1026. *P. amplexicaulis, Cav*, H F B.I. IV. 706.

Vern. :—Gajpipali, isafgol, spighwal (Pb)

Habitat·—Panjab Plains, from the Sutlej westwards Malwa, Sindh on the Boogta Hills.

An annual or perennial herb, stemless or subcaulescent, sparsely hairy a subglabrescent, branched from the base 2-4in high, bearing axillary leaves and scapes Leaves long, very narrowly lanceolate, finely acuminate 3 nerved, base sheathing Scapes very numerous, stout, glabrous, axillary Spikes ovoid ½-1½in Flowers large Bracts cupular, glabrous, membranous, except the green rib Sepals rounded, outer with a green keel, inner all membranous. Corolla-lobes ovate, acute Seeds $\frac{1}{8}$in, boatshaped, brown Septum $\frac{1}{4}$-$\frac{1}{4}$in, oblong, thickened, black,

Uses —Said to be an astringent, useful in intermittent fever, and as an application to the eyes in ophthalmia, also used as an antidote for snake bite, highly valuable in pulmonary affections (Ainslie.)

1027. *P ovata, Forsk*, H.F B I, IV 707.

Syn —P Ispaghula, *Roxb* 135

Vern —Isubgol (H), Isabgul (B), Spungai (Sind), Isapgul (M) Esopgol, uthamu jirun Guz Iskolvirai (Tam), Isabagâla vittulu Tel), Isabagolu, Visamagolu (Kan)

The seeds are not mentioned by the old Hindu writers, but the Guzerati name appears to be of Sanskrit origin In all the vernaculars, corruptions of the Persian name, Ispaghul, are in use This word is a compound of اسپ "a horse," and غول "the ear in allusion to the shape of the seeds (Dymock)

Habitat —Punjab Plains and low Hills, from the Sutlej westwards, Sindh

An annual, stemless or subcaulescent herb, sparsely or thickly villous Stem rarely branched from the base Leaves all radical. 3-9in, rarely $\frac{1}{4}$in diam, usually 3 nerved, entire or distantly toothed, narrow-linear or filiform, finely acuminate Scapes glabrous, pubescent, longer or shorter than the leaves Spikes $\frac{1}{2}$-$1\frac{1}{2}$, ovoid a cylindric Bracts with broad scarious margins, ovate, oblong, obtuse, glabrous. Corolla glabrous; lobes rounded, concave, obtuse. Sepals sub-similar, glabrous or pubescent. Capsule 2-celled, cell 1-seeded Seeds cymbiform

Uses:—Demulcent, and mildly astringent. The seeds have been found serviceable in febrile, catarrhal, and renal affections, but their chief use is in diarrhœa and dysentery. Moistened with water, they form a good emollient poultice.

The seeds yield to water a good deal of mucilage, and form a cooling demulcent drink which is prescribed in cases where emollients are required. A slight degree of astringency and some tonic property may be imparted to the seeds by application of a moderate degree of heat, and it is said that this remedy cures the chronic diarrhœa of European and native children on the failure of other medicines. (Bentley and Trimen.)

The crushed seeds made into a poultice with vinegar and oil are applied to rheumatic and gouty swellings. With the mucilage a cooling lotion for the head is made. Two to three drachms moistened with hot water and mixed with sugar are given in dysentery and irritation of the intestinal canal to procure an easy stool. The decoction is prescribed in cough. The roasted seeds have an astringent effect, and are useful in irritation of the bowels in children and in dysentery.

1028. *P. Psylium. Linn*, H F.B.I., iv. 707.

Habitat:—North-Western Punjab; Peshawar and South of Bannoo; Tarki, N of Indus.

Scapigerous herbs, annual, erect, strict, glandular-pubescent. Stem leafy, 4-8in. Leaves opposite, linear or linear-lanceolate, flat, obtuse, 1-1½in, with fascicles in their axils, hence appearing whorled; margin entire, with a very few glandular tubercles; bases, ciliate. Peduncles in the upper axils. Scapes usually shorter than the leaves. Spikes ovoid, ⅓-½in.; bracts acute, lower elongate, hispid. Sepals oblong, subacute. Corolla very small.

Use:—The seeds are used like those of *P. Major, Linn.*

N. O. NYCTAGINÆ.

1029. *Boerhaavia diffusa, Linn.*, H. F. B. I., IV 709 (*a variety of B. repens*), Roxb. 49.

Sans.:—Punarnavâ; Sothaghni.

Vern. :—Sânt, Gadhâ pûrna, (H.); Punarnabâ, seveta punarnabâ (B.); Punarnavâ, khâparâ, ghetuli (Bomb.); Vakha khaparo, dholi sáturdi, moto satodo (Guj.); Punárnawn (Satodiputchee) (Cutch); Vasu (Mar.); Thikri-ká-jhâr (Duk.); Nakbel (Sind); Mukaratte-kire, mukúkratt (Tam.); Atatamámidi (Tel.); Itsit (Pb.); Tamilama, talutâma (Mal.); Sanadika, balevadakigida (Kan.).

Habitat:—Throughout India; from the Punjab to Assam and South to Travancore.

A diffusedly branched herb; root stout, fusiform, rootstock woody. Stems 2-3ft. long, slender, prostrate or ascending, swollen at the nodes, minutely hairy and sometimes viscid or subglabrous, often tinged with purple. Leaves rather thick, arranged in unequal pairs at each node, ½-1½in. long, ovate oblong or suborbicular, green and glabrous above, usually white beneath; base rounded or subcordate, margins subundulate, often pink; petioles about as long as the blade. Flowers minute, subcapitate, 4-10 together in small bracteolate umbels forming slender long-stalked axillary and terminal panicles; bracteoles lanceolate, acute. Perianth ⅓in. long, tube glandular-hairy; limb red, funnel shaped, with 5 narrow vertical bands outside. Stamens 2 or 3, slightly exserted. Fruit ⅛in. long, clavate, rounded, viscidly glandular on the 5 broad blunt ribs (*Duthie*).

Uses:—"It is used in jaundice, ascites, anasarca, scanty urine, and internal inflammations" (Dutt). In the Punjab, considered useful for the eyes (Ibbetson's Gujrat). In Goa, the herb is esteemed as a diuretic in gonorrhœa, in Bombay is much used for dropsical swellings (Dymock). The use of the root in gonorrhœa appears to have been introduced by the Portuguese; in the West Indies, the plant is known as Bejuco de purgacion, and is the popular remedy for that disease. The root used in bronchitic asthma. This has been confirmed by the experience of the French in the Antilles, where the plant is called Patagon or Patagonelle-Valeriane. Its diuretic properties have been borne testimony to by numerous medical officers. (Watt, 1. 486.)

"Assistant-Surgeon B. M. Chatterjee reports having found it a very good expectorant, and that he has prescribed it in several cases of asthma with marked success. He employed it in the form of powder, decoction, and infusion, but the doses and proportions are not furnished. Taken largely it acts as an emetic." (Ph. Ind.)

In *Food and Drugs* for October 1910, p. 80, Dr. Lal Mohan Ghoshal concludes his observations on the action of this plant as follows:—

1. "The active principle is a diuretic, chiefly acting on the glomeruli of the kidney through the heart, increasing the beat and strength, and raising the peripheral blood pressure in consequence; on the cells of the tubules it exerts little or no action and, if any, it is only initial and comparative.

2. On respiration it has little or no action, and if it is anything, it is probably due to the fatty principle found in the weeds.

3. On liver the action is principally secondary and in chemical combination with other drugs.

4. On other organs the drug has practically no effect.

From what has been gone through it may be inferred that the drug may be given in any condition of the kidney where there is lessened secretion or where increased secretion of kidney is wanted Thus it may be given in all renal affections stopping secretion of kidney, in ascites, either from cirrhosis of liver or heart or kidney. As it increases the systole of the heart, it may be useful in all stenosed conditions of the valves, as by increasing the force and duration of the systole it can pump all the blood from the heart. Where there is dropsy and ascites due to weaknes of the heart or to dilation of the heart, this medicine in my opinion may do extreme good by relieving the circulation through the kidney. In pleurisy and some such affections, where there is accumulation of fluid in the cavities, the drug may be useful by increasing the quantity of urine."

It contains (1) a sulphate of a body, alkaloidal in nature; (2) an oily amorphus mass of the nature of fat (probably); (3) sulphates and chlorides and traces of nitrates and chlorates from the ash. The amount of the alkaloidal body is very small. (*Food and Drugs*, Oct. 1910, p. 73.)

1030. *Pisonia aculeata, Linn.* H.F.B.I., IV. 711. Roxb. 312.

Vern. :—Baghachura (Beng.); Hati-ánkusá (Uriya); Karu-indu (Tam.); Kunki-pootri, embudi chettu, konki (Tel.)

Habitat :—South Concan, and elsewhere in the Deccan Peninsula

A large, woody, thorny, straggling or climbing shrub, often forming impenetrable thickets "Young shoots and inflorescence pubescent armed with sharp axillary, more or less curved thorns" (Brandis) Bark light-brown, thin Wood light brown, soft, of peculiar structure (Gamble) Trunk very short. Branches subopposite, horizontal Leaves 2-3in., elliptic obtuse, entire, base cuneate, glabrous Blade 2-3in., petiole ¼-⅓in. long. Flowers greenish white in compact, sometimes paniculate, axillary cymes Male flower campanulate, pedicelled, 5-toothed. Stamens 7-8 Female flower ovoid, obscurely toothed Stigma lacerate. Fruit long-pedicelled, ⅓-½in., narrowly oblong or clavate, 5-ribbed, ribs muricate, with several rows of glands (J. D. Hooker) The gland protuberances are viscid, says Brandis.

Uses —The bark and the leaves are used as a counter-irritant for swellings and rheumatic pains (T. N. Mukherji). The juice mixed with pepper and other ingredients is given to children suffering from pulmonary complaints (Watt's Dict.).

1031. *P. alba, Spanoghe.* H.F.B.I., IV. 711.

Vern.—Chinai Sálit (Bomb.)

Habitat :—Cultivated in India

An evergreen unarmed tree of middle size, 30-40ft., glabrous, except the youngest shoots and inflorescence Leaves large, pale green or bright greenish yellow, those of the ends of the branches often nearly white, somewhat resembling the lettuce in taste, but is an "indifferent substitute' (Gamble). Eaten in Ceylon by the Singhalese (Trimen) and by the European-Jews of Bombay (K. R. K.). The male tree has much darker leaves and not much brown as the lighter leaved are in gardens in coast towns in India, as in Calcutta, Madras, Colombo and Bombay.

Leaves 6-10in., elliptic, oblong-ovate or oblong, acute or acuminate. Petiole ½-1½in. Flowers in dense corymbose terminal cymes. Male flowers ¼in. long. tubular campanulate, pedicelled, 5-toothed, stamens 8 Female flower much smaller ; stigma pedicellate. Fruit flower much smaller. Stigma pedicellate. Fruit ½-¾in. long, long-pedicelled, narrow club-shaped, 5-angled, angles with one row of prickles.

Use :—The fresh leaves, moistened with Eau-de-Cologne, are used to subdue inflammation of an elephantoid nature in the legs and other parts (Sakharam Arjun)

N. O. AMARANTACEÆ.

1032. *Celosia argentea, Linn*, F.B.I. IV. 714. Roxb. 228.

Vern. —Debkoti, sufaid múrgha, sarwari sirâli, ghogiya (H.) ; Sirgit arak (Santal), Salgâra, chilchil, sil, sarpankha (Pb) ; Swet murgâ (B.), Sarwali, ucha-kukui (Sind), Lâpadi (Guz) ; Kudhu, kurdu (Bomb.), Kúrdú kurada (Mar), Gurugu, panche chettu (Tel). (Several of these vernacular names imply white coxcomb).

Habitat :—Central and Northern India.

A glabrous erect annual herb, 1-3ft , stout slender, simple or branched. Leaves 1-6in , narrow, linear or lanceolate. Spikes solitary, few or many, 1-8 by ½-1in ; peduncles slender. Flowers ⅓-½in., white, glistening ; bracts much shorter than the acute sepals ; style filiform. The top of the spike sometimes branches out in a coxcomb form.

Uses :—The seeds are officinal, being an efficacious remedy in diarrhœa. The Revd. A. Campbell says the Santals extract a medicinal oil from them. The amount of oil extracted by ether amounts to only about 7 per cent. The author of the Muffaridat-i-Násiri states that 180 grains of the seeds with an equal quantity of sugar-candy taken daily in a cup of milk is a most powerful aphrodisiac. (Dymock)

1033. *C. Cristata, Linn.*, H.F.B.I., IV. 715; *Roxb.* 228.

Sans. :—Mayura Sikha.

Vern. :—Kokan, pîla-murghka, lál-murghka (H.); Mawal, taji khoros, bostan afraz, kanju, dhurá-drâ (Ph.); Lál-murga, huldi-murga (B.); Erra-kodi-utta-tota-kuru, Kodi-juttu-tota-kura (Tel.).

Habitat :—Throughout India, cultivated, and as an escape.

An annual erect glabrous herb Stem tall, branching. Leaves ovate lanceolate, sometimes 9in long and 3in. broad, sometimes varying from linea to ovate, acute or acuminate; spikes cylindric, very stout. Flowers densely imbricate $\frac{1}{6}$-$\frac{1}{4}$in Style filiform, lengthening after fruiting Utricle acute; dehiscence circumciss

Uses :—The flowers are considered astringent, they are used in cases of diarrhœa, and in excessive menstrual discharges (Stewart.) The seeds are demulcent and useful in painful micturition, cough and dysentery. (U. C. Dutt.)

The seeds of C cristata, Linn afford a greenish brown, drying oil, with an iodine value of 126 3. The insoluble fatty acids melt between 27° and 29°

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Regarding the genus Amarantus, Sir George Watt, in his Comml. Prod of India, p. 62, writes—

"There may be said to be two or perhaps three distinct groups of amaranths that are of economic value to the people of India These are the species cultivated in gardens and mainly, if not exclusively, as Pot-herbs: second, the wild species that are eaten as pot-herbs or Medicines: and third, the forms cultivated in fields and exclusively so as edible Grains. The last mentioned are by far the most valuable and hence may be taken up in greater detail than the others. But in passing it may be observed that the Indian species of this genus seem to be sadly wanting careful study and revision."

1034. *Amarantus spinosus, Linn.*, H. F. B. I., IV. 718.

Sans. :—Tanduliya.

Vern. :—Kanta nutia (Beng.); Kante mat (Dec.); Mulluk-kirai (Tam.); *Mah*: Kánte bhaji, kánte math Chanlai kánte-dár (H.); Mullan-chira (Malay); Mullu-tota-kura; Nalla doggali; Erra mulu goranta (Tel.).

Habitat:—Throughout India, in waste places, fields and gardens.

An annual erect glabrous herb Stem 1-2ft., hard, terete, leaf-axils with 5 straight spines $\frac{2}{3}$in. and under (J. D. Hooker). "Stem," writes Trimen (Ceylon), "polished, much-branched, cylindrical with a pair of very sharp divaricate opposite spines in leaf axils at the base of the bud or branch." This is what I find among the Konkan plants (K R Kirtikar) Leaves $1\frac{1}{2}$-$2\frac{1}{4}$ in., ovate-lanceolate, tapering to base, obtuse, spinous apiculate; entire undulate, glabrous above, slightly scurfy beneath, lateral veins numerous, prominent beneath, petiole $\frac{1}{2}$-2in Flowers very numerous, sessile, pale green, clusters dense, both axillary and in terminal interrupted spikes, male fewer than female Bracts linear, bristle-pointed. Perianth leaves 5, rather longer than racts, ovate, bristle pointed. Stamens 5, spreading; ovary ointed, pubescent. Styles 2, long, spreading, hairy (Trimen). ticle rugose, nearly equalling the sepals Flowers $\frac{1}{24}$in. ng, sepals of male acuminate, of female obtuse apiculate Stigmas 2. Seeds $\frac{1}{30}$in. diam., blacky shining, border obtuse, not thickened. The plant varies from green to red and purple. (J. D. Hooker.)

Uses:—"Considered light, cooling and a promoter of the alvine and urinary discharges. Root said to be, according to Bhâvaprakash, useful in menorrhagia." (Dutt's, p 221.) "Roots made into poultice are applied to buboes and abscesses for hastening suppuration." (Asst.-Surg. A. C. Mukerji.) The whole plant is used as an antidote for snake-poison, and the root as a specific for colic. It is also considered a lactagogue, and, boiled with pulses, is given to cows (I. P., p. 184). Assistant-Surgeon Amrita Lal Deb, of Howrah, recorded the root as a specific in gonorrhœa; also advocated its use in eczema (I. M. G., Nov. 1881).

1035. *A. paniculatus, Linn.*, H.F.B.I., IV. 718.

Syn. :—A. frumentaceus, *Ham.* Roxb. 663. A. Anacardana, *Ham.* A. farinaceus, *Roxb.*

Vern. :—Chuko, Bathu (B.); Rajagaro (Guz.); Rájgira (Dec.); Táj-e-khurus ; Bustan afroz (Persian) ; Chúa márs a, ganhar. (H.) ; Kahola-bháji (Bomb.).

Habitat :—Cultivated throughout India and up to 9,000 ft. in the Himalayas.

A tall robust annual. Stem 4-5ft., striate, sometimes thicker than the thumb, glabrous or puberulous. Leaves 2-6 by 1-3in , elliptic or ovate-lanceolate, acute or finely acuminate, base cuneate, petiole as long as the leaf. Spikes sub-erect, red, green or yellow, in dense thyrses squarrose from the long curved bracts, centre one longest. Bracts acicular, recurved, very much longer than the oblong-lanceolate acuminate sepals. Sepals 5. Stamens 5. Utricle circumciss, top 2-3 fid. Seeds $\frac{1}{20}$in. diam., yellowish white or pitchy black with a narrow thin border.

Uses :—Used for purifying the blood and in piles, and as a diuretic in strangury. (Baden-Powell.) Used in scrofula and as a local application for scrofulous sores ; administered in the form of a liquid. (Watt.)

Sir George Watt, in his Comml. Prod. Ind. (pp. 63-64), writes—

It is one of the most important sources of Food with the hill tribes of India, and there are both golden-yellow and bright purple conditions. The former is more frequent and seems therefore to be preferred ; most fields, however, contain a few red plants among the yellow. It is an exceedingly ornamental crop : the hillsides on account of the fields of this plant, become in autumn literally golden-yellow and purple."

" The grain has been analysed by Church (*Food-Grains of Ind.*, 107-9) and the average of three samples gave the nutrient ratio at 1 : 5-3 and the nutrient value 90. It has been estimated that one plant will produce 100,000 grains. Speaking of another sample, which Church attributed to *A. gangeticus*, but which may possibly have been one of them any forms of the present species, he remarks : " The analysis shows that we have in these seeds a food in which the proportions, not merely of albuminoids of total starch *plus* the starch-equivalent of the oil, but also of the oil itself, are very nearly those of an ideal or standard ratio." Visitors to the hills of India are inclined to smile at people who live very largely upon these minute grains, but they might with advantage to themselves use this extremely wholesome article of diet.

1036. *A. gangeticus, Linn., Var. angustifolia.* H.F.B.I., IV. 719 ; Roxb. 662.

Vern. :—Báns-patá-natiya (B.) ; Máti chulai (Bomb.) ; Lálsâg, chulâi-sâg, labra (Merwara).

Habitat :—Cultivated throughout India.

An erect glabrous annual herb stout handsome species, much cultivated, 2-3ft., leafy green, pink, rufuse liver-coloured or bright-red. Leaves 2-5in , very variable from linear-lanceolate, to rounded oval and 3in , diam. or deltoid ovate ; tip rounded or long and slender, but always obtuse and often notched, base elongate cuneate. Petiole equalling the blade. Clusters squarrose, crowded in the lower axils and forming a terminal spike ; bracts $\frac{1}{8}$in long Bracts awned subulate, equalling or exceeding the 3 lanceolate sepals and utricle Stamens 3. Utricle circumciss Seeds lenticular, pitch-black, $\frac{1}{20}$in diam , border acute

Use :—Used as an emollient poultice.

1037. *Ærua javanica, Juss.*, H.F.B.I., IV. 727.

Syn. :—Achyranthes incana, *Roxb.* 225.

Habitat :—From the Oudh Terai to the Punjab, Sindh, and Central India. The Deccan, from the Concan southward.

A semi-shrubby plant. Stem 2-3ft , branched, cylindric, covered with a thick coat of very dense stellate wool which is easily detached. Leaves nearly sessile alternate, 1-1$\frac{1}{2}$in , linear-oblong or oblong-spathulate, rounded, slightly emarginate or acute, with dense woolly coat like the stem Flowers white, sessile, uni-sexual, arranged in naked terminal panicles Bracts large, broadly ovate, acute, papery, veinless. Perianth leaves 5, rather unequal, lanceolate or oval, papery, densely covered outside with long woolly hair, stigmas 2, long. Seed lenticular, black polished (Trimen) ; style elongate ; flowers $\frac{1}{10}$ in. (J. D. Hooker.) Male flowers are said to be few.

1038. *Æ. lanata, Juss.*, H.F.B.I., IV. 728.

Syn. :—Achyranthes lanata, *Linn.* Roxb. 227.

Sans. :—Astmabayda.

Vern. :—Chaya (B); Bhui (Raj.); Bui, jari (Sind) ; Búi-kallam (Pb) ; Kul-ke-jar, khul (Duk.) ; Azmei, spirke, sassái

(Trans-Indus); Kapur-madhura (Mar.); Sirrú-púláy vayr (Tam.); Pindie-conda (Tel.).

Habitat :—Plains of Bengal, from Dacca and Behar westward to the Indus. The Concan, Central India and throughout the Deccan.

A very common perennial weed, often woody at base. Stems erect or prostrate, numerous, long, with slender branches, cylindric, more or less cottony hairy Leaves alternate, numerous, $\frac{3}{4}$-1$\frac{1}{2}$in. on main stem, much smaller, $\frac{1}{4}$ $\frac{3}{8}$in., on branches, oval or spathulate-oval, tapering at base, rounded or sub-acute at apex, entire, finely hairy-pubescent above, more or less white with cottony hair beneath. Petiole short, obscure Flowers very small, sessile, often bisexual, greenish white, in very small, dense, sessile axillary heads or spikes. Bracts shorter than sepals, ovate, obtuse, with membranous margins woolly with long white hairs outside. Stigmas 2, very short.

Uses :—The flowering tops of the above two species are officinal, and the roots are used in the treatment of headache, and by the natives of the Malabar Coast are regarded as demulcent

1039. *Achyranthes aspera*, *Linn.*, H.F.B I., IV. 730; Roxb. 226.

Sans. :—Apámárga, ágh ta, apangak ı.

Vern. :—Apáng (Beng. and Ass); Látjira, chirchira, chirchitta (H.); Aghára (Bom and Mah), Uttaréni, antisha, apa márgamu (Tel.); Náyuruvi (Tam); Kutri, phut kanda (Gujrat); Kataláti (Mal.); Utráni-gida uttaráne (Kan.); Aghedo (Guj); Margia (Sind.)

Eng. :—The Prickly Chaff-flower.

Habitat :—A shrub found all over India, ascending to 3,000 ft.

Annual herbs. Stems 1-2ft , erect, stiff, with long spreading branches thickened above nodes, striate, pubescent. Leaves few, usually thick, leathery, broadly ovate or orbicular, 3-5 by 2-3in., tapering to base, usually rounded, on short petioles, sometimes acute, or apex entire, but often very undulate, very finely and

softly pubescent both sides. Flowers in robust woolly pubescent spikes upto 18in long, numerous, stiffly reflexed against rachis, densely crowded. Bracts short, reflexed, ovate, membranous, with a long very acute point ; bractlets very sharply spinescent (very hard in fruit), with a broad membranous wing at base. Perianth-leaves about $\frac{1}{8}$in., oblong oval, acute, glabrous and shining, with a narrow white membranous margin. Stamens 5, staminodes, large, truncate, fimbriate. Fruit very small, oblong cylindrical, truncate, nearly smooth, brown, enclosed in a hard perianth.

A very common weed throughout the Tropics in India, Ceylon, in waste land and in grass. Trimen observes that the perianth containing the fruit disarticulates from the rachis above the bract carrying away with it the spinescent bractlets by which it becomes attached to other objects and is transported. Flowers greenish white.

Uses :—It possesses valuable medicinal properties as a pungent and laxative, and is considered useful in dropsy, piles, boils, eruptions of the skin, etc. The seeds and leaves are considered emetic, and are useful in hydrophobia and snake-bites. (T. N Mukerji's Amsterdam Catalogue.) The dried plant is given to children for colic and also as an astringent in gonorrhœa. (Stewart's Punjab Plants.) Major Madden says that the flowering spikes are regarded as a protective against scorpions, the insects being paralysed through the presence of a twig. The ash yields a large quantity of potash, rendering it useful in the arts as well as in medicine. Mixed with orpiment this ash is used externally in the treatment of ulcers, and of warts on the penis and other parts of the body. (U. C. Dutt.) Sesamum oil and the ash (*apamarga taila*) are used in the treatment of disease of the ear, being poured into the meatus. Dr. Bidie says : " Various English practitioners agree as to its marked diuretic properties in the form of a decoction." Dr. Cornish reports favourably, having found it efficacious in the treatment of dropsy. Dr. Shortt reports on its use as an external applicant in the treatment of the bites of insects ; and Dr. Turner calls attention to it as a remedy

in snake-bite. (Pharm. Indica.) Used in cases of abscess ; its ashes are used in cases of asthma and cough. (Ibbetson's Gujrat). In Sind, it is used by the native foresters as an application to wounds caused by Babool thorns (Murray, p. 101). To an infusion of the root is ascribed a mild astringent virtue (Honigberger, Vol II , p 222). The flowering spike made into pills with a little sugar is a popular preventive medicine in Behar for persons bitten by rabid dogs. (Balfour.) As an ash, however, there seems no reason to think it possesses any virtues other than those of the simple alkali of our shops.

" The drug may be useful in all conditions arising from nervousness Thus it is used as a talisman in hysteria, and I know personally of cases that were benefited by it. How it acts in such a way, I cannot say ; it may be possible that the good effects are obtained by ionisation only, if anything of such nature there is in the drug But that it is undoubtedly useful in hysteria and such nervous disorders, there is no gainsaying. In hysteria what we find is that there is extreme nervous sensibility attended with muscular contraction, either violent or mild, it is preceded generally by irregular heart or palpitation" (Dr. Lal Mohan Ghoshal, in ' Food and Drugs ' for Oct. 1912 pp. 84-85.)

1040. *Alternanthera sessilis*, *Br.*, H.F.B.I., IV. 731.

Syn. .—Achyranthes triandra, *Roxb.* 227

Vern. :—Moku-nú-wanna (Singh.) ; Ghardugbi (Rohilkhand); kánchari (Bomb.).

Habitat :—Throughout hotter India in damp places, ascending the Himalaya to 4,000 ft.

A prostrate or ascending, nearly glabrous, herb, branching from base, 6-18in Leaves opposite, nearly sessile, narrowly oblong or ovate, 1-3in , obtuse. Flowers minute, white, crowded in shining, very short head-like sessile axillary spikes. Perianth scarious 5-parted ; segments acute. Stamens 5, the alternate ones sometimes without anthers ; filaments united at base ; anthers 1-celled. Ovary ovoid, notched at top ; style very short, stigma capitate. Fruit a dry, flattened utricle, enclosed by the perianth and containing a single seed.

Use :—It is largely eaten in Ceylon as a vegetable, especially by mothers to increase the flow of milk ; also used as a wash for the eyes. (Watt.)

N. O. CHENOPODIACEÆ.

1041. *Chenopodium album*, *Moq.*, H.F.B.I., V. 3, Roxb. 260.

Syn. :—C. viride, *Linn.*

Sans :—Vastuk.

Vern. :—Bathu sâg or bathuâ sâk, chandan betu (B Bathûa, bâthû, jansâg, lunak (Pb.) ; Bethuá, charái, jansâg, H.) ; Bhatua, arak' (Santal ; Châkwat, ghânen, (Bomb); Jhil (Sind) ; Khuljeh ke baji (Duk) ; Parupu kire (Tam) ; Pappu kura (Tel).

Eng. :—The white goose-foot.

Habitat :—Common throughout India

Erect or ascending, scentless herbs, mealy or green. Stems 1-10ft., rarely slender or decumbent, angled, often striped green, red or purple. Leaves extremely variable in the cultivated forms, 4-6in. long, with petiole sometimes as long or longer ; rhombic, deltoid, or lanceolate, acute or obtuse, entire, toothed or irregularly lobulate, upper narrower, more entire. Clusters in compact or lax panicles ; spikes, which in cultivated forms become thyrsoid. Sepals 5, herbaceous (not succulent in fruit). Seeds very vertical. Forms vary from green to red.

Use :—Considered laxative and recommended for use by Sanskrit writers in the form of pot herb in piles. (U. C Dutt.)

Chemical investigation of the composition of Chenopodium oil.

There is a pronounced increase in specific gravity and decrease in optical rotation after samples have been kept for a year at the ordinary temperature. For example, in the case of one oil with a specific gravity of 0·9700 and a D= —6·20, at 25°C, the corresponding values after a year were sp. gr. 0·9804 and a D= —5·5°. When the oil was kept in a refrigerator these changes were less pronounced. The formation of the glycol produced on hydrating ascaridol with ferrous sulphate has been found to correspond to the same re-arrangement of the molecule which takes place when ascaridol is heated. In addition to this glycol, two other crystalline products were also formed. One of these, termed B-glycol, melted in the anhydrous state at 108°

105°C. It crystallised with one mol. of water and had the composition $C_{10}H_{18}O_3+H_2O$. When warmed with dilute sulphuric acid it was decomposed, with the formation of thymol. The other new body was an erythritol, melting at 128° to 131°C, after drying *in vacuo*, and having the composition $C_{10}H_{20}O_4+H_2O$. When boiled with dilute sulphuric acid, it was decomposed, the products of decomposition including a ketone with a strong odour of menthone, and a crystalline phenolic substance, melting at 80° to 81°C. The formation of more than one glycol by the hydration of the re-arrangement product of ascaridol may be explained by adopting the view of Wallach, whose results indicate that ascaridol is a 1—4-and not a 3 6-peroxide. Oxidation of the erythritol yielded an acid, $C_{10}H_{18}O_6$, which was regarded as one of the modifications of *a d*-metylisopropyl *a a*-dihydroxyadipic acid differing in its properties from the two modifications previously described by Wallach Oxidation of the *a*-glycol yielded an acid agreeing in its reactions with the structure of 1—4 cineolic acid (J. Ch. I. April 15th, 1913, p. 379.)

1042. *C. Cotrys, Linn.*, H.F.B.I., V. 4.

Eng.:—The Jerusalem Oak.

Habitat:—Temperate Himalaya, from Kashmir to Sikk'm; Peshawar and Bombay. A weed in fields.

Very aromatic, erect, glandular, pubescent herbs Stem grooved and ribbed, 6-18ft., stout, slender. Branches spreading and recurved Leaves 1-3in., very obtuse, lower leaves petioled, ovate-oblong, deeply sinuate, or lobulate, upper oblanceolate, more entire. Petals variable. Cymes spreading and recurved, short, branched. Flowers solitary or clustered, minute Embryo incompletely annular.

Use:—It has been used in France with advantage in catarrh and humoral asthma The officinal preparation is an oil (U. S Dispensatory.)

Used as a substitute for *C. anthelmenticum*, and to possess the same properties as those of *C. ambrosioides*. (Watt, II. 267.)

1043 *C. Ambrosioides, Linn.*, H.F.B.I., V. 4.

Eng.:—The sweet pig weed; Mexican Tea.

Vern.:—Chandan batavá; Vasuki (Bomb.).

Habitat:—Bengal, Sylhet and the Deccan.

A strongly aromatic glandular rank herb, erect, puberulous. Branches numerous, strict. Leaves shortly petioled, oblong or lanceolate-obtuse, sinuate toothed, upper entire, clusters in

slender axillary and terminal long slender simple or panicled spikes of small clusters Sepals closing the utricle. Seed horizontal, smooth, shining; margin horizontal. Wight remarks that the flowers are polygamous at Coimbatore. (J. D. Hooker.)

Uses :—This is said to afford an essential oil to which the tonic and antispasmodic properties of the plant are attributed. It is commonly reported that this plant is used as a substitute for the officinal *C. Anthelminticum*, having in a milder degree the anthelmintic properties of that plant It is employed in pectoral complaints and enjoys the European reputation as a useful remedy in nervous affections, particularly chorea Officinal preparation an infusion It is remarkable that the properties of this plant should be practically unknown to the people of India. (Watt. II 267)

1041. *Beta vulgaris, Linn.*, H.F.B.I., V. 5.

Syn. :—B. benghalensis, *Roxb.* 260

Vern. :—Bit palang (B.); Lebleboo (Pb.); Pâlak (H.).

Habitat :—Largely cultivated in Bengal and Upper India.

A succulent annual or perennial glabrous herb Stem 1-3ft, erect, furrowed. Lower or root leaves ovate or oblong-obtuse, often trowel-shaped, base cuneate or cordate, decurrent on the petiole, margin waved, upper or cauline, short incurved, rhombic-ovate, oblong-ovate or lanceolate Flowers 2-sexual, sessile, solitary or 2-3-adnate, in axillary spiked or cymose clusters Spikes 6-18in., slender; clusters remote Bracts narrow, acute. Perianth urceolate, 5-lobed, covering in fruit by their enlarged hardened bases Sepals oblong-obtuse, with membranous margins, thickened at base in fruit. Ovary depressed, sunk in the fleshy annular disk. Style short, Stigmas 2-4-subulate. Utricle adnate to the disk and base of perianth Seed horizontal, testa thin, albumen floury, Embryo annular.

Use :—The seeds have cooling and diaphoretic properties. Bellew says that the fresh leaves are applied to burns and bruises. (Watt.,

The ethereal extract of the dry matter of the common mangel was examined and found to contain triglycerides, free fatty acids, and two neutral subs-

tances. The free and combined fatty acids consisted largely of palmitic, oleic, and erucid acids, while the two neutral substances were of phytosterol nature, and gave results on analysis corresponding with the empirical formulæ $C_{31}H_{58}O_2$ and $C_{29}H_{48}$ and O_2 respectively. (J. Ch. I. 31. 5. 1912, p. 501.)

1045. *Spinacia oleracea, Linn*, H.F.B.I., V. 6.

Syn. :—S. tetrandra, *Roxb.* 718.

Vern. :—Palak (H.); Palang (Beng.), Isfanaj Vusaleykiray (Tam.); Dum-pa-bachchali, mattur bachchali (Tel.); Pâlak bhâji (M.).

Habitat :—Cultivated throughout India.

Annual deltoid, ovate, acuminate, acutely broadly pinnatifidly lobed, erecth erbs. Leaves attenuate. Flowers dioecious, ebracteate, males in terminal leafless spikes; females in axillary clusters. Male :—Sepals 4-5, herbaceous, simple. Stamens 4-5, filaments capillary. Female:—perianth subglobose, 2-4-toothed. Fruiting perianth free, 2 spinous. Fruiting enclosing the Utricle, coriaceous, unarmed or with 2-3 dorsal spines Stigmas long, filiform, connate below Utricle hard, compressed, adnate to the perianth. Seed vertical, testa thin, albumen floury. Embryo annular.

Use :—The seeds are laxative and cooling and useful in difficult breathing, inflammation of the liver, and in jaundice. (Taleef Sherif. They yield a fatty oil. The green plant is believed to be useful in urinary calculi. (Sakharam Arjun.)

Regarding its chemical composition, the authors of the *Pharmacog. Ind* write –

Chem. comp.—Besides a large quantity of mucilage, spinach contains so large a proportion of nitrates, that the water in which it has been boiled may be used for making touch-paper. The following figures give the mean percentage composition of three samples of spinach recorded by Konig :—

Water	88·47
Nitrogenous matter	3·49
Fat	0·58
Sugars	0·10
Nitrogen-free extractive	4·34
Fibre	0·93
Ash	2·09

Anhydrous spinach contained, as the mean of three analyses of different samples,—

Nitrogen	4·94
Carbohydrates	37·93

1046. *Kochia indica, Wight,* H.F.B.I., V. 11.

Syn. :—Panderia pilosa, *H. f. and T.*

Vern :—Kaura ro, bui (Pb).

Habitat:—North-West India, from Delhi to the Indus common. Dekkan ; salt soils at Coimbatore.

An annual herb, erect and softly villous, diffusely branched from the base. Branchlets divaricate, long. Leaves small, elliptic or linear-oblong, acute. Wings of fruiting perianth short, broadly triangular-ovate, obtuse, thick, nerveless, much shorter than the diameter of the disk. Wight states that flowers are sometimes male only, and I think it probable that fertile males are on different plants from the female or hermaphrodite. (J. D. Hooker.)

Use:—The plant is employed medicinally in the Punjab (Stewart). Used as a vascular (cardiac) stimulant in cases of weak and irregular heart, especially when following on fevers, (Dr. Perry, in Watt's Dic.)

1047. *Salicornia brachiata, Roxb.*, H.F.B.I., V. 12. Roxb. 28.

Vern.:—Oomarie Keeray (Tam.); Koyalu (Tel.).

Habitat:—Bengal, in salt marshes; and Tanjore.

A semi-shrubby, leafless, fleshy-jointed, seacoast marshy plant. Stem woody, 12-18in., thick at the base, much branched, more or less erect, very much branched. Branches $\frac{1}{6}$-$\frac{1}{4}$in. diam. Joints $\frac{1}{4}$-$\frac{1}{2}$in., rather slender, slightly dilated and 2-toothed at top. Spikes 2-3in., slender, cylindrical. Flowers 3-nate. Stamen 1. Utricle ovoid, subacute, style distinct. Seed pale-brown, hispid, with white hair. Testa thinly coriaceous. Embryo hooked, both ends pointing downward.

Use:—This is one of the numerous sources of the alkaline earth, *sajji*, used in medicine and in the arts. (Watt.)

1048. *Suæda fruticosa, Forsk.*, H.F.B.I., v. 13.

Syn. :—Salsola fruticosa, *Linn.*

Vern. :—Lonuk, chotee lanee, usak lanee (Pb.); Morasa (Mar.); Ushuklani (Sind.); Zimeh (Pushtu).

Habitat :—North-West India, from Delhi, and throughout the Punjab, westward to the Indus, common in the plains.

A perennial herb, sub-erect or decumbent. Stem and branches usually slender, erect or divaricate. Leaves ½-terete, linear or ellipsoid, obtuse (very variable) ⅛-½in long. Spikes slender, leafy. Flowers minute, axillary, usually 2-sexual, bracteate, and 2-bracteate. Perianth short, subglobose. 5-lobed or partite; lobes or segments equal or unequal, simple or gibbous or subwinged. Stamens 5, short; Styles 3, short. Fruit, utricle included, membranous. Seeds vertical or horizontal; testa black, shining.

Uses :—This is one of the plants from which *sajji-khar* is prepared. The woolly excrescenses on the tips of its branches, mixed with an empyreumatic oil, are used as an application to sores on the backs of camels The leaves are applied as a poultice to ophthalmia, and used, infused in water, as an emetic by Sindhis. (Stewart and Murray)

1049. *S. monoica, Forsk.*, H.F.B.I., v. 13.

Vern. :—Umari Nandi (South Arcot)

Habitat .—South Deccan; on the seacoast at Tinnevelly and Tuticorin.

Shrubby, branches suberect, leaves linear flattish obtuse, spikes leafy panicled, flowers axillary 2-3-nate polygamous, bracts minute scarious entire, fruiting perianth obovate-oblong, lobes obtuse incurved, styles 2-5 short, seed vertical, testa black shining. I am in great doubt about this Indian plant, which in a dry state is difficult to distinguish from *S. fruticosa and vermiculata.* (J. D. Hooker.)

Use :—It is put to the same uses as the preceding. From it also Sajji khar is prepared. *Indian Forester* for Nov. 1914, contains a note on Saltworts of South Arcot from the pen of Mr. T. P. Ghose, who says—

"The plants are dried in the sun for two or three days, care being taken not to overdo this. They are then burnt in round pits 3 to 4 feet in diameter and 2 to 3 feet in depth. As the stuff burns more of it is continually added to the burning mass which is always kept stirred. The fused alkali now comes out as a liquid and collects at the bottom of the pit in a separate mass which on cooling forms the "barilla" ready for export."

1050. *Salsola Kali, Linn.*, II.F.B.I., V. 17.

Vern. :—Sajjî bûtî (Pb.).

Habitat :—N.-W. Punjab, common in Baluchistan.

Annual spinescent herbs; pubescent, scabrid or glabrous, usually glaucous. Stem 6-18in., rarely erect, branches soft and pithy within, striped green white, diffusely branched from the base. Leaves short, subulate, lanceolate from a ½-amplexicaul base, thick rigid, pungent, ½-1½in., spreading and recurved. Flowers 1-3 together, axillary or subspicate, bracts sepals subequal pungent. Fruiting perianth cartilaginous, ¼-½in., diam. transparent, often rose coloured; base rounded, wings obovate, orbicular or reniform, scarious, sometimes obsolete. Seed adherent to the utricle.

Use :—This plant is used in the manufacture of *sajji*.

1051. *Basella rubra, Linn.*, II.F.B.I., V. 20. Roxb. 275.

Vern. :—Pói, lál-bachhe (H.); Rakto-púi, púisák (B.), Lal bachle-kí-bhájí (Duk.); Shirappu-vasla-kire (Tam.); Alla-batsalla, pedda-mattu-neatku-batsala, erra-allu-bach-chali (Tel.); Chovva-una-basella-kira (Mal.); Kempa-basale (Kan.); Mayák bhaji, Velgond (Bomb.).

Habitat :—Throughout India under cultivation.

A much-branched, twining fleshy herb, glabrous. Leaves petioled, broadly ovate, or cordate-orbicular, 2-7in. diam., narrowed into the petioles. Spikes 1-6in., axillary peduncled, simple or branched. Flowers red. Fruit size of a pea, purple when mature.

"Roxburgh regards two varieties of this, a red and a regen-

stemmed one, as wild in India, and adds three cultivated sorts, a red and a white stemmed that are raised from seed, and differ only in luxuriance from the corresponding wild forms; and lastly a large sort (*B. lucida*, L., and *cordifolia*, Lamk.), which is the most cultivated, and is always increased by slips, it is the largest form, covering trellises and native houses, and is the most succulent, and more used as a pot-herb than the others." (J. D. Hooker)

Uses —The juice of the leaves is used in catarrhal affections of children (Dymy). Demulcent and diuretic, useful in gonorrhœa and balanitis (Asst. Surg. J. N. Dey, Jeypore, in Watt, I. 404.)

1052. *Basella alba, Linn.* H.F.B.I., V. 21. Roxb. 275.

Eng. —White basil or Indian Spinach.

Sans. —Vishwa-tulasi, Potiki, Upodika.

Vern. —Poí, nyal-ki-bhaji, sufed-bachla, safed tulsi (H.), Sufed-bachlá-ki bháji (Duk.), Wahlea (Mar.), Vasla-kire, Caujang kire, Vellapachalai (Tam.), Alubichebali, karu-bachchali, polum-bachchali, pedda-bach-chali (Tel.), Bili-bâsale-balli (Kan.), Basella-kira (Mal.).

Habitat —Cultivated all over India.

Uses —The leaves are made into a pulp used to hasten suppuration.

The juice of the leaves which is demulcent and cooling, is a popular application to allay the heat and itching of urticaria arising from dyspepsia, an affection which the Hindus consider to be indicative of bile in the blood. The boiled leaves are also used as a poultice.

N. O. PHYTOLACCACEÆ.

1053. *Phytolacca acinosa, Roxb.*, H.F.B.I., IV. Roxb., 389.

Vern.:—Jirrag (Kumaon); Lúbar, búrgu, denturû, rinsâg, jirka, matazor, sarunga (Pb.).

Habitat :—Temperate Himalaya, from Kashmir and Hazara to Bhutan.

A nearly glabrous, erect herb. Stems 3-5ft., robust, succulent. Leaves alternate, broadly lanceolate, 6-10in., entire long-pointed, narrowed into a short stalk ; stipules none. Flowers ⅓in. diam., pale-green, 2-sexual, in leaf opposed, cylindrical ; racemes 2-6in., long ; bracts linear. Perianth 5, nearly separate segments. Stamens 8 10, filaments united at the base ; anthers 2-celled, soon falling off. Ovary composed of 6 8 carpels arranged in a whorl, each with a short recurved stigma. Fruit dark-purple, succulent, crowded in an erect, thick raceme, 1-8in. long ; carpels separating when ripe, each containing a single black shining kidney-shaped seed.

Uses :—The natives do not appear to use any part of the plant as a medicine, but in every district in which it is cultivated they seem to be fully aware of its power of producing delirium. It is commonly stated that the poisonous property is only destroyed by complete boiling The narcotic virtues of certain American species are well-known, and it is possible that the Indian plant may be equally valuable. (Watt)

N. O. POLYGONACEÆ.

1054. *Calligonum polygonoides, Linn.*, H.F.B.I., v. 22.

Vern. :—Balanja, berwaja, tatuke (Trans-Indus) ; Phok, phog, phogalli (flowers) ; tirni (root) (Pb. and Sind).

Habitat :—Punjab, Sind and Rajputana.

An almost leafless shrub or small tree with terete pale flexuous branches and very slender branchlets. Leaves most minute, bristles at the distant nodes. Flowering branches about as thick as a crow-quill or less ; internodes 1-1½in. long. Pedicels ⅛-⅛in., sepals 5, flat, about as long. Stamens 12-18. Ovary 4-angled. Fruit ½-1in diam., a nut, 4-angled, oblong, hard, densely clothed with many series of branching intricate, rigid, red-brown flexuous bristles ; seed about ¼in.

Use :—The roots are bruised, and, boiled in combination with Catechu (Kath), used as a gargle for sore-gums. (Murray)

1055. *Polygonum, aviculare Linn.*, H.F.B.I., V. 26.

Vern :—Indranee, bigbund, hunraj (Hind.); Kesrú, bandúke (Pb.); Miromati (Sans); Machooti (Pb.); Drob (Kash).

Habitat :—Western Himalaya, from Kashmir to Kumaon; Rawal Pindee and the Deccan

A glabrous herb Root mostly annual Branches procumbent or ascending, grooved, leafy. Leaves elliptic or elliptic-oblong or lanceolate, obtuse flat, nerveless; stipules shorter than the internodes, hyaline, lacerate, many-nerved Flowers axillary; pedicel short, pointed at the tip Perianth obovoid, cleft to near the base; nut ovoid, obtusely 3-gonous, minutely rugosely striolate

Uses —In Chumba, the dried root is applied externally as an anodyne, and officinal in Kashmir (Stewart) The seeds are also said to be powerfully emetic and purgative In Europe, the whole plant is considered vulnerary and astringent In the *Year Book of Pharmacy* for 1874, an interesting account is given of the reputed value of the decoction of the herb in cases of vesical calculus A case is described in which a dose of two tumblerfuls of the decoction is said to have been followed by almost immediate relief.

'It was used by the ancients to arrest hemorrhage, the seeds were considered to be laxative and diuretic and to arrest defluxions. For burning pains in the stomach the leaves were applied topically, and were used in the form of a liniment for pains in the bladder and for erysipelas. The juice was administered in fevers, tertian and quartan more particularly, in doses of two cyathi, just before the paroxysms. Arabian physicians consider it to be cold and dry, and reproduce what the Greeks have said concerning its medicinal uses.

In India, the plant is still used by the Hakims in the diseases named by Dioscorides.

In our own times Polygonum root has been used as a febrifuge in Algeria, and has been reported upon as being an excellent remedy for chronic diarrhœa and stone in the bladder. Its value has apparently been much exaggerated. (J. R. Jackson, *Amer. Journ. Pharm.*, 1873, p. 247.)

In the *Lancet*, (1885, p. 658) it is said to be used in Russia, under the name of Homeriana, as a popular remedy in lung affections. Dr. Rotschinin, who has experimented with the drug, found it really valuable in several cases of

bronchitis, two of which were capillary; also in three cases of whooping cough. It was tried in phthisis, but no definitely satisfactory results were obtained. A tumblerful of the decoction was given three times a day." (Pharmacog. Ind., Vol. III. p. 149.)

1056. *P. plebejum, Br., Var. indica,* H.F.B.I., v. 27.

Vern. :—Rânîphûl (Santal).

Common in central and S. India, also in the Bombay Presidency.

Branches uniformly spreading all round from the crown and leafy, internodes short. Leaves $\frac{1}{4}$-$\frac{1}{2}$ in. long, linear or obovate-oblong, flat, obtuse or apiculate; stipules very short. Flowers crowded in the axils, pedicels shorter than the perianth or none. Sepals broad, 2 outer acute. Nutlets $\frac{1}{12}$ in. (Duthie.)

Use :—The root is given for bowel complaints (Campbell).

1057. *P. viviparum, Linn.*, H.F.B.I., v. 31.

Syn. :—P. bistorta, *Linn.*

Vern. :—Maslûn, bîlaurî, anjabar (Pb.).

Habitat :—Alpine and Sub-alpine Himalaya, from Kashmir to Sikkim, etc.

A perennial, glandular herb. Stem solitary, 4-12in., slender simple, erect, from a woody root-stock as thick as the thumb or less. Root leaves long-petioled, linear or linear-oblong, acute, obtuse or cordate; 1-6in., coriaceous, sometimes pubescent, or even tomentose beneath. Cauline leaves sessile, erect Spikes 1-4in. long, solitary, erect, slender. Bracts ovate, acuminate. Perianth very variable in size. Flowers suberect, pink, the lower re-placed by bulbils. Stamens included or exserted. Styles filiform, slender, free and included or greatly lengthened and connate below. Nut very small, trigonous, or biconvex.

Uses :—The root is a useful astringent and said to be applied to abscesses; a decoction may be used in gleet and leucorrhœa as an injection; makes an excellent gargle in relaxed sore-throat and spongy gums, and an excellent lotion for ulcers. Mixed with Gentian, it is given in intermittent fevers; also useful in passive hæmorrhage and diarrhœa (Dr. Stewart).

1058. *P. glabrum, Willd.*, H.F.B.I., V. 34 ; Roxb 334.

Vern.—Sauri arak, jioti (Santal); Laiborna, bih agui, bih langaui, patharua (Assam); Rakta rohida sheial (Bomb); Atalaria (Tam.)

Habitat:—In ditches, etc, from Assam, Sylhet and Bengal westward to the Indus and Sindh, and southward to Burma, ascending the Himalaya to 6,400ft in Garhwal

Glabrous herbs Stem 2-5ft, stout, slightly branched, somewhat swollen above nodes, shining purplish-red. Leaves usually large, 3-10in, linear-lanceolate, much tapering at both ends, entire, glabrous or slightly rough with minute prickles, minutely glandular, midrib prominent, broad, lateral veins numerous, pellucid Petiole very short ($\frac{1}{8}$-$\frac{1}{2}$in), stout, stipules about 1in, membranous, veined, truncate, not ciliate Flowers bright-pink, numerous all the year round on short glabrous pedicels; racemes 1-3in, erect, bracts short, truncate, glabrous. Perianth $\frac{1}{8}$-$\frac{1}{4}$in., long, pink or white, not glandular, segments broadly oval, acute. Stamens usually 8 (sometimes fewer), shorter than perianth Styles 2 divergent, sometimes 3, united above the middle; stigmas globose. Nuts black shining, $\frac{1}{8}$in in diam, usually rounded and flattened, 3 angled in the 3 styled flowers

It is difficult to separate this from smooth forms of P. Persicaria, of which it is the tropical representative, it is, however much larger less branched, with more attenuate leaves brown when dry, and normally ciliate bracts and stipules (Hooker)

Uses.—An infusion of the leaves is used by the country people of Bombay to relieve pain in colic (Dymock) In Chutia Nagpur, it is employed as a cure for "stitch in the side," and in Assam as a remedy for fever (Watt)

1059. *P. persicaria, Linn*, H.F.B.I., V 35.

Habitat.—Western Himalaya, Kashmir, etc.

Use:—It may be put to the same uses as the other species of this genus.

Annual, erect or ascending, leaves subsessile, elliptic-oblong or lanceolate eglandular, stipules usually hirsute and ciliate,

racemes oblong dense-fid., bracts ciliate, pedicels glabrous, perianth red eglandular nerves slender, stamens usually 6.

Chem. Comp.—It has the following percentage composition:—Moisture 10·07, ash 6 52, ethereal oil 0 053, wax 1.92, tannin 1·52, mucic and pectic substances 5·42, calcium oxalate 2 18, total nitrogen 3·97, ammonia 0·31, cellulose 27 61, volatile acids 0·0464, sugar 3·24. The ash contains Na, K, Mg, Ca, Fe, Cl, So_3, Si O_2, P_2O_5, and several quantities of Mn. It was dissolved by light petroleum, consists of an easily hydrolysable phytosterol oleate along with free phytosterol, and a solid acid melting at 55°C. The ethereal extract contains chlorophyll and a resin, and the alcoholic extract, sugar, tannin, gallic acid, quercetin and phlobaphen; the latter is hydrolysed by dilute sulphuric acid forming a sugar which gives an osazone melting at 177°-178°C. Only traces of volatile aminic bases are present, but considerable quantities of ammonia, the bases precipitated by phosphotungstic acid are two or three in number and differ in their solubility in chloroform and amyl alcohol. The ethereal oil is noteworthy as consisting principally of volatile fatty acids, especially acetic and butyric acids; the remainder is made up of a camphor-like solid with an agreeable odour (*persicariol*) and a liquid, not further investigated (J. S Ch. I Jan 15, 1902, p 66.)

1060. *P. barlatum*, *Linn.*, II.F.B.I., V. 37.

Syn.:—P. rivulare, *Kœn.*, Roxb. 335

Vern.:—Narri (Pb); Bekh-unjubaz (P.); Atalari (Tam.); Kondamalle, niru ganeru (Tel.); Velluta modela mukku (Malay); Dhâkṭî sheral (Mar.); Mangarleta (Jaspur).

Habitat:—Throughout the hotter parts of India, from Assam to the Indus, and southwards to Malacca, Penang and Ceylon.

Stems erect, glabrous, 1½-3ft Leaves numerous, 5-6in, linear-lanceolate, nearly sessile, tapering to both ends, acute, finely hairy on both sides and at margins; stipules 1½in., usually longer than internodes, strigose with long hair, ciliate, with strong coarse hair, as long as the tube Flowers on short slender pedicels. Racemes 2-4in, erect, slender, rather lax. Bracts strongly pectinate Perianth white, without glands. Styles 3. Stamens 5-8. Fruit a nut, triangular, black shining.

Uses:—The seeds are employed in Malabar and Canara to relieve the griping pains of colic (Dr. Stewart, also Dr. Ainslie). In Patna, the root is used as an astringent and cooling remedy (Irvine). In China, a decoction of the leaves and stalks is said to be used as a stimulating wash for ulcers (Watt).

1061. *P. Hydropiper, Linn.*, H F.B.I , V. 39.

Vern. :—Packur-mul (B.)

Habitat:—Plains and hills of India, in wet places, from Assam, Silhet, Chittagong and Bengal to N-W India, and Madras.

A glabrous, rather robust annual Roots tufted or shortly creeping. Stems erect and branches ascending, rather stout leafy, 12-18in. high , always glabrous, often glandular , nodes often swollen Leaves rarely more than 3in long, sessile or petioled, lanceolate or oblong-lanceolate, glabrous or with the midrib scabrid beneath Stipules glabrous or sparsely strigose, very shortly ciliate Racemes flexuous, leafy at base, filiform, decurved, interrupted ; bracts glabrous, glandular or not. Perianth pinkish , mouth naked or minute, ciliate. Nut usually trigonous, opaque, finely granulate, sometimes flat

Uses —In China. the juice is used for itch, and also as a diuretic, carminative and anthelmintic (P.J 20-12-84).

The root is stimulating, bitter and tonic, and is used for these properties in Patna (Irvine.) O'Shaughnessy states that the whole plant is reputed to be a powerful diuretic, but to lose its activity on drying.

"This plant possesses very acrid qualities, and is hot and biting to a degree, so that no animal will eat it, even insects avoid it ; and it is said that when dried and laid amongst clothes no moth will touch them Its bruised leaves are still used in villages instead of a mustard poultice, and they are put into the mouth to cure toothache. It is said to be a powerful diuretic, and a water distilled from it was formerly used in some nephritic complaints." (Sowerby's *English Botany*, Vol VIII, pp. 71-72)

***Chem. comp.*—Dr. C. J. Rademarker (Amer. Journ. Pharm , Nov 1879) separated from P. Hydropiper a crystalline principle which he named Polygonic acid. H. Trimble and H. J. Schuchard (Am. Journ. Pharm., Jan. 1885) re-examined the plant with following results :—They found that the peculiar pungent principle, although present in a weak alcoholic tincture, disappeared on distillation, the pungent taste of the herb being absent from the distillate and the residue in the retort.**

From these experiments they conclude that the active principle is decomposed on the slightest heating, and that the only proper preparation of the drug would be one made without the application of heat. They prepared the polygomic acid of Dr. Rademaker, and conclude from their experiments that it is only a mixture of impure tannic and gallic acids. (*Pharmacog. Ind.* III pp. 150-151.)

1062. *P. alatum, Ham.*, H.F.B.I., V. 41.

Syn :—P Nepalense, *Meissn.*

Vern. :—Sat balon (Pb.).

Habitat :—Throughout the Himalaya, from Sikkim to Kashmir. Khasia Mts, Nilghiri Mts, Canara; and the Bababudan Hills.

An annual herb. Stem 1-2ft, long, rarely creeping for a short distance at the base, erect and sub-simple or branched from the base, erect, tall or low, glabrous or sparsely hairy. Branches 6-8in. high, slender or rather stout, flaccid or stiff. Leaves large or small ($\frac{3}{4}$-1$\frac{1}{2}$in. long), ovate or deltoid, ovate-obtuse or acute or narrowed into a broadly winged, often amplexicaul, petiole, glandular or not Stipules tubular, obliquely truncate. Peduncles glandular, hispid at tip. Involucre-leaf often longer than the head, sessile, ovate, cordate, obtuse or acute. Heads usually with an involucral leaf, $\frac{1}{4}$-$\frac{3}{4}$in Bracts ovate-lanceolate, glabrous, not ciliate. Perianth 1-5-fid, stamens 7-8, included, sepals white or pale-purple, membranous, sub-equal, very variable in size Style long, with one or two long arms and capitate stigmas. Nut varying in size, 1-in., the same head, closely invested and cohering with the thin perianth-tube and crowned with the lobes, bi-convex or tri-gonous, striate and punctate.

Use :—In Kangra its leaves are applied to swellings (Stewart).

1063. *P. Molle Don Brod.*, H.F.B.I., IV. 50.

Habitat :—Central and Eastern Himalaya; Nepal, Sikkim, Mishmi Hills.

Shrubby, erect, 3-6ft. Stems angled, hairy, becoming tomentose in the upper parts. Leaves stalked or the upper nearly sessile, oblong-lanceolate, 4-9in. by 1$\frac{1}{2}$-3$\frac{1}{2}$in, long-pointed, upper

surface glabrous or thinly hairy, the lower softly and densely hairy, especially in the mid-rib and nerves. Stipules tubular, very long, hairy, strongly nerved, pointed. Flowers white or tinged with pink, in terminal, usually erect, panicles, 6-18in. long. Bracts flat. Perianth 5-parted, ¼in. diam. Stamens 8. Styles 3, free nearly to the base Nut 3 angled, pale-brown.

Use.—It is used for the same purposes as *P. Hydropiper* and *P. alatum*. It is astringent

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1061. *Rheum spiciforme, Royle*, H.F.B.I., v. 55.

Habitat:—Western Himalaya; in the drier ranges, from Kumaon westwards to Western Tibet

A stemless herb. Root short or long, thicker than the thumb. Leaves all radical, 6-12in. diam., very leathery, with prominent radiating nerves and reticulated nervules beneath, red-brown in age, orbicular, broadly ovate or cordate, glabrous or stellately puberulous beneath Petiole 3-6in., very stout, glabrous or puberulous Racemes 1-3, glabrous, radical, 4-12in., strict, dense-fld Peduncle and rachis stout, glabrous Bracts minute, ovate, scarious Flowers $\frac{1}{10}$in diam., on capillary pedicels. Fruit broadly ellipsoid or oblong, wings membranous, broader than the disk, ⅓-½in long, 3-4-times as long as the oblong obtuse sepals, tip rounded or notched, wings membranous. Pedicel half as long as the fruit or less

1065 *R. Moorcroftianum, Royle*, H.F.B.I., v. 56.

Habitat.—Western Himalaya; Kumaon

Stemless species of stout herbs, with woody large roots. Flowers in a spike like raceme "This plant," says J.D. Hooker, "differs from R. spiciforme in the very much larger pubescent peduncles and racemes which together are two feet long, and in the form of the fruit." Leaves all radical, thickly coriaceous, orbicular, glabrous or stellately puberulous beneath Racemes pubescent, fruit ovoid, wings narrow.

1066. *R. emodi, Wall.*, H.F.B.I., v. 56.

Vern.:—Revand-chini (H. and B.); Révande-hindi (Pers.);

Variyâttu (Tam.); Natturéval-chinni (Tel.); Gamni-revan-chini (Guz.); Padam-chal (Nepal); Archu (Garhwal); Mulkâ-cha-reval-chini (Mar.); Nat-reva-chinni (Kan.).

Habitat:—Sub-alpine and Alpine Himalaya; Nepal, Sikkim and Simla.

Herbs. Stem very stout, tall, branched, leafy; 5-6ft. high, streaked, green and brown. Root very stout. Radical leaves often 2ft. diam, papillose beneath, scabrous above; petiole 12-18in., very stout, scabrulous, orbicular, or broadly ovate, obtuse; base cordate, 5-7 nerved Panicle leafy, papillosely puberulous, fastigiately branched, 2-3ft. Flowers dark-purple, $\frac{1}{8}$in. diam Fruit $\frac{1}{2}$in. long, oblong, ovoid, purple, base cordate, apex notched, wings narrower than the disk

1067. *R. acuminatum, Hook. f and Thom.*, H.F.B.I., v. 57.

Habitat:—Sikkim, Himalayas.

Probably only a small form, says J D. Hooker, of R. Emodi, Wall., with acuminate leaves, but the flowers are considerably larger, and, though long under cultivation, it does not attain half the size of that plant or vary in its character Stem leafy; leaves long-petioled, triangular or orbicular, ovate, acuminate; base cordate, 5-7-nerved, panicles papillosely puberulous, fastigiately branched and leafy; flowers red; fruit ovoid, oblong, base, cordate, tip entire or notched, wings narrower than the nucleus.

1068. *R. Webbianum, Royle*, H.F.B.I., v. 57.

Habitat:—Central and Western Alpine Himalaya.

Very variable in size, from 1 to 6ft. high, stem branched, leafy. Leaves 4in.—2ft. in diam; long-petioled, orbicular-cordate or reniform, 5-7-nerved papillose or glabrous, tip rounded or subacute Panicles axillary and terminal, leafy, quite glabrous. Flowers pale-yellowish, very much smaller than R. Emodi, the panicles less strict, the fruit broader, $\frac{1}{8}$in. diam., with broader wings. Fruit notched at both ends.

Uses:—The roots of the several species of *Rheum*, described above, inhabiting the elevated portions of Himalaya, constitute the principal portion of the Indian or Himalayan Rhubarb. There are two principal varieties, 1 *The large* (from *R. Emodi*?); occurs in twisted or cylindrical pieces of various sizes and shapes, furrowed; cut obliquely at the extremities, about four inches long and an inch and a half in diameter; of a dark brown colour, feeble rhubarb odour, and bitter astringent taste; texture radiated, rather spongy, not presenting on fracture the marbled texture characteristic of ordinary rhubarb; pulverized with difficulty; powder of a dull brownish yellow colour. 2 *The small* (from *R. Webbianum*); consists of short transverse segments of the root branches, of a dark-brownish colour, odourless, or nearly so, with a very bitter astringent taste. Both kinds are liable to considerable variation in physical characters. The trials made with Himalayan rhubarb by Prof. Royle (*Calcutta Med. Phys. Trans.*, vol. iii p 139), and Mr. Twining (*Diseases of Bengal*, vol. i. p. 220), were productive of satisfactory results; the latter authority, indeed, regarded it as superior to imported rhubarb as a stomachic tonic. Subsequent experience has not confirmed this view. The general tenor of all the reports received from India in which this drug is noticed is to the effect that the indigenous rhubarb procured in the bazaars is generally worthless, and unfitted to replace the imported article. Dr. Hugh Cleghorn (*Madras Quart Med. Journ.*, 1862, vol. v., p. 464), who furnishes some interesting remarks on Himalayan Rhubarb, states that it is only an inferior variety that reaches the plains of Hindustan. He tested the action of the fresh root, and found it resemble that of Russian Rhubarb. Cultivated with due care, there is reason to believe that a good serviceable drug, equal to Chinese or Turkish Rhubarb, might be obtained from the Himalayan plants. (Ph. Ind.)

In the Second Rept. of Indig. Drugs Comm. (p. 71) Captn. W. M. Anderson, I.M.S., who used the powder, gives his opinion, as to the value of the drug, as follows:—

"Not satisfactory as a purgative; requires to be given in 5—10 gr. doses; is very liable to gripe and is irregular in its action. In some cases the bowels were only opened after repeated doses."

1069. *Oxyria digyna, Hill.* H.F.B.I., V. 58.

Vern. :—Amlu ; Chohahak (Pb.).

Habitat :—Alpine Himalaya, from Sikkim to Kashmir.

An erect, fleshy-glabrous herb. Rootstock tufted, with many erect succulent stems, 4-18in. high. Leaves radical, many, long-petioled, 1-4in diam., rarely 3-lobed or sub-hastate, cauline 1-2 ; petiole sometimes 8in. Racemes slender, panicled. Flowers 2-sexual ; pedicels pointed in the middle ; tip thickened. Outer two sepals, spreading or reflexed ; inner two spathulate, 3-5-nerved. Stamens 6. Ovary compressed. Styles 2, short , stigmas fimbriate. Fruit a nut, 2-winged, biconvex, $\frac{1}{6}$-$\frac{1}{4}$in. diam., orbicular-cordate, wing membranous, veined, top notched.

A most agreeable salad, raw and cooked. Except in often attaining a very large size (18in. high), the Himalayan plant does not differ from the European. (Hooker.)

Use :—In Chumba it is eaten raw and in *chatní*, and is considered cooling, and in Kanawár it is known as a medicine (Stewart).

1070. *Rumex maritimus, Linn.*. H.F.B.I., V. 59.

Syn. :—R. acutus, *Roxb.* 309.

Vern. : –Janglí-pâlak, jûl-palam (H.) ; Bun-palung (B) ; Hûlâ obûl ; Zagû-kei ; Khattíkan ; Bij-band (Pb.).

Habitat :—Marshes in Assam, Silhet, Cachar and Bengal.

An annual herb, rather shrubby. Stem 1-4ft., angled and deeply grooved. Leaves 3-10in., lanceolate, narrowed into the petiole. Whorls of flowers lax or dense, many or few-fid. Panicles leafy to the top. Flowers 2-sexual. Fruiting perianths all unarmed, or on the same plant, some armed and some unarmed, yellow-brown when ripe, tubercle smooth, with a narrow, sometimes reticulate, margin ; spine sometimes 4 times as long as the valve ; tip straight or slightly hooked. Stamens 6. Ovary 3-gonous; styles 3, terminal. Stigmas fimbricate. Nut included in the usually enlarged inner sepals (valves), angles acute.

Uses :—The plant has cooling properties, the leaves are applied to burns and the seeds are sold as *bij-band* of the

bázárs, and used as an aphrodisiac (Atkinson).

N. B.—According to Murray (*Plants and Drugs of Sind*), the fruit of *Polygommi aviculare* is known as *Bijband* or *Endrani* in Sind. It is probable that seed of several species of *Polygonum* and *Rumex* are collected and sold as *Bijband*.

1071. *R. dentatus, Linn.*, H.F.B.I., v. 59.

Habitat :—Plains of India, from Assam and Sylhet to the Indus, ascending the Himalaya to 1,000 ft , Sind and Concan.

An erect annual, 1-2ft. high. Stems grooved, glabrous, usually tinged with red Leaves 3-1in long, oblong, obtuse, glabrous, base rounded or cordate, petioles of radical leaves up to $2\frac{1}{2}$in. long. Flowers shortly pedicelled, 2-sexual, arranged in distinct leafy or leafless whorls. Perianth $\frac{1}{8}$-$\frac{1}{5}$in long; inner segments broadly ovate, reticulate-veined, much enlarged in fruit and with an ovoid-oblong smooth tubercle on its back, margins irregularly toothed or pectinate; the teeth numerous, short, straight, not hooked. Nutlets $\frac{1}{10}$in long, acutely 3-gonous or almost winged. (Duthie.)

Use :—The root yields a dye, and is used as an astringent application in cutaneous disorders (Watt)

1072. *R. nepalensis, Sprenq* . H.F.B.I., v. 60.

Habitat : —Temperate Himalaya, from Bhotan to Kashmir; Khasia Mts , Western Peninsula ; on the Ghats

Tall herbs. Roots with tuberous fibres Stem 2-4ft. stout, erect. Branches stiff, spreading Radical leaves often 6-14 by 3-5in., undulate or not, large oblong, ovate-oblong or triangular-ovate, acute or obtuse, base widely or narrowly cordate, upper sessile or petioled, similar or with narrowed bases, or lanceolate. Flowers 2-sexual, in whorls forming long, nearly leafless, racemes. Fruiting sepals broadly ovate, fringed one thickend and forming an oblong tubercle.

Uses :—The tuberous roots are said to be sold in the bázárs of Bengal under the name of *Rewund Chíní* as a substitute for rhubarb. They are given in constipation, in doses of 10 gr. to 120 gr. (Irvine).

Oswald Hesse has isolated from the root three new substances, one of which, rumicin, is isomeric with, and closely resembles, chrysophanic acid, but is not identical with it.

Rumicin, $C_{15}H_{10}O_4$, crystallises from light petroleum in golden-yellow leaflets with metallic lustre, and melts at 186-188°; the solution in caustic potash is purple-red, becoming colourless on exposure to carbonic anhydride, which precipitates rumicin. When heated with hydriodic acid, it yields chrysophano-hydro-anthrone, which is obtained from chrysophanic acid under the influence of the same agent

Nepalin, $C_{17}H_{14}O_4$, crystallises from glacial acetic acid in microscopic, orange needles, and melts at 136; it is insoluble in alkali carbonates, but dissolves in caustic potash, forming a purple solution, which becomes colourless under the influence of carbonic anhydride. The solution in concentrated sulphuric acid is blood-red The *diacetyl* derivative crystallises from glacial acetic acid in lustrous brownish-yellow rhombohedra, which darken at 170°, and melt at 181°.

Nepodin, $C_{18}H_{16}O_4$, crystallises from a mixture of benzene light petroleum in long, greenish-yellow prisms, and melts at 158°. It dissolves readily in alkali carbonates, forming a yellowish-brown solution; the solution in concentrated sulphuric acid is an intense, yellowish-red colour The *diacetyl* derivative crystallises in pale-yellow rhombohedra, darkens at 180° and melts and decomposes at 168°.

These three constituents of *Rumex nepalensis* of which nepalin greatly preponderates, are separated from one another by extracting the root with ether, removing nepodin by means of aqueous potassium carbonate, evaporating the ether, and extracting the rumicin from the residue with boiling acetone; the nepalin remaining undissolved. (J. Ch S. 1896 A. I. 573)

Rumicin is chrysophanic acid, uncontaminated with methyl. chrysophanic acid, whilst nepalin is identical with nepodin, $C_{18}H_{16}O_4$ (J Ch S. 1900 A I. 41).

1073. *R. vesicarius*, *Linn*, H F B I, v. 61.; Roxb. 309.

Sans.—Chukra; Shutavedhee.

Vern.—Chuká Chukápalang (H. and B), Shakkan-kirai (Tam.), Shukk-kura-ku (Tel); Sukhasag (Assam); Ambut chuká (C. P.); Triwakka, khatbúi, khattítan, khatta mitha, saluní (Pb.); Chuká (Sind); Ambari, chukká (Deccan); Chuká (Bomb.).

Habitat:—Western Punjab; on the Salt Range and Trans-Indus hills; cultivated, and an escape in other parts of India.

A pale-green annual, monœicous, glabrous, 6-12in. high, dichotomously branched from the root, rather fleshy. Leaves petioled, elliptic, ovate or oblong, 3-5-nerved, base cuneate, rarely cordate or hastate, 1-3in. acute or obtuse. Petiole as long as the blade. Racemes short, terminal, leaf-opposed, leafless, 1-1½in.;

pedicels slender, jointed about the middle or unjointed. Flowers sometimes 2-nate and connate, valves large, orbicular, 2-lobed at each end, very membranous and reticulate without a marginal nerve Fruit ½in. diam , white or pink , valves hyaline.

Uses·—It has obtained the name of Sorrel in India, and is considered by the natives as cooling and aperient, and, to a certain extent, diuretic (Ainslie). The juice is said to allay the pain of toothache, and by its astringent properties to check nausea, promote the appetite and allay morbid craving for unwholesome substances It is also considered very cooling and of use in heat of stomach, and externally as an epithem to allay pain, especially that caused by the bites or stings of reptiles and insects The seeds are said to have similar properties, and are prescribed roasted in dysentery, and as an antidote to scorpion stings The root is also medicinal (Dymock)

N. O ARISTOLOCHIACEÆ.

1074. *Bragantia Wallichii*, *Br* , H.F B.I., V. 73.

Vern —Alpam (Mal)

Habitat —Deccan Peninsula , in the western forests, from the Southern Concan southwards

An erect slender shrub, 6-10f Bark smooth, yellowish. Twigs swollen above the nodes Young parts finely pubescent. Branches angled Leaves distichous, 5-7in., linear-lanceolate, acute at base, attenuate, very acute, entire, glabrous above, minutely pubescent and paler beneath, 3-nerved at base, veins, prominent beneath Petiole very short, stout. Flowers purple or greenish on rather long pubescent pedicels, in shortly stalked, irregularly umbellate cymes Bracts small, linear. Perianth segments over ¼in , ovate, pubescent, concave. Capsule 3-4in., obtuse, 4-seeded Seeds acute at both ends, deeply rugose. Leaves slightly aromatic when bruised (Trimen).

Uses : —The juice of the leaves, like that of many plants of this Natural Order, is valued as an antidote in venomous snake bites, especially in that of the Cobra. Fra Bartolomeo (Voyage,

p. 416) quotes a Malabar proverb, to the effect "as soon as Alpam enters the body, poison leaves it." (Ph. Ind.) This is regarded as one of the most powerful antidotes to poison known on the West Coast. The whole plant mixed with oil and reduced to an ointment is said to be very efficacious in psora or inveterate ulcers (Drury).

1075. *B. tomentosa, Blume.*, H.F.B.I., V. 73.

Habitat :—Silhet.

A low, herbaceous plant Stem creeping below, and rooting, then ascending, 6-12in., simple angular, geniculate, tomentose. Leaves densely tomentose beneath 4-6 by 2½-4in., 1-3, oblong or ovate-cordate smooth, opaque above. 6-9-nerved at the base and penni-nerved beyond; the first pair of basal nerves not reaching the middle of the leaf. Flowers in simple spikes, ½-¾in. diam.; bracts oblong persistent. Perianth-lobes rounded-cordate, acute. Stamens 6. Capsule 2in long, straight; Seeds ½in. long, 3-gonous, rugose

Use:—It possesses intense bitterness, and, according to Horsfield, is employed by the Javanese as an emmenagogue (Ph. Ind.).

1076. *Aristolochia bracteata, Retz*, H.F.B.I., V. 75; Roxb. 400.

Sans :—Dhûmrapatra

Vern. :—Kirâamâr gandân or gandatî (Hind. and Dec); Addu-tina-pally (Tam.); Gadidegada-para-âku (Tel.); Gandhâtî, kidâmârî (Bom.); Kadapara (Tel.); Vtutinâppâla (Mal.); Paniri (Uriya).

Habitat :—Deccan Peninsula, northward to Bundelkund, and Scinde.

Perennial herbs, quite glabrous. Roots slender. Stem or branches slender, 12-18in., angled, striate. Leaves 1½-3in. long and broad, widely and shallowly cordate at base or reniform, tip obtuse or subacute, margins flat or waved, glaucous beneath. Petiole 1-1½in. Peduncle short; bracts usually orbicular, variable in position, sometimes basal. Flowers solitary.

Perianth 1-1¼in., base globose, tube cylindric, erect, slender, lip erect, linear, as long as the tube, dark-purple with rootute edges, villous, with purple hairs. Anthers six Stylar column 6-lobed. Fruit a pyriform capsule, 1in. long, many grooved Seeds triangular, cordate

Uses:—Every part of this plant is nauseously bitter, which remains long, chiefly about the throat. For a purging with gripes, two of the fresh leaves are rubbed up in a little water, and given to an adult for a dose, once in 24 hours (Roxb)

It is well-known by its Hindustani name *Kirâ-mâr*, from its *supposed anthelmintic properties*, and also probably from the fact of the expressed juice of the leaves being applied to foul and neglected ulcers, for the purpose of destroying the *larvæ of insects*. A belief in the anthelmintic virtues of the leaves is common amongst the natives In Dalzell and Gibson's *Flora of Bombay* (p. 225), it is spoken of as possessing "a merited reputation as an antiperiodic in intermittent fevers." Emmenagogue properties are also assigned to it Dr. J Newton reports that in Scinde the dried root, in doses of about a drachm and-a-half, in the form of powder or in infusion, is administered during labours to increase uterine contractions (Ph Ind)

The leaves are applied to the navel to move the bowels of children, and are also given internally in combination with castor oil as a remedy for colic

Dr. Hove states that the root and leaf are remarkably bitter, and yield a thick yellowish juice, which is mixed with boiled milk and given in syphilis, and combined with opium is used with great success in gonorrhœa Ainslie notices the application of the leaf, when bruised and mixed with castor oil, to obstinate psora (the carpang of the Tamils)

The native doctors in Bombay make a paste, with water, of the plant, along with the seeds of Barringtonia acutangula, Celastrus paniculata, and black pepper, and rub the whole body with it for the cure of malarial fevers

The evidence collected by Dr. Watt (Dict. Ec. Pr. India, i. 314) shows that it is the opinion of several European phy-

sicians in different parts of India that the plant has a decided action upon the uterus, and increases or induces uterine contractions. There appears to be no doubt as to its anthelmintic properties. (Dymock).

Chem. comp.—The plant contains a nauseous volatile substance, an alkaloid, and a large quantity of salts. The alkaloid is amorphous and gives no colour reactions with the strong mineral acids. The bitter concentrated tincture on standing deposited cubical crystals of potassium chloride The ash calculated on the air-dried plant was 17·75 per cent., and strong alkaline fumes were given off from the plant when burning

1077. *A. indica, Linn.*, H.F.B.I., V. 75; Roxb. 622.

Sans.:—Rudrajatâ, Arkamula; Sunanda; Ishvari.

Vern.:—Isharmul, isharmûl-kî-jar (H and Duk.); Isarmul (B), Bhedi jane-tet (Santal), Sâpasand (Bomb and Mar), Arkmula, ruhimula (Cutch and Guj.); Peru-marindu, perum-kizhangu (Tam.); Ishvara-véru, dûla-gôvela, govila (Tel), Karalekam, karukakpulla, karal-vekam, ishvarâ-muri (Mal.); Ishverîvérû (Kan.); Ich-chura-mulivei (Tam.).

Habitat:—Throughout the low country of India, from Nepal and lower Bengal to Chittagong; and the Deccan Peninsula, from the Concan southward.

Shrubby, quite glabrous, twining, prostrate herbs Stems slightly woody at base, branches slender. Leaves very variable, membranous, linear, ovate, obovate-oblong, or subpanduriform; base cuneate or rounded; basal nerves short; in the narrowest form 4 by ½-⅓in, in the broadest 4-5 by 3in., abruptly or gradually obtusely acuminate or apiculate, often oblong and quite obtuse. Petiole ¼-½in, very slender. Perianth straight, greenish-white; base globose; tube shortly funnel-shaped; mouth oblique, trumpet-shaped, gradually passing into short, oblong, obtuse, glabrous, purple and brownish lip. Flowers 1-3; corymbs short, pedunculate. Anthers 6; stylar column 6-lobed. Capsule 1½-2in. long, oblong, grooved. Seeds flat, triangular, winged.

Uses:—The root, which is very bitter, is held in much esteem by the natives as a stimulant, tonic, and emmenagogue, and is employed by them in intermittent fevers and other affections.

Nothing certain is known of its virtues; but Dr. Kirkpatrick (*Cat. of Mysore Drugs*, No. 455) considers that its properties as a febrifuge are deserving of investigation; and Dr. Fleming, judging from the aromatic bitterness of the root, is of opinion that it will be found useful in dyspepsia (*Asiat. Researches*, vol. xi.). Dr. Gibson regards it as valuable in bowel affections. From its sensible properties, and the high esteem in which it is held by the natives, it may be worthy of further notice. It is as an antidote to snake bites, however, that it has obtained most repute, and by the early Portuguese settlers was termed *Raiz de Cobra*, from its supposed efficacy in those cases, even in the bite of the Cobra de Capello. The leaves, and the expressed juice of the leaves, have more recently been brought to notice in the same class of cases by Mr. Lowther (*Journ. of Agri.-Hort. Soc. of India*, 1846, vol. v. pp. 138, 742, and vol. vii. p. 42.) (Ph. Ind.). It seems to be, however, more used by the native Madras physicians for snake-bite than in the Dekkan or Concan where I come from. I am not aware of the drug being experimented on by any European physicians. It is worth a trial on theoretical grounds certainly (K.R.K.).

In Bombay it is chiefly prescribed in the bowel complaints of children; and in cholera it is regarded as a stimulant tonic, and is also applied externally to the abdomen. Babu T. N. Mukharji states that the juice of the fresh leaves is very useful in the croup of children, by inducing vomiting, without causing any depression.

Dr. S. M. Shircore of Moorshidabad states that it is undoubtedly used to procure abortion.

"With regard to the antidotal properties ascribed to Aristolochiæ, Dr. Hance remarks that undoubtedly no genus comprising a large number of species, widely diffused over both hemispheres, has been so universally credited with alexiteric properties as *Aristolochia*, and this, too, in all ages, and in every condition of society, alike by the wandering savage and the polished citizen or learned physician of a highly civilized commonwealth.* * * *

"Modern physicians seem with one accord to regard these plants as diaphoretics, stimulant tonics, and emmenagogues only; but the array of testimony from all quarters of the globe, and extending over a period of more than two thousand years, in favour of their alexiteric properties, is so overwhelming, that it is in my judgment incredible that these virtues should be imaginary."—(Ph. J. March 15, 1878, pp. 725-726.)

Mr. R. Modlen concludes a paper "on the *Aristolochiaceæ* as antidotes to snake-poisons" in the Ph. J. for Nov. 20, 1880, p. 411, as follows:

"Although we English pharmacists may never be in a position to test this remedy, still it seemed to be one of sufficient interest to be noted. Strangely enough, the only place in this neighbourhood (Oxford) where I have seen an adder is the only locality for *A. Clematis*."

According to the authors of the Pharmacographia Indica, the roots contain an alkaloidal principle.

N. O. PIPERACEÆ.

1078. *Piper longum, Linn.*, H.F.B.I., V. 83. Roxb. 52.

Syn :—Chavica Roxburghii, *Miq*

Sans. :—Pippali

Vern.—Pipul (H and B), Pippul-chittoo (Tel); Pipili (Tam.); Bangâlî-pim-pali (Bomb)

Habitat:—Hotter provinces of India, from East Nepal to Assam, the Khasia Mts and Bengal, westward to Bombay and southward to Travancore

Root-stock erect, thicker pointed, branched. Stems herbaceous, numerous, creeping below; young shoots downy, branches prostrate or creeping with broad, glabrous leaves. Flowering shoots erect Branches soft, angular and grooved when dry Leaves generally membranous Lower leaves 2-3in., ovate, cordate, often rounded ovate, acuminate, 7-nerved; sinus rounded, but narrow; basal lobes equal; petiole 1-3in. Upper leaves narrower, oblong, cordate, sessile, amplexicaul; 2-5in. basal lobes often unequal. Spikes simple, solitary. Flowers dioecious Male spikes 1-3in., female $\frac{1}{2}$-$\frac{3}{4}$in. broad, 1-1$\frac{1}{2}$in long, blackish-green, shining, short, sub-erect Fruit about $\frac{1}{10}$in. diam., in dense cylindric, rarely globose spikes.

Uses:—Like *Black Pepper*, it contains a volatile oil, an acrid resin and piperine; and, like it, it possesses stimulant carminative properties, but *more powerful*. Its chief use is as a condiment. Dr Herklots reports favourably of the following Mahomedan nostrum in the treatment of beri-beri: Take of Long Pepper, bruised, four ounces; Black Pepper and