used in rheumatism and in skin diseases; roots used as a substitute for Ipecauanha.


Stems 5-15 (-25) cm, erect or decumbent. Leaves cauline: lamina 0.7-2.5 (-4.5) × 1-3 (-5) cm, rotundate-crenate, glabrous; petioles 0.5-6 cm. Stipules 3 mm, ovate-denticulate. Peduncles 0.8-5 cm, bi-bracteolate above the middle. Flowers 1 cm across, yellow. Sepals 5 mm subulate, acute. Petals 1 cm, elliptic-obovate, spur linear 5-6 mm, obtuse. Stigma bi-lamellate, lobes spreading. Capsules 4 mm, oblong, apiculate.

Type: Nepal, Wallich Num. List no. 1443 (G-holo !).

Fls. & Fruts.: May-Sept.

Distrib.: INDIA: Sikkim, West Bengal; NEPAL, BHUTAN.

Notes: This species is distinguished from V. biflora L. by its ovate-cordate rotundate-crenate leaves; subulate, acute sepals and slender, 5-6 mm long spur.


Root-stock ± articulated. Stolons up to 20 cm. Leaves in rosette: lamina 2.5-7 × 1-3.5 cm, crenate-serrate, acute, pilose, petioles 1-6 cm, pilose. Stipules lanceolate, acuminate, fimbriate to sub-ciliate. Peduncles 3-6 (-11.5) cm. Flowers white. Sepals up to 1 cm, linear, acute, densely ciliate, trinervate, appendage short truncate. Petals up to 1.5 cm, obovate oblong, spur 2 mm. Ovary glabrous: style clavate; stigma shortly beaked above. Fruits not seen.

Type: China: Yunnan, A. Henry 10685 (K-holo & CAI.-iso !).

Fls.: Apr.-May.

Distrib.: INDIA: Arunachal Pradesh (BM), Nagaland; CHINA, BURMA.

Notes: This species is allied to V. hosset W. Beck. but readily distinguished by its somewhat densely pilose, ovate-oblong leaves, larger flowers and longer tri-nervate densely ciliate sepals.
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*R. P. W. Howrah—770—8-53.*
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