A MANUAL
OF
MATERIA MEDICA
AND
PHARMACOLOGY

COMPRISING THE

ORGANIC DRUGS WHICH ARE OR HAVE BEEN RECOGNIZED BY THE UNITED STATES PHARMACOPŒIA AND NATIONAL FORMULARY

TOGETHER WITH

IMPORTANT ALLIED SPECIES

ESPECIALLY DESIGNED FOR STUDENTS OF PHARMACY AND MEDICINE, AS WELL AS FOR DRUGGISTS, PHARMACISTS, AND PHYSICIANS

BY

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Abies abies

Ab'ies Abies (*excel'sa*), *Pix Burgundica, Burgundy Pitch.*—The prepared resinous exudation, U. S. P. 1820–1890; S. Europe (Burgundy province, France). Lofty tree, 24–45 M. (80–150°) high; leaves short, 4-cornered, green; flowers, staminate and pistillate; fruit purple, cylindrical; scales oval. The oleoresin (Jura turpentine) is obtained from incisions made through the bark, after which it is melted in water and strained, thus yielding the once official product. It is yellowish-brown, hard, yet gradually conforming to the container, shining, conchoidal fracture, opaque or translucent, brittle, softened by heat, aromatic, terebinthinate, sweetish, not bitter; contains volatile oil 5 p. c., water 5–10 p. c. (absorbed during treatment), remainder is resin (chiefly abietic acid). Stimulant, counter-irritant, in plasters, as a base and for support; rheumatism, joint affections, chest troubles, pleurisy, bronchitis, catarrh, asthma, hepatitis, phthisis, pneumonia.

Abies Abies (*excelsa*).

Abies balsamea

A. balsam'ea, Terebinthina Canadensis, Canada Turpentine.—The liquid oleoresin (balsam of fir), U. S. P. 1820–1900; Canada, United States, chiefly Laurentine Mountains, Quebec. Beautiful, ornamental tree (American Silver Fir), 9–15 M. (30–50°) high, pyramidal shape; bark smooth, reddish-gray when young, filled with blisters (reservoirs) containing the oleoresin; leaves 2 Cm. (¾′) long, linear, silvery beneath; flowers, staminate—catkins, pistillate—cones, 5–10 Cm. (2–4′) long, 2.5 Cm. (1′) broad; pollen bright yellow; seed with wing. Oleoresin (Canada turpentine), viscid, yellowish, transparent, odor agreeable; taste terebinthinate, bitter, acrid, soluble in ether, chloroform, benzene; collected by puncturing vesicles with the sharp-pointed nozzle of the "balsam-collector's" can; contains volatile oil 24 p. c., acid resin 63 p. c., indifferent resin 12 p. c., acids (4)—canadinic, canadolic, *a*- and *b*-canadinolic. Properties and uses, similar to oil of turpentine, except this dries into an adhesive, transparent varnish, thus becoming valuable in microscopic technique. Dose, gr. 15–60 (1–4 Gm.). *A. Fra'seri.*—Resembles the preceding, but cones only 5 Cm. (2′) long, sharp-pointed scales projecting and recurved; New England, North Carolina, in mountains; used for collecting balsam of fir.

Can for collecting balsam of fir.

Abies picea

A. Pi'cea (*pectina'ta*), *Strassburg Turpentine* (*Terebinthina Argentoraten'sis*).—Vosges. Obtained like Canada balsam, chiefly differing in odor (lemon); taste bitter, not acrid; completely soluble in absolute alcohol. *A. Menzie'sii, Oregon Balsam of Fir,* resembles Canada balsam when fresh, but becomes gradually granular and opaque.

Acacia catechu

Acacia Cat'echu, Catechu; Catechu Nigrum (Br.).—An extract prepared from the heart-wood, U.S.P. 1820–1890; India, Hindustan. Plant crooked, shrubby tree, 4.5–12 M. (15–40°) high, 15–45 Cm. (6–18′) thick, bark brown, wood whitish and reddish, leaves paripinnate, pinnæ in 10–20 pairs, with a pair of hooked, brown prickles at each base, leaflets 20–30 pairs in each pinna, flowers yellow, fruit, pod (loment), brown, flat, 5–12.5 Cm. (2–5′) long, seed 3–10, brown, shining; extract (catechu) in irregular masses, dark brown, brittle, porous, fracture conchoidal, little glossy, inodorous, taste sweetish, astringent. It is prepared by removing bark and sapwood, and boiling in water, for about 12 hours, the reddish-black heart-wood, cut in chips, straining, evaporating, stirring frequently and vigorously to improve the product—over-boiling being injurious, as it converts catechin into catechu-tannic acid; when of syrupy consistency it is cooled somewhat and poured into clay molds or on leaves, mats, etc., previously dusted with cow-dung ashes; by morning it is hard, brittle, when it is broken up into suitable pieces for market; contains catechu-tannic acid 35 p. c., catechin 13–34 p. c., quercetin, gum, extractive. There are several varieties: 1, Plano-convex (Cake); 2, Pegu; 3, Quadrangular (Cake), Bengal; 4, Ball, Bombay. *Adulterations:* Largely with leaves, mats, cloths, sticks, sand, dried blood, ashes, clay, starch, ferrous carbonate, sometimes to 65 p. c.; artificial variety made from roasted mahogany, walnut, etc. Astringent, tonic, similar to tannic acid—much more harsh than gambir, owing to which it is used chiefly for tanning, arts, etc.; diarrhea, leucorrhea, gonorrhea, chronic sore throat, relaxed uvula, spongy gums (mouth wash), hemorrhages, bronchitis. Dose, gr. 5–30 (.3–2 Gm.); compound tincture, 10 p. c. (diluted alcohol), dose, ʒss–2 (2–8 cc.); fluidextract; infusion. *A. arabica* (*vera*) and *A. decur'rens*, bark (*Acacia Cortex*—Br.) rusty-brown, blackish, stri-

Acacia Catechu.

ated, spines and fruit long; contains tannin, mucilage: *Decoctum*, 6 p. c.; *A. gummif'era, A. Ehrenbergia'na, A. Adanso'nii, A. tor'tilis, A. Fis'tula,* and several others give valuable gums. *A. Su'ma* differs from *A. Catechu* only in its white bark, more leaflets, shorter corolla, and stronger spines; S. India, E. Africa (forests), S. America once furnished most of the commercial catechu, and still some; the bark used in tanning. *A. arabica, Babul Bark,* India; furnishes good extract; the fruit contains tannin 22 p. c.

Acacia senegal ACACIA. ACACIA, *U.S.P.*

Acacia Senegal, *Willdenow*, or some other species. { The dried, gummy exudation from the stems and branches, yielding not more than 1 p. c. of water-insoluble residue, nor 15 p. c. of moisture.

Habitat. E. and W. Africa, Senegal, Kordofan, Egypt, Abyssinia, India, Nubia, Upper Nile.

Syn. Acac., Gum Arabic, Gum Senegal, Egyptian Thorn, Indian Gum Tree, Babla(c)h Pods, Acacia bambolah, Gummi Africanum or Mimosæ; Br. Acaciæ Gummi, Gum Acacia; Fr. Gomme arabique du Sénégal; Ger. Gummi arabicum, Arabisches Gummi.

A-ca'cia. L. fr. Gr. ἀκακία, a thorny Egyptian tree, fr. ἀκή, a point—*i. e.*, tree studded with thorns.

Sen'e-gal. L. belonging to Senegal, a country and river in W. Africa—*i. e.*, the plant's original and present habitat.

Ar'abic—misnomer, as Arabia produces little and exports none.

PLANT.—Shrubby tree, 6 M. (20°) high; stem tortuous with terete branches, nodes with 3 short, black-tipped spines subtending the leaves; bark smooth, grayish-brown; leaves alternate, bipinnate, paripinnate, 2.5–4 Cm. (1–1⅗′) long; pinnæ 3–5 pairs; leaflets sessile, 10–20 pairs, grayish-green, 4 Mm. (⅙′) long; flowers yellow, spikes; fruit (pod), loment, compressed, smooth, pale, 7.5–10 Cm. (3–4′) long, 18 Mm. (¾′) broad, 2–6-seeded. GUM (acacia), in spheroidal tears, angular fragments up to 32 Mm. (1⅖′) in diameter, yellowish-white, light-amber, translucent, brittle; fracture glassy, sometimes iridescent; almost odorless; taste mucilaginous; insoluble in alcohol, slowly and almost completely soluble in water (2), forming mucilaginous liquid of slight, characteristic odor and acid reaction. POWDER, whitish—in angular microscopic fragments with but slight traces of starch or vegetable tissue. *Tests:* 1. Aqueous solution (1 in 10) 10 cc., + basic lead acetate T. S. (.2)—gelatinous precipitate. 2. With iodine T. S.—not blue (abs. of starch), nor red (abs. of dextrin). 3. Aqueous solution (2 p. c.) 10 cc. + ferric chloride T. S. .1 cc.—no blackish coloration or blackish precipitate (abs. of tannin-bearing gums). Dose, *ad libitum.*

ADULTERATIONS.—GUM: Inferior, dark colored, opaque and insoluble gums, bdellium, rock salt, ligneous and earthy substances, sand, dirt, dextrin in lumps; POWDER: Flour, rice flour, starch, dextrin—all recognized by solubility, viscosity, the microscope, and iodine test. The gum from quince seed, flaxseed, Irish moss, etc., often used as a substitute.

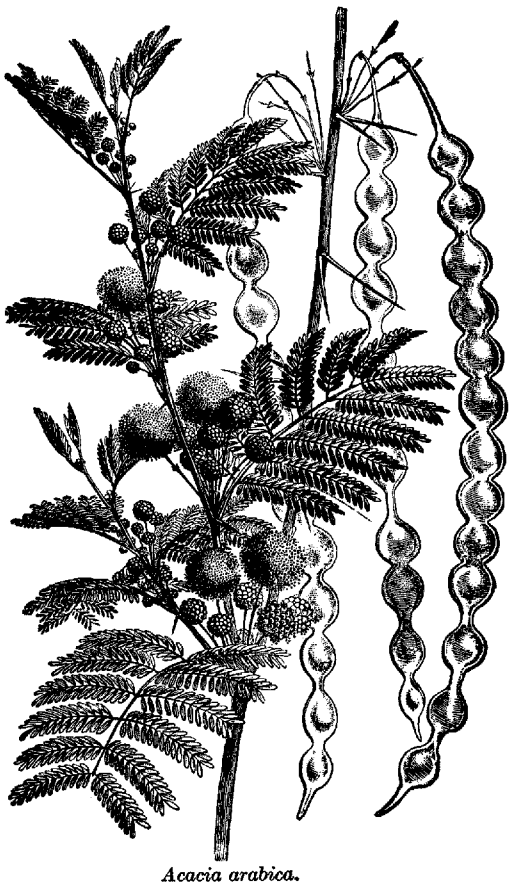
Commercial.—Plants grow associated with little other vegetation in sandy soil, deserts, forming entire forests. Gum, a degenerative product, the result of "gummosis"—transformation of cell contents (cellulose) in the cambium, cortex, and adjacent parenchyma, a process favored in dry hot seasons and unhealthy trees—exudes as a thick juice through fissures caused by dry winds after the rainy season, or artificial incisions, and sooner or later, whereby depends color, hardens on the bark similar to our cherry, apple, or plum gum. It is collected Oct.–Dec., some in March, by the Moors and negroes, who in caravans enter the acacia forests and gather it in leather sacks, detaching adherent lumps with wooden axes and picking up fallen pieces from the ground. It enters market in bags, boxes, casks, skins, mostly from Egypt, via Cairo, Alexandria, Trieste, where it is received as unassorted acacia, "acacia in sorts"—the aggregated product of various species, assorted into "first picked," "second picked," etc., down to sorts (unworthy of assorting)—there being recognized at Trieste thirty-two grades. Acacia is known by the natives as *Verek* (Senegal) or *Hashabi* (E. Africa), the best being white, opaque, and chiefly from *A. Senegal* (*Ve'rek*) and *A. arabica* (*vera*), which grow promiscuously with other species and contribute the several varieties: 1, *Turkey* (*Arabian, Egyptian*), which includes (*a*) Kordofan (*A. Senegal, A. Verek*), from west of White Nile, once constituting the bulk of the superior gum, (*b*) Sennaar (*A. fis'tula, A. stenocar'pa*), from east of White Nile, inferior, mucilage sours quickly, (*c*) Suakin (Talca—*A. stenocarpa, A. Se'yal*), from near Red Sea, mixture of white and brown pieces, very brittle, usually semi-pulverulent, only soluble with alkali; 2, *Senegal* (*A. Senegal*), from north of Senegal River, W. Africa, being

Acacia Senegal.

controlled by France and shipped to Bordeaux; larger than Turkey gum, some nodules the size of a pigeon egg, less brittle, more yellow or reddish, with fewer cracks and more conchoidal fracture, not amber-yellow when heated with potassium hydroxide, as are Turkey gum and dextrin solutions; 3, *Barbary* (*Morocco, Mogador—A. nilot'ica, A. arabica*), collected July–August, consisting of two kinds that enter Mogador, one from Morocco (resembling Turkey), the other from Timbuctoo (resembling Senegal), both in more or less brownish, roundish tears, brittle, soluble in water; 4, *India* (*Persian—A. arabica*, +), from Somali districts, E. Africa, conveyed by Arab vessels to Bombay; resembles somewhat Turkey and Senegal gums, however, much mixed and often containing Bassora gum or allied substances (insoluble, swelling and softening with water into viscid mass), also resinous products resembling turpentines; deprived of these the variety is well suited for general use.

Gums are produced also by other *Acacia* species in Morocco, Cape Colony, Australia (Wattle gum), Brazil (Para, Angico gum), etc.; Mesquite gum (*Proso'pis juliflo'ra*), Texas, California, New Mexico, Chile, resembles acacia, but is yellow, brown, and not precipitated by lead subacetate, ferric chloride, borax; also considerable gum from plants of different genera and family, darker color but resembling the official.

Powdered acacia occurs in two forms: 1, *Granulated* (*sanded*), produced by heating the gum until deprived of 2 p. c. of moisture; 2, *Finely powdered* (*dusted*), produced by heating the gum until deprived of 10 p. c. of moisture—a process rendering it more lumpy and less soluble in water.



Acacia arabica.

CONSTITUENTS.—Arabic acid, $C_{12}H_{22}O_{11}$, combined with Ca, Mg, K —arabates; sugar (trace), moisture 14 p. c., ash 3–4 p. c.

Arabic Acid (*gummic acid, arabin*).—A glucoside obtained by adding alcohol to acidified (HCl) mucilage. After drying, it swells with water, but dissolves only upon the addition of an alkali, boiled with acids yields arabinose (arabin sugar, pectinose, pectin sugar), $C_5H_{10}O_5$, in prismatic crystals, sweet, but not directly fermentable, and possibly also galactose, granular and less sweet.

PREPARATIONS.—1. *Mucilago Acaciæ*. Mucilage of Acacia. (Syn., Mucil. Acac., Mucilage of Gum Arabic; Fr. Mucilage de Gomme; Ger. Mucilago Gummi arabici, Gummischleim.)

Manufacture: 35 p. c. Wash acacia 35 Gm. in a tared bottle (flask) with sufficient cold water, discard washings, drain, add warm distilled water, in which sodium benzoate .1 Gm. has been dissolved, q. s. 100 cc.; after corking, lay bottle on its side, rotating it occasionally, and when acacia dissolved, strain mucilage. Must be made frequently and not dispensed if sour or moldy. When cold or hot water employed alone acetic acid is formed from the acid calcium arabate, which may be neutralized by lime water (35 p. c.), or retarded by sodium benzoate ($\frac{1}{1000}$ p. c.), alcohol (6 p. c.), glycerin (10 p. c.), acetanilid (.4 p. c.), or chloroform (.5 p. c.). Dose, *ad libitum*.

2. *Emulsum Olei Morrhuæ*, 12.5 p. c. 3. *Emulsum Olei Terebinthinæ*, 5 p. c. 4. *Pilulæ Phosphori*, $\frac{1}{2}$ gr. (.03 Gm.). 5. *Pulvis Cretæ Compositus*, 20 p. c. 6. *Emulsum Olei Morrhuæ cum Hypophosphitibus, N.F.*, 12.5 p. c. 7. *Emulsum Olei Ricini, N.F.*, 9 p. c. 8. *Emulsum Petrolati, N.F.*, 12.5 p. c. 9. *Mistura Copaibæ, N.F.*, 3.5 p. c. 10. *Mistura Copaibæ et Opii, N.F.*, 6.5 p. c. 11. *Pilulæ Ferri Iodidi, N.F.*, $\frac{1}{6}$ gr. (.01 Gm.). 12. *Trochisci Eucalypti Gummi, N.F.*, 2 gr. (.13 Gm.).

Unoff. Preps.: Syrup, 10 p c, + sucrose 80, distilled water q. s. 100. *Emulsions, Pills, Troches*, etc.

PROPERTIES.—Demulcent, emollient, protective, nitritive. Forms often the food of Hottentots and camels. By its viscidity sheaths inflamed surfaces; as a diluent, lessens acrimony of irritating medicines.

USES.—Coughs, laryngitis, gastritis, typhoid fever, dysentery, diarrhea. Fine powder locally stops slight hemorrhage; thick mucilage protects burns, ulcers, etc. In pharmacy used to suspend insoluble substances in water—emulsifying oleoresins, fixed and volatile oils, for adhering pills, troches, etc ; in arts for giving luster to fabrics, silks, thickening colors, mordants, suspending iron tannate in ink, etc. The bark of tree for dyeing, tanning, as it contains tannic and gallic acids.

Achillea

Achille'a Millefo'lium, Yarrow, Milfoil.—The leaves and flowering tops, U.S.P. 1860–1870; N. America. Perennial herb, .3–.6 M. (1–2°) high, hairy; leaves lanceolate, glandular beneath, 5–25 Cm. (2–10′) long, twice pinnatifid, segments toothed; flowers Aug., corymbs, receptacle flat, chaffy, ray-florets white, pistillate; disk white, perfect; fruit achenes, chamomile odor, taste bitter, aromatic; contains volatile oil, achilleine, resin, tannin. Stimulant, tonic, emmenagogue; amenorrhea, menorrhagia, piles, leucorrhea, colic, relaxed throat, sore nipples, intermittents; infusion, expressed juice. Dose, ʒss–1 (2–4 Gm.); oil, ♏v–15 (.3–1 cc.).

Achillea Millefolium.

Aconitum

ACONITUM. ACONITE, *U.S.P.*

Aconitum Napellus, *Linné.* { The dried tuberous root with not more than 5 p. c. of stems, nor 2 p. c. of other foreign organic matter.

Habitat. Europe, Asia, N. America, Himalaya, Alps, Pyrenees Mountains, 3,300–4,800 M. (11,000–16,000°) elevation; cultivated in England, C. Europe.

Syn. Aconit., Aconite Root, Monkshood, Wolfsbane, Cuckoo's or Friar's Cap, Friar's Cowl, Wolfroot, Styrian Monkshood, Mousebane, Face-in-hood, Jackob's-chariot, Blue-rocket; Br. Aconiti Radix; Fr. Aconit Napel, Coqueluchon; Ger. Tubera Aconiti, Eisenhutknollen, Sturmhut.

Ac-o-ni'tum. L. fr. Gr. ἐν, on, + ἀκόνας, rock—*i. e.*, it grows upon steep rocks in mountains; or fr. Fr. *Acone*, a town in Bithynia, where it grows plentifully.

Na-pel'lus. L. a little turnip; fr. *napus*, a turnip—*i. e.*, mediæval name from shape of roots, once used generically.

PLANT.—Perennial herb; stem .6–1.5 M. (2–4°) high, round, smooth, leafy; leaves 5–10 Cm. (2–4′) broad, palmately 3–7 divided, dark green above, lighter below, smooth, shining, petiolate, divisions wedge-shaped, with 2–3 lobes extending midway; flowers July (third year), large, beautiful, violet-blue, on stem's summit, racemes, sepals petaloid, nectariferous; fruit, 3–5 pod-like capsules. ROOT, produced at the end of a short rhizome, conical, fusiform, 4–10 Cm. ($1\frac{3}{5}$–4′) long, 1–3.5 Cm. ($\frac{2}{5}$–$1\frac{2}{5}$′) thick at crown; grayish-brown, smooth or longitudinally wrinkled, upper end with a bud, remains of bud-scales or a stem-scar, other portions with many root-scars or short rootlets; fracture short, horny, mealy; internally, bark brownish, 1–2 Mm. ($\frac{1}{25}$–$\frac{1}{12}$′) thick, cambium zone 5–8-angled with a small fibro-vascular bundle in each angle; pith whitish, 2–7 Mm. ($\frac{1}{12}$–$\frac{1}{4}$′) broad; odor very slight; taste sweetish, acrid, soon developing tingling sensation, numbness. POWDER grayish-brown—numerous, spherical (plano-convex) starch grains, .003–.02 Mm. ($\frac{1}{8325}$–$\frac{1}{1250}$′) broad, tracheæ, stone cells tabular, irregular, fragments of cork (few) and parenchyma (many), stem bast-fibers (few, long). *Solvent:* alcohol. Dose, gr. 1–2 (.06–.13 Gm.).

ADULTERATIONS.—Allied aconite roots (*A. variegatum*—much smaller, *A. Fischeri*—light gray, plump, smooth), defective roots, small horse-radish roots (collected only when leaves absent, as by these they may easily be distinguished), yellowish externally, taste exceedingly pungent irritating; roots of European Masterwort (*Imperato'ria* (*Peuced'anum*) *Ostru'thium*), which closely resemble aconite root, but are aromatic, pungent, with oil-cells arranged in several circles, easily visible in cross-sections.

a *b* *c* *d* *e*

Aconitum Napellus: a, transverse section of tuber, *b*, fruit carpels; *c*, flowering branch; *d*, flower deprived of calyx, showing the only 2 peculiarly shaped petals, the 6 others almost aborted; *e*, tuber.

Commercial.—Plant grows wild, but under cultivation becomes slightly stronger, owing to which the Br. P. recognizes alone its root collected in autumn; all parts are very poisonous, a fact even known to the ancients, and was not introduced into medicine until 1762 (Baron Störck, Vienna); it is grown in gardens for ornamental flowers and when these have expanded, thereby insuring identity, the root should be collected. Imported mostly from Germany (England, France, Switzerland, India) in packages, bales, etc.

CONSTITUENTS.—Four alkaloids (one crystalline, three amorphous) .24–.62–1.15 p. c.: Aconitine (crystalline), Picraconitine (benzaconine, isaconitine), $C_{25}H_{39}O_{11}N$, Aconine, Pseudaconitine (napelline), $C_{33}H_{45}O_{12}N$, aconitic acid, $H_3C_6O_6H_3$, starch, resin, fat, sugar, mannite.

Aconitina, Aconitine, $C_{34}H_{47}O_{11}N$, *U.S.P.*—(Syn., Aconitin., Napaconitine, Aconitia; Fr. Aconitine; Ger. Aconitin.) Exists in combination with aconitic acid, and is obtained by exhausting root with cold rectified fusel oil, shaking resulting tincture with diluted (1 p. c.) sulphuric acid, adding chloroform to remove resin, rendering alkaline with sodium carbonate, shaking out with ether. It is in colorless or white crystals, odorless, permanent, producing tingling and numbing sensation to tongue, lips—taste cautiously even when diluted; soluble in alcohol (28), ether (65), benzene (7), slightly in water, almost insoluble in petroleum benzin; solutions alkaline; melts at 195° C (383° F.); forms salts, as hydrochloride, nitrate, sulphate, etc.; commercial aconitine occurs in amorphous and crystalline forms, but the latter should alone be used, as the former contains derivatives lessening its activity 10–15 p. c. *Tests:* 1. Dissolve .001 Gm. with 2–3 drops of nitric or sulphuric acid on white porcelain surface—colorless solution; with 2 drops of sulphuric acid containing .005 Gm. of ammonium vanadate in each cc.—orange solution. 2. Dilute solutions, + mercuric potassium iodide T. S., or + tannic acid T. S., or + gold chloride T. S.—precipitate; concentrated solutions, + platinic chloride T. S., or + mercuric chloride T. S., or + trinitrophenol (picric acid) T. S.—precipitate; incinerate—ash negligible. 3. Evaporate a solution of 0.1 Gm. with 5 drops of fuming nitric acid, cool, resulting yellow residue, + alcoholic potassium hydroxide T. S.—not violet (abs. of pseudaconitine, atropine). Should be kept dark in well-closed containers. Dose (crystals), gr. $\frac{1}{640}$–$\frac{1}{200}$ (.0001–.00035 Gm.; (amorphous), gr. $\frac{1}{240}$–$\frac{1}{120}$ (.001–.003 Gm.).

Aconine, $C_{26}H_{41}O_{11}$.—This appears antagonistic to aconitine in cardiac effect; picraconitine is considered inert; aconitic acid is abundant, but is chiefly in combination with calcium, and is almost inert.

PREPARATIONS.—1. *Tinctura Aconiti.* Tincture of Aconite. (Syn., Tr. Aconit.; Fr. Teinture de Racine d'Aconit; Ger. Akonittinktur, Eisenhuttinktur.)

Manufacture: 10 p. c. Similar to Tinctura Veratri Viridis, page 104; use menstruum: 70 p. c. alcohol, and adjust to assay (biological). Dose, ♏ss–10 (.03–.6 cc.).

Preps.: 1. *Dentilinimentum Aconiti Compositum, N.F.,* 80 p. c.
2. *Dentilinimentum Aconiti et Iodi Compositum, N.F.,* 85 p. c.

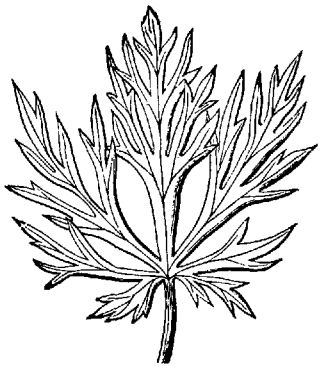
2. *Fluidextractum Aconiti, N.F.* (75 p. c. alcohol). Dose, ♏ss–2 (.03–.13 cc.): Prep.: 1. *Linimentum Aconiti et Chloroformi, N.F.,* fldext. 4.5 p. c., alcohol 8, chloroform 12.5, soap liniment 75.

Unoff. Preps.: Abstract (alcohol), gr. $\frac{1}{4}$–1 (.016–.06 Gm.). *Extract* (alcohol), gr. $\frac{1}{6}$–$\frac{1}{3}$ (.01–.02 Gm.). *Fleming's Tincture Aconite Root,* 70 p. c. (alcohol), ♏ss–4 (.03–.26 cc.). *Linimentum Aconiti* (Br.), 50 Gm. + camphor 3 Gm., alcohol q. s. 100 cc. *Oleate of Aconitine,* 2 p. c. *Tincture Aconite Leaves,* 8 p. c. (diluted alcohol), ♏j–6 (.06–.4 cc.). *Unguentum Aconitinæ* (Br.), 2 p. c. *Glycerite. Plaster.* Pseudaconitine (*A. ferox*), gr. $\frac{1}{250}$–$\frac{1}{100}$ (.00026–.00065 Gm.).

PROPERTIES.—Sedative (heart and nerve), anodyne, diaphoretic, antipyretic, myotic, poisonous. Produces tingling and numbness of the lips, mouth, and fingers; increases the secretion of the kidneys, salivary glands, and skin; circulation (heart action, pulse) becomes weak and slow, due to direct depression of heart-muscle, and stimulation of vagus (pneumogastric) nerve; respiration (breathing) shallow and slow; arterial pressure is decreased; temperature is lowered, all causing a tendency to fainting when in the erect position, and giving rise to its popular name "therapeutic lancet;" it increases urinary flow; effect lasts about 3 hours—paralyzes first the sensory and then the motor nerves.

USES.—It should never be given in asthenic or debilitated conditions, or when the heart action is weak, or in gastric catarrh, but may be employed in all sthenic or inflammatory fevers of the young and vigorous; croup, laryngitis, pharyngitis, tonsillitis, acute meningitis, peritonitis, pleuritis, rheumatism; measles, scarlet fever, erysipelas, first stage of pneumonia, pericarditis and pleurisy, nervous heart palpitation, cardiac hypertrophy, epistaxis, vomiting of pregnancy. Locally on non-abraded surfaces; neuralgia, rheumatism, sciatica, herpes zoster, chilblains, pruritus, odontalgia, periodontitis, inflamed pulps.

Poisoning: Have anxious countenance, pallid, clammy skin covered with cold sweat; pulse and respiration slow, weak, and irregular; muscular weakness, loss of sight and hearing, pupils either normal, contracted or dilated, general anesthesia, collapse, death from syncope, or respiratory paralysis, sometimes preceded by convulsions; conscious until near the end, when carbon dioxide narcosis sets in. Evacuate stomach reclining, direct recumbent position, feet elevated, warmth to extremities, give diffusible cardiac stimulants (brandy, whisky, alcohol, ether, ammonia) by the stomach, rectum, or skin, then digitalis, tannin; artificial heat and respiration (rhythmically raising and lowering arms from straight at sides to up over head and back again 20 times per minute), amyl nitrite, atropine, and strychnine (hypodermically) to stimulate heart and respiration.



Aconitum Napellus: leaf, small sized.

Incompatibles: Ammonia, alcohol, alkalies, atropine, digitalis, ether, morphine, heat, turpentine.

Synergists: Veratrum viride, pulsatilla, staphisagria, cold, fatigue.

Leaves, U.S.P. 1820–1870. These are considered 5–20 times weaker than the root, yet many specimens yield considerable alkaloids; their uncertainty and deception have led to disuse; but if collected when flowers are two-thirds in bloom they are reliable; it is then that all nutrient constituents are in demand for the perfection of reproductive organs, thus leaving behind in the leaves a goodly quantity of the (waste products) alkaloids. Dose, gr. 1–4 (.06–.26 Gm.).

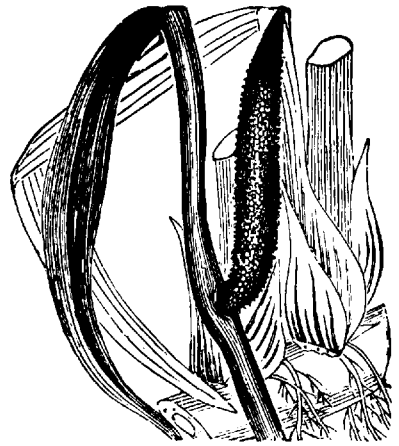
Allied Plants:

1. *Aconitum neomonta'num.*—Leaves, U.S.P. 1820–1830, and *A. panicula'tum*, leaves, U.S.P. 1840, possess very little acridity, but even now their roots are collected and mixed with the official.

2. *A. Cam'marum* (*variega'tum*).—Europe; root globular, ovate, 12 Mm. ($\frac{1}{2}'$) long, pith rays 5, short, rounded; and *A. Störckia'num*, Europe; root conical, slender, pith roundish pentagonal, similar in effect, smaller than, but often found mixed with the official.

3. *A. fer'ox.*—India aconite (native Bikh or Bish) is the strongest species, with root 5–10 Cm. (2–4′) long, 2.5 Cm. (1′) thick, conical and brown; yields pseudaconitine (peraconitine), similar to and as active as aconitine; *A. uncina'tum* and *A. lu'ridum* roots are collected with this, as they all have constituents similar to the official, but here pseudaconitine predominates.

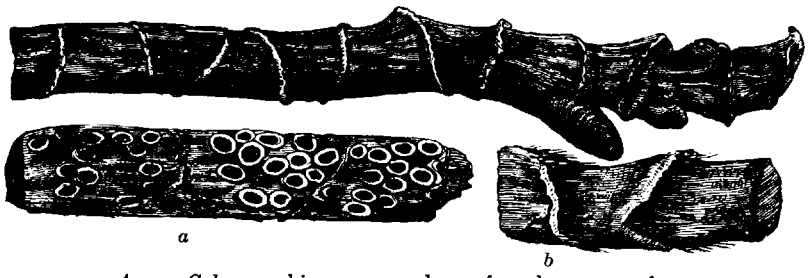
4. *A. Fisch'eri* and *A. japon'icum, Japanese* and *Chinese Aconite.*—Roots napiform, long, pith circular, 5–7-rayed; yields japaconitine, identical with aconitine; allied to former is *A. columbia'num;* Rocky Mountains; poisonous. *A. heterophyl'lum*, India—fusiform, conical, bitter, not acrid or poisonous, *A. Antho'ra*, Europe—fusiform, long, pith thin, rays short and long, and *A. Lycoc'tonum*, Europe, N. Asia —rhizome oblique, several-headed, bitter.



Acorus Calamus.

Acorus calamus

Ac'orus Cal'amus, Calamus Root, Sweet Flag.—Araceæ. The unpeeled, dried rhizome, U. S. P. 1820–1900; N. America, Europe, Asia, swamps. Perennial herb; leaves, like those of *Iris versicolor*, 1–1.3 M. (3–4°) long, 2–4 Cm. ($\frac{4}{5}$–$1\frac{3}{5}'$) wide, equitant, sharp-pointed, sharp-edged; flowers on scape, spadix (spike) 5–10 Cm. (2–4′) long, 1 Cm. ($\frac{2}{5}'$) thick, minute, greenish-yellow. Rhizome, .6–1 M. (2–3°) long, 1–2 Cm. ($\frac{2}{5}$–$\frac{4}{5}'$) thick, entire or longitudinally split pieces, cylindraceous, yellowish-brown, wrinkled, annulate (remnants of leaf-sheaths), leaf-scars above, pitted root-scars beneath, fracture short, sharp, corky, spongy, whitish, showing oil cells; odor aromatic; taste pungent, bitter; solvents: alcohol, hot water partially; contains (most in cortex) volatile oil 1.5–3.5 p. c., acorin .2 p. c., choline (calamine), resin. Stimulant, carminative, tonic, bitter, aromatic; dyspepsia, colic, flatulency, coughs, flavoring. Dose, gr. 15–60 (1–4 Gm.); fluid-extract (75 p. c. alcohol), ♏xv–60 (1–4 cc.; tincture 20 p. c., ʒj–2 (4–8 cc.); infusion.



Acorus Calamus, rhizome: *a*, under surface; *b*, upper surface.

Adonis

Ado'nis verna'lis, Adonis, Pheasant's Eye, False Hellebore, N.F.—The dried overground portion with not more than 5 p. c. of foreign organic matter; N. Europe, Asia, cultivated for ornament. Plant 15–50 Cm. (6–20′) high, leaves light green, pinnatifid; flowers yellow, stem glabrous, grooved, soft, weak, fruit, head of ovoid achenes; odor faint; taste bitterish, acrid. Powder, grayish-green—pith parenchyma, tracheæ, elliptical stomata, few or no starch grains and calcium oxalate crystals; contains aconitic acid, *adonidin* (adonin—consisting largely of aconitic acid) and picroadonidin which is a powerful heart poison, bitter, amorphous, soluble in water, alcohol, ether. Cardiac stimulant, diuretic, resembles digitalis, being more prompt and non-cumulative, but inferior to it—increases heart-force and arterial pressure; cardiac failure and dropsy, dyspnea, epilepsy. Dose, gr. 1–2 (.06–.13 Gm.); 1. *Fluidextractum Adonidis* (75 p. c. alcohol); Adonidin, gr. $\frac{1}{16}$–$\frac{1}{3}$ (.004–.02 Gm.).

Aegle

Æ'gle Mar'melos, Belæ Fructus, Bael Fruit (Br.), *Bengal Quince.*—The fresh half-ripe fruit; Malabar, Coromandel, cultivated in India. Fruit round, size of a large orange, cherry-red color, aromatic, sweetish, acidulous, mucilaginous, astringent when unripe, laxative when ripe, seed woolly, pulp firm, brittle, 12-celled, covered with hard, gourd-like nearly smooth rind, 3 Mm. ($\frac{1}{8}'$) thick. The dried, half-ripe fruit is used, being adulterated sometimes with fruit of *Garcin'ia Mangosta'na, Mangosteen;* contains gum, pectin, sugar, tannin, bitter principle, volatile oil. It is mildly astringent. Dose, gr. 15–30 (1–2 Gm.), in diarrhea, dysentery.

Aethusa

Æthusa Cynapium.

Æthu'sa Cyna'pium, Fool's Parsley, Small Hemlock.—Leaves non-poisonous, and sometimes carelessly mixed with those of conium—the plants, however, being distinguished easily, as *Æthusa Cynapium* has leaves of different shape, darker color, leek-like odor; occasionally have mixed also the pubescent ciliate leaflets of several species of *Chærophyl'lum.*

Agar Agar

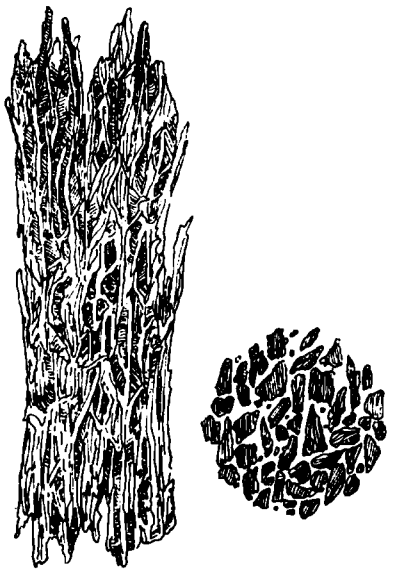
AGAR. AGAR, *U.S.P.*

Gelidium corneum (*Hudson*) *Lamouroux*, and other species, also closely related algæ.

The dried extracted mucilaginous substance, with not more than 1 p. c. foreign organic matter, yielding not more than 1 p. c. acid-insoluble ash and 16 p. c. moisture.

Habitat. Japan, China, Malaysia, Ceylon; Atlantic Ocean, United States.
Syn. Agar-agar, Jelly Plant, Corsican (Worm) Moss, Crow-silk, Japanese (Chinese, Bengal, Ceylon) Isinglass, Vegetable Gelatin, Gelosine; Fr. Mousse de Chine; Ger. Wurmmoss, Wurmtang.
Ge-lid'i-um. L. see etymology, above of Gelidiaceæ.
Cor'ne-um. L. fr. *corneus*, hard, horny—*i. e.*, the tough fronds.
A'gar-A'gar—*i. e.*, fr. Malay *agar-agar*, Eastern name of Ceylon Moss or Bengal Isinglass.

PLANT.—Very similar to *Chondrus crispus* and *Gigartina mamillosa, Irish Moss*, but in reproduction the carpogonium gives rise to one or more elongated branched ooblastima filaments which fuse with one or more auxiliary cells, the sporangia being produced from the ooblastima filaments—not directly from the auxiliary cell (cells). AGAR occurs usually in bundles, 30–60 Cm. (1–2°) long, consisting of thin, translucent, membranous, agglutinated pieces, 4–10 Mm. ($\frac{1}{6}$–$\frac{2}{5}$′) broad, yellowish-brownish-white, tough (damp), brittle (dry), insoluble in water, slowly soluble in hot water; solution in hot water (1 in 100)—stiff jelly upon cooling; odor slight; taste mucilaginous. POWDER, pale buff—in chloral hydrate T. S., fragments transparent, granular, striated, angular, occasionally frustules of diatoms. *Tests:* 1.—With iodine T. S., some fragments—bluish-black, with some areas—bright red. 2.—Aqueous-solution (1 in 100), made by boiling, upon cooling, + tannic acid T. S.—no precipitate



Agar; portion of sheet; granules.

(abs. of gelatin), + iodine T. S.—not blue (abs. of starch). *Impurities:* Shells, incrusting Bryozoa, spicules, sand, gelatin, starch. *Solvent:* hot water. Dose, ʒj–2 (4–8 Gm.).

Commercial. — Seaweeds, collected by hand and rakes, May-August, are spread upon beach to dry and bleach in the sun, then pounded by hand, or passed through a concrete mortar-and-pestle battery (to remove adhering shells, frustules, spicules, sand, etc.), then alternately washed and sun-dried for several days until thoroughly bleached and cleansed—a process sometimes hastened by bleaching chemicals. It is now boiled, 3–5 hours, with water (1 in 50) in an iron kettle (to extract the gelose in soluble form), filtered through (1) coarse cloths and (2) squeezed through linen bags in a press (to separate from insoluble matter), and the filtered jelly poured into wooden trays, 2° long, 1° wide, 3′ deep, to cool and solidify into hard jelly (Japanese "tokoroten"), which is cut by sharp knives into blocks, 1° long, 2′ square, and pressed through coarse wire grating that divides them into bundles of slender straws. In this condition the "tokoroten" is subjected to low temperature,—5– —15° C. (23–5° F.), until sticks are frozen solid (to allow water to crystallize out), and then melted (to permit substances soluble in cold water to drain off in solution), thereby leaving pure gelose. Repeated freezing, thawing, and drying in the sun (open air) yields a pure agar insoluble in cold water. Sticks, before thoroughly dry, may be put through a forcing machine that flattens each fine strip into a transparent sheet, which, after drying in the sun, are tied into bundles, $\frac{1}{2}$–3 pounds; it is also prepared in sheets, 8–12′ long, 1–1$\frac{1}{2}$′ wide, and in rectangular blocks, 8′ long, 1′ square. Our importation, 1920, was 240 tons, valued at $500,000, which suggests our using *G. cartilagin'eum* and *G. aman'sii*, California coast, that yield a dry gelatin 28–30 p. c., of which a 2 p. c. solution makes a hard, elastic jelly, the equal of agar, that remains hard at 58° C. (137° F.), and does not begin to liquefy until 76° C. (170° F.).

CONSTITUENTS.—Gelose (*gel*(atin)+*ose*), amorphous gelatin-like carbohydrate 60–70 p. c., moisture 23 p. c., mineral salts, ash 4 p. c.; gelose heated with strong nitric acid yields mucic and oxalic acids; dissolved in acidulated water with heat—does not gelatinize on cooling.

PROPERTIES AND USES.—Demulcent, nutrient, aperient, emulsifier. In the United States chiefly in hospitals and bacteriological laboratories as a base for culture media, being superior to any substitute as it remains solid (other jellies useless—melting under requisite conditions),

with a smooth, firm surface at the higher temperature required for cultivating certain species of bacteria. In chronic constipation (instead of mineral oil), the action depends on its property of absorbing and holding water, along with it becoming a lubricant and mild mechanical stimulant, unaffected by digestive enzymes or intestinal bacteria; action not violent, as ordinary cathartics, and leaves no harmful after-effects, being best when stools unduly dry. In Japan and China long esteemed as a food in making jellies and candy, thickening soups, ice cream, fruits, meats, fish, etc. It is a valuable dressing for wounds, and its emulsion for photographic plates is superior to that of ordinary gelatin. May be taken in granular powder, or emulsionized with mineral or other oils, or mixed with cereal, bread, biscuit, chocolate agar, etc. It is a poor substitute for sodium stearate in suppositories, as it absorbs only 70 p. c. of glycerin, and melts at higher than body temperature. Native "Kanten" and "Funori," from related algæ, are used to impart gloss to textiles, silk, stiffening linen (starch), decorating china, plastering walls, sizing, glue, etc. Dose, ʒj–4 (4–15 Gm.).

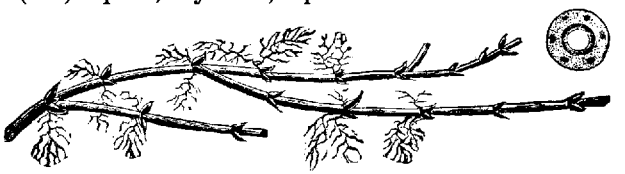
Agaricus

Polyp'orus (*Bole'tus*) *officina'lis*, *Agaricus; Agaric, White* (*Larch*) *Agaric, N.F.*—Polyporaceæ. The dried fruit body, deprived of outer rind, with 5 p. c. foreign organic matter, yielding to boiling alcohol 50 p. c. non-volatile resinous extract; C. and S. Europe—growing on *Pinus, Larix, Picea* species. In light, fibrous, spongy, irregular pieces, grayish, brownish; internally yellowish, resinous; fracture tough; friable, difficult to powder; odor faint; taste sweetish, acrid, bitter. Powder, yellowish-brown—numerous narrow mycelial threads, few calcium oxalate crystals; solvent: diluted alcohol; contains agaracin. Antihydrotic; sweating from coal-tar products and salicylates—acts upon nerve filaments in the sweat-glands. Dose, gr. 5–10 (.3–.6 Gm.); 1. *Pilulæ Antiperiodicæ*, ⅛ gr.; 2. *Tinctura Antiperiodica*, ⅕ p. c., +; *Agaracin*, gr. 1–2 (.06–.12 Gm.).

Agropyron

Agropy'ron re'pens, Triticum, Couch Grass, Dog Grass, N.F.—The dried rhizome and roots with not more than 2 p. c. of foreign organic matter, yielding not more than 3 p. c. of acid-insoluble ash; Europe, N. America. Perennial weedy grass (farmer's pest); culm .6–1.2 M. (2–4°) high; spikes resemble wheat, spikelets 3–8-flowered, 2-ranked glumes shortened or acute. Rhizome, usually in pieces 4–12 Mm. (¼–½′) long, 1–2.5 Mm. (1/25–1/10′) thick, yellowish, furrowed, smooth, lustrous, nodes, leaf-, and root-scars; fracture tough, fibrous, hollow pith; roots filiform, brownish root hairs; odor slight, aromatic; taste sweetish. Powder, light yellowish—tracheæ, pores, sclerenchymatous fibers, epidermal cells separated by a narrow cell, parenchyma; solvent: water; contains triticin 8 p. c., fruit sugar 2.5–3.5 p. c., inosite, glucose, mucilage, malates, ash 2–3 p. c. Diuretic, aperient, demulcent, vulnerary; cystitis, irritable bladder, dysuria, gravel, fevers, jaundice, bronchitis, gout. Dose, ʒss–3 (2–12 Gm.); 1. *Fluidextractum Tritici* (water—when finished add one-fifth vol. of alcohol, as preservative); 2. *Elixir Sabal et Santali Compositum*, 26 p. c., + triticum 26. *Decoction* (Br.) 5 p. c.; *Infusion*, 5 p. c.

Agropyron repens.



Agropyron repens: rhizome and transverse section, magnified 3 diam.

Aletris farinosa

Al'etris farino'sa, Aletris, Star Grass, Unicorn Root, N.F.—The dried rhizome and roots with not more than 5 p. c. of foreign organic matter, yielding not more than 10 p. c. of acid-insoluble ash; United States—southern pine-barrens. Perennial, .6–1 M. (2–3°) high; leaves radical, star-shaped, 7.5–10 Cm. (3–4′) long, 2.5 Cm. (1′) broad; flowers white, as though dusted with meal (indumentum—*farinosa*). Rhizome, 2–4 Cm. (⅛–1⅗′) long, 5–10 Mm. (⅕–⅖′) thick, grayish-brown, circular stem-scars above, numerous tough, wiry, flexuous roots on sides and beneath; fracture short; internally light brown, cortex 1–2 Mm. (1/25–1/12′) thick, twisted fibro-vascular bundles; odor slight, acetous; taste sweetish, bitter. Powder, yellowish-brown—tracheæ, lignified cells, parenchyma with starch grains, numerous calcium oxalate raphides, glandular hairs; contains starch, bitter principle. Uterine tonic, diuretic, emetic, purgative; chronic rheumatism, dropsy, colic. Dose, gr. 5–15 (.3–1 Gm.); 1. *Fluidextractum Aletridis* (diluted alcohol): Preps.: 1. *Elixir Aletridis Compositum*, fldexts.—aletris, mitchella, helonias, caulophyllum, āā, 6.55 p. c. + fldext. viburnum opulus 3.27 p. c.; 2. *Elixir Viburni Opuli Compositum*, 7.5 p. c. Decoction, Tincture.

Allium sativum

Allium sativum.

Al'lium sati'vum, Allium, Garlic, N. F.—The fresh bulb; C. Asia, S. Europe. Bulbous plant .6 M. (2°) high; leaves long, flat, grass-like; flowers small, white umbels. Bulb, subglobular, 4–6 Cm. (1⅗–2⅖′) broad, compound, with 8–15 bulbels surrounded by whitish membranaceous scales and attached to a flattened circular base having numerous yellowish-white roots; bulbels ovoid, 3–4-sided, apex acute; each bulbel covered by whitish membranaceous scale-like leaves and pinkish layer of epidermis cohering but easily separable from solid portion; odor when bruised powerfully alliaceous; taste intensely pungent, persistent; contains volatile oil .25 p. c., mucilage 35 p. c., albumin, sugar, starch, water 60 p. c. Stimulant,

carminative, condiment, diuretic, expectorant, rubefacient; bronchitis, indigestion, infantile catarrh; poultice in catarrhal pneumonia, abscesses, earache, convulsions of children, insect and serpent wounds. Dose, ʒss–1 (2–4 Gm.); 1. *Syrupus Allii,* 20 p. c.—garlic 20 Gm., sucrose 80, diluted acetic acid q. s. 100 cc. (50 cc. +), dose, ʒj–4 (4–15 cc.); volatile oil, ♏j–5 (.06–.3 cc.). *A. Ce'pa Onion* and *A. Por'rum, Leek* are used like garlic.

Aloes

ALOE. ALOE, *U.S.P.*

Aloe { **Perryi,** *Baker,* **vera,** (*Linné*), **ferox,** *Miller.* } The inspissated juice of the leaves, yielding not more than 4 p. c. ash, 10 p. c. moisture, and 50 p. c. water-soluble extractive.

Habitat. 1. E. Africa, Island of Socotra; cultivated. 2. W. Indies (N. E. Africa, India); cultivated in Curaçao, Aruba, Bonaire, Italy, Sicily, Malta, naturalized in Barbados Island, etc. 3. Cape of Good Hope (S. Africa).

Syn. 1. Aloe Socotrina, Socotrine (*sucus citrinus*)–, Bombay-, Mocha-, Turkey-, Zanzibar-Aloe; Fr. Aloès; Ger. Aloë, Aloe, Socotra Aloe, Socotrinische Aloe. 2. Aloe Barbadensis, Barbados-, Curaçao-, East Indian-, India-, Bitter-, Hepatic-, Horse-Aloe; Fr. Aloès hépatique des Barbades, ou de la Jamaique; Ger. Barbados Aloe. 3. Aloe Capensis, Aloe lucida, Shining (Glassy) Aloe; Fr. Aloes du Cap; Ger. Kapaloe.

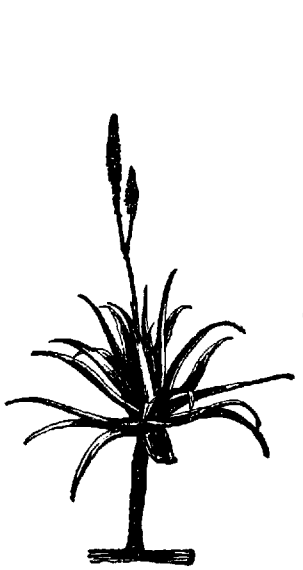
Al'o-e. L. fr. Ar. *Alloeh,* Gr. ἀλόη, native names for the aloe.

Per'ry-i. L. after Wykeham Perry, who studied the plant natively.

Ve'ra. L. *verus,* true—*i. e.,* the original and true primitive kind.

Fer'ox. L. fr. *ferox* or *ferus,* fierce, coarse, wild—*i. e.,* large plant with leaves prickly on surface as well as margins.

PLANTS.—Perennials; stems 1.5 M. (5°) high, woody, rough from leaf-remnants; leaves glaucous-green, often with darker spots, thick, succulent, bayonet-shaped, margin with reddish spines or serratures; flowers racemose or spicate, tubular, yellowish, orange-red; stamens 6, unequal, 3 longer than corolla. INSPISSATED JUICE (aloe—*A. Perryi*): *Socotrine,* yellowish-, blackish-brown, opaque, smooth glistening masses, fracture somewhat conchoidal; odor characteristic; (*A. vera*): *Curaçao,* orange, blackish-brown, opaque masses; fracture uneven, waxy, somewhat resinous; odor characteristic, disagreeable; (*A. ferox*): *Cape,* reddish-brown masses, usually with yellowish powder, or in thin, transparent fragments, reddish-brown; fracture smooth and glassy; odor characteristic, sour, disagreeable. With nitric acid, Socotrine aloe—yellowish, reddish-brown solution; Curaçao—deep red; Cape—reddish-brown, to purplish-brown, finally green; taste of each variety very bitter, nauseous. POWDER, yellowish-brown, dark reddish-brown; mounted in a bland expressed oil, appears yellowish to reddish-brown angular or irregular fragments, color depending somewhat on thickness of fragments. *Tests:* 1. Shake 1 Gm. + cold water 25 cc. occasionally during 2 hours, place on filter, dry over sulphuric acid, wash with cold water q. s. 100 cc.; residue not over 50 p. c.; color of filtrate light yellowish-brown (socotrine), reddish-brown (curaçao), yellowish (cape), darkens upon standing. 2. 5 cc. above filtrate, + water 45 cc. + 20 cc. sodium borate solution (1 in 20)—green fluorescence, upon standing brownish liquid. 3. 10 cc. above filtrate, + water 90 cc., shake + benzene 10 cc., separate benzene layer + ammonia T. S. 5 cc.—permanent deep rose color in lower layer. 4. 1 Gm., + 50 cc. alcohol, heat gently, cool,—nearly clear solution (abs. of gum, inorganic impurities). *Solvents:* alcohol; boiling water; cold water (4); insoluble in ether, chloroform. Dose, gr. ½–10 (.03–.6 Gm.).



Aloe Perryi.

Aloe vera (vulgaris).

ADULTERATIONS.—ALOE: Chiefly dried juice of inferior allied species, small amount of leaves, wood, sticks, stones, leather, monkey and goat skins, implements, knives, nails, iron, resin, pitch, ochre, burned bones, gum, extract of glycyrrhiza, etc.—5–27 p. c., increasing ash to 26.5 p. c. ALOIN: Resinous and other matter, recognized by imperfect solubility in water.

Commercial.—Plants resemble to some extent *Aga've america'na,* American Aloe or century plant, and were known to Dioscorides and Celsus. The large, thick leaves have a central insipid, thick, mucilaginous juice as well as a peripheral bitter, watery, colorless juice (aloetic) in distinct, elongated, thin-walled ducts, which varies in activity with age of leaf and season of year. This superficial juice—possibly a plant protection—is collected when not too scanty or watery, March–April, just after the rainy season, by cutting off the leaves near their base, during sunshine, and standing them up for half an hour in skins depressed in the ground, or in a series of 5 V-shaped wooden troughs (1.2 M.; 4° long—.3–.5 M.; 12–18′ deep), each with an opening in the lower inclined end to run off juice as it exudes by gravity alone (any pressure serving to expel also the undesirable central juice, possessing emmenagogue properties and suitable for poultices) into iron or copper vessels for evaporation, which continues 5 hours, occasionally ladling out the impurities. The colorless juice on exposure soon becomes yellowish-brown, but may be kept in barrels for months, as it does not spoil, and according to demand reduced slowly by sun

(socotrine) or rapidly by fire (curaçao, cape), thus imparting a heavier odor without injuring medicinal properties. In Curacao immediate evaporation, below the boiling-point, yields a variety called "Capey," from its luster and yellowish powder, but if evaporation is deferred a year the surface is dull, odor suggestive of fermentation; powder brownish, and less soluble in water (4–13 p. c.). When of proper consistence the evaporated product—commercial aloe—is poured into tin-lined boxes, kegs, casks, tubs, monkey or goat skins and sent via Zanzibar to Bombay (socotrine), or into gourds (2–15–50 pounds; 1–7–23 Kg.), boxes (60–100 pounds; 27–46 Kg.), small calabashes and shipped from Curaçao, Bonaire, Jamaica, Barbados (Curaçao), or into boxes, cases, skins, and shipped from Algoa Bay, Cape Town, Mossel Bay (cape). There are three varieties: 1, *Socotrine* (*A. Perryi*), most expensive, highly esteemed and flavored—the best; 2, *Curaçao* (*Barbados—A. vera* (*vulgaris*)), mostly used, and commands a higher price upon keeping; 3. *Cape* (*A. ferox*), production equals all other varieties combined; not used much in this country, but largely in Germany, S. Europe.

CONSTITUENTS.—Aloin (chiefly—barb-aloin), Resin 30–50 p. c., Emodin (Cape and Barbados) .15–2 p. c., volatile oil (to which disagreeable odor is due) .0015 p. c., moisture 5–10 p. c., ash 1–4 p. c.

Aloinum. Aloin, *U.S.P.*—A pentoside or mixture of pentosides from aloe, varying in chemical composition, physical and chemical properties according to source. Obtained chiefly by dissolving Curacao aloe (1) in boiling acidulated, HCl or H_2SO_4, water (10), letting stand 24 hours for resin to deposit, decanting, evaporating to 2 parts, setting aside 2 weeks to crystallize—yield 20–25 p. c. It is a microcrystalline powder, minute crystals, lemon-yellow, darker on exposure, odorless, slight odor of aloe, intensely bitter taste; varies in solubility with its composition—soluble in water, alcohol, acetone, ammonia water, solutions of alkali hydroxides, slightly in ether. *Tests:* 1. Aqueous solution—yellow, brown on standing, neutral, faintly acid. 2. Dissolves in alkaline hydroxide solutions—red, yellow becoming red, green fluorescence. 3. Decomposes when added to alkaline solutions, more slowly in acid solutions; alcoholic solution + a drop of ferric chloride T. S.—brownish-green; incinerate—ash .5 p. c.; insoluble residue in water dried —1.5 p. c. 4. Shake 1 Gm. + benzene 10 cc.—filtrate imparts faint pink color to equal volume of 5 p. c. ammonia water (lim. of emodin). Curaçao-aloin, $C_{17}H_{20}O_7$, identical with barb-aloin, ugand-aloin, cap-aloin, when boiled with nitric acid—chrysammic acid, crimson color; soc-aloin, $C_{15}H_{16}O_7$, with nitric acid—no color change; nat-aloin dissolved in sulphuric acid in proximity to glass rod dipped into nitric acid—solution green, blue, violet, orange-red—but no effect on the two preceding. Twice as active as aloe and usually produces no griping. Should be kept dark, in well-closed containers. Dose, gr. ½–2 (.03–.13 Gm.).

Resin.—Obtained by allowing a dilute aloetic infusion to cool, when it precipitates, filtering, drying. Like aloin, varies according to source, the several kinds being esters of various acids (cinnamic, paracumaric, etc.) with aloresino-tannol; soluble in hot water (thus differing from other resins), alcohol, ether, alkaline solutions, brownish-black by ferric salts; equally active as the drug, due possibly to accidental presence of aloin.

Emodin (*Aloe-emodin*).—Believed to be in Cape and Barbados, but not in Natal or Socotrine, and is obtained by dissolving it in ether from aloin, of which, as well as of aloe, it is the purgative principle. In aloin, just as in anthraglucosennin, rhein, frangulin, and purshianin, the alkaline secretions of the upper intestine must produce decomposition, whereby the emodin thus set free may produce peristalsis, hence the cathartic action of the drug.

PREPARATIONS.—I. ALOE: 1. *Pilulæ Aloes.* Pills of Aloe. (Syn., Pil. Aloes; Br. Pilula Aloes, Aloes Pill; Fr. Pilules d'Aloès et de Savon; Ger. Aloepillen.)

Manufacture: Mix aloe 13 Gm., soap 13, water q. s. 100 pills. Dose, 1–4 pills.

2. *Extractum Colocynthidis Compositum,* 50 p. c. 3. *Tinctura Benzoini Composita,* 2 p. c. 4. *Pilulæ Aloes et Asafœtidæ, N.F.,* āā, 1½ gr. (.09 Gm.). 5. *Pilulæ Aloes et Ferri, N.F.,* āā, 1 gr. (.06 Gm.). 6. *Pilulæ Aloes et Mastiches, N.F.,* 2 gr. (.13 Gm.). 7. *Pilulæ Aloes et Myrrhæ, N.F.,* 2 gr. (.13 Gm.). 8. *Pilulæ Aloes et Podophylli Compositæ, N. F.,* 1 gr. (.06 Gm.). 9. *Pilulæ Aloes Hydrargyri et Podophylli, N.F.,* 2 gr. (.13 Gm.). 10. *Pilulæ Ferri, Quininæ, Aloes et Nucis Vomicæ, N.F.,* 1 gr. (.06 Gm.). 11. *Pilulæ Rhei Compositæ, N.F.,* 1½ gr. (.09 Gm.). 12. *Pilulæ Antiperiodicæ, N.F.,* 2 gr. (.13 Gm.). Dose, each, 1–2 pills. 13. *Pulvis Aloes et Canellæ, Hiera Picra, N.F.,* 80 p. c. + canella 20. Dose, gr. 15–30 (1–2 Gm.). 14. *Tinctura Aloes, N.F.,* 10 p. c. Dose, ʒss–1 (2–4 cc.). 15. *Tinctura Aloes et Myrrhæ, N.F.,* āā 10 p. c. Dose, ʒss–1 (2–4 cc.). 16. *Tinctura Antiperiodica, N.F.,* 3.5, p. c. II. ALOIN: 1. *Pilulæ Aloini Compositæ, N.F.,* ½ gr. (.032 Gm.). 2. *Pilulæ Aloini, Strychninæ et Belladonnæ, N.F.,* ⅕ gr. (.013 Gm.). 3. *Pilulæ Aloini, Strychninæ et Belladonnæ Compositæ, N.F.,* ⅕ gr. (.013 Gm.). 4. *Pilulæ Laxativæ Compositæ, N.F.,* ⅕ gr. (.013 Gm.). Dose, each, 1–2 pills.

Unoff. Preps.: Compound Decoction (Br.—1 p. c. of extract). *Extract,* gr. ½–5 (.03–.3 Gm.). *Wine.*

PROPERTIES.—Cathartic, drastic, emmenagogue, vermifuge, stomachic. The action is especially on the colon and lower half of the large intestine, and thus causes irritation to uterus and inflamed hemorrhoids; stimulates the functions of the liver, intestinal secretions generally, increases the flow of bile, and acts in about 15 hours. Abnormal doses do not produce proportionately excessive results, but invariably cause tormina, tenesmus with heat, and rectal irritation—the latter (stomach and rectum) being remedied largely by combining with soap or an alkaline carbonate.

USES.—Costiveness (dependent upon weakness of muscular layer of the large intestine), atonic dyspepsia, jaundice, non-active hemorrhoids, amenorrhea, ascarides; for the two last may give by enema.

Poisoning: Have irritation of intestinal canal, causing pain, vomiting, and purging, cold sweats, prostration, sometimes convulsions, collapse. Empty stomach, give demulcents, opium, stimulants, artificial heat to body and extremities, hot fomentations to abdomen.

Allied Products:

1. *Hepatic Aloe.*—This name was applied formerly to a variety of Socotrine aloe from E. Indies, but now the term is given in this country to Barbados, in fact to any opaque liver-colored aloe.

2. *Natal Aloe.*—This has a greenish-slate hue, crystalline, fracture less shining than, but odor of Cape aloe; it is of little value, and is shipped from Port Natal.

3. *Moka Aloe.*—This has brownish-black color, irregular fracture, disagreeable odor, and is from the interior of Arabia.

4. *Caballine* or *Horse Aloe.*—This is inferior, impure, having a dark color, fetid odor, being from irregular sources.

5. *Jafferabad Aloe.*—This has black-pitch color and luster, glassy, porous fracture, and is less agreeable than Socotrine aloe.

Alpinia

Alpin'ia officina'rum, Galanga, Galangal, N. F.—The dried rhizome with not more than 2 p. c. of foreign organic matter, yielding not more than 3 p. c. of acid-insoluble ash; China, cultivated. Perennial flag-like herb; flowers terminal racemes, white, red-veined. Rhizome, irregularly branched, 2–10 Cm. ($\frac{4}{5}$–4′) long, 1–2 Cm. ($\frac{2}{5}$–$\frac{4}{5}$′) thick, branches with annuli of lighter-colored leaf bases, 3–10 Mm. ($\frac{1}{8}$–$\frac{2}{5}$′) apart, rusty brown, internally orange-brown, cut end of branches circular and expanded; fracture fibrous; odor aromatic, agreeable; taste hot, spicy, ginger-like. Powder, reddish-brown—numerous starch grains, oil cells and reddish resin cells, tracheæ with thickenings, pores, thick-walled fibers, no lignified tissue; contains volatile oil .5 p. c., resin, gum, bassorin, fat, galangol, galangin, kæmpferid, alpinin, starch 23 p. c. Stimulant, aromatic, carminative; improve digestion, relieve flatulence. Dose, gr. 5–20 (.3–1.3 Gm.); 1. *Tinctura Aromatica*, 2 p. c.

Galanga.

Althea

ALTHÆA. ALTHEA, *U.S.P.*

Althæa officinalis, *Linné.* { The dried root deprived of the brown, corky layer and small roots.

Habitat. Europe, Western and Northern Asia; naturalized in salt marshes, New England, New York, Australia; cultivated in Europe.

Syn. Marsh Mallow Root, Marsh Mallow, White Mallow, Mortification Root, Sweetweed, Wymote; Fr. Racine de Guimauve, Guimauve; Ger. Radix Althææ, Eibischwurzel, Eibisch.

Al-thæ'a. L. fr. Gr. *ἀλθαίνω*, to heal, cure—*i. e.*, its medicinal qualities (Dioscorides).

Of-fi-ci-na'lis. L. see (*Smilax*) *officinalis*

Plant.—Perennial herb .6–1.3 M. (2–4°) high, having several woolly stems; flowers large, 2.5–5 Cm. (1–2′) in diameter, purple. Root, slenderly tapering, 15–30 Cm. (6–12′) long, 1–2 Cm. ($\frac{2}{5}$–$\frac{4}{5}$′) thick; usually cut into small pieces, 5 Mm. ($\frac{1}{5}$′) thick, whitish, longitudinally furrowed, frequently spirally twisted and covered with somewhat loosened bast-fibers (hairy); fracture fibrous (bark), short, granular (wood); internally yellowish-white; bark 1–2 Mm. ($\frac{1}{26}$–$\frac{1}{12}$′) thick, porous (due to mucilage cells) and separated from slightly radiating wood by grayish cambium zone; odor slight; taste sweetish, mucilaginous. Powder, whitish—many starch grains up to .03 Mm. ($\frac{1}{833}$′) in diameter, usually with long central cleft; groups of fibers with thick, more or less lignified walls; tracheæ, scalariform thickenings or bordered pores, few calcium oxalate crystals in rosette aggregates. *Tests:* 1. Macerate 1 Gm. for 30 minutes in water 10 cc., stirring occasionally, filter through purified cotton—pale yellow, neutral mucilage, + a few drops of sodium hydroxide T. S.—turns deep yellow; mucilage does not have a sour or ammoniacal odor. Leaves (Althææ Folia, Marsh Mallow Leaves, *N. F.*). The dried leaves with not more than 5 p. c. stems and fruits or other foreign organic matter. Crumpled or matted, gray-green, densely and finely tomentose, petioles 1–6 Cm. ($\frac{2}{5}$–2$\frac{2}{5}$′) long; blades 3–15 Cm. (1$\frac{1}{5}$–6′) long, 3–10 Cm. (1$\frac{1}{5}$–4′) broad, thin, cordate, rounded at base, acute, doubly serrate-dentate, lobed, 2–6 principal veins from midrib in the petiole; odor slight, scarcely characteristic; taste mucilaginous. Powder, grayish-green—stellate and glandular hairs, calcium oxalate in rosette aggregates, stomata, mucilage cells, pollen grains. *Solvents:* water—cold, dissolving asparagin, mucilage, sugar; hot, also starch. Dose, ℥ss–1 (2–4 Gm.).

Althæa officinalis.

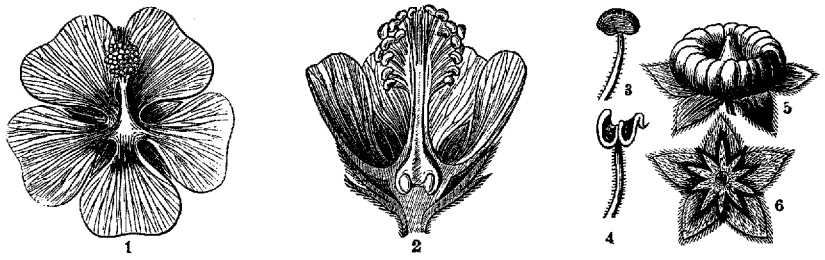
Adulterations.—Root: Belladonna root, when young and peeled, resembles althea, but distinguished by absence of hair-like bast-fibers, and by possessing visible yellowish wood bundles; old dark-colored althea roots sometimes are whitened with calcium oxide or sulphate, which subside to the bottom upon soaking in water, thereby readily being detected; root sometimes marketed cut in small cubes, rendering admixtures more likely; Powder: Starchy substances recognized by shape of starch granules.

Commercial.—Plant during first 2 years produces only a tap-root, which soon therafter becomes tough, woody, inert, and much branched, the branches having little medicinal value; the unscraped root is yellowish-brown, nonfibrous, and should be collected (late autumn) from cultivated plants, peeled, and dried carefully; leaves and flowers sometimes used.

Constituents.—Root: Asparagin (althein, amido (-succinamide) -succinic acid, asparamide) 1–2 p. c., Mucilage (bassorin, althea mucilage, upon which value depends) 35 p. c., Starch 37 p. c., pectin 11 p. c., betaine, sugar 11 p. c., fat 1.25 p. c., ash 4–8 p. c. Leaves: similar but less mucilage.

Asparagin, $C_4H_8O_3N_2.H_2O$.—Obtained by putting the thick, viscid, mucilage of althea into a dialyzer, with water outside; asparagin passes into the water, which upon evaporation yields the crystals. These are colorless, neutral, transparent, lustrous, sp. gr. 1.520, soluble in water (47), acids, alkalies, converted by these latter into ammonia and aspartic acid; therapeutically inactive. Dose, gr. 5–10 (.3–.6 Gm.).

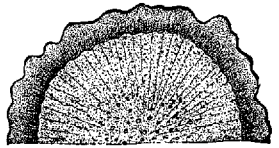
PREPARATIONS.—ROOT: 1. *Massa Hydrargyri*, 15 p. c. 2. *Pilulæ Ferri Carbonatis*, $\frac{1}{6}$ gr. (.01 Gm.). 3. *Pilulæ Phosphori*, 1 gr. (.06 Gm.). 4. *Syrupus Althææ, N.F.*, 5 p. c., + alcohol 3, glycerin 10, sucrose 70, water q. s. 100. Dose, ℥j–4 (4–15 cc.). 5. *Species Pectorales, Breast Tea, N.F.*, 40 p. c., + coltsfoot 20, glycyrrhiza 15, anise, mullein



Althæa officinalis: 1, expanded flower; *2*, vertical section of flower; *3*, stamen; *4*, stamen after discharge of pollen; *5*, fruit; *6*, outside calyx as seen from beneath.

flowers, āā 10, orris 5. LEAVES: 1. *Species Emollientes, Emollient Cataplasm, N.F.*, 20 p. c.—althea leaves, mallow leaves, melilot, matricaria, linseed, āā 20 Gm., hot water q. s. 100. Poultice.

Unoff. Preps.: Decoction, Infusion, each, 5 p. c., ℥j–4 (30–120 cc.). Ointment.



Althæa: transverse section, magnified 2 diam.

PROPERTIES.—ROOT and LEAVES: Demulcent, emollient, protective.

USES.—Inflammations of pulmonary, digestive, and urinary organs, mucous membranes; skin eruptions, herpes, psoriasis, enema (decoction) for vaginal and rectal irritation. In pharmacy, the powdered root being very absorbent, is used to harden pills, troches, electuaries, etc. *A. ro'sea, Hollyhock.*—Levant, formerly cultivated in gardens for flowers (petals—*Flores Malvæ Arboreæ*), 7.5–12.5 Cm. (3–5′) broad, nearly sessile, composed of tomentose calyx and 5 purple petals.

Amanita *Agar'icus musca'rius* (*Amani'ta musca'ria*), *Fly Fungus* (*Agaric*).—N. Europe, Russia. This mushroom grows in the autumn mainly, under pine trees; stalk is white, tuberous at base, 7.5–15 Cm. (3–6′) high, 1.8 Cm. ($\frac{3}{4}$′) thick. Cup (pileus) 10–15 Cm. (4–6′) broad, orange-red; contains chiefly *muscarine* (muscarina), $C_5H_{15}O_3N$, a colorless, odorless, crystalline, deliquescent alkaloid, yielding deliquescent salts (nitrate, sulphate); all usually occur as brown, syrupy liquids, soluble in water, alcohol; resembles Calabar bean in action; antihydrotic, antispasmodic, myotic. Reduces force and frequency of pulse, contracts muscles of intestines and bladder, increases abdominal secretions, causes dyspnea, paralysis, death. Given for intestinal torpor, duodenal catarrh, diabetes, antidote to atropine, to replace physostigmine. Dose (muscarine), gr. $\frac{1}{30}$–$\frac{1}{15}$ (.002–.004 Gm.).

Amber *Pini'tes succin'ifer* (*Pi'cea succinif'era*), *Succinum* (*Amber*).—Fossil resin, U. S. P. 1820–1850; Baltic Sea, Prussia, coal mines. There are 50 Pinaceæ species that yield this resin. Such trees have been submerged under seawater, and from time to time yield by natural exudation this oleoresin, which is found along shores under and above water in irregular-sized pieces, that of 13 pounds (6 Kg.) being, so far, the largest; it is rough, dull, hard, brittle, fracture conchoidal, glossy, transparent, yellowish-red, sp. gr. 1.09, aromatic when heated, tasteless, melts at 288° C. (550° F.), yielding succinic acid, if heated higher get water, volatile acids, empyreumatic oil; contains succinic acid, $C_4H_6O_4$, several resins. Used for preparing succinic acid and (empyreumatic) oil of amber, for fumigation, in the arts. *Oleum Succini, U. S. P.* 1820–1880. *Oleum Succini Rectificatum, U. S. P.* 1830–1870. Stimulant, antispasmodic, diuretic; hysteria, whooping-cough, infantile convulsions, intestinal irritation, amenorrhea. Externally—rheumatism, rubefacient liniments. Dose, ♏v–15 (.3–1 cc.).

Amygdalus communis var. amara

AMYGDALA AMARA. BITTER ALMOND

Oleum Amygdalæ Amaræ. Oil of Bitter Almond, *U.S.P.*

Amygdalus communis (var. **amara**), *Linné*, or other kernels containing amygdalin. } A volatile oil from the dried ripe kernels (deprived of fixed oil) obtained by maceration with water and subsequent distillation with steam.

Habitat. W. Asia, Persia, Syria, Barbary, Morocco; naturalized in Mediterranean Basin; cultivated in Europe; unsuccessfully in United States.

Syn. Greek Nuts; Ol. Amygd. Amar., Bitter Almond Oil, Oleum Amygdalarum (Amararum) Æthereum; Fr. Amande amère; Essence d'Amande amère; Ger. Amygdalæ Amaræ, Bittere Mandeln; Bittermandelöl.

A-myg'da-lus. L. fr. Gr. *αμύσσω*, to lacerate—*i. e.*, its fissured shell.

Com-mu'nis. L. common, general—*i. e.*, the ordinary or common species.

A-ma'ra. L. *amarus*, bitter—*i. e.*, the fruit.

PLANT.—Small tree, 5–6 M. (15–20°) high, bark purplish; leaves bright green; flowers pale pink or white; fruit drupe, ovate, 5 Cm. (2′) long, 2.5 Cm. (1′) broad, sarcocarp green, leathery, splitting into two halves when ripe, and falling from the stone. This remaining stone is the commercial almond, and may be sold as such or may be bleached by sulphur dioxide, thereby also killing any attached insects. By cracking off hard shell the kernel, or, properly, the seed, is left, which, when deprived of papery endocarp by hot water, constitutes the more desirable blanched almond. Seed (almond), 2.5 Cm. (1′) long, oblong-lanceolate, flattish; testa cinnamon-brown, thin, finely

downy, marked by about 16 lines radiating from broad scar at blunt end; embryo straight, white, oily, with 2 plano-convex cotyledons; taste bitter, oleaginous; triturated with water yields milk-white emulsion, emitting odor of hydrocyanic acid.

ADULTERATIONS.—SEED: Sweet almonds chiefly (Valencia) and peach seed—both cheaper; the bitter differs from the sweet in flavor, odor with water, containing amygdalin, being shorter, broader, thinner, less plump and darker, and from peach seed by being much larger; OIL: Alcohol, oil of turpentine, nitrobenzene, impure benzaldehyde from toluene (chlorine), etc.

Commercial.—There are several varieties of these (*French, Sicily, Barbary,* in the order of value), being exported chiefly from Mogador, in Morocco.

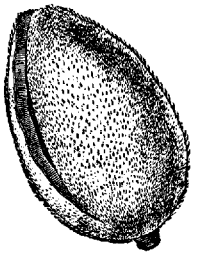
CONSTITUENTS.—KERNELS: Fixed oil 46 p. c., Amygdalin 1–3 p. c., Emulsin, mucilage 3 p. c., proteins (myosin, vitellin, conglutin) 24–30 p. c., precipitated by acetic acid, sugar 6 p. c., ash 3.5 p. c.—K, Ca, Mg —phosphates); yield volatile oil 1 p. c.; hydrocyanic acid .25 p. c.

Amygdalin, $C_{20}H_{27}O_{11}N$.—A crystalline cyanogenetic glucoside obtained from expressed cake (deprived of fixed oil) by boiling in alcohol, distilling to syrup, adding water and yeast, and then allowing fermentation; after this, filter, evaporate to syrup, add alcohol to precipitate amygdalin and gum, from which boiling alcohol takes up the former, depositing it upon cooling.

Emulsin (*synaptase*).—A ferment (enzyme) coagulated by heat, precipitated by alcohol, but not by acetic acid, and in the presence of water, acts upon amygdalin, forming glucose, $C_6H_{12}O_6$, hydrocyanic acid, HCN (1 part being formed from 17 of amygdalin), and benzaldehyde, C_7H_6O—oil of bitter almond 1–4 p. c.; $C_{20}H_{27}O_{11}N + 2H_2O = 2(C_6H_{12}O_6) + HCN + C_7H_6O$.

Oleum Amygdalæ Amaræ. Oil of Bitter Almond.—This volatile oil, like volatile oil of mustard, oil of gaultheria, and methyl salicylate, does not preëxist in the kernels (seeds), but results from macerating with water for 12 hours the expressed cake of bitter almonds, wherein amygdalin undergoes fermentation, then distilling the oil formed by passing steam through the mixture; kernels of the peach (*P. Persica*) and apricot (*P. armeni'aca*) yield much of the commercial oil, which may also be prepared synthetically from toluene (see benzaldehydum, page 278). It is a clear, colorless, yellowish, strongly refractive liquid, characteristic odor and taste of benzaldehyde, soluble in alcohol, ether, slightly in water, forms clear solution in 70 p. c. alcohol (2); sp. gr. 1.038–1.060, optically inactive or dextrorotatory; at first neutral, but becomes acid from the formation of benzoic acid; yields not less than 85 p. c. of benzaldehyde, C_6H_5CHO, and 2–4 p. c. of hydrocyanic acid, HCN (sometimes as much as 8–10 p. c.); when freed from

Amygdalus communis: *1*, flowering twig; *2*, twig, with fruit; *3*, fruit hull cracked off; *4*, seed deprived of hull; *5*, vertical section of flower; *6*, longitudinal section of seed.



Amygdalus communis: fruit in the act of opening.

this latter it is less poisonous, but even then has a marked physiological action on the nervous system. *Impurities:* Nitrobenzene, chlorinated products, heavy metals. The label must indicate definitely its specific source, as this is intended for medicinal use, and not for flavoring foods. Should be kept dark, cool, in small, well-stoppered, completely filled, amber-colored bottles, and when showing crystals (benzoic acid) must not be dispensed. Dose, ♏¼–1 (.016–.06 cc.).

PREPARATIONS.—OIL: 1. *Elixir Amygdalæ Compositum, N.F.,* 1/20 p. c.: Preps.: 1. *Elixir Bromidorum Trium, N.F.,* q. s. 2. *Emulsa*—as flavoring when preferred. 3. *Spiritus Amygdalæ Amaræ, N.F.,* 1 p. c., Dose, ♏xv–30 (1–2 cc.). Preps.: 1. *Elixir Anisi, N.F.,* 1.2 p. c. 2. *Elixir Terpini Hydratis, N.F.,* ½ p. c.

Unoff. Preps.: Water (oil 1/10 p. c.), ʒj–3 (4–12 cc.). *Syrup* (spt. of bitter almond 1, orange flower water 10, syrup q. s. 100), ʒij–4 (8–15 cc.).

PROPERTIES.—Demulcent, nutrient, sedative; often produces urticaria.

USES.—Coughs, pulmonary troubles, flavoring.

Poisoning: Here have hydrocyanic acid symptoms; hence give emetics to induce vomiting, galvanism, brandy, whisky, ammonia to nostrils, etc.

Allied Products:

1. **Benzaldehydum. Benzaldehyde,** C_6H_5CHO, *U.S.P.*—(Syn., Benzald., Oleum Amygdalarum Æthereum (Artificiale)-sine Acide Prussico, Synthetic Oil of Bitter Almond; Fr. Aldehyde benzoique; Ger. Kunstliches Bittermandelöl.) An aldehyde produced synthetically or from oil of bitter almond, containing not less than 85 p. c. of benzaldehyde.

Manufacture: 1. Shake oil of bitter almond (peach, apricot, etc.) with concentrated solution of acid sodium sulphite (3) to form crystal-

line sodium benzalhydroxysulphonate, wash with cold alcohol, treat with strong sodium carbonate solution, rectify by distillation with steam. 2. Treat boiling toluene, C_7H_8, with chlorine, heat resulting benzyl chloride with barium nitrate and water, while passing carbon dioxide through the mixture, the benzyl nitrate formed decomposes into benzaldehyde and oxides of nitrogen. It is a colorless, yellowish, refractive liquid, bitter almond-like odor, burning aromatic taste, soluble in water (350), miscible with alcohol, ether, fixed or volatile oils; sp. gr. 1.045; differs from oil of bitter almond in having no hydrocyanic acid. *Tests:* 1. Shake .5 cc. with distilled water 5 cc., + sodium hydroxide T. S. .5 cc., + ferrous sulphate T. S. .1 cc., warm gently, + excess of hydrochloric acid—no greenish-blue color or blue precipitate within 15 minutes (abs. of hydrocyanic acid). 2. Dissolve 1 cc. in alcohol (20), + distilled water until turbid, evolve hydrogen 1 hour by adding zinc and diluted sulphuric acid, filter, evaporate to 20 cc.; of this boil 10 cc. + a drop of potassium dichromate T. S.—not violet (abs. of nitrobenzene). *Impurities:* Hydrocyanic acid, chlorinated compounds, nitrobenzene. Should be kept dark, in small, well-stoppered bottles. Dose, ♏¼–1 (.016–.06 cc.).

PROPERTIES AND USES.—Similar to oil of bitter almond; largely as a flavoring agent, having the advantage of the oil in being devoid of hydrocyanic acid, and not being poisonous except in large quantities.

2. *Nitrobenzene, Nitrobenzol, Oil of Mirbane.*—False artificial oil of bitter almond is obtained by acting on benzene with nitric acid. It is very poisonous, has the true bitter almond oil odor, owing to which substitution has been made with fatal results; should not be taken internally—used for flavoring soaps, making aniline, etc.

Amygdalus communis var. dulcis

AMYGDALA DULCIS. SWEET ALMOND.

Oleum Amygdalæ Expressum. Expressed Oil of Almond, *U.S.P.*

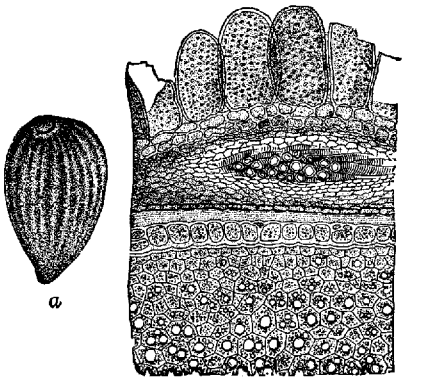
Amygdalus communis (var. dulcis), *Linné.* { A fixed oil obtained from the kernels of several varieties.

Habitat. W. Asia, Persia, Syria, Barbary, Morocco; naturalized in Mediterranean Basin; cultivated in Europe, S. California.

Syn. Jordon Almond, Malaga, Paper-shell, Greek Nuts; Fr. Amande(s) douce(s); Ger. Amygdalæ dulces, Susse Mandeln; Ol. Amygd. Exp., Oil of Sweet Almond, Oleum Amygdalæ Dulcis; Br. Oleum Amygdalæ, Almond Oil; Fr. Huile d'Amande (douce); Ger. Oleum Amygdalorum, Mandelöl.

Dul'cis. L. sweet—*i. e.*, the fruit without bitterness.

PLANT.—Small tree, 5–6 M. (15–20°) high, bark purplish; leaves bright green; flowers pale pink or white; fruit drupe, ovate, 5 Cm. (2′) long, 2.5 Cm. (1′) broad, sarcocarp green, leathery, splitting into two halves when ripe, and falling from the stone. This remaining stone is the commercial almond, and may be sold as such or may be bleached by sulphur dioxide, thereby also killing any attached insects. By cracking off hard shell the kernel, or, properly, the seed, is left, which, when deprived of papery endocarp by hot water, constitutes the more desirable blanched almond. Seed (almond), 17–25 Mm. (¾–1′) long, 10–13 Mm. (⅖–½′) broad, 4–7 Mm. (⅙–⅓′) thick, oblong-lanceolate; seed-coat light brown with numerous parallel veins, thin, easily removed by soaking in water; embryo straight, white, 2 plano-convex cotyledons; taste bland, sweet; triturated with water—milk-white, non-acid emulsion having no odor of benzaldehyde, or hydrocyanic acid (abs. of bitter almond). Powder, creamy-white—numerous small and large oil globules, crystalloids, globoids, fragments of parenchyma of endosperm and seed-coat, aleurone grains, spiral tracheæ; no starch grains.



Amygdalus communis: a, seed-kernel; *b*, section through seed-coats and portion of cotyledon.

Commercial.—Of these there are several varieties (*Jordan, Valencia, Sicily, Barbary,* in the order of value), imported chiefly from Spain, S. France, via Marseilles or Bordeaux (*soft-shelled;* var. *frag'ilis*), and Malaga (*Jordan* or *long*) or Valencia (*hard-shelled*), being larger and longer than the var. *amara,* with more convex sides. The Jordan only, owing to easy recognition, are used in the Br. P. To preserve almonds, should keep dry, thereby preventing decomposition of amygdalin and fixed oil; when rancid the embryo has changed into gum bassorin, which renders them unfit for medicinal use.

CONSTITUENTS.—Fixed oil 56 p. c., Emulsin (mucilage 3 p. c., sugar 6 p. c., proteins (myosin, vitellin, and conglutin) 24–30 p. c., precipitated by acetic acid, ash 3–5 p. c.—K, Ca, Mg—phosphates); the *testa* of both varieties contain tannin.

Oleum Amygdalæ Expressum. Expressed Oil of Almond.—This fixed oil is obtained from both varieties of almonds (sweet and bitter) by grinding or bruising in an iron or stone mortar the clean and perfect kernels, enclosing mass in canvas bags and subjecting them to hydraulic pressure of 350 atmospheres between polished steel plates slightly heated (30° C.; 86° F.); the expressed turbid oil is set aside in a cool place, decanted from sediment and filtered; most of the commercial oil is from the bitter almonds prior to preparing the volatile oil. It is a clear, pale straw-colored, colorless, oily liquid, almost odorless, bland taste; slightly soluble in alcohol, miscible with ether, chloroform, benzene, petroleum benzin; sp. gr. 0.912; contains triolein 75–85 p. c., tripalmitin, trilinolein. *Tests:* 1. Clear at —10° C.; 14° F., congeals at —20° C.; —4° F. (abs. of olive, cottonseed, sesame, lard oils, congealing at —5° C.; 22° F., apricot and peach oils remaining fluid at —20° C.; —4° F.). 2. Shake vigorously oil (2), fuming nitric acid (1), distilled water (1)—the mixture is not more than colored (abs. of peach and apricot oils—red color, sesame and cottonseed oils—brown color). Should be kept cool, in well-closed containers. Dose, ʒj–2 (30–60 cc.).

ADULTERATIONS.—Olive, arachis (ground-nut), lard, cottonseed,

sesame, poppy, apricot and peach oils; apricot kernels yield 25–38 p. c. of oil, which, with peach oil, is substituted often (in part or entire) for the pure article.

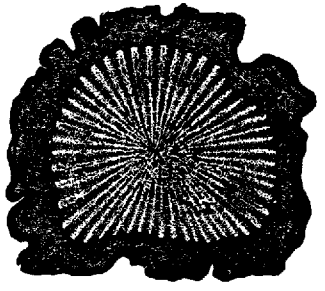
PREPARATIONS.—1. *Unguentum Aquæ Rosæ,* 56 p. c. 2. *Emulsum Petrolati, N.F.,* 22.5 p. c. 3. *Oleum Phosphoratum, N. F.,* 90 p. c. 4. *Unguentum Veratrinæ, N.F.,* 6 p. c.

Unoff. Preps.: Emulsion (seed 6 p. c., + acacia 1, sucrose 3, water q. s. 100), ʒij–4 (8–15 cc.). *Pulvis Amygdalæ Compositus* (Br.)—seed 60 parts, + sucrose 30, acacia 10.

PROPERTIES.—Demulcent, nutrient, laxative.

USES.—The meal of the expressed cake as a toilet powder, and since it contains no starch it may readily be made into bread, cake, puddings, etc., which is excellent for diabetics. Seed very popular as a confection. Expressed oil, employed like olive oil, also for pulmonary trouble.

Anacyclus Pyrethrum: A, expanded flower; *B,* involucre seen from below; *C,* dried flower.



Pyrethrum: transverse section magnified 3 diam.

Anacyclus pyrethrum

Anacy'clus Pyre'thrum, Pyrethrum, Pellitory (Root).—The dried root, U.S.P. 1820–1910; N. Africa, Algeria—high lands, cultivated in gardens. Procumbent perennial, resembling chamomile, .3 M. (1°) high, with 1 large terminal flower; leaves doubly pinnate, pale green; flowers, April-June, 2.5–4 Cm. (1–1⅗′) broad, rays white above, reddish-purple below, disk yellow; fruit obovate achene. Root, tapering, in pieces 2.5–10 Cm. (1–4′) long, 5–20 Mm. (⅕–⅘′) thick, dark brown, furrowed, wrinkled; fracture short; bark with 1–2 circles of resin ducts, closely adhering to yellowish radiate porous wood in which occur 1–3 rows of resin ducts; odor distinct; taste sweetish, pungent, very acrid, tingling, sialagogue effect. Powder, brownish—masses of inulin, fragments of woody tissue, stone cells, cork, tracheæ, parenchyma; should be kept in tightly closed containers; solvents: alcohol, boiling water partially; contains pyrethrine (activity), brown acrid resin (containing pellitorin), 2 potassa-soluble acrid fixed oils, inulin 50 p. c., tannin, volatile oil, gum, ash 3–5 p. c. Irritant, rubefacient, sialagogue (prickling sensation to tongue and fauces with heat, pungency), sternutatory—poisonous; masticatory—headache, rheumatism, neuralgia, toothache (tincture or extract as an anesthetic in carious teeth), paralysis of tongue or throat, relaxed uvula, chronic catarrh. Dose, ʒss–1 (2–4 Gm.). Tincture, 20 p. c., ʒss–2 (2–8 cc.); Fluidextract, ʒss–1 (2–4 cc.); Decoction, Extract (alcohol), Gargle. *A. officina'rum, German Pellitory*—annual variety, cultivated in Saxony, Bohemia, Prussia, near Magdeburg, having root 6 Mm. (¼′) thick; bark with 1 circle of resin-cells, medullary rays without resin-cells.

Anamirta

Anamir'ta Coc'culus, Cocculus (Indicus), Fish (Indian) Berry, N.F.—The dried ripe fruit with 2 p. c. foreign organic matter; E. India, Ceylon. Large woody climber; leaves 10–20 Cm. (4–8′) long, cordate; flowers, small, dicœcious. Fruit (in clusters 2–5) drupe, reniform, 8–13.5 Mm. (⅓–1½′) long, 7–11 Mm. (¼–½′) broad, 7–10 Mm. (¼–⅖′) thick, blackish-brown, wrinkled, hilum and micropyle near ridge on convex side; stalk scar; pericarp tough, 1 Mm. (½⅕′) thick, 1 urn-shaped seed, taste bitter, seed intensely bitter. Powder, brown—epicarp fragments with alkalies—reddish-brown, fixed oil globules, aleurone grains, acicular crystals soluble in diluted hydrochloric acid, fibers, tracheæ; contains (seed)—picrotoxin, anamirtin (cocculin, not bitter or poisonous), fat; (pericarp, nearly tasteless)—menispermine, paramenispermine, hypopicrotoxic acid, resin. *Picrotoxin* (picrotoxinum), $C_{30}H_{34}O_{13}$—U.S.P. 1880–1890, not a single body, but composed of picrotoxin 54 p. c., and picrotin 46 p. c.; obtained by evaporating to syrup a tincture made with hot alcohol, removing fat, boiling residue with water, filtering, which deposits picrotoxin upon cooling. It is in colorless, shining prismatic crystals or powder, odorless, very bitter, soluble in alcohol, ether, chloroform; with H_2SO_4 + $NaNO_3$ + NaOH gives brick-red, fading in few hours. Cerebrospinal excitant, nervine, antiparasitic, with combined action of belladonna and nux vomica; slows heart and respiration, causes spasms of flexors, death by paralyzing heart; convulsions resemble epileptic paroxysms (circular spasms)—those of strychnine being tonic (tetanic), affecting the extensors; paralysis (laryngeal), epilepsy, chorea, eclampsia, chronic spasms of the limbs, vomiting with giddiness, morphine antidote; externally—parasitic skin diseases, itch, lice, ringworm (avoiding abraded surfaces); powdered berries, mixed with dough, sometimes thrown upon water in order to catch fish; after eating this, fish whirl around, become stupefied, and lie motionless upon the surface, so that they may readily be picked up; berries also prevent secondary fermentation of alcoholic liquors, adding strength thereto, but dangerous. *Poisoning:* Symptoms and treatment similar to strychnine. Dose, seed, gr. 1–3 (.06–.2 Gm.); 1. *Tinctura Cocculi,* 10 p. c. (diluted alcohol), dose, ♏ij–15 (.13–1 cc.)—externally to destroy parasites; picrotoxin, gr. 1/64–1/32 (.001–.002 Gm.); menispermine, gr. 1–2 (.06–.13 Gm.); *decoction,* 2.5 p. c.; *ointment,* 2 p. c.

Anamirta Cocculus (paniculata).

a *b* *c*

Anamirta Cocculus: ***a,*** **staminate flower;** ***b,*** **longitudinal section of fruit, magnified;** ***c,*** **fruit and section, normal size.**

Andropogon

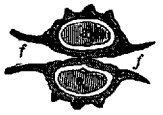
Andropo'gon squarro'sa (*murica'tus*), *Vetiveria* (*Vetivert*).—E. India. The fibrous wiry roots from the rhizome; yellowish-brown, waxy, 15–20 Cm. (6–8′) long, 1 Mm. ($\frac{1}{25}$′) thick, tough, aromatic, balsamic; contains volatile oil, resin. Used as tonic, stimulant, in perfumery, sachet powders (violet), etc.

Anethum

Ane'thum (*Peuced'anum*) *grave'olens*, *Anethi Fructus*, *Dill Fruit* (Br.).—S. Europe, Asia. Herb .6 M. (2°) high; leaves finely divided, glaucous; flowers yellow; fruit oblong, 4 Mm. ($\frac{1}{6}$′) long, brown, smooth, mericarps 2, flat-faced, each having 5 ribs, 6 vittæ, of which 3 are filiform, 2 lateral ones broadly winged, light colored, odor, and taste spicy, caraway-like; contains volatile oil 3–4 p. c., fixed oil Carminative, stimulant, stomachic, condiment, flavoring; as a substitute for anise and caraway in flatulent colic, hiccough, indigestion. Dose, gr. 10–30 (.6–2 Gm.); volatile oil (*Oleum Anethi*, Br.), ♏ij–5 (.13–.3 cc.); *Aqua Anethi* (Br.), 10 p. c., ℥ss–2 (15–60 cc.).

Angelica

Angel'ica Archangel'ica, *European Angelica;* 1. *Angelica Radix*, *Angelica Root*, *N.F.*—The dried rhizome and roots of this and other species with not more than 5 p. c. of stem-bases or other foreign organic matter, yielding not more than 4 p. c. of acid-insoluble ash; 2. *Angelica Fructus*, *Angelica Fruit* (*Seed*), *N.F.*—The dried ripe fruit of this and other species with not more than 3 p. c. of foreign fruits, seeds or other foreign organic matter; N. Europe, cultivated in Germany. Stout perennial herb, 1.8–2 M. (5–6°) high, purplish, smooth, hollow, jointed, leaves double pinnate; flowers greenish-white. Rhizome, short, thick, 5–10 Cm. (2–4′) long, sometimes split, frequently crowned with leaf and stem-bases; roots numerous 10–20 Cm. (4–8′) long, 5–7 Mm. ($\frac{1}{5}$–$\frac{1}{3}$′) thick at base, tapering to 1 Mm. ($\frac{1}{25}$′), twisted together, dark brown, deep furrows; fracture short, smooth; odor aromatic, taste sweetish, pungent, aromatic, bitter. Powder, yellowish-brown—starch grains, tracheæ, brownish oil canals, parenchyma tissue with starch, cork cells, wood-fibers, yellowish oil globules. Fruit, cremocarps oval, yellowish-brown 4–8 Mm. ($\frac{1}{6}$–$\frac{1}{3}$′) long, 3–6 Mm. ($\frac{1}{8}$–$\frac{1}{4}$′) broad, 1–2 Mm. ($\frac{1}{25}$–$\frac{1}{12}$′) thick, base notched, apex bearing 5 calyx teeth; mericarps joined or separate, each flat on one surface, convex upon the other, with 3 ribs, separated by grooves; odor characteristic, agreeable; taste aromatic, pungent, sweetish. Powder, light brown—spongy parenchyma, oil tubes, aleurone grains, calcium oxalate rosettes; solvent: alcohol; contain volatile oil .5 p. c., acrid resin (angelicin), angelic acid, tannin, pectin. Tonic, stimulant, carminative, diaphoretic, emetic; typhoid condition, bronchitis, intermittents; rheumatism, gout, painful swollen parts, condiment, Dose, gr. 10–30 (.6–2 Gm.); Root: 1. *Fluidextractum Angelicæ Radicis* (92 p. c. alcohol), dose, ♏xv–30 (1–2 cc.); Infusion, Tincture, Fresh juice (poisonous); Fruit: 1. *Pilulæ Antiperiodicæ*, ½ gr. (.03 Gm.); 2. *Tinctura Antiperiodica*, $\frac{4}{5}$ p. c.



Angelica—flowering stem and cross-section of cremocarp: *a*, the seed; *f*, the 2-ribbed wings (mericarps).

Anisum

ANISUM. ANISE, *N.F.*

Oleum Anisi. Oil of Anise, *U.S.P.*

Pimpinella Anisum, *Linné,* or **Illicium verum,** *Hooker filius.* } The volatile oil distilled from the dried ripe fruits.

Habitat. W. Asia, Egypt, S. E. Europe; cultivated in S. Europe, United States, in gardens.

Syn. Anis., Aniseed, Aneys, Aunyle, Common Anise, Sweet Cumin, Semen Anisi; Br. Anisi Fructus; Fr. Anis, Anis vert, Graines d'Anise; Ger. Anis, Anissame; Ol. Anisi, Anise Oil; Fr. Essence d'Anis; Ger. Anisöl, Anethol.

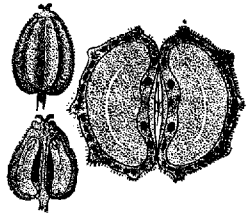
Pim-pi-nel'la. L. Medieval name, altered, from *bipinnate* or *bipinnella*—*i. e.*, the pinnate leaves; lit. "the two-winged little plant."

An'i-sum. L. fr. Gr. *ἄνισον*—*ἄνηθον*, Ar, *anisum*, anise, dill—*i. e.*, classic name.

Il-li'ci-um. L. *illicere*, to allure, charm—*i. e.*, in allusion to its attractive perfume.

Ve'rum. L. *verus*, true—*i. e.*, the genuine or real type.

PLANTS.—*Pimpinella Anisum:* Annual herb .3 M. (1°) high; dentate, pinnatifid; flowers white, small, umbels 8–14-rayed. Fruit—Anisum, Anise (Seed), *N.F.*—The dried ripe fruit with not more than 3 p. c. of other fruits, seeds or foreign organic matter, yielding not more than 1.5 p. c. of acid-insoluble ash; cremocarp, broadly oval compressed, mericarps usually cohering and attached to slender pedicel 2–12 Mm. ($\frac{1}{12}$–$\frac{1}{2}$′) long, apex with 2 styles, grayish-green, seldom brownish, slightly pubescent; odor and taste agreeable, aromatic—Russian variety closely resembles conium. Powder, yellowish-brown—numerous fragments of pericarp with yellowish oil tubes, tracheæ, carpophore fibers, endosperm cells, aleurone grains, calcium oxalate rosette aggregates, non-glandular hairs. *Test:* 1. Heat 1 Gm. with potassium hydroxide T. S., (10)—no mouse-like odor (abs. of conium). *Illicium verum.*—Magnoliaceæ: Small tree, 3–6 M. (10–20° high, branched; leaves pellucid-punctate; flowers greenish-yellow; Fruit, star-shaped—8 stellately arranged boat-shaped carpels, 8 Mm. ($\frac{1}{3}$′) long, brown, woody, wrinkled, each carpel containing 1 glossy-brown seed; solvents: alcohol, boiling water. Dose, gr. 10–30 (.6–2 Gm.).



Anisum: fruit and longitudinal section magnified 3 diam.; transverse section magnified 8 diam.

CONSTITUENTS.—Volatile oil (anethol) 1–3 p. c., fixed oil 3–4 p. c., choline, resin, sugar, mucilage, malates, phosphates, ash 7 p. c.

Oleum Anisi. Oil of Anise. Oil of Star Anise, *U.S.P.*—This volatile oil is a colorless, pale yellow, strongly refractive liquid, characteristic odor and taste of anise, soluble with not more than slight cloudiness in 3 vols. of 90 p. c. alcohol; sp. gr. 0.983, increasing with age; contains a liquid body—terpenes and methyl-chavicol, $C_{10}H_{12}O$, and a stearoptene, anethol, $C_{10}H_{12}O$, 80–90 p. c., upon which the value depends, being converted by exposure or oxidation with nitric acid into anisic acid; star anise oil is the same chemically, containing anethol 80–90 p. c., *d*-pinene, *d*-phellandrene, and possibly safrol, but congeals at 1° C. (34° F.), while anise oil at 10–15° C. (50–59° F.). *Tests:* 1. Levorotatory (abs. of oils of fennel, caraway, coriander—dextrorotatory). 2. Shake with water in graduated tube—volume should not diminish; drop into water—no milkiness unless agitated (abs. of alcohol). 3. Alcoholic solution neutral; with a drop of ferric chloride T. S.—no blue or brown color (abs. of phenols). *Impurities:* Heavy metals, oil of fennel, phenols. The label must indicate definitely its specific source, and if solid material has separated, carefully warm the oil until liquefied and thoroughly mix before dispensing. Should be kept dark, in well-stoppered, amber-colored bottles. Dose, ℥ij–5 (.13–.3 cc.).

Anethol. Anethol, *N.F.*—The methyl ether of para-propenyl phenol $C_6H_4C_3H_5.OCH_3$, obtained from this and other oils (star anise, fennel), by fractionating, chilling, crystallizing; practically identical with the oil. It is a colorless, faintly yellow, highly refractive liquid at 23° C. (73° F.), sweet taste and aromatic odor of anise, solidifies at 20° C. (68° F.) to white glistening, crystalline mass, remelting at 22° C. (72° F.), soluble in ether, chloroform, alcohol (2), almost insoluble in water; sp. gr. 0.985, boils at 235° C. (455° F.); optically inactive, levorotatory (if from anise), dextrorotatory (if from fennel). *Test:* 1. Shake 10 cc. with 50 cc. saturated aqueous solution of sodium bisulphite in graduated cylinder, let stand 6 hours—no diminution of anethol volume nor crystalline deposit (abs. of aldehydes). Should be kept dark, in well-stoppered, amber-colored bottles. Dose, ℥ij–5 (.13–.3 cc.).

ADULTERATIONS.—FRUIT: Earthy fragments, partly exhausted fruits, recognized by shriveled appearance, chiefly, however, with conium fruit (which resembles mostly the Russian anise), but odor and taste not aromatic—becoming mouse-like with solution potassium hydroxide even when 1 p. c. present; non-hairy; consisting usually of single smooth mericarps, grooved upon the face, 5-crenate ribs (ridges) with wrinkles between them, no vittæ; POWDER: Star-anise recognized by its peculiar sclerotic cells, earthy matter sinking when stirred in strong brine; OIL: Spermaceti 5–35 p. c., wax, petroleum, fixed

oils, oils of turpentine and fennel, camphor (to raise congealing-point), alcohol, fenchone (fennel stearoptene); the two first insoluble in cold alcohol, whereas oils and camphor are mostly soluble; camphors recognized—by odor; alcohol—by milkiness to water; star-anise oil is the same chemically, but has a slight distinguishing smell and taste, also lower congealing-point (1° C.; 34° F.).

Commercial.—Plant was known and cultivated by the Romans, while Theophrastus wrote of its aromatic properties; now grown mostly in Malta, Spain, Italy, S. Russia, Greece, Chile. There are four varieties: 1, *Spanish (Alicante)*, small, best, preferred; 2, *German (French)*, larger; 3, *Italian*, exported via Leghorn; 4, *Russian*, very short, resembling conium most; that cultivated at home supplies largely our market.

PREPARATIONS.—OIL: 1. *Aqua Anisi.* Anise Water. (Syn., Aq. Anisi; Fr. Eau d'Anis; Ger. Aniswasser.)

Manufacture: ⅕ p. c. A saturated solution; similar to Aquæ Aromaticæ—triturate oil .2 cc. with purified talc 1.5 Gm., adding gradually recently boiled distilled water q. s. 100 cc. Dose, ʒij–8 (8–30 cc.).

2. *Spiritus Anisi.* Spirit of Anise. (Syn., Sp. Anisi, Essentia Anisi; Fr. Alcoolat (Esprit) d'Anis; Ger. Anisgeist.)

Manufacture: 10 p. c. Mix oil 10 cc. with alcohol q. s. 100 cc. Dose, ʒj–2 (4–8 cc.).

3. *Fluidextractum Cascaræ Sagradæ Aromaticum,* ¼ p. c. 4. *Spiritus Aurantii Compositus,* ½ p. c. 5. *Syrupus Sarsaparillæ Compositus,* 1/50 p. c. 6. *Tinctura Opii Camphorata,* ⅖ p. c. 7. *Elixir Phosphori, N.F.* ⅛ p. c.; 8. *Syrupus Trifolii Compositus, N.F.,* 1/60 p. c. 9. *Tinctura Opii et Gambir Composita, N.F.,* 1/10 p. c. FRUIT: 1. *Species Laxativæ, N.F.,* 12.5 p. c. 2. *Species Pectorales, N.F.,* 10 p. c. 3. *Tinctura Rhei Dulcis, N.F.,* 4 p. c. ANETHOL: 1. *Elixir Anisi, N.F.,* .35 p. c. 2. *Pulvis Rhei et Magnesiæ Anisatus, N.F.,* 8 p. c. 3. *Spiritus Ammoniæ Anisatus, N.F.,* 3 p. c. 4. *Spiritus Cardamomi Compositus, N.F.,* ½ p. c.

Unoff. Preps.: FRUIT: *Fluidextract,* ♏x–30 (.6–2 cc.). *Infusion,* 5 p. c., ʒj–8 (4–30 cc.).

PROPERTIES.—Aromatic stimulant and carminative, stomachic, once supposed a galactagogue, now doubted, although it does impart peculiar taste to secreting milk.

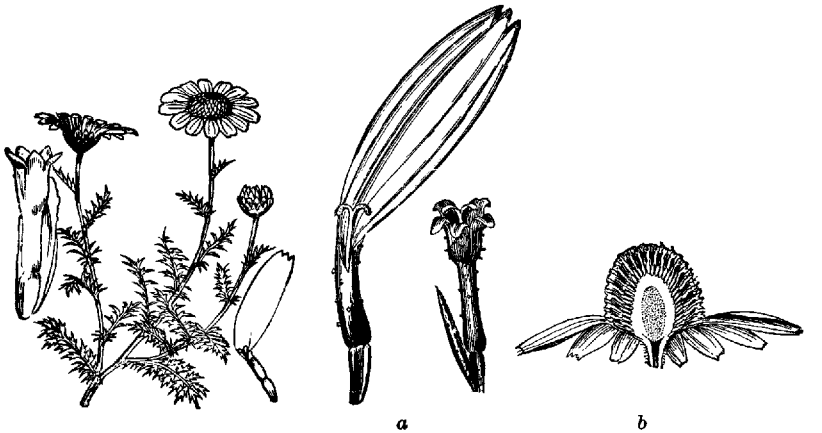
USES.—Flatulent colic, bronchitis, infantile catarrh. As a corrigent to griping cathartics, but here fennel is preferred; much used for flavoring food, confectionery, and in veterinary practice.

Allied Plants:

Pimpinella Saxif'raga and *S. mag'na;* dried rhizome and roots; light yellowish-brown, aromatic, sweetish, pungent; composition, properties and uses similar to anise. Dose, gr. 10–30 (.6–2 Gm.); tincture, 20 p. c. (67 p. c. alcohol).

Anthemis

An'themis no'bilis, Roman Chamomile.—The dried flower-heads of cultivated plants, U.S.P. 1820–1900; S. and W. Europe. Perennial herb, 15–30 Cm. (6–12′) high, hairy; leaves bipinnatisect, hairy. Flowers, 18 Mm. (¾′) broad, subglobular, consisting of imbricated involucre, many white, 3-toothed ray-florets and a few tubular disk-florets inserted upon chaffy, conical, solid receptacle; odor agreeable; taste aromatic, bitter; solvents: alcohol, hot water; contains volatile oil 1 p. c., anthemic acid (bitter principle), anthemene (anthemidin),



Anthemis nobilis: wild.

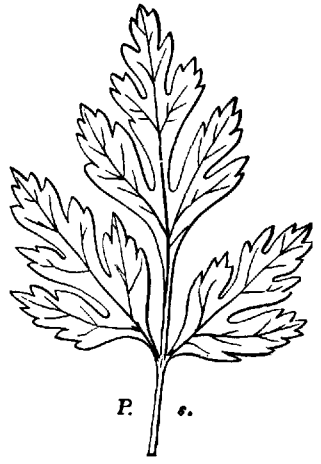
a *b*

Anthemis: *a*, ray- and disk-floret, magnified 4 diam.; *b*, section through single flower-head, natural size.

resin 5.25 p. c., tannin, fixed oil. Stimulant (volatile oil), tonic (anthemic acid), carminative, nervine emmenagogue; warm infusion—emetic; cold infusion—tonic; large doses emetic, cathartic; intermittents, torpid liver, delirium tremens, dyspepsia (masticatory); externally—colic, toothache, earache, rheumatism, ulcers, sprains (poultice with vinegar, laudanum); oil—rheumatism, flatulent colic. Dose, gr. 15–60 (1–4 Gm.); fluidextract, ʒss–1 (2–4 cc.); infusion (best form), 5 p. c., ʒj–2 (30–60 cc.); oil, ♏j–5 (.06–.3 cc.). *A. (Maru'ta) Cot'ula, Mayweed;* the herb, U.S.P. 1820–1870; N. America. Annual plant in fields, roadsides, .3–.6 M. (1–2°) high, greenish, furrowed, leaves thrice pinnatifid; flowers, June-Sept., receptacle solid, conical, chaffy, ray-florets white, disk yellow; contains volatile oil, valeric acid, fat, tannin, anthemidine (?), anthemic acid. Stimulant, antispasmodic, sudorific, emmenagogue, vesicant for hysteria, colic, dysmenorrhea; in infusion. Dose, ʒss–2 (2–8 Gm.).

Apium

Ap'ium grave'olens, Apii Fructus, Celery Fruit (Seed), N.F.—The dried ripe fruit with not more than 5 p. c. of unsound or foreign fruits or other foreign organic matter, yielding not more than 3 p. c. of acid-insoluble ash; S. Europe, cultivated. Biennial herb; root fusiform, white—when wild, poisonous, under cultivation, harm-



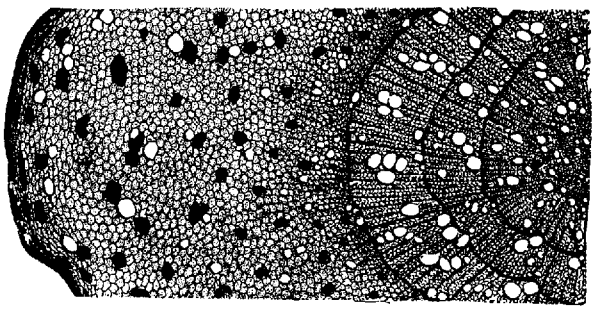
Apium (Carum—Petroselinum) graveolens: pinnate leaf.

Fruit, mericarps 2, united or separate, ovoid, 1–2 Mm. ($\frac{1}{25}$—$\frac{1}{12}$′) long, dark brown; inner surface flat, outer convex, with 5 slender ribs, 2 being marginal; odor characteristic, agreeable; taste aromatic, warm, pungent. Powder, brown, oily—pericarp fragments with yellowish oil tubes, brown secretion cells and few epidermal papillæ; tracheæ, fibers, aleurone grains, calcium oxalate rosettes; solvent: alcohol; contains volatile oil 2–3 p. c., fixed oil, ash 3–8 p. c. Carminative, stimulant, nervous sedative, flavoring (infusion, juice); bronchitis, intermittents, contusions, swollen glands. Dose, gr. 15–30 (1–2 Gm.); 1. *Fluidextractum Apii Fructus* (alcohol), dose, ♏xv–30 (1–2 cc.): Prep.: 1. *Elixir Guaranæ et Apii*, 15 p. c.

Apocynum

Apo'cynum cannab'inum, Apocynum, Canadian Hemp, Dogbane, N.F.—The dried rhizome and roots with not more than 5 p. c. of stems or other foreign organic matter; United States, Canada to Florida. Perennial milky-juiced herb, 1–2 M. (3–6°) high, glabrous, branched; leaves opposite, entire, mucronate; flowers, cymes, greenish-white; fruit acute follicle, 20 Cm. (8′) long, 4 Mm. ($\frac{1}{6}$′) thick. Rhizome, cylindrical, branched, varying length, 3–10 Mm. ($\frac{1}{8}$—$\frac{2}{5}$′) thick, grayish-brown, wrinkled, occasional transverse fissures with vertical sides through bark; fracture short; bark (50–65 p. c. of root) brownish, 1.5–3 Mm. ($\frac{1}{18}$—$\frac{1}{8}$′) thick—containing laticiferous ducts and bitterness; wood radiate with large tracheæ; pith small, in rhizome pieces only; almost inodorous; taste starchy, bitter, acrid. Powder, light brown—numerous starch grains, some altered, swollen and with central cleft, lignified wood-fibers, tracheæ, few cork cells with reddish-brown walls, few latex cells, few or no stone cells; solvents: 60 p. c. alcohol, boiling water partially; contains cynotoxin, tannin, resin, starch, ash 5 p. c. Diuretic, diaphoretic, expectorant, antiperiodic, alterative, cardiac stimulant (similar to digitalis); emetic; cardiac and renal dropsy, intermittents, dyspepsia. Dose, gr. 2–5 (.13–.3 Gm.); emetic, gr. 15–30 (1–2 Gm.); 1. *Fluidextractum Apocyni* (60 p. c. alcohol), dose, ♏ij–5—30 (.13–.3—2 cc.). Extract (aqueous), Infusion, 5 p. c., Tincture, 10 p. c. *A. androsæmifo'lium, Spreading Dogbane.*—The rhizome (root), U.S.P. 1830–1870; N. America. Grows associated with the preceding, having stem more spreading, leaves broader, rhizome thinner, tougher, with central pith; bark thinner with layer of stone cells; flowers pinkish; contains (supposedly) about the same as *A. cannabinum*, causing it to be used for similar purposes, but, as a fact, it produces quite different effects.

Apocynum cannabinum.



Apocynum cannabinum: root, transverse section, magnified 25 diam.

Aralia nudicaulis

A. nudicau'lis, Wild, Virginian, False Sarsaparilla.—The root (rhizome), U.S.P. 1820–1870; N. America. Small shrub, stem scarcely above ground, leaf single, petiole .3 M. (1°) high; leaflets ovate, serrate, flowers greenish. Root .3 M. (1°) long, 5 Mm. ($\frac{1}{5}$′) thick, annulate, brownish-gray, inside whitish, spongy pith, aromatic odor and taste; contains volatile oil, resin, starch. Stimulant, diaphoretic, alterative—like sarsaparilla, in infusion, decoction. Dose, gr. 30–60 (2–4 Gm.).

Aralia racemosa

Ara'lia racemo'sa, Aralia, American Spikenard, Spignet, N.F.—Araliaceæ. The dried rhizome and roots with not more than 5 p. c. of stem-bases or other foreign organic matter; United States, Georgia to Canada, west to Rocky Mountains. Large perennial herb, 1 M. (40′) high, branched, leaflets ovate, cordate, serrate; flowers small, greenish-yellow. Rhizome, 12 Cm. (5′) long, 5 Cm. (2′) thick, scaly, pale brown, internally whitish, frequently cut longitudinally, nodes approximate, prominent stem-scars, 3 Cm. (1⅕′) broad, fracture fibrous; roots numerous, .5–.7 M. (20–30′) long, 5–25 Mm. (⅕–1′) thick; odor aromatic, taste mucilaginous, pungent, slightly acrid, Powder, yellowish—starch grains, calcium oxalate rosettes, tracheæ, lignified cells with walls showing simple pores (dist. fr. *A. nudicaulis*); solvent: diluted alcohol; contains resin, volatile oil, starch, pectin. Stimulant, diaphoretic, alterative; syphilis, chronic rheumatism and cutaneous affections; locally to sluggish ulcers. Dose, gr. 30–60 (2–4 Gm.); 1. *Fluidextractum Araliæ*, (67 p. c. alcohol), dose, ʒss–1 (2–4 cc.).

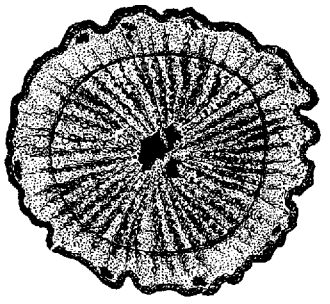
Aralia spinosa

Ara'lia spino'sa, Hercules' Club, Prickly Elder.—The bark, U.S.P. 1820–1870; East and west N. America. Prickly tree, 3–9 M. (10–30°) high, leaflets crowded at summit; flowers white; bark in quills, curves, gray, prickly, inside yellowish, aromatic, acrid; contains araliin, volatile oil, resin. Stimulant, diaphoretic, demulcent (emetic, cathartic), alterative; rheumatism, skin eruptions, syphilis, colic, dyspepsia, toothache, vomiting, nervousness; externally antidote to rattlesnake-bites; in infusion, decoction, tincture, masticatory. Dose, gr. 30–60 (2–4 Gm.).

Arctium

Arc'tium Lap'pa, Lappa, Burdock Root, Clotbur, N.F.—The dried first year root with not more than 5 p. c. of leaf-bases nor 2 p. c. of other foreign organic matter; Europe, N. Asia, naturalized in N. America—rich waste places. Coarse biennial weed .6–2 M. (2–6°) high, branched; leaves cordate-oblong, dentate, rough, petiolate; flowers purple, calyx of imbricated scales with hooked extremities for adhering to objects; achenes (burs) 12–25 Mm. (½–1′) broad, globoidal, 3-angled; seed quadrangular; *A. mi'nus*, heads small, involucre at first cottony, finally smooth; leaves unequally rounded at base. Root .25–.8 M. (10–30′) long, 5–20 Mm. (⅕–⅘′) thick, nearly simple, fusiform, frequently split or broken, grayish-brown, longitudinally wrinkled, crown annulate, sometimes surmounted by woolly tuft of leaf remains; fracture somewhat horny; dark cambium separating thick brownish bark from yellowish, porous radiate wood, centrally hollow or with white pith-like tissue; odor slight, pyroligneous on milling; taste mucilaginous, sweetish, slightly bitter. Powder, light brown—parenchyma cells of cortex, medullary ray cells and wood parenchyma of young roots; few wood-fibers, no starch or calcium oxalate; solvents: diluted alcohol, boiling water partially; contains inulin, bitter extractive, resin, fat 9 p. c., mucilage, sugar, wax, tannin (phlobaphene), lappin, ash 6 p. c. Diaphoretic, diuretic, alterative, aperient, depurative; rheumatism, gout, pulmonary catarrh, psoriasis, acne, syphilis, scrofula, urinary deposits, burns, wounds, eruptions, swellings, Dose, ʒss–2 (2–8 Gm.); 1. *Fluidextractum Lappæ* (diluted alcohol), dose,

Arctium Lappa.



Lappa: transverse section, magnified 2 diam.

ʒss–2 (2–8 cc.). Tincture, 10 p. c. (diluted alcohol, whisky), dose, ʒij–3 (8–12 cc.), after meals. *Fructus Lappæ, Semen Bardanæ*, U.S.P. 1830; the seed about 6 Mm. (¼′) long, obovate-oblong, slightly curved, angular, flattened, roughish, brown-gray, mottled with black; inodorous taste oily, bitter; contains drying oil 15.4 p. c., resins 5.5 p. c., lappin; tincture 25 p. c. (75 p. c. alcohol), ʒss–2 (2–8 cc.); fluidextract, ♏xv–30 (1–2 cc.—tonic); ʒss–1 (2–4 cc.—alterative). *Fructus Silybi (Sil'ybum Maria'num), Mary Thistle;* S. Europe; achenes 5 Mm. (⅕′) long, not curved, obovate, flattened, smooth, glossy, light brown, with blackish striæ, brownish; taste oily, bitter. *Bi'dens bipinna'ta, Spanish Needles, Beggar-lice;* stem square, achenes triangular, barbed; stimulant, aromatic (vol. oil), antispasmodic, expectorant, diaphoretic; hay fever, amenorrhea (hot infusion), asthma, bronchitis. *Rudbeck'ia hir'ta, Yellow Daisy, Black-eyed Susan, Nigger-head;* stimulating diuretic ("Eclectic's").

Arctostaphylos UVA URSI. UVA URSI, *U.S.P.*

Arctostaphylos Uva-ursi, *(Linné) Sprengel.* { The dried leaf with not more than 5 p. c. stems or other foreign organic matter.

Habitat. Europe, Asia, N. America, United States, south of New Jersey, westward to California, New Mexico; rocky or sandy soil—pine woods.

Syn. Bearberry, Red Bearberry, Upland (Mountain, Wild) Cranberry, Universe Vine, Mountain Box, Bear's Grape (Bilberry, Whortleberry), Barren Myrtle, Kinnikinnick, Fox (Meal) berry; Br. Uvæ Ursi Folia; Fr. Busserole, Raisin d'Ours; Ger. Bärentraubenblätter.

Arc-to-staph'y-los. L. fr. Gr. ἄρκτος, a bear, + σταφυλή, a bunch of grapes—*i. e.*, the roughness of the fruit and these berries occurring in clusters like grapes.

U've-ur'si. L. *uva*, a grape, + *ursus, ursi*, a bear, of a bear—bear-berry—*i. e.*, berries are rough or bearish.

PLANT.—Low evergreen shrub; stem creeping, young branches rising obliquely upward several inches; flowers May, 3–15 together, pinkish-white, racemes, calyx reddish, corolla urceolate, reddish-white or white with red lips; fruit autumn, 6 Mm. (¼′) broad, fleshy, bright red berry, pericarp thick, 5-seeded, resembles currants in appearance and clusters. LEAVES (LEAF), obovate, oblong-spatulate, 12–30 Mm. (½-1⅕′)