





spurred nor crested. Filament pale-red, long, slender. Lateral staminodes broad. Style slender, long, filiform. Stigma subglobose. Ovary 3-celled; placentas axillary. Capsule glabrous, globose.

*Use* :—The aromatic root-stocks are used as a stomachic, carminative, tonic and stimulant.

*Chem. comp.*—The dried tubers have been examined by J. C. Thresh (*Pharm. Journ.* [3] XV. 361). The proximate analysis gave the following results :—

Soluble in petroleum ether—

Ethyl-methyl-paracoumarate	...	..	..	3·0	} 5·0
Fixed oil and odorous body	.	...	...	2·9	

Soluble in alcohol—

Indif. substance ppt. by tannin	.	..	...	} 2·7
Acid resin, &c	..	...	...	

Soluble in water—

Glucoside or saccharine matter	..	.	..	1·0
Mucilago	..	.	...	2·8
Albuminoids, organic acid, &c.		...	...	1·0
Starch	.	...	..	52·3
Moisture	..	...	...	13·6
Ash	...	...	...	4·6
Cellulose, &c.	..	...	...	15·2
				100·0

(*Pharmacogr. Ind.* III. 418-419.)

1241. *Amomum xanthioides*, Wall., H.F.B.I., VI. 239.

*Vern.* :—Iláyechi (H.); Elách (B.); Elam (Tam.); Elakulu (Tel.); Eláchí (Mar.).

*Habitat* :—Tenasserim; Tavoy.

Herbs, perennial, widely creeping. Root-stock leafy; stems 5-6ft. Leaves 1-1½ft. by 1½-3in., firm, bright-green, lanceolate, glabrous. Spike globose, shortly peduncled, lin., few-fid. Peduncle arcuate, glabrous, slender, 2-3in.; outer bracts ½-¾in., acute, glabrous, small, oblong. Corolla tube under lin.; segments oblong, ⅓-½in. Lip cochleariform, bifid, longer than the corolla-segments with an orbicular blade, ½-¾in. broad, narrowed suddenly to a broad claw. Anther-crest auricled on each side, short, broad, entire. Capsule rigid, echinate, oblong-trigonus, pale-brown, under lin. long.

*Uses* :—The seeds are stimulant and carminative, and are useful in all the affections in which the common cardamoms are indicated. They are also of great service in relieving tormina and tenesmus, and even frequency of motions, in some cases of dysentery, and, for this purpose, they must always be used in powder with butter. They are administered in simple powder and compound tincture, the latter being prepared in the same way as the Tincture Cardamom Co of the Pharmacopœia of India. Dose of the powder, from 20 to 40 grains, and of the tincture, from ʒi to ʒii. (Moodeen Sheriff, Khan Bahadur, Madras.)

1242. *A. subulatum*, Roxb., H.F.B.I., VI. 240.  
Roxb. 15.

*Sans.* :—Brihat upa kunchikâ ; Ela

*Vern.* .—Barí-ilácbí (H.) ; Bara-elách (B.) ; Elachi, elcho, moto-ilácbi (Guj) ; Mote-veldode (Mar.) , Periyaelakkáy, káttuelak-káy (Tam.) ; Peddaelakáyalu, adaviyela-káya (Tel.) ; Doddaelakkí (Kan ) , Perelam, periya-elattan (Mal.)

*Habitat* .—Eastern Himalayas

Root-stock perennial, widely creeping. Leafy stem 3-4ft. Leaves 1-2ft by 3-4in, green, glabrous on both surfaces, oblong, lanceolate. Spike globose, very dense, shortly peduncled, 2-3in. ; bracts red-brown, outer ones 1in, ovate, obtuse, with a horny cusp, inner shorter and obtuse. Calyx and corolla-tube 1in. ; segments subulate, shorter than the tube. Lip obovate, cuneate, emarginate, yellowish-white, rather longer than the corolla-segments. Filaments very short, anther-crest entire, small, truncate. Capsule densely echinate, 1in., globose, red-brown.

*Uses* :—The seeds yield a medicinal oil. It is an agreeable, aromatic stimulant.

“ It acts as a stomachic, and is said to allay irritability of the stomach produced either by cholera or some other affections. The decoction of cardamom is used as a gargle in affections of the teeth and gums. In combination with the seeds of melons





it is used as a diuretic in cases of gravel of the kidneys." (Assistant-Surgeon Gholam Nabi.) "Invaluable in certain disorders of the digestive system, marked by scanty and viscid secretion from the intestines, promotes elimination of bile, and is useful in congestion of the liver." (Surg. J. Maitland, M. B., Madras.) "Very useful in liver affections, especially where abscess threatens; dose x grains." (Surg.-Maj. C. R. G. Parker, Pallaveram, Madras.) "I have found it most useful in neuralgia in large doses, 30 grains, in conjunction with quinine." (Surg.-Maj. H. D. Cook, Calicut.) "Used in gonorrhœa as an aphrodisiac." (Surg.-Maj. J. J. L. Ratton, M. D., Salem.) —Watt's Dictionary.

1243. *A. aromaticum*, Roxb., H.F.B.I., VI. 241. Roxb. 15.

*Vern.* .—Morang-iláchi (H. & B.); Veldode (Mar.).

*Habitat.*—Eastern Himalayas; Nepal; Sikkim; Khasia Hills; Silhet and Northern Bengal.

Root-stock perennial, widely creeping. Leafy stem 3-4ft. Leaves  $\frac{1}{2}$ -1ft. by 2-4in., glabrous on both sides, oblong-lanceolate. Spike small, globose. Peduncle short, rarely longer and decumbent. Outer bracts lin., small ovate, pale-brown. Corolla-tube lin.; segments obtuse, nearly as long as the tube, white, tinged with brown. Lip pale-yellow, twice as long as the corolla-segments, outer half deflexed. Anther-crest large, trind, petaloid, lobes rounded. Capsule lin., oblong, trigonous, neither costate nor echinate.

*Use* :—The seeds and oil used like the preceding species.

1244. *Zingiber officinale*, Zosc., H.F.B.I., VI. 246. Roxb. 16.

*Sans.* :—Plant=ârdra<sup>k</sup>a, sringavera; dried root=vishva-bhishagam, nâgara, sunti, mahaushadha; fresh root=ârdrakam.

*Vern.* :—Pl.=adrak, dr. rt.=sonth, sindhí, fr. rt.=adrak, (H.); Pl.=âdâ, dr. rt.=sûnt, fr. rt.=âdâ (B.); Pl.=ada, adrak, dr. rt.=zangzabil, sûnth, fr. rt.=zunjbel, adrak (Pb.); Pl.=âle

(Mar.); dr. rt. = sânt, fr. rt. = âdû (Guz.); dr. rt. = shukku, fr. rt. = inji (Tam.); Pl. = allam, dr. rt. = sonti, allam, fr. rt. = allam (Tel.); dr. rt. = vana-sunthi, fr. rt. = hasísunthi (Kan.); dr. rt. = chukka, fr. rt. = inchi (Mal.); Pl. = khyen-seing, dr. rt. = ginsi-khiáv, fr. rt. = gin sîn (Bur.); dr. rt. = velicha-inguru, fr. rt. = amu-inguru (Sing.); dr. rt. = zanjabîl, zanjabîle-yâbis, fr. rt. = zanjabile-ratab (Ar.) dr. rt. = zanjabîl-e-khushk, fr. rt. = zanjabîl-e-tar (Per.).

*Habitat* :—Cultivated throughout India.

Root-stock bi-ennial, bearing many, sessile, aromatic tubers, leafy stems 3-4ft. Leaves 6-3 by lin., tapering gradually to the point, lanceolate dark-green, glabrous beneath. Spike 2-3 by lin., oblong, cylindric. Peduncle  $\frac{1}{2}$ -1ft. Bracts about lin., greenish, sub-orbicular, cuspidate. Corolla segments lanceolate, greenish, subequal, under one inch long. Lip small, purplish-black, shorter than the corolla-segments. Midlobe orbicular, lateral ovate. Stamens dark-purple, as long as the lip. "Very rarely flowers, and has never seen seed." (Roxburgh.)

*Uses* :—Ginger is officinal in the British as well as Indian Pharmacopœia. Its uses are too well known to be detailed here.

1245. *Z. Zerumbet*, Smith, H.F.B.I., VI., 247. Roxb. 17.

*Sans.* :—Sthula-granthi.

*Vern.* :—Mahâbari bach; Nar-kachur (H. & B.); Kachur, narkachur (Pb.); Kathu-inshi-kua (Mal.).

*Habitat* :—Widely cultivated throughout India.

Herbs. Root-stock very large, tuberous, pale-yellow within, hard, bi-annual, root-fibres vermiform. Leafy stem 5-6ft., about  $\frac{1}{2}$ in. diam., cylindric, glabrous, annual. Leaves 10-12 by 2-3in., sessile, oblong-lanceolate or oblanceolate, acuminate, glabrous; base narrowed, ligule,  $\frac{1}{2}$ - $\frac{3}{4}$ in. long, truncate membranous. Flowering stem 12-18in., stout, usually flexuous, clothed with long appressed obtuse sheaths, with sometimes rudimentary blades. Spikes 3-4in. by 2in. diam., conico-







oblong, bracts 1-1½ in., closely imbricate, ovate-oblong, tip rounded, glabrous, green, bright-red in fruit. Margins membranous. Calyx-tube 1 in., appressed to the corolla-tube, 3-toothed, glabrous. Corolla-tube 1¼ in., segments ovate-lanceolate, acuminate; lateral smaller, adnate to the base of the lip. Lip shorter than the corolla-segments, 3-fid; lobes obtuse, median, longest; anthers glabrous. Style glabrous; stigma minute, funnel-shaped; mouth ciliate. Fruit 1 in., long, oblong. Seeds ⅙ in., long, oblong, black. Flowers very pale, the lip rather darker.

*Uses*:—This wild ginger has the aromatic flavour of *Z. Officinale*, mixed with some bitterness. The rhizome is used like the officinal ginger. It is employed as a hot remedy for coughs, asthma, "special diseases," worms, leprosy and other skin diseases. (Baden-Powell.)

1246. *Z. Casumunar*, *Roxb.*, II.F.B.I., VI., 248. *Roxb.* 17.

*Sans.*:—Van-ardraka

*Vern.*:—Ban-âdâ (H & B.); Nisa, Malabari halad (Mar.); Kâru allamu, Kâra pasupu, Karpushpaî (Tel.).

*Habitat*:—From the Himalaya to Ceylon and Malay Peninsula, Konkan. Southern Maratha Country, Western Ghats, Kanara, widely cultivated.

Root-stock perennial, bright-yellow inside. Leafy stem 4-6 ft. Leaves 12-18 by 2-3 in., oblong-lanceolate, pubescent beneath. Spike oblong, 4-6 in. 1½-2 in. diam.; peduncle 3-12 in.; bracts ovate, 1-1½ in. and nearly as broad, bright-red or greenish-red, or reddish. Corolla-segment whitish; lip unspotted, yellowish-white, with a deeply bifid, ¾ in., broad and long, mid-lobe basal; auricles large, oblong, obtuse. Corolla-tube as long as the bract; segments 1 in., upper broader and more concave. Stamen yellowish-white, shorter than the lip. Capsule small, globose.

*Uses*:—It has a similar reputation to the officinal ginger, and in the Konkans is considerably used as carminative stimulant in diarrhoea and colic. (Dymock.)

*Chem. comp.*—The drug yielded to analysis—

Ether extract (essential oil, fat, and soft resins)	...	0.96
Alcoholic extract (sugar, resins)	.. ...	7.20
Water extract (gum, acids, &c.)	.. ..	13.42
Starch	... ..	15.08
Crude fibre	... ..	12.61
Ash	. ...	6.80
Moisture	.. ..	7.66
Albuminoids, modifications of arabin, &c		30.18
		100.00

The root had a pungent odour, similar to a mixture of camphor and nutmeg, the soft resin had a bitter and burning taste. The colouring matter had many of the reactions of curcumin, but was more readily bleached than true curcumin, and the colour of the powder was very fugitive. The water extract gave a crystalline precipitate with lead acetate, which was found to be due to the presence of malic acid. The root contained more mucilage and sugar than that of *Curcuma aromatica*. (*Pharmacogr. Ind.* III, 427.)

1247. *Costus Speciosus*. *Smith*, H.F.B.I., VI., 249; Roxb. 20.

*Sans.* —Kemuka; Pushkara mulaka

*Vern.* —Kîst, kén (B & H), Osop (Santal); Ğudâichî-kânda (Bomb); Pinnga, penva (Mal.), Bommakachika (Tel.); Tsjanakua (Mal.); Keyu, Keoli, kîtsîhiu (U P)

*Habitat* :—Throughout India

An annual herb. Root-stock tuberous, horizontal. Leafy stem 6-9ft., stout. Leaves  $\frac{1}{2}$ -1ft., or more, oblong; acute, thinly silky beneath. Spike very dense-fid, 2-4in, bracts ovate bright-red, 1-1½in. Calyx 1in.; segments 3, ovate, cuspidate. Corolla-segments white, oblong, 1-1½in. Lip white, suborbicular, 2-3in, the margins incurved and meeting. Filaments 1½-2in., including the oblong petaloid connective. Capsule 1in., globose, red, crowned with the persistent calyx.

*Uses* :—The root is said to be bitter, astringent and digestive, and to be useful in catarrhal fevers, coughs, skin diseases, &c. (U. C. Dutt.) In the U. Provinces, from the root a strengthening tonic is made, and it is also used as an anthelmintic. (Atkinson.) Roxburgh notices a preserve made of the fresh roots which is considered wholesome and nutritious. Ainslie, quoting Brown's History of Jamaica, says that the root is there used as





a substitute for ginger, but is very inferior to it. (*Mat. Ind.* ii, 167.) In the *Calcutta Exhibition Catalogue*, the root is described as depurative and aphrodisiac; similar properties are attributed to it in the Concan, where it is very abundant in most situations. The rhizome resembles the great Galangal in growth and structure, but has no aromatic properties, the taste being mucilaginous and feebly astringent; it could only be used as a substitute for ginger by being preserved with a quantity of that root sufficient to flavour it (*Pharmacogr. Ind.* III, 427). The root is prescribed by the Santals for pain in the marrow (Revd. A. Campbell.)

1248. *Elettaria Cardamomum*, Maton., H.F.B.I., VI., 251

*Syn.* —*Alpinia cardamomum*, Roxb. 24

*Sans.* —Upakunchika; Ela.

*Vern.* :—Chhoti-elâchî (Hl.); Chhoto Elâch (B.); Veldoda (Mar.), Ellakay, aila-cheddi, Ellay (Tam. & Tel.); Yalakki (Kan.); Ellettari, ailum cheddy (Mal.)

*Habitat.* —Malabar; on the Western Ghats, from Kurg southwards.

Perennial herb, with a horizontal thick root-stock. Stem leafy, 6-9ft. Leaves 1-2ft. by 3in., pubescent beneath. Panicles several to one leafy stem, 1-2ft.; bracts linear-oblong, persistent, 1½-2in. Calyx ½in. Corolla-tube shortly exserted; segments ½in. long. Lip longer than the corolla-segments, white sheathed with violet. Capsule sub-globose or oblong, marked with many fine vertical ribs. Seeds small, black, highly aromatic.

*Uses.* :—The seeds are aromatic, and used as an ingredient in compound preparations.

The seed yields 2.14 per cent. of oil soluble in 4 parts of 70 per cent. alcohol, has a sp. gr. = 0.943 at 15°, a rotatory power at 19° = +84°52' (100 mm. tube) and a saponification number = 132. The oil contains cineol, a solid terpineol of rotatory power = +88°31' at 21°, and considerable quantities of alkylic acetates.—*J. Ch. S.* 1899 A. I. 68.

1249. *Alpinia Galanga*, Sw., H.F.B.I., VI., 253.

*Sans.* :—Dumparástma, kúlinjána.

*Vern.* :—Kúlanján, bará-kúlanján, Bare vâ malabari-pán-ki-jar (H.); kúlinján (B.); Kolinjan (Guj.); Kosht-kulinján (Mar.); Kunjar, kathi (Sind.); Khúlanjáne-qasbi, khúlanján-e-kabîr (Arab.); Khusrave-dârúe-kalán (Pers.); Pera-rattai (Tam.); Pedda-dumpa-rásh-trakam (Tel.); Peraratta (Mal.); Dumpa-rásmi (Kan.); Padagoji (Burm.).

*Habitat* :—Throughout India

Root-stock perennial, tuberous, slightly aromatic. Leafy stem 6-7ft. Leaves 1-2ft. by 4-6in., green and glossy on both sides, oblong-lanceolate, glabrous beneath. Panicle copiously compound, (dense-sid)  $\frac{1}{2}$ -1ft.; rachis densely pubescent, branches numerous, short; pedicels  $\frac{1}{8}$ - $\frac{1}{6}$ in.; bracts small, ovate. Flowers small. Calyx greenish-white,  $\frac{1}{2}$ in oblique at the throat. Corolla-segments  $\frac{1}{2}$ - $\frac{3}{4}$ in., linear, oblong, greenish-white. Lip obovate-clawed, emarginate, white-veined, with lilac,  $\frac{3}{4}$ in., with a pair of linear, subulate, ascending, reddish glands at the base of the claw. Stamen arcuate, shorter than the lip. Ovules 1-2 in a cell. Fruit orange-red, roundish, about  $\frac{1}{2}$ in. diam.

*Uses* :—The rhizomes of this species are aromatic, pungent, and bitter, and are used in the form of an infusion in fever, rheumatism, and catarrhal affections. As a drug, they are supposed to improve the voice. The aromatic tubers are sometimes used as carminative or fragrant adjunct in complex prescriptions, but they have nothing peculiar in their properties or action. (U. C. Dutt.) How far these properties may have been intended to be attributed to this root-stock or should have rather been given to *A. officinarum*, cannot be accurately determined. The statements of Indian authors have to be accepted for the present, but it seems probable that future enquiry may show that, while both the greater and the lesser galangals are regularly imported into India, as far as their medicinal properties are concerned, the former is only used as substitute for the latter, being commercially less valuable and less active in its therapeutic properties. It is, however,



difficult to determine in many cases to which species authors refer. Dr. Irvine, in his *Medical Topography of Ajmere*, says: "Rhizome of this plant is hot and stimulating; used in *mesalihs*, has a sweet scent; is put into bazar spirits to make it more intoxicating." This habit of flavouring spirits with galangal also prevails in Russia. The seeds also possess similar medicinal properties.

"Hakims use it in impotence, brouchitis, and dyspepsia. It is disinfectant, used to destroy bad smells in the mouth or any other part of the body. It is also advocated in diabetes mellitus." (Asst. Surg. J. N. Dey, Jaipur.) "In Mysore a domestic medicine, much used by old people with bronchial catarrh." (Surg.-Maj. John North.)

The crystalline constituents of Galanga root have been investigated by Jahus, who isolated three compounds, which were termed campheride, galangin, and alpinin. The first-named substance, which has the Empirical formula  $C_{16} H_{12} O_6$ , crystallises from methylic alcohol in lustrous, golden needles a centimetre in length; it contains 1 mol. of the solvent, which is removed at  $100^\circ$ , and melts at  $227-229^\circ$ . The triacetyl derivative crystallises from alcohol in pale-yellow needles, and melts at  $193-195^\circ$ . When the substance is heated with methylic alcohol, potassium hydroxide, and methylic iodide, the dimethoxymethyl derivative is produced, along with two compounds melting at  $154-155^\circ$  and  $138-140^\circ$  respectively; the dimeth-oxy-methyl derivative crystallises from methylic alcohol in rectangular plates and melts at  $178^\circ$ .—J. Ch. S. 1899 A. I. 537.

The oil, boiled at  $170-275^\circ$ , had a sp. gr. 0.91 at  $20^\circ$ , a rotatory power— $2^\circ 27'$  in a 100 mm. tube, and  $n_D^{20} 1.4663$  at  $20^\circ$ . Pinene, cineol, and possibly cadinene are present in the oil; in the fraction  $230-24^\circ$ , a new hydro-carbon is found, the hydro-chloride of which  $C_{15} H_{24} \cdot 2 H.Cl$ , crystallises in leaflets, is optically inactive, and melts at  $51^\circ$ .—J. Ch. S. 1902 A I. 551.

1250. *A. allughas*, *Rosc.*, II.F.B.I., VI., 253.  
Roxb. 161.

*Vern.* :—Taro, taruko (B.).

*Habitat* :—Throughout India.

Root tuberous, aromatic; stem. 3-6 ft.; leaves very shortly petioled,  $1-1\frac{1}{2}$  ft. by 3-6 in., linear-oblong or oblong-lanceolate, acuminate, with usually a twisted cusp, glabrous, base acute, sheath compressed, ligule rounded; panicle erect, decomposed, 6-12 in. long, pubescent or tomentose, lax- or dense-sid., branches short, ascending, with linear deciduous bracts, 4-6 in.

long at the lower forks; flower suberect, shortly pedicelled, 1-1½ in. long; bracts small, cupular; calyx-tube ¼-½ in., sub-campanulate, pubescent, mouth oblique, obtusely 2-3-toothed; corolla-tube as long as the calyx segments, longer than the tube, linear-oblong, cymbiform, dorsally pubescent, shortly spurred below the hooded tip; lip 1 in. long, including the slender claw, cuneiform or nearly orbicular, bifid, margins waved and erose, claw as long as the limb, base with 2 fleshy teeth; filaments nearly as long as the anthers, cells distant, glabrous, connective produced into a small, lobed crest; style glabrous, stigma small; fruit globose, ⅓ in. diam., pericarp black, fragile, seeds small, black. (Trimen.)

*Uses* :—According to Trimen, the aromatic rhizomes are used as a medicine, probably for the same purposes as other species of this genus.

1251. *A. calcarata*, Rose., H.F.B.I., VI., 254.  
Roxb. 169.

*Habitat* :—Southern Malay Peninsula and the Concan

Root-stock perennial, not tuberous. Leafy stem slender, 2-4 ft. Leaves 6-12 by 1-2 in., lanceolate, acuminate, green and glossy on both surfaces. Panicle short, dense-sid, 3-4 in.; rachis pubescent, lower branches short, bearing 3-4 crowded flowers; bracts small, ovate. Calyx-tube funnel-shaped, ¼-½ in.; ovary densely pubescent. Corolla segments ½ in., oblong, greenish-white. Lip 1-1½ in., oblong, beautifully variegated with red and yellow on a pale ground with edges slightly incurved; base spurred. Anther-cells minutely margined. Ovules many in a cell. Capsule globose, red. (*Baker*).

*Uses* :—Sold and used as a substitute for galangal in Hyderabad and other parts of India. (Moodeen Sheriff.)

1252. *Canna indica*, Linn., H.F.B.I., VI., 260.  
Roxb. 1.

*Sans.* :—Sarvajayá.

*Vern.* :—Sarba jaya, Kiáwra, Ukilbar-ki-munker (H.); Sarbajaya, Kámákshi (B.); Hakok (Pb.); Devakeli, kardali (Mar);

Soogândaraju gida, kelahú, húdingana (Kan.); Kullvalei-mani, kunda-mani cheddi (Tam.); Krishna-tamarah, guri genza chettu (Tel.); Katúvâra (Mal.).

*Eng.* :—Indian shot.

*Habitat* :—Cultivated in gardens all over India as ornamental and flowering plants.

Root-stock stout, perennial, tuberous, with many fibres. Stem 3-4ft. Leaves 6-18 by 4-8in., lanceolate to ovate, oval or almost orbicular, caudate-acuminate; veins arching, sheath open above, margins membranous. Lower leaf 1ft. or more. Raceme with a pedicle 1ft. or more, erect, peduncles with a long narrow sheath about the middle; bracts  $\frac{1}{2}$ in. oblong, ovate, obtuse, membranous, green. Flowers rather distant 2-2 $\frac{1}{2}$ in. long. Calyx segments  $\frac{1}{2}$ - $\frac{1}{3}$ in., lanceolate or oblong, membranous, obtuse. Corolla-segments 1in., erect, narrow, oblanceolate, acuminate, greenish or coloured. Staminal segments longer than the corolla, 3 sub-erect, spathulate, 1 linear, revolute. Fruit erect,  $\frac{3}{4}$ -1in. long, sub-globose or oblong, obscurely 3-lobed, crowned with calyx segments, pericarp echinulate, black, thin; seeds very many, pea-sized, globose; testa crustaceous, black, shining. (Trimen and J. G. Baker.)

*Uses* : The root is used as a diaphoretic and diuretic in fevers and dropsy (Atkinson), and also given as a demulcent. (Irvine.) It is considered acid and stimulant. (Fleming) When cattle have eaten any poisonous grass, which is generally discovered by the swelling of the abdomen, the natives administer to them the stock of this plant, which they break up into small pieces, boil in rice-water with pepper, and give the cattle to drink. (Drury.) The seed is cordial and vulnerary. (Baden-Powell.)

1253. *Musa sapientum*, Linn., H.F.B.I., VI., 262.  
Roxb. 222.

*Sans.* :—Kadali; Rambhá. Dirghapatra, Vriṣapuspa.

*Vern.* :—Kelá (H.); Kolá (B.); Kolpaká (As.); Kewiro (Sind.); Mouz, kel (Mar.); Vazhaip pazham, valai (Tam.); Arati,

kadalamu (Tel.) ; Bále ; bále-náru (Kan ) ; Vála, vazhap-pagham, vellacoi, pizang (Mal.).

*Habitat* :—Cultivated throughout India.

Root-stock stoloniferous. Stem subarborescent of convolute leaf-sheaths, cylindric, erect, 8-12ft. Leaves very stoutly petioled, 4-5ft, oblong, bright-green above, paler beneath ; midrib channelled ; veins horizontal. Spike decurved, usually about 2ft.-3ft., very rarely as long as the leaf, glabrous ; peduncle about 1½in. diam., below the inflorescence green, glabrous. Bracts large, many-rid, spathiform, bright to dark crimson. Male bracts 6 by 2½in., ovate, oblong-obtuse, deciduous ; male flowers very many in each bract, 1½in. long, nearly white. Calyx tubular, slit to the base in front, 5-toothed teeth, recurved ; 3 outer larger, yellowish-white. Calyx lobes ovate, acute. Corolla a single, convex, membranous petal, opposite the slit of the calyx, embracing the base of the stamens and style. Petal about half as long as the calyx, *i.e.*, ½-¾in, tip rounded ; stamens 5, (rudimentary or 0) ; Anther ¼in., obtuse, 2-celled. Stigma clavate, tip constricted, truncate. Fruit ¼in long, obovate-oblong, slightly curved, suddenly constricted at the apex and at the base into a stout pedicel, ¼-½in., long, obtusely 3-5 angled, golden yellow, sweet, pulpy when ripe. Seedless in cultivated form ; full of many seeds in the wild form. Seeds about ¼in diam., subglobose, angled by pressure tubercled, testa brownish-black, crustaceous, rugose, ¼in. diam.

*Uses*.—The unripe fruit, called *mochaka* in Sanskrit, is considered cooling and astringent ; it is much used in diabetes in the form of a *ghrita*, composed of plantain flowers, rootstock, and unripe fruits, *ghi*, cloves, cardamoms, and several other drugs. This medicine is generally prescribed in doses of two *tolas* along with some preparation of tin or other metallic drug. (U. C. Dutt.) Young plantain leaves are used as a cool dressing for blisters, burns, &c., and to retain the moisture of water dressings. They may also be used as a green shade in ophthalmia and other eye diseases. The root and stem are considered tonic, anti-scorbutic, and useful in "disorders of the blood" and venereal disease. Emerson states that the sap forms a valuable





drink and mouth-wash to allay thirst in cholera. According to Dymock, Mir Muhammad Husain states in the *Makhzan*, that the kind of plantain, called *málbhok*, is used as a poultice to burns, while that called *bolkad* is boiled and employed as an ointment for the syphilitic eruptions of children. He also notices the use of the ashes on account of their alkaline properties, and of the root as an anthelmintic. Ainslie writes, "The plantain is one of the most delicious of all the Indian fruits, and one of the safest for such as have delicate stomachs, being entirely free from acidity; it is, moreover, very nourishing, and is always prescribed as food by the Hindu practitioners for such as suffer from bile and heat of habit."

The fruit has long been known and commented on by European writers. Perhaps the first authentic description is by Pliny, who quotes the name *pala*, a term which still exists in Malabar. He states that the Greeks of Alexander's expedition saw it in India, and that sages reposed beneath its shade and ate its fruit (hence the name "sapientum"). In the middle ages, it had some reputation as a medicine. Avicenna wrote that it engendered phlegm, and that it spoiled the stomach but that it was good for heat in the stomach, lungs and kidneys, and provoked urine. Rhasis stated that the fruit was hurtful to the "maw." Serapio that it was in the end of the first degree warming, diuretic and aphrodisiac. Paludanus, the commentator and friend of Linschoten, confirms these statements, and, from personal observation, supports the remark that the fruit breeds "a heaviness in the maw." In modern times, it is employed medicinally by Europeans as an anti-scorbutic only, and as a mild, demulcent astringent diet in cases of dysentery, but several other less well-known properties are attributed to different parts of the plant in the following opinions:—

"The ripe fruit of the finer varieties of the plantain is useful in chronic dysentery and diarrhoea. The dried fruit of the larger varieties is a valuable antiscorbutic. In North Bengal, the dried leaves, and in fact the entire plant, is burnt, and the ashes, dissolved in water and strained, yield an alkaline.

solution, containing chiefly potash salt, which is used in curries, especially as a cure for acidity, and anti-scorbutic, and where common salt is scarce, this is used by the people for seasoning their curries." (C. T. Peters, M. B., Zandra, South Afghanistan.) "I have known a diet of green plantain well boiled, and curds (*dahi*), sweetened with sugar or seasoned with salt according to taste, to be of singular benefit, in cases of dysentery and diarrhoea. (2) Ripe plantain, well beaten up with pulp of old tamarind and sweetened with old treacle or sugar-candy, is a household remedy among the natives of Bengal for dysentery, at the commencement of the attack. (3) Flour, made out of green plantain, dried in the sun, is used in the form of *chappatis* in certain parts of Tihoote in cases of dyspepsia with troublesome flatulence and acidity. I have known one case in which it agreed remarkably well when even a diet of plain sago and water brought on a severe attack of colic. The *chappatis* are taken dry with a little salt" Assistant-Surgeon N. C. Dutt, Durbhanga.) "A combination of ripe plantain, tamarind, and common salt is most efficacious in dysentery. I have used it in many cases both of the acute and chronic forms of the disease, and seldom failed to effect a cure. It may, in fact, be said to be a specific. It is simple, easily procurable, and may safely be administered to a child. In simple cases, a single dose is sufficient, as a rule, three or four doses are required to effect a cure. The patient should be kept quiet and placed on low diet. The dose for an adult is, — ripe plantain one ounce, the pulp of ripe tamarind half an ounce, common salt quarter of an ounce; well mixed and administered immediately. It may be given two or three times a day." R. A. Parker, M. D.) "The juice of the tender roots contains a large quantity of tannin and is used with mucilage for checking hæmorrhages from the genital and air passages. The ashes, produced by burning the plant, contain a large amount of potash salts, and are used as an antacid in acidity, heart-burn, and colic. The tender fruit is used as a diet for patients suffering from hæmoptysis and diabetes." (J. H. Thornton, B.A., M.B., Monghyr.) "The juice of the bark and leaf is frequently given to children suffering







from an overdose of opium. The juice of an ounce of bark, mixed with an ounce of *ghi*, acts as a brisk purgative." (Surgeon J. McCloghey, Poona.) "The root juice, in which burnt borax and nitre are dissolved, is given with success in ordinary cases of retention of urine. The juice of the flowers, mixed with *curds*, is used in dysentery and menorrhagia" (Native Surgeon T. R. Moodelliar, Chingleput, Madras.) "The juice of the root is used as an antidote to arsenical poisoning in the lower animals. Mixed with *ghi* and sugar and administered internally, it is said to be useful in gonorrhœa." (J. Parker, M.D., Poona.)

Dr. Reginald Ashe, the Superintendent of the Jail at Mymensingh, has lately used with much success in the treatment of diarrhœa and dysentery flour made from the plantain. The plantains are cut just before ripening, they are skinned with a sharp wooden knife, so as to avoid blackening, then cut into thin slices, sun-dried, pounded in a mortar and sifted through muslin. The fine powder or flour should be stored in air-tight glass bottles. The issue is 2oz for each meal cooked in a brass vessel with a little water. *Dahi* or butter-milk can afterwards be added. The taste of the plantain powder is slightly astringent, but fruity and palatable. There is no doubt of the high nutritive value of the plantain. The flour is said to be easily digested. It is well worth trying for patients with chronic bowel complaint who cannot digest milk. I. M. G., July 1900.

N. B.—K. R. Kirtikar once obtained some of this powder from Kanara, but he used it only for congies and not for medicinal purposes. The congy with sugar is very agreeable and easily digestible.

Regarding the use of plantain in Diabetes, see my brochure on Diabetes and its Dietetic Treatment, 8th Edition, 1917, Panini Office, Allahabad. (B. D. B.)

"Plantain leaf is the cleanest and nicest dressing for a blistered surface that I know, and is also useful in covering other dressings. A piece of plantain leaf introduced into the helmet on a hot day forms an effectual protection from the sun's rays, without appreciably adding to the weight of the head-dress." (H. DeTatham, Watt's dictionary.)

The gunj obtained from the unripe plantain mixed with rice water is used in diarrhoea. In the Punjab, the sap of the fresh stem is largely used in nervous affections, viz., hysteria, epilepsy, etc. (B. D. Basu.) The ashes of the stem are useful in intestinal worms.

## N. O. HAEMODORACEAE

1254. *Sansevieria Roxburghiana*, Schult., H.F.B.I., vi., 271.

*Syn.*—*S. Zeylanica* Willd. Roxb. 291.

*Habitat*:—Coromandel coast. "I suspect that it is the only species indigenous to India and is confined to the Western Peninsula and Ceylon, wild or cultivated" (J. D. Hooker, in Fl. Br. I. vi. 271.)

*Sans.*: - Mûrva.

*Vern.*—Murahi, Marul (H.), Mumba, Gorachakra (B.), Ghanasphan, Marvel (M.), Murvel (Guz.); Mârût Kalang (Tam.); Ishaura-koda-udr (Tel.); Katu-kapel (Mal.); Heggurutike (Kan.)

Root-stock very stout, branching stoloniferous; stem very short; leaves about 8 or 9 in. a tuft, 2½-3 ft. by 1 in. towards the middle, sub-erect, dagger-shaped, rigid, pale-green, with transverse bands of dark green, concave above, and striate, dorsally rounded, ½ in. thick from back to front, margins thin, reddish, terminated by a terete, acute, rigid, spiniform, green tip, 1-2 in. long. Scape a foot long, cylindrical, green or pale-purple, with a few linear, acuminate bracts, 1-2 in., long. Raceme 1-2 ft. long by 1½-2 in. diam., striate, erect, cylindrical. Flowers in fascicles of 3-6, sub-erect, very shortly pedicelled, sweet-scented; bracts very minute, ovate, acute, pale-green; perianth pale, greenish-white tinged with violet, tube ½ in., long, cylindrical, lobes about as long as the tube, linear-oblong, obtuse, revolute; tips purplish; stamens erect; filaments as long as the perianth lobes; anthers oblong, versatile, ovary trigonous, 3-lobed, lobes pitted at the top; style filiform, exserted; stigma minute. Fruit sparingly produced, globose, ½ in. diam., of one





fertile cell, with 2 minute imperfect cells at the base, dark-orange colour. Seed solitary, broadly ovoid, white; albumin horny.

*Uses*:—It is described as purgative, heavy, sweet, pungent, tonic, and cardiacal; a remedy for bile, heat of blood, gonorrhœa, tridosha (a corruption of the three humors), thirst, heart disease, itch, leprosy, fever, rheumatism, and glandular enlargements.

Ainslie (Mat Ind. ii) remarks—

“This fleshy creeping root is, in a slight degree, warm to the taste; and of a not unpleasant odour; and is prescribed, by the native practitioners, in the form of an electuary, in consumptive complaints and coughs of long standing, to the quantity of a small tea-spoonful twice daily. The juice of the tender shoots of the plants they administer to children to clear their throats of viscid phlegm. The plant is cultivated in great abundance at Cumbum, and on the Vursenand Mountains in the Dindigul district” (Pharmacogr Ind. Vol III., p. 493.)

## N. O. IRIDEÆ

1255. *Iris cusata*, Thunb., H.F.B.I., VI., 272.

*Vern.*: —Irisa, sosun (H.); Tesma (Bhote); Krishûn, uarjal, marjal (Kashmir).

*Habitat*.—Common on the temperate N.-W Himalaya and Kashmir, in damp places; often grows in gardens.

Root-stock stout, prostrate and creeping. Stems tufted, short, or 1½-2ft., stout or slender; sheaths fibrous. Leaves 1-2ft. by ¼-½in., linear, rigid, grooved, glaucous. Spathes 3-4in., 1-3-fid; valves lanceolate, green. Flowers pedicelled, lilac. Perianth tube 0. Sepals neither crested nor bearded, blade 1½-2 by ½-¾in. rhomboidly ovate, obtuse, entire, shorter than the claw. Petals oblanceolate, erect, ¼in. broad. Ovary lin., cylindric style; arms lin. linear; tip acutely 2-fid, crests large, deltoid. Capsule 1½-3in. by ½-¾in., 6-ribbed, beaked, ribs rounded. (J. D. Hooker.)

*Use* :—It is said to be used medicinally. Further information is required.

1256. *I. nepalensis*, Don. H.F.B.I., VI., 273.

*Vern.* :—Chalnumdar, sosan, shoti, chiluchi (Pb. and U. P. Himalayan names.)

*Habitat* :—Western and Eastern Himalaya.

Root-stock stout, prostrate and creeping, with densely fibrous sheaths and copious, fleshy, finger-like roots. Stem  $\frac{1}{2}$ -1ft. Leaves linear, 6in. long at flowering time, elongating to 24 by  $\frac{1}{4}$ in., streaked with purple lines and dots. Spathes 1-3-fid,  $1\frac{1}{2}$ -2in. long, outer valves thin, green, persistent; pedicels very short. Perianth-tube slender,  $1\frac{1}{2}$ in, limb 1- $1\frac{1}{2}$ in, pale lilac; blade of sepals oblong, half an inch broad, as long as the claw; crests narrow, yellow. Petal oblong,  $\frac{1}{3}$ in. broad. Style arms lin. and less; crests large-toothed. Capsule oblong, 3-gonous, with broad, flat sides and a long slender beak, 1- $1\frac{1}{2}$ in., enclosed in the persistent spathes (J. D. Hooker.)

*Uses* :—The root is described as having properties similar to costus, and appears to have been regarded by both Hindus and Arabs as a kind of costus. Iris root is considered by Mahometan hakims to be deobstruent, aperient, diuretic, especially useful in removing bilious obstructions. It is also used externally as an application to small sores and pimples. From the large number of diseases in which this drug is recommended, it would appear to be regarded as a panacea. (Pharmacogr. Ind. III. 452.)

1257. *I. kumaonensis*, Wall., H.F.B.I., VI. 274.

*Vern.* :—Piáz, karkar, tezma (Pb.).

*Habitat* :—Temperate and Alpine N.-W. Himalaya.

A dwarf species. Root-stock stout, prostrate and creeping. Stems 2-12in., crowded; outer basal sheaths fibrous. Leaves linear, 12-14 by  $\frac{1}{3}$ in. Spathes 2-3in., 1-fid; valves lanceolate, ventricose. Pedicels very short. Flower-heads solitary. Perianth-tube 2- $2\frac{1}{4}$ in. long, limb  $1\frac{1}{2}$ -2in., bright lilac. Blade of sepals  $\frac{1}{2}$ in. broad, spreading, cuneate, obovate, as long as the







bearded claw, blotched with darker lilac; beard of the claw of yellow tipped hairs on a white crest; blade of petals erect,  $\frac{1}{2}$  in. broad, oblong. Style arms  $\frac{3}{4}$  in. long; crests deltoid, acute. Capsule 1-2 in., ellipsoid or sub-globose beaked, trigonous, angle obtuse. Don describes the sepals as blood-red, with black-purple spots (J. D. Hooker.)

*Use*:—In Chumba, the root and the leaves are given in fever. (Stewart.)

1258. *Crocus sativus*, Linn., H.F.B.I., VI., 276.

*Sans.*:—Kunkuma

*Vern.*:—Kesar Jafran (B.); Kesar, zafran (H); Sarfran, keshar, (Bomb.); Kungumapu (Tam); Kunkum, apave (Tel);

*Habitat*:—Cultivated in Kashmir.\* Native of the south of Europe. The best saffron comes to Bombay from Spain. J. D. Hooker has the following note:—“The Kashmir saffron is regarded by Royle as a variety of that cultivated in England, distinguished by the very dark violet-blue flowers, yellow anthers and brick-red stigmas, but this accords exactly with the common form, figured by Bentley and Trimen.”

\* The *Crocus sativus* is the only plant grown in Kashmir the stigmata of which compose hay saffron. The famous saffron fields are situated in the vicinity of Pampur, on a plain fully 50 feet above the valley. The bulbs grow on soil said to have been specially imported for the purpose. In dry seasons the produce averages nearly a ton quantity. Some 1500 lbs. of saffron are exported yearly from Kashmir to Ladakh. The bulbs are planted out in June, and the stigmata are collected in October. It tinges the saliva yellow. Pereira makes one grain of good saffron to contain the stigmata and styles of nine flowers, so that the formation of an ounce would require 4,320 flowers.

The four stations for saffron cultivation, called “Warewas,” are flat treeless tablelands, on the borders of the hills, 50 to 150 feet higher than the Kashmir Valley, which is 5,200 feet above the sea-level. They are little, if at all, irrigated. The soil is a stiff clay. Dr. Downes has been informed that saffron has been successfully cultivated in the gardens of the city of Kashmir. He does not think a special soil needed for cultivation of *Crocus sativus*. In a hopeful experiment of this kind at Alwar, near Delhi, Mr. Landseer started bulb-growing on earth brought in barrels from Kashmir. But in the second year the five beds of bulbs had increased to nine, and as there was no further import of Kashmir, earth, native soil had to be used, and with success. In Kashmir the *C. sativus* is cultivated on raised parterres, well drained and carefully weeded, though Dr. Downes believes not irrigated. (Ph. J. 9·7 1881 p. 9).

A perennial herb, with a root-stock in the form of a sheathed corm. Stem O. Sheaths of corms closely reticulate. Corms large, globular, depressed. Leaves radical, long, slender, grass-like channeled above, white beneath, the edges turned back, fringed, and the lower portion of the leaf-bundle surrounded by sheaths of thin, translucent, whitish tissue. Flowers fragrant, solitary, or in bundles, enclosed in a 2-valved spathe, embracing the scape. Flowers violet, marked with lighter, autumnal, appearing with the leaves. Perianth large, tube very long, slender, funnel-shaped; limb sub-equally 6-lobed, in 2 series; the six segments equal in form and almost in size, but the inner ones are invariably somewhat shorter than the outer, concave, narrow, oblong. Throat of tube bearded. Stamens attached to the base of outer segments, the filaments free; anthers yellow. Ovary hidden between the bases of the leaves, under ground, egg-shaped; style thread-like, branching into 3 style-arms, *i.e.*, stigmas exerted, orange-red, sub-clavate; tips entire or lobulate. (These stigmas constitute the saffron of commerce). Capsule spindle-shaped; seeds roundish (Step and Watson's Favourite Flowers of Gardens and Green-house, Vol. IV, page 553, London 1897).

*Uses* :— As a medicine, it is used in fevers, melancholia, and enlargement of the liver. It has also stimulant and stomachic properties, is highly thought of as a remedy for catarrhal affections of children, and is used in certain Indian dishes to give them a color. Mullahs (priests) make a kind of ink with this substance with which they write charms (Dr. Emerson). Formerly regarded as anti-spasmodic and emmenagogue; employed at present chiefly as a coloring and flavouring agent. (Ph. Ind).

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1259. *Belamcanda chinensis*, *Leman.*, H.F.B.I., VI., 277.

*Syn.* :—*Pardantbus chinensis*, *Ker.*

*Habitat* :—Very doubtfully wild in the Himalaya; cultivated all over India; a native of China.

Root-stock creeping, stem erect; leafy. Leaves ensiform;





equitant. Inflorescence branched; sheaths membranous; spathes several-fid, subscarious; bracts scarious; flowers pedicelled. Perianth-tube very short; segments oblong, spreading, subequal. Stamens inserted at the base of perianth; filaments filiform, anthers linear basifixed. Ovary obovoid. Style filiform; arms elongate; tips reniform, stigmatic. Capsule obovoid, membranous, loculicidal; valves reflexed, leaving the seed-bearing axis persistent and free. Seeds subglobose; testa lax, shining, fleshy within. (J. D. Hooker).

*Uses*:—Lourcero states that the roots are used medicinally in Cochin-China, and that they have aperient and resolvent properties and purify the blood of gross humors, being specially useful in Cynanche. According to Rheede, it is used as an alexipharmic in Malabar, being given to those who have been bitten by the cobra, and to cattle who have fed upon poisonous plants.

### N. O. AMARYLLIDÆ.

1260. *Agave americana*, Linn., H.F.B.I., VI., 277; Roxb. 296.

*Vern.*:—Rakas patta, banskeora, barakanwar, kantala, (Hind.); Jungli or Bilati-ananash, bilatipat, koyan, murga (Beng.); Jangli-kunvara, parkanda (Bomb.); Rakas-patta (Dec.); Anaik-kat razhai, pithakalabhuntha (Tam.); Rakashimatalu (Tel.); Wilyatu kaitalu (Ph.); Janglikunvâra (Guz.); Panam-katrâzua (Mal.); Bhuttâlê budukattalenaru (Kan.).

*Habitat*:—Originally a native of America, naturalized in many parts of India.

Leaves lanceolate, many, in a lax rosette, from a short stout prostrate or ascending trunk which is usually hidden by their thick bases, deep green, often variegated with white or pale yellow longitudinal stripes or borders, sometimes rather glaucous; at base spreading, then ascending, tips sometimes recurved, 4 to 6ft. long, and as much as half a foot broad above the middle; sharply constricted just above the base; margins armed with strong dark brown prickles, mostly pointing

downwards, leaf edge between the prickles concavely indented, terminal spine slightly grooved, dull-brown, 1 to 2in. long derived from the upper leaf margins which for about three inches from the top are involute and horny; scape with the panicle 15 to 25ft. in height, primary branches of the inflorescence almost horizontal, fascicles of blossoms crowded at the ends of subsidiary ascending branches; germen faintly sulcate, about equalling the perianth or shorter than it, perianth lobes ovate-lanceolate, tips obtuse, amber-coloured as are also the filaments, pollen orange-yellow, style faintly three-lobed, capitate; capsule bluntly trigonous or oblong-cylindrical, rather broader upwards.—(Agricultural Ledger, 1907. No. 7.)

*Uses*:—The roots are diuretic and anti-syphilitic, and are said to find their way to Europe mixed with Sarsaparilla. (Lindley).

The expressed juice of the leaves is administered by American doctors as a resolvent and alterative, especially in syphilis, scrofula and even cancers.

Diuretic and alterative properties are assigned to its roots, by the Mexicans. Dr. Æ. Ross reports having employed them in this character, in decoction (in the proportion of four ounces to one pint of water), in secondary syphilis, with great apparent benefit. Dr. R. F. Hutchinson regards this remedy as well worthy of further trials; he mentions, also, that a thin slice of the large fleshy leaves constitutes a good poultice

The *sap* is said to be laxative, diuretic and emenagogue. Very useful in scurvy (U. S. Dispens.) Genl. Sheridan is reported to have used the juice with great success amongst his men who were suffering from scurvy, in a small isolated post on the Texas border (Year-book of Phar. 1875; 232). The large, moist, fleshy *leaves* used with much advantage as poultice; the fresh juice applied to bruises and contusions. The *gum* found exuding from the leaves and lower part of the stem is used in Mexico as a cure for tooth-ache. "The pulp of the leaves placed between folds of muslin and applied to the eye in conjunctivitis; and also used mixed with sugar, in gonorrhœa, twice a day. (H. S. P. Kinsley, Madras).







A vegetable soap was prepared from the leaves which was found as detergent as Castille soap for washing linen, and had the superior quality of uniting and forming a lather with salt water as well as fresh

The *Agave Americana* is extensively grown in Mexico for the sake of the juice of the stalk, from which a fermented intoxicating drink called *pulque* is made. The substance yielding the alcohol is a sugar, which may be isolated by the following process:—The juice is first treated with alcohol (2 Vols. 90 per cent.) and filtered; basic lead acetate is next added to the solution, which is again filtered, the excess of lead being subsequently removed from the filtrate by means of hydrogen sulphide; the clear liquid is now evaporated to a syrup under diminished pressure, and left to crystallise in a warm place.

*Agavose*,  $C_{12}H_{22}O_{11}$ , is an inactive sugar, which reduces alkaline copper tartrate, and yields a laevogyrate sugar ( $[\alpha]_D = -14.43$ ) on inversion. It is oxidised by nitric acid, but not to mucic acid, and forms a soluble lime compound, which is precipitated by alcohol or by heating.—J. Ch. S. LXIV., pt., I. (1893) p. 64.

1261. *Curculigo orchoides*, Gærtn., H.F.B.I., VI. 279. Roxb. 288.

*Sans.* :—Mushali.

*Vern.* :—Kâlî-mûslî, siyâh mûslî (Hind); Kâlî-mûslî (Guz.); Nilap-tali-gaddalu (Tel.); Nelappanakizhanna (Mal.); Talura (Beng); Musar Kand (Gond.)

*Habitat* :—Common in most parts of India.

Root-stock stout, or elongate, with copious, fleshy root-fibres. Leaves sessile, 6-18 by  $\frac{1}{2}$ -lin., linear to lanceolate, acuminate, membranous, 5-veined; tips sometimes rooting or reaching the ground, glabrous or softly sparsely hairy; base sheathing; scape very short, clavate, with the pedicels, bracts, and ovary hidden amongst the leaf-sheaths, flattened; raceme subcorymbiform. Flowers bright-yellow, subdistichous, lowest in the raceme perfect, upper male; bracts lanceolate, membranous; perianth produced above the ovary in a filiform, hairy, very slender stripes  $1\frac{1}{2}$ -lin. long, which alone with the perianth segments appear above ground; segments  $\frac{1}{2}$ - $\frac{2}{3}$ in., long, oblong-ovate, acute, dorsally hairy; stamens small; filaments short; anthers linear; ovary lanceolate; cells 6-8-ovuled; style short. Fruit oblong,

$\frac{1}{2}$  in., hypogaeous, 1-4-seeded; septa spongy. Seeds oblong; testa deeply grooved in wavy lines, black, shining (Trimen).

Trimen further observes thus:—"The long slender beak of the ovary resembles a pedicel or scape, and the raceme and ovary being concealed in the leaf-sheaths, the perianth segments assume the appearance of a whole flower."

*Uses*:—The tuberous roots are considered alterative, tonic, restorative, and useful in piles, debility and impotence. Also useful in gonorrhœa, dysuria and menorrhagia. (Hindu Mat. Med. Pharm. Ind.)

The roots of this small low-growing plant, common in most parts of India, are described by Ainslie (Mat. Ind., vol. ii., p. 242) as tuberous, wrinkled, about four inches long, having a slightly bitter and mucilaginous taste. How far they constitute a portion of the Safed Múslî of the Native Materia Medica (as has been supposed) is undetermined. Dr. Birdwood (Products of Bombay, p. 92) agrees with Dr. Royle in referring this drug to *Murdannia scapifolia*, Royle (Illust., t. 95). Further inquiries are required to determine its botanical source. The roots of *C. orchoides* are held in the highest esteem by the Hindu doctors of Travancore, in gonorrhœa, dysuria, menorrhagia, &c.; and from the unanimous testimony borne by them to their value in these and other allied affections, there is reason for supposing that they exercise some influence on the genito-urinary system generally; but there is no evidence based on European observation as to their value in these cases. (Ph. Ind.)

It is prescribed for asthma, piles, jaundice, diarrhœa, colic and gonorrhœa; it is considered to be demulcent, diuretic, tonic and aphrodisiac, and is often combined with aromatics and bitters. (Dymock.)

*Chemical composition*.—A proximate analysis of the powdered roots was made with the following results:—

Ether ext. (fat, &c )	...	..	...	...	1.28
Alcoholic ext. (resin, tannin)	...	...	...	...	4.14
Water ext. (mucilage)	...	...	..	...	19.92
Starch, &c., by difference	...	..	...	..	48.48
Crude fibre	...	...	.	...	14.18
Ash	...	...	...	...	8.60
Moisture	...	...	...	...	8.40
					<hr/> 100.00 <hr/>





The resin was soluble in spirit and alkaline solutions, and gave a fine red colour with strong sulphuric acid. The tannin gave a green colour with ferric salts, and when determined separately amounted to 4.15 per cent. of the root. Oxalate of calcium was present.—(Pharmacogra. Ind III. 465.)

1262. *Crinum asiaticum*, Linn., H.F.B.I., VI., 280.

*Syn* :—*C. toxicarium*, Roxb. 285.

*Sans.* :—Vishamandala.

*Vern.* .—Chindar, kanwal, pindar, kanmu (H.); Nagdamani (Guz); Nágdavana (Mar.); Naginka-patta (Dec.); Bara-kanur, Nag-daun. bodakanod (Beng.); Vishamungil (Tam.); Kesarchettu, visha mungali, lakshminárayanáchettu (Tel)

*Habitat* :—Cultivated in Indian gardens

Herbs with large coated bulbs. Bulbs 2-3in. diam., narrowed into a neck, 3-12in. high, which is clothed with old leaf-sheaths. Roots from the short root-stock or base of the bulb numerous, vermiform. Leaves 3-5ft. by 5-8in., linear-lanceolate, shortly acuminate, flat, narrowed into the sheathing base, coriaceous, bright-green; margins smooth. Scape from the axils of the old leaves 1½-3ft. up to 1in. diam., compressed, solid, stout; bracts 2, spathiform, 3-4in. long, oblong, acute, papery; bracteoles filiform. Umbel 10-50-fid, somewhat bipartite, with a tuft of bracteoles in the sinus; pedicels ¼-1in. Perianth salver-shaped; perianth tube 3-4in., cylindrical, slender, green; segments rather shorter, linear, recurved or revolute; filament very slender, free, spreading, green, shorter than the perianth segments; anthers reddish, ½-¾in. Flowers fragrant at night. Fruit rarely produced, subglobose, 1-2in. diam., 1-rarely 2-seeded, beaked by the fleshy base of the perianth, dehiscing irregularly. (Trimen).

*Uses* :—The fresh root is officinal in the Pharmacopoeia of India and said to be an "emetic, in small doses nauseant, and diaphoretic, analogous to squill."

[The dried sliced roots are also an efficient emetic, but require to be given in double the dose of the recent article. Sir W. O'Shaughnessy remarks (Bengal Disp., p. 656) that this is the only indigenous and abundant emetic plant, of which he

has experience, which acts without producing griping, purging, or other unpleasant symptoms. In a communication to the Editor, he remarks that it is a good emetic and diaphoretic whenever ipecacuanha is not at hand, but that it should be regarded, not so much as a substitute for that article, as a resource in case of need ]—Ph Ind.

The leaves bruised and mixed with castor oil useful in whitlows and local inflammations. The juice of the leaves is used in ear-ache. In Java, it is used as an emetic. (Drury)

1263. *C. latifolium*, Linn., H.F.B.I., VI., 283.

*Syn.* :—*Crinum zeylanicum*, Linn ; Roxb. 286.

*Vern.* :—Sukh-darsan (B. and H.) ; Gadāmbikanda (Bomb) ; Vishamungil (Tam.).

*Habitat* :—Plentiful throughout the peninsula of India.

Perennial herbs, with large coated bulbs. Bulbs 5-6in long, globose or ovoid, elongate ; neck stout, short. Leaves many, 2½ft. by 3-4in., lorate or oblong-linear, acuminate, flat ; margin slightly scabrous. Scape inserted on the neck of the bulb, about as long as the leaves, stout, tinged with purple. Bracts 3-4in., oblong or broadly lanceolate, inner linear. Umbel 10-20-fid ; pedicels very short ; perianth-tube 3-6in., curved, cylindrical, limb nodding, 3-4in. long, funnel-shaped ; segments about 3-4 by 1in, oblong-lanceolate, acute. Stamens declinate, about ½ shorter than the perianth segment. Athers ½-¾in. long ; style longer than the stamens. Ovary cells 5-6—ovuled. Fruit sub-globose, 1½-2in. diam. Flowers white with purplish or pink stain down centre of perianth-segments. Trimen says this is an extremely variable plant.

*Uses* :—The bulb is extremely acrid, and is used for blistering cattle, a slice being bound upon the skin. When roasted, it is used as a rubefacient in rheumatism. The juice of the leaf is used in earache.

Rheede states that the crushed and toasted bulb is applied to piles and abscesses to cause suppuration, and that if given to dogs it causes their teeth to fall out. According to Loureiro, it has the properties of squills.



1264. *C. sp. ?* (found in Chutia Nagpur).

(Mr. C. B. Clarke writes of this plant that he is unable to name it, and presumes it may be an undescribed species; in that case it should bear the discoverer's name—the Rev. A. Campbell.)

*Vern.* :—Sikyom baha (Santal)

*Habitat* :—High and dry situations in Chutia Nagpur, flowering during the hot season before the leaves appear. In some respects, this resembles *C. latifolium* as described in Roxburgh's *Flora Indica*.

*Uses* :—A decoction prepared from the bulb is given internally and pounded and made into a paste, it is also applied externally by the Santals in dropsy. It is used for the diarrhœa of cattle (Campbell) Watt n. 591.

## N. O. TACCACEÆ.

1265 *Tacca pinnatifida*, Forst., H.F.B.I., VI., 287.

*Habitat* :—The Concans, Central India.

Leaves 2-3ft. diam.; tripartite segments 2-3-fid or irregularly pinnatifid or pinnate at the base; petiole 1-3ft., smooth. Scape tapering, longer than the petiole, striped, dark and light-green, 10-40-fid. Flowers drooping; involucre leaves 4-12 or more, subequal, oblong, acuminate, lanceolate, recurved, striped with purple; filiform bracts very numerous. Perianth greenish, subglobose,  $\frac{2}{3}$ in. diam., fleshy; lobes conniving, subequal, margined with purple. Fruit size of a pigeon's egg, 6-ribbed, yellow. Root-stock globose, 1ft. diam., under cultivation. (Hooker). Seeds angular. (Trimen.)

*Uses* :—The root-stock is intensely bitter when raw. It is full of starch, which, when prepared, is of excellent culinary properties, and is far preferable to that of any other arrowroot for dysentery.

## N. O. DIOSCOREACEÆ.

1266. *Dioscorea pentaphylla*, Linn., H.F.B.I., VI. 289.

*Vern.* :—Mándá (Mar.); Ts-iagri-nuren (Mal.); Shendurvel (Bomb.); Padimuskir (Gond); Pandigada (Tel.).

*Habitat* :—Throughout tropical India

Herbs, with large tuberous root-stocks. Root tubers 5-6ft. long. Stem slender, glabrous, more or less prickly, especially towards the base, often tuberiferous in the leaf axils. Leaves alternate, 3-5-foliolate glabrous, or sparsely pubescent beneath. Petiole, 1-4in.; leaflets 2-6in., shortly petiolate, oval, obovate or lanceolate, acuminate, cuspidate or subcaudate, membranous; base acute, lateral oblique at the base. Male flowers in very slender racemes, 1½in. long, which are solitary or binate on a very slender, flexuous tomentose rhachis, 6-12in. long. Bracts very broad, apiculate, membranous, much shorter than the flowers. Perianth about ¼in. diam; segments glabrous or sparsely pubescent, broadly ovate, obtuse. Stamens 3; anthers subsessile; staminodes 3, minute; pistillode 3-lobed. Female flowers in axillary, flexuous, pendulous, tomentose spikes, 2-6in. long. Perianth segments broader than in the male. Staminodes 3, minute. Stigmas spreading, linear; fruit ¾-1in long, quadrately oblong, retuse at both ends, glabrous; seeds ½in. long, wing terminal, longer and broader than the short, oblique nucleus. Flowers pale greenish, fragrant tubers edible (Trimen).

*Uses* :—The tubers are sometimes used to disperse swellings. (Dymock.) Also used as a tonic.

1267. *D. oppositifolia*, Linn., H.F.B.I., VI., 292; Roxb. 730.

*Vern.* :—Már-páspoli (Bomb.); Piska (Santali); Aretige, tegálu, avatenga tige (Tel.); Girs konda, sut konda (Gond).

*Habitat* :—Tropical India, from Assam, Silhet and Chittagong, southwards to Ceylon.





Root-stock short, with many long cylindric tortuous roots as thick as a swan's quill; stem slender, unarmed, not tuberiferous, terete, pubescent or tomentose; leaves opposite rarely alternate 3-5 by 1-3in., polymorphous, from lanceolate to oblong-oval or orbicular, obtusely acuminate or rounded at both ends, coriaceous, 3-5-veined, margins cartilaginous, sparsely hairy on both surfaces, petiole  $\frac{1}{4}$ - $\frac{1}{2}$ in.; male spikes  $\frac{1}{4}$ - $\frac{3}{4}$ in., alternate or whorled on a long filiform tomentose pendulous rachis 4-10 in. long; flowers pale-greenish, crowded, sessile by a broad base, nearly glabrous, about  $\frac{1}{20}$  to  $\frac{1}{12}$ in. broad; bract small, ovate, acuminate, membranous; outer perianth-segment broadly ovate or orbicular, concave, inner smaller, obovate; stamens 6, filament short, anther didymous; pistillode obscure; flower female distant on axillary, pendulous, tomentose spikes 6-8in. long, bracts minute; perianth-segments orbicular, glabrous or pubescent; staminodes 6, minute; stigmas linear, 2-fid; fruit orbicular or broader than long,  $1\frac{1}{2}$ - $2\frac{1}{2}$ in. diam, glabrous, top retuse or almost 2-lobed, base cuneate, carpels  $\frac{1}{2}$ -circular; seeds orbicular,  $\frac{3}{4}$ - $1\frac{1}{4}$  in. diam., wing very broad all round. (Trimen).

*Uses*:—The root, ground and heated, is applied to reduce swellings; it is also used in snake-bite and scorpion sting.

1268. *D. sativa*, Linn., H.F.B.I., VI., 295.

*Vern*:—Rátalu (H); Ato sang (Santal); Chiná, gordikaunphal (Bomb.); Gorkand, gorádu (Mar); Zamskollung (Guz.); Heggenasu (Kan.).

*Habitat*:—Cultivated over the greater part of India.

An extensively climbing herb. Root-tubers very large, globose or elongate; stem terete, unarmed, glabrous, tuberiferous in the leaf-axils. Leaves opposite and alternate, 3-14in. long and broad, broadly ovate, cordate, sometimes broader than long, acuminate, cuspidate or caudate, 7-9-veined, glabrous, membranous; basal sinus broad, deep or shallow; petiole 2-6in. Male-spikes 1-4in., filiform, crowded or scattered on the branches of crowded axillary, slender, pendulous, glabrous spikes or panicles up to 12in. long, green or purplish. Flowers yellowish-white, solitary, sessile by a

broad base; bracts ovate, acuminate; perianth-segments sub-valvate, fleshy, outer  $\frac{1}{10}$  in. long, lanceolate, inner rather smaller and narrower; stamens 6; filaments much shorter than the segments. Anthers minute, didynamous, pistillode, 3-lobed; female spikes axillary, solitary or fasciated, 4-10 in. long, pendulous; flowers sessile,  $\frac{1}{5}$  in., glabrous; perianth-segments as in the male. Staminodes 6, ovary, with 2 minute, ovate, acuminate bracts at the base; style short, conical; stigmas 3, very short, recurved. Fruit  $\frac{2}{3}$ -lin. long, by  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad, quadrately oblong, rather broader upwards; top truncate or abruptly acute; base truncate or subcordate. Seeds winged at the lower end only; wing twice as long as the nucleus. (Trimen.)

*Use* :—In the form of a powder, the root is used as an external application for ulcers.

1269. *D. bulbifera*, Linn., H.F.B.I., VI., 296.

*Vern.* :—Zamin kand (H.); Piska (Santali); Kárandâ (Bomb.); Kau-karinda (Dec.); Kuru kanda (Chanda); Kathálu, patni-alu, mati-alu (Assam); Malaka-kaya-penda lam, chedu paddu dumpa (Tel.).

*Habitat* :—Sylhet, Chittagong and throughout the Western Ghats of Bombay.

It is a distinct species, the capsule being longer than broad, and the seeds winged at the base only; the leaves are bright, shining, green; and the transverse nerves rest within channels. The tubers are round, not larger than a man's fist. The stem bears numerous little tubers by which the plant may be propagated. The aerial tubers also afford characters by which the varieties may be separately recognised. (Watt's Commercial Products of India, p. 493).

*Uses* :—The tubers are applied to ulcers after being dried and powdered. In the plains of the Punjab, the leaves are used medicinally and sold under the name of *tatar puttr*. Baillon alludes to the known febrifugal property of the leaves of certain species of *Dioscorea*, rendering them useful in the treatment of intermittent fevers. The flower spikes long, white, tender, and beautiful (female) are cooked and eaten as a savoury vegetable in the Thana district. (K. R. Kirtikar.)







## N. O. LILLIACEÆ.

1270. *Smilax glabra*, Roxb., H.F.B.I., VI., 302 ;  
Roxb. 725.

*Vern.* :—Badi chobchini (H.) ; Hariná-shuk-china (B.) ; Hazina (Garó).

*Habitat* :—Eastern Bengal ; Sylhet, and the Garó and Khasi hills.

The long, white, tender and beautiful flower spikes. Females are cooked and eaten as a savoury vegetable in the Thana district. (K. R. Kirtikar.)

Climbing, straggling shrubs. Branchlets slender, terete, smooth, unarmed. Leaves, alternate, 3-6 by  $1\frac{1}{4}$ - $2\frac{1}{4}$  in., elliptic or ovate-lanceolate, acuminate, 3-costate to the rounded or cuneate base, rather thin, petiole,  $\frac{1}{2}$ - $\frac{2}{3}$  in., narrowly sheathing, unarmed ; cirrhi very slender ; sheath  $\frac{1}{3}$ - $\frac{2}{3}$  in., long, axillary. Umbels many-fid ; peduncle bracteate ; pedicels  $\frac{1}{4}$ - $\frac{1}{2}$  in., bracteoles subulate. Flowers very small, white ; buds depressed—globose, deeply 6-lobed from the groove on the back of the obovate, cucullate, coriaceous sepals ; petals minute ; stamens very short ; staminodes in female flowers 3. The roots are nodose. (J. D. Hooker.)

*Uses* :—A decoction of the fresh root is used by the hill tribes of Assam for the cure of sores and venereal complaints (Watt.)

1271. *S. lanceaefolia*, Roxb. H.F.B.I., VI. 308.  
Roxb. 725.

*Vern.* :—Hindi chobchini (H.) ; Gutea-shuk-china (B.).

*Habitat* :—Eastern Himalaya, from Sikkim to Bhutan ; the Khasia hills ; Naga-hills and Manipur.

A climbing shrub. Branches slender, sub-terete ; prickles few or 0. Leaves 4-6 by  $1\frac{1}{2}$ -3 in., orbicular-oblong or oblong-lanceolate, acuminate, 3-costate ; base acute, membranous, subcaudate, intra-marginal nerves very slender, punctulate, and lineolate. Petiole  $\frac{1}{2}$ - $\frac{3}{4}$  in., sheath, obscure. Male umbel, subsessile, 15-25-fid pedicels  $\frac{1}{3}$  in., filiform ; bracteoles ovate, acute. Flowers  $\frac{1}{4}$  in. diam., peduncles, naked, shorter than the petioles. Sepals and

petals linear, sub-equal; anthers oblong, much shorter than the filaments. Female umbels sub-similar. Peduncles stout, flattened; bracteoles very minute, subulate or 0. Stamnodes 3, ovary short, obtusely trigonous; stigmas short, obtuse, recurved. Berry about  $\frac{1}{4}$  in. diam.

*Uses*:—The large tuberous roots are so like those of *S. China*, *Linn.*, as not to be distinguished by the eye. The juice of the fresh root is taken inwardly for the cure of rheumatic pains, and the refuse, after extracting the juice, applied to the affected parts. (Roxburgh.)

1272. *S. macrophylla*, *Roxb.* H.F.B.I., VI. 310. *Roxb.* 725.

*Vern.*:—Jangli-aushbah, Chobchini (H.); Kumarika (B.); Atkir (Santal); Chopchini (Nepal); Guti, gútwe, gholyel (Mar.); Malait-támara (Tam.); Konda dontena, konda támara, konda gurava tige, sitapu, chettu, kistapa, tamara, kummara baddu (Tel.); Kal-támara (Malay.).

*Habitat*:—Tropical Himalaya, from Kumaon eastward, Assam, Bengal, Chittagong, Burma, the Central Provinces and Konkan. Fairly common in the Sal Forests of the Siwalik Division, (Kanjilal).

A large, thickly climber. Stem sometimes exceeding 1 in. diam., stout, terete. Leaves ovate or orbicular, 6-18 in. long, thinly coriaceous, cuspidate, shining above; nerves 5-7, from the rounded or sub-cordate base, cirrhi long. Petiole stout, 1-1 $\frac{1}{2}$  in. long, the lower half narrowed and sheathing. Male peduncles  $\frac{1}{2}$ -1 $\frac{1}{2}$  in., slender. Umbels many-fid, 2-3, many flowered. Pedicels not exceeding  $\frac{1}{8}$  in., stout in fruit. Sepals  $\frac{1}{8}$  in. long, linear. Stamens as long as the sepals. Stamnodes of females 3, ovary oblong; stigmas 3 sessile. Berries  $\frac{1}{3}$ -1 $\frac{1}{2}$  in. round, 1-2-seeded. Seeds biconvex.

*Uses*:—In some parts of India, the roots are used as a substitute for sarsaparilla in the treatment of venereal disease. Among the Santals, they are applied for rheumatism and pains in the lower extremities. The inhabitants of Nepal give them in doses of three *máshas*, for the treatment of gonorrhœa and other discharges from mucous membranes. (Watt.)





1273. *Asparagus filicinus*, Ham. H.F.B.I., VI., 314.

Vern. :—(Pb.).

Habitat :—Temperate and Tropical Himalaya, from Kashmir to Bhutan. The Khasia hills. Jaunsar, Burma

A tall, erect, unarmed shrub, having tuberous roots. Stems flexuous, fistular, much branched, smooth; lower branches spreading; upper internodes short. Cladodes 2-5-nate, falcate, flat, acuminate, costate,  $\frac{1}{10}$ - $\frac{1}{4}$  in. Pedicels solitary or 2-nate,  $\frac{1}{4}$ - $\frac{1}{2}$  in., jointed above the middle, very slender. Flowers white, scarcely  $\frac{1}{10}$  in. diam.; solitary or in pairs, polygamous. Perianth  $\frac{1}{2}$ - $\frac{1}{10}$  in., sub-campanulate, stamens short, anthers minute. Berry  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam.

Uses —The root is considered tonic and astringent. In Kanawar a sprig of this is put in the hands of small-pox patients as a curative measure (Stewart)

1274 *A. racemosus*, Willd., H.F.B.I., VI., 316; Roxb. 291.

Sans. —Shatamúli (S. and B.)

Vern. —Shakákúl (H.); Satávar, bozandán, bozidán (Pb.); Shaquaqul-e-misri (Duk.); Satávari (Guj.); Satávari-mul (Mar.); Iannir-muttan-kizhangu, skimai-shadavari (Tam.); Khalla-gaddu, pilli-pichara (fresh-root), sima-shata-vari (dry root) (Tel.), Shatavali (Mal.); Majjige-gadde (Kan.)

Habitat —Found all over India

A tall, rambling and scandent, spinous, excessively branched undershrub, root-stock tuberous. Branches triquetrous; spines  $\frac{1}{2}$ - $\frac{1}{2}$  in., straight or sub-recurved. Cladodes 2-6-nate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long,  $\frac{1}{10}$  in. broad, in the middle, acicular, trigonous, falcate, finely acuminate at both ends. Raceme 1-2 in., many-fid, solitary or fascicled, simple, rarely branched; pedicels very slender,  $\frac{1}{8}$  in., joined at or above the middle. Perianth white, fragrant,  $\frac{1}{2}$ - $\frac{1}{8}$  in. across; segments oblong, obtuse; anthers small, shortly oblong, purplish. Ovary-cells ovuled. Berry 1-2 seeded, globose or didymous,  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam. Very variable in length of leaves and spines. (Trimen).

*Uses*:—The root of this plant is used medicinally as a refrigerant, demulcent, diuretic, aphrodisiac, antispasmodic, alterative, anti-diarrhoeatic and anti-dysenteric. It is used chiefly as a demulcent in veterinary medicine. Baden-Powell says that it prevents confluence of small-pox. The root is used in impotence in the form of a preserve. Tuberous roots pickled; shoots eaten as vegetable. (Kanjilal).

*Chem. comp.*—The powdered roots were separated into—

Water extract	...	...	...	...	52.43
Crude fibre	...	...	...	...	33.65
Moisture	..	..	...	...	9.46
Ash	...	..	...	...	4.46
					100 00

The amount of saccharine matter, estimated as glucose, in the water extract was 7.14 per cent. Some of this extract was boiled and filtered and evaporated down to a soft consistence and allowed to remain for three months under a bell jar. At the end of that time no crystalline substances had formed, indicating the probable absence of crystalline sugars, mannite, and asparagin.

1275. *A. adscendens*, Roxb., H.F.B.I., VI., 317; Roxb. 291.

*Vern.*:—Suféd músli, satávar (H.); Khairuwa (N-W. P.); Sápgheta musali, dholi musali (Bomb.); Dholi musali, saphéd-musli, ujli-musli (Guj.); Saféda-musali (Mar.)

*Habitat*:—The Western Himalaya, in the Punjab, from Murree eastward to Kumaon, the Dieu and Sal forests.

A sub-erect shrub, with stout terete stem and grooved, rough angled, ascending branchlets; spines  $\frac{1}{2}$ - $\frac{3}{4}$  in. straight. Cladodes 6-20-nate,  $\frac{1}{2}$ - $\frac{2}{3}$  in, slender, filiform, soft, terete, suberect or curved. Racemes many-fid, 1-3 in long, copious, often bearing cladodes at tip of branches of racemes. Pedicels  $\frac{1}{2}$ - $\frac{1}{4}$  in., jointed above or below the middle. Flowers white,  $\frac{1}{8}$  in diam. Bracts minute. Perianth segments spreading; anthers medium-sized. Ovules many in each cell. Berries  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam, 1-seeded.

*Uses*:—The tuberous roots used as demulcent and tonic and as a substitute for *Salep Tonic*, demulcent. Said to be useful in diarrhoea, dysentery and general debility.







*Chem. comp.*—The powdered roots were found to contain—

Water extract	...	...	..	...	77.55
Cellulose	..	...	...	...	12.85
Moisture	...	...	...	...	6.00
Ash	..	...	...	...	3.60
					100.00

The water extract was a thick mucilaginous liquid which threw out white flocks of albuminous matter when boiled, and was not affected by Fehling's solution. The portion of the root insoluble in water consisted of almost pure cellulose. (*Pharmacogr. Ind.* III. 485.)

1276. *A. gonoclados*, Baker, H.F.B.I., VI., 318.

*Vern.* :—Satamúli (B.); Hatmuli (Assam); Tilora (Sind); Shatávari (Bomb. and Guz.); Satávari-múl, zatar (Mar.); Kilávari, tannir-vittán-kizhangu, tanni-muttán-kalangu (Tam.); challagaddalu, pilli-pichara (Tel.); Shatávari-kizhanna, shatávali (Mala); Majjige-gadde (Kan.); Shaqáqul or shakakúl (Arab., Pers., and Hin.). This is erroneously called *Safed musli* in some parts of India.

*Habitat* :—Upper India, Concan and the Deccan.

An excessively branched, subscandent, armed under-shrub; stem terete; branches curved, green, triquetrous. Spines short. Cladodes 2-6-nate, 1-1½ in. long, by 1⁄8 in. broad, flat, straight or falcate, subcostate, narrowed to the acuminate base and tip; racemes 1-3 in., often fascicled, sometimes connate; pedicels 1⁄10-1⁄2 in. jointed much below the middle, bracts as long as the lower joint of the pedicels, cymbiform; perianth 1⁄2-1⁄10 in. across; segments spreading, outer linear-oblong, inner more spatulate; anthers much shorter than the filaments. Berry globose, 1⁄8 in. diam., or didymous and twice as broad. Flowers white.

*Uses* :—The root is considered nourishing and aphrodisiac. Boiled with oil, it is applied to cutaneous diseases. It is given in gonorrhœa in 15 grains per dose. The root is used to adulterate or as substitute for *Aconitum heterophyllum* (Watt.)

1277. *Polygonatum multiflorum*, All., H.F.B.I., VI., 319.

*Habitat* :—Western Temperate Himalaya, from Kashmir to Kumaon.

Herbs, glabrous or nearly so. Root-stock creeping; stems 2-3ft., round, arching. Leaves alternate oblong, ovate,  $3\frac{1}{2}$ -4in. by  $1\frac{1}{2}$ in., nearly sessile, pointed, sub-bifarious or secund, oblong, by lower surface glaucous, sub-acute. Peduncles 1-5-fid.,  $\frac{1}{2}$ - $\frac{1}{3}$ in. Racemes solitary, axillary, 2-5 flowered. Perianth  $1\frac{1}{2}$ - $\frac{3}{4}$ in.; tube white; lobes green, constricted in the middle; nerves within hairy. Filaments puberulous, inserted above the middle of the tube. Berry globose,  $\frac{1}{2}$ in. diam., blue, black. Seeds few.

*Uses*:—The rhizomes are used in Europe as a popular remedy for removing bruises, and discoloration of the skin resulting from blows.

1278. *Asphodelus tenuifolius*, Cavan., H.F.B.I., VI., 332.

*Vern.*:—Piázi, bokát (Pb); Bingham-bij (seed) (Pb.)

*Habitat*:—Abundant as field weed in most parts of the plains of India, from Bengal westward to Gujrat and the Punjab.

An erect, glabrous, annual herb. Leaves radical, linear, 6-12in., slender, terete, fistular, erect, acuminate,  $\frac{1}{2}$ in. diam. Scape smooth or papillosely scaberulous, 6-24in., often much branched. Pedicels jointed below the middle,  $\frac{1}{8}$ - $\frac{1}{4}$ in. Flowers bracteate, racemed. Perianth 6-parted,  $\frac{1}{4}$ in. long. Segments white, with a red-brownish costa, spreading. Stamens 6, hypogynous, filaments fusiform towards the tip, with bases dilated, concave, closely covering the ovary. Ovary 3-celled; style straight. Stigma 3-lobed, terminal. Ovules 2 in each cell. Capsule globose,  $\frac{1}{2}$ in. diam., horizontally wrinkled. Seeds usually 3, 3-sided. J. D Hooker remarks: "Wight's figure is very incorrect as regards the filaments; he is unable to give any locality for the specimen figured, which, he supposes is from the sandy soils of the East Coast of the Deccan."

*Uses*:—The seed is officinal at Lahore. It is said to be diuretic.

1279. *Chlorophytum arundinaceum*, Baker., H.F.B.I., VI., 333.

*Vern.*:—Saféd musli (H.); Ganjagata (Gond).





*Habitat* :—Eastern Himalaya, Sikkim, Bhotan, Assam, Behar at Monghyr, on Parasnath. Central Provinces, frequent, especially on the plateau land in Balaghat and Bilaspur.

Root fibres cylindric. Leaves 6-18 by 1½-2in., oblanceolate, obtuse, acute or acuminate, usually narrowed into a broad petiole. Scape 6-20in., stout, naked; raceme 3-8in., elongate, simple or shortly branched; bracts ¾-½in. or lower, longer; pedicels ¼-½in. jointed in the middle. Perianth-segments ⅓-½in., lanceolate, white. Anthers longer than the filaments. Capsule ⅓in. broad, 2-lobed at the tip and base; cells 3-4 seeded. Seeds ⅓in. diam.; sub-orbicular, flat, black. In small specimens, the leaves are narrower and broadest at the base. (Hooker.)

*Uses* :—Saféd musli appears in the market in white dry pieces 5-2-5" long and .25" thick. They swell in water to a cylindrical fusiform shape, and are said to be used (like Kâlâ Musali) as a tonic. (Haines.)

*N.-B.*—No other writer, except Mr. H. H. Haines, I.F.S. considers *Safed musli* to be the product of this plant (Indian Forester, Vol. XL (1914), p. 477.)  
B. D. B.

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Genus *Allium*, Linn. strong smelling, scapigrous herbs. J. D. Hooker calls them "fotid." Well he may. A congener *A. ascalonicum* is surnamed *A. fragrans*  $\beta$ . *nepalensis*. I don't call them foetid. Of course opinions differ. They are, no doubt, strong smelling, some with ammonical odours. (K.R.K.) Bulbs coated. Leaves usually narrow, often fistular. Flowers capitate or umbelled, all at first enclosed in 1-3 membranous spathes, stellate or campanulate; sepals free or connate below. Stamens hypogynous or inserted on the perianth; filaments free or connate below, anthers oblong. Ovary 3-gonous, 3-celled. Style filiform; stigma minute; cells few-ovuled. Capsule small, loculicidal. Seeds few, compressed; testa black.

1280. *Allium ascalonicum*, Linn., H.F.B.I., VI., 337. Roxb. 288.

*Vern.* :—Ek-kanda-lasun or ek-kali-lasan (one-clove garlic)

*Eng.* :—The Shallot.

*Habitat* :—Extensively cultivated in India during the latter part of the rains.

Root biennial, or more, consisting of a fascicle of several ovate, oblong bulbs, generally (as found in the markets) about as large as the first joint of the middle-finger. Leaves somewhat bifarious, fistulous, more than semi-cylindrical, tapering, pointed, compressed toward the apex, smooth and shorter than the scapes. Scapes rising from the centre of the short stem formed by the united sheathes of the leaves, naked, round, smooth, slightly swelled towards the base and from thence tapering to the umbel, from one to two feet long. Sheaths shorter than the umbel, irregularly bursting into two or three sub-ovate segments. Umbels globular, as much as two-hundred-flowered. Flowers like those of the common onion (*Allium cepa*). Petals equal, expanding, shorter than the stamens, white, with a green keel. Filaments erect, alternately dilated at the base. Anthers ovate, green. (Roxburgh.)

*Uses* :—It is used to cure earache, a small piece being placed in the meatus. It is also fried in butter and preserved in honey as an aphrodisiac. (Pharmacogra. Ind., Vol., III. p. 492).

1281. *A. cepa*, Linn., H.F.B.I., VI., 337 ; Roxb. 287.

*Sans.* :—Palandu.

*Vern.* :—Piyáz (H. B. and Pb.) ; Dungari (Guz. and Sind.) , Kanda (Mar.) ; Vella-Vengazam, irulli, ira-vengay-am (Tam.) ; Vulli-gaddalu, niruli (Tel.) ; Vengazam, nirulli, kumbali (Kan.) ; Bawang (Mal.).

*Habitat* :—Cultivated all over India.

Leaves fistular, sub-distichous, shorter than the inflated scape. Heads dense with flowers and bulbils. Pedicels shorter than the stellate flowers ; sepals linear-oblong ; filaments exserted, simple, or the inner 2-toothed at base.

*Uses* :—The bulbs contain an acrid, volatile oil, which acts as a stimulant, diuretic, and expectorant. Onions are occasionally used in fever, dropsy and catarrh, and chronic bronchitis ; in colic







and scurvy. Externally as rubefacient, and, when roasted, as a poultice. Considered by natives hot and pungent, useful in flatulency. Said to prevent the approach of snakes and venomous reptiles. (Baden-Powell.)

They are also described as aphrodisiac. Eaten raw they are emmenagogue. The juice rubbed on insect-bites is said to allay irritation. The centre portion of a bulb, heated and put into the ear, is good for ear-ache. The warm juice of the fresh bulb is also used for this purpose.

The seeds yield a colourless clear oil used in medicine.

Onion tea will often relieve sleepless and irritable children when opium and other narcotics have failed. Let the opium go, and try onions first.—Family Doctor, June 19, 1886.

The expressed juice of the bulbs, with salt dropped in the eye, is said to be useful in night blindness. A poultice of bulb is also used. (B. D. B.)

“The bulb is crushed and the acrid smell is utilised emitted like smelling-salts for fainting and hysterical fits.” (S. M. Robb, Ahmedabad). “Said to increase the peristaltic action of the intestines, and is prescribed in obstruction. Used in jaundice, hæmorrhoids, and prolapsus ani, also in hydrophobia. As an external application, onions are used in scorpion bites and to allay irritation in skin diseases. They have antiperiodic properties attributed to them, and are said to mitigate cough in phthisis, and mixed with vinegar, used in sore-throat.” (Surg. J. McConaghey, Shahjahanpore.) Used as a decoction in cough.” (Surg. Ross, Delhi). Onion juice, mixed with mustard oil in proportion, is used as a liniment to allay rheumatic pains. (Watt’s Dictionary).

Onions yield 0.005 per cent. of their weight of a dark-brown essential oil which does not contain oxygen, has  $\bar{a}$  sp-gr. at  $8.7^{\circ}$ —1.041, and exhibits a rotation of  $5^{\circ}$  in a 100 mm. tube; a small quantity of crystals separate on cooling it in a freezing mixture. As it decomposes when distilled at the ordinary pressure, it was fractionated under a pressure of 10 mm.

The main portion of the oil consists of a compound,  $C_6H_{12}S_2$  an oil of sp. gr. 1.0284 at  $12^{\circ}$ , which boils at  $75-83^{\circ}$  (10 mm.), and is converted into the compound  $C_6H_{12}S_2$  on treatment with potassium; this new compound boils at  $68-69^{\circ}$  (10 mm.), and seems to be present in small quantity in the original oil. The compound  $C_6H_{12}S_2$  is converted by zinc-dust into a mono-sulphide,  $C_6H_{12}S$

(C-p. 133°). A small quantity of a substance was isolated from the fractions boiling above 100° (10 mm.), and appears to be identical with one of the compounds obtained from oil of asafoetida. The residue boiling above 126° (10 mm.) contains a higher sulphide, and gives the compound  $C_6H_{12}S_2$  on reduction with zinc-dust. Neither allyle sulphide, nor a sesquiterpene were present.—J. Ch. S. LXIV. pt. I (1893) p. 104.

The outer skins of the bulb of the onion contain a yellow colouring matter (Quercetin) of which the formula is  $C_{15}H_{10}O_7$ .

1282. *A. sativum*, Linn., H.F.B.I., VI., 337; Roxb. 287.

*Sans.* :—Lasuna; Mahaushada.

*Vern.* :—Lassun (H.); Rasun (B.); Naharu (Ass.); Lasun (Mar.); Shunam (Dec.); Vallai-pundu (Tam.); Velluli-tallagadda (Tel.); Belluli (Kan.); Gokpas (Bhoté). The best kind sold in Bombay is called "Goghari Lusoon. (K. R. K.)

*Habitat* :—Cultivated much in the U P., especially in Garhwal, and Kumaon. Also in the Panjab and Kashmir. In the Western Peninsula.

A perennial herb. The true stem, which is much reduced, gives off roots from the base, and supports, as cauline appendages, the overlapping scales (old leaf bases), which were thickened below and bear, in their axils, small bulbs or cloves. These closely imbricating scales, together with the cloves and the reduced stem, form the bulb. The leaves are flat. The slender flowering stem, or scape, emerges from the centre of the bulb, and bears a few flowers in umbels, the majority being replaced by diminutive bulbs or bulbils. (Duthie.) Spathes long-beaked. Sepals lanceolate, acuminate. Stamens 3-pointed. (Roxb) Inner filaments 2-toothed.

*Uses* :—Garlic is considered hot and aperient; given in fevers, coughs, piles, leprosy, being regarded as carminative, diuretic, stomachic, alterative, emenagogue and tonic, and much used in nervous affections. Externally, the juice is applied to the ears for deafness and pain. The oil extracted from the seed is also medicinal. The cloves of the bulb are given in confection for rheumatism. The properties of garlic depend upon a volatile oil which may readily be obtained by





distilling the bruised bulbs. When purified, this oil is colourless, and may be distilled without decomposition. When garlic has been eaten, the odour of this oil may be detected in the various secretions of the body. Regarded by some as an anthelmintic.

Mixed with vinegar it is used as an astringent in relaxed sore-throat and relaxation of the vocal cords. It is also used in asthma, general paralysis, facial paralysis, gout and sciatica, much thought of in the treatment of flatulent colic. Supposed to prevent the hair turning grey when applied externally. (Dr. Emerson.) It is resolvent in indolent tumors. Is largely used as a liniment in infantile convulsions and other nervous and spasmodic affections. It is also frequently used as a poultice in retention of urine from debility of the bladder.

Garlics were found to yield 0.09 per cent. of their weight of a yellow-coloured, optically inactive, essential oil, which has the well-known intense odour; its sp. gr. at 14.5° is 1.0525. It deposits a small quantity of crystals when cooled in a freezing mixture, does not contain oxygen, and decomposes when heated at 150°. The oil was fractionally distilled under a pressure of 16 mm.

*Fraction 1* (6 per cent.) consists of *allylpropyl bisulphide*,  $C_3H_5S_2$ , Pr., a bright-yellow oil of sp. gr. 1.0231 at 15°, boiling at 66-69° (16 mm.), and having the odour of onions; it gives voluminous precipitates with mercuric and auric chlorides, which are sparingly soluble in alcohol, and when treated with zinc-dust at 130°, yields a compound,  $C_6H_{12}S$ . It is decomposed by oxidising agents with the production of carbonic anhydride, oxalic acid, propionic and lower fatty acids, and sulphuric acid.

*Fraction 2* (60 per cent.) is *diallyl bisulphide*,  $S_2(C_3H_5)_2$ , a light-yellow oil, having the odour of garlic; it is rendered colourless by distilling with a little potassium when it passes over at 78-80° (16 mm). It has a sp. gr. at 14.8° = 1.0237 and, on reduction with zinc-dust, yields a compound,  $C_6H_{10}S$ , which boils under the ordinary pressure at 135-139°; it also reacts with potassium, decomposes into carbonic anhydride, oxalic, formic, and acetic acids, on oxidation with nitric acid, combines with halogens, and does not react with mercuric oxide, even at 100°.

*Fraction 3* (20 per cent.), representing the portion passing over between 112° and 122° (16 mm.), has the empirical formula,  $C_6H_{10}S_3$ , its sp. gr. at 15° being 1.0845; it yields the compound,  $C_6H_{10}S$ , when heated with zinc-dust.

*Fraction 4* (10.5 per cent.) consists of the residue boiling above 122° (16 mm.); it decomposes if the distillation is continued. On analysis, values were obtained approximating to those required by the formula  $C_6H_{10}S_4$ .

Oil of garlic contains neither allyl sulphide nor a sesquiterpene.—J. Ch. S. LXIV., pt. I (1898), p. 103.

The reserve material of the bulbs and other underground parts of certain monocotyledons (such as garlic, hyacinth, narcissus and tuberose) is a kind of inulin. To separate this substance, the bulbs, &c. are cut into small fragments, and digested with ether, to cause the expulsion of the sap from the cells; the sap collecting at the bottom of the vessel, together with a further amount remaining in the fragments, and liberated by pressure, is purified with basic lead acetate and animal charcoal, and the inulin precipitated by baryta water. The insoluble baryta compound of the carbo-hydrate is decomposed by carbonic anhydride, and the inulin precipitated with alcohol-ether as a syrup. Finally, this is dried in succession by washing with alcohol and ether, and then under diminished pressure, and at 100°.

The *inulin of garlic*,  $C_6 H_{10} O_5$ , is a white, inodorous, amorphous powder, distinct from the inulin of the Jerusalem artichoke. Its taste is insipid, and it is very deliquescent. It melts at 175-176°, and is soluble in water and dilute alcohol, but only sparingly in strong alcohol. The rotatory power is  $[\alpha]D = -39^\circ$ . It does not reduce alkaline copper tartrate, and is completely hydrolysed by acids to levulose. It is precipitated neither by normal nor by basic lead acetate, except in presence of ammonia. It is not hydrolysed by amylase (malt diastase), but is resolved into levulose by an enzyme *inulase*, which is secreted by *Aspergillus niger*, and is similar to the enzyme of the inulin of the Jerusalem artichoke, and of *Atractylis*. The inulin of garlic is not fermented either by hydrolytic or non-hydrolytic yeasts.

The sap from the offshoots of the garlic bulbs contains only traces of reducing sugars, and yields nothing but levulose on hydrolysis, so that it contains no reserve material but inulin.—J. Ch. S. 1896 A. I. 5.

1283. *Urginea indica*, Kunth., H.F.B.I., VI., 347.  
Roxb. 289.

*Sans.* :—Vana-palândam.

*Vern.* :—Kándá, janglí-piyáz, kánde (Hind.); Jongli piaáj, ban-piaáj, kánde (Beng.); Iskíl, kúndri, kunda, korikan. (U. P.); Ghesuwa (Kumaon); Phaphor, kachwassal (Pb.); Ránácha-kándá (Mar.); Jangli-kánda, rankando (Guz.); Nari-vengáyam (Tam.); Nakka vulli-gadda (Tel.); Adavi-irulli (Kan.); Kíttulli (Malay).

*Habitat* :—Simla, Dekkan, the Coromandel coast, Shaharanpur, Siwalik and also in the Tons valley. Sindh, on the lower hills. Bundelkhand and adjoining Central India States.

A small, annual, flabrous, herbaceous plant; flowers appearing before leaves. Bulbs of the size of a small orange or apple, bitter, nauseous,  $\frac{1}{2}$ in. in diam. or more. Leaves radical, 6-18in. by  $\frac{1}{2}$ in. Scapes 12-18in., erect. Bracts soon disappearing. Stalks 1-1 $\frac{1}{2}$ in. slender. Flowers drooping or spreading, distant,



