VERBENA LITORALIS f. ALBIFLORA (Mold.) Mold., stat. nov.
   Verbena litoralis var. albiflora Mold., Phytologia 1: 432. 1940.

VERBENA LITORALIS f. CONGESTA (Mold.) Mold., stat. nov.

VERBENA PERENNIS f. JOHNSTONI (Mold.) Mold., stat. nov.
   Verbena perennis var. johnstoni Mold., Phytologia 2: 150. 1946.

VERBENA Plicata f. DEGENERI (Mold.) Mold., stat. nov.
   Verbena plicata var. degeneri Mold., Phytologia 2: 24-25. 1941.

VITEX GLABRATA f. BOMBACIFOLIA (Wall.) Mold., stat. nov.

VITEX GLABRATA f. PALLIDA (Wall.) Mold., stat. nov.

VITEX HARVEYANA f. GEMINATA (H. H. W. Pearson) Mold., stat. nov.

ADDITIONAL NOTES ON THE GENUS VITEX. XIII

Harold N. Moldenke

Vitex Tourn.


Bentham (1876) comments that "In Benth. Fl. Austral. v. 66 drupa
Viticis errore 4-pyrena dicitur; endocarpium undique continuum est v. rarissime vix separabile".

Pobéguin (1906) cites Kouroussa 230, 232, 682, 810, & 1255, Teliko 799, and Timbo 741 from the Republic of Guinea as unidentified species of Vitex known locally as "ba coudou né", "coudou", and "koukou".

VITEX AGNUS-CASTUS L.


Recent collectors describe this species as a large, fast-growing, deciduous shrub, 1.5-7 m. tall, aromatic, spreading or dense, with several stems, the branches erect to ascending, the foliage pungent-spicy when crushed, with the aroma of lavender or garden sage, the flowers pleasantly lavender-scented when bruised. The corollas are said to be "lilac" in color by Blackburn (1952) and Graf (1963), "violet or blue" by Dean (1968), "light hyssop-violet" by Turriull (1962), "pale-violet" by Makins (1936) and Munz (1968), and "bright-violet" by Parker (1924). They are said to have been "violet-blue'
on Shinners 8582, "blue-violet" on Gillis 8449, "light-purple" on Bayliss BS.6236, "purple or lighter" on Witham 304, "mauve" on Bayliss BS.5095 & 7270 and Sykes 16/68, "bright-mauve" or "lavender-mauve" on Bayliss BS.4542, and "purplish outside, dark-purple within on Abedin 7403.

Recent collectors have found this plant growing in thickets, *Pinus sylvestris* forests, in partial shade on blackland clay, in sandy loam, on seashores, in mostly limestone soil, in dry riverbeds, and on dry riverbanks, at altitudes of sealevel to 1300 meters, flowering from June to August, in fruit in July, August, and October.

Emberger (1960) reports the chromosome number of *Vitex agnus-castus* as 2n = 24 and the same number is reported by Paterman (1935), while Sugiuara (1936), Paterman (1938), and Sharma & Mukhopadhyay (1963) report 32; Darlington & Wylie (1956) say"x = 6, 8". Löve (1971) reports the number as 2n = 32, based on Murin & Sheikh s.n. from Iraq. Trelease (1967) illustrates the longitudinal and cross-section views of the twigs, as well as the appearance of the leaf-scars and buds. His reference, however, to C. K. Schneider's "f. 191" seems to be an error since that figure in Schneider's work has nothing whatever to do with *Vitex agnus-castus*. Similarly, Imboden's statement that this is a "tree or shrub glabrous to tomentose or villous throughout -- from Baja California to Sonora [Mexico] and Chihuahua to Oaxaca" is quite erroneous -- probably meant to apply to *V. mollis* H.B.K. instead. Etchison adds that "This is an aromatic tree that grows to 30 feet [and] is found in dry sunny situations. I doubt if *Vitex agnus-castus* ever attains a height of more than 15 feet. Theophrastus, however, according to Knobloch (1948), in his "definitions of the various classes into which plants may be divided" asserts that *V. agnus-castus* is one that "increases in stature under cultivation, so that they become trees and yet they belong to the class of shrubs".

Speta (1977) says that "an der Ansatzstelle der Filamente befinden sich mehrzellige, verzweigte Haare, deren Kerne dicht mit feinen Kristallamellen angefüllt sind".

Serbanescu-Jitariu & Mitroiu (1973) describes the pollen, based on Herb. INCEF 3335, as follows: "subprolat; 3-colpat; văzut apical 26--46,8 μ in diam., din profil înalt 33,8--46,8 μ, lat 26--33,8 μ. Polenul scurtat din antere și văzut cu ochiul liber, este galben, în apă la microscop, portocaliu brun, iar în chloralhidrat, galben-cenușiu. Sporodermo crassinexinată cu o grosime de 2,6 μ; exina prezintă în sec. optică o structură tehilit-baculată, iar suprafața este acoperită cu veruculi neuniform distribuți. Colpii 2/3 din raza microsporilor, fînt înguști și ascuți spre capete."

Battandier & Trabut (1902) report that *V. agnus-castus* occurs in the littoral zone in Algeria and Tunisia; Maire asserts that it is both "cultivated and escaped" in Egypt; Fedtschenko (1913) lists it as cultivated in Turkestan (Russia). Bayliss records it as wild in Zululand and as cultivated in the "subtropic area of
South Africa" [Transvaal]; Knoche (1974) lists it as cultivated in the Balearic Islands. Marco & Mossa (1973) describe it as Euro- mediterranean and report it as "rare" on Sardinia. Innamorati (1973) found it in Morocco, while Boberty (1974) lists it as cultivated in what was French West Africa. Humbert (1958) encountered it in the northern and central Sahara: "Sud oranas, rare (Vallée de la Zousfana et probablement ailleurs; lits d'oueds, bord des mares". Speta (1977) records it from the island of Brac, Jugoslavia. Bischoff (1831) asserts that it is sometimes cultivated in Germany; Priszter (1971) says that it is cultivated in Hungary and offers seed of it as his seed no. 1672 in trade. Molina (1976) lists it as cultivated in Honduras, while Adams (1972) reports it cultivated on Jamaica. Sherk & Buckley (1968) refer to it as "hardy" in Canada only in the province of British Columbia. Radford & al. (1964) found it "rare in pastures" in Darlington County, South Carolina, where it flowers in June and July. McGregor & al. (1977) report it from Cleveland, Custer, Grady, and Payne Counties, Oklahoma. Hyland (1967) reports it cultivated in Maryland, grown from seed no. 263177 from Israel, 17720 from Baja California Norte, Mexico, 269411 from Afghanistan, 307618 from Turkey, and 259959 collected by Gentry in Mexico.

Sweet (1826), Bean (1956), and Fletcher (1972) tell us that V. agnus-castus is "said to have been cultivated in the British Isles since 1570", introduced from Sicily; Loudon (1832) give the date as "1590". Stalter (1972) found it in Georgetown County, South Carolina; Greuter (1976) reports it from Psaya island in the Aegean Sea. Patzak & Rechinger (1967) give its natural distribution as "Regio Mediterranea, Asia austro-occidentalis et centralis usque ad Turcomanian et montes Pamir-Alaz", asserting that the type population "Habitat in Siciliae ad Napolis paludosius".

Bicknell (1896) found the species "along roads and torrents" in western Liguria (northwestern Italy), while Sommier & Caruana Gatto (1915) record it from Comino, Cozo, and Malta islands, noting that "A Malta À quasi distrutto. A Gozo forma ancora in alcuni luoghi dei piccoli boschetti. Varia a fiori bianchi." Huber says that it "is occasionally cultivated" in west tropical Africa; LeGrand (1887) lists it from France and southern Germany; Pampanini (1930) lists it doubtfully from Cyrenaica: "La presenza del V. Agnus-castus spontaneo a Tocra mi è incerta perché il Dotti H. Scaetta lo segnò senza alcuna indicazione in Proposito, mentre in seguito...lo indicò come coltivato." Lakela & al. (1976) report it "planted, escaping locally" in the Tampa Bay area of Florida, blooming there in spring and summer; Bouloumoy (1930) lists it from streamsides in Lebanon and Syria. Parker (1924) writes that it is cultivated on the plains of the Punjab where "It is very hardy both as regards cold and drought". Horowitz (1969) calls it "a hydrophile among trees on the banks of the Jordan river" in Palestine. Munz (1968) notes that it is "Found in alkali sink e. of Weedpatch, Kern Co.", California; Maheshwari (1963) reports it from "shrubberies of parks and gardens" in Delhi, India. Linnaeus (1753) and Raeuschel (1797) report it from Sicily.
According to Bayliss it flowers in the autumn in South Africa. Quézel & Pamukçuoglu (1973) report finding it growing with Phragmites communis, Holoschaemus vulgaris, Paliurus australis, and many Ephedra fragilis in maritima zone areas. Picci reports it from Molara island off the coast of Sardinia. The Browns (1972) found it becoming naturalized in Maryland. Dean (1968) avers that it "Grows in gardens, roadsides, waste places" on the coastal plain from Florida to Texas and north to North Carolina [U.S.A.] Bailey (1972) reports that "Like Buddleia, this species may die back to the ground in severe winters" but actually is hardy in Zone 7 in the United States.

Turrill (1962) says "a V. negundo L. foliolis lanceolatis vel anguste lanceolatis, corolla circiter 8 mm. longa, staminibus styloque exsertis, corollae lobis plusminusve aequilongis inter alia recedit". Jafri & Ghafoor, in a personal communication to me, add that "in V. agnus-castus the leaflets are 5--7 and the cymes sessile or subsessile, forming a subcylindrical narrow inflorescence, the flowers fragrant, while in V. negundo the leaflets are 3--5, the cymes are often somewhat lax and panicked, forming a pyramidal inflorescence, and the flowers are not fragrant."

Palmer & Pitman (1972) remind us that "agnus-castus" is derived from the Greek hagnos and the Latin castus, both signifying "chastity". They also note that "The generic name Vitex is said to be derived from the Latin vieo, meaning 'to plait', because of the flexibility of the shoots. Pliny used the name for a willow-like species which has ever since been known as the 'chaste tree', for the remarkable reason that it is believed to have the power of subduing the passions. 'For that the dames of Athens', Pliny assures us, 'during the feasts of the goddess Ceres...made their pallets and beds with the leaves thereof, to coole the heat of lust and to keep themselves chaste for the time'."

Little, Woodbury, & Wadsworth (1974) give a rather detailed distribution for V. agnus-castus: "Native of the Mediterranean region from southern Europe and Morocco to western Asia including Turkey, Iraq, and Pakistan, but widely planted for ornament and escaping from cultivation and naturalized in tropical and subtropical regions including West Indies. Also southeastern United States from Florida to Texas and California and north to New York and beyond, where the plants are killed to the ground in winter."

Emberger (1938) says "Le Gattilier est répandu dans tout le bassin méditerranéen jusqu'en Asie Centrale. Le centre de dispersion du genre est l'Asie Sud-orientale. Notre espèce est la seule Verbénaceæ ligneuse d'Europe et de l'Afrique septentrionale [this is untrue: other woody Verbenaceae in north Africa are found in the genera Chascanum, Svensonia, Clerodendrum, Lantana, Premna, and Vitex].....Il n'est pas douteux que cette espèce est chez nous un survivant tertiaire," He also says that "Ce petit arbre habite le bord des rivières et le lit des Oueds intermittents de la plaine et des basses montagnes de tout le Maroc jusque dans l'Anti-Atlas, mais dépasse rarement l'altitude de 1.000 mètres. Il
forme, avec le Laurier-rose et les *Tamarix* le fond décoratif de notre végétation ripicole."

Van Melle (1943) reviews the characters of *V. agnus-castus* and *V. negundo* as cultivated shrubs, telling us that they are both "highly decorative, tender-wooded shrubs which, in mild climates, grow to a considerable height and width but are best treated in our zone by way of die-back shrubs; that is, pruned close to their base every spring and then permitted to put on their annual growth, to a height of 3 or 5 feet, on which they will bear their showy terminal panicles of small, fragrant flowers which, in the better forms, are a good lavender-blue.

"In *V. Agnus-castus* these are arranged the more showily in paniced spikes, appearing in July to September; in *V. Negundo* they come in loose panicles, in July and August.

"In both kinds the total effect of the foliage is grayish, the leaves having a gray-woolly hairiness on the lower surface...... They are effective, but rather exotic-looking and erect shrubs, not easily blended in the border and perhaps better used by way of garden accent plants or 'cut-back' garden hedge-rows. They flower at a time when there is not much else in bloom among the shrubs and, in the better, lavender-blue forms, contribute a worth-while decorative note to the small landscape.

"They thrive well in light, sandy soils, in full sun. Being coarse-rooted and difficult to dig with a ball of earth, they are best transplanted bare-rooted, in the spring.

"When they are treated as die-backs, the tenderness of the top-growth need not worry one. The roots are hardy enough; and should an occasional plant be lost in severe winters, these shrubs are worth planting again."

Spach (1840), speaking of it in France, says: "Cette espèce,... est commune dans l'Europe méridionale, aux borde des ruisseaux et dans l'autres localités humides; elle fleurit en juillet et en août. On la culture comme arbrisseau d'ornement, mais, dans le nord de la France, elle ne résiste pas aux hivers rigoureux, à moins d'être plantée dans une situation abritée."


Many authors have listed medicinal and economic uses — or purported ones — for *Vitex agnus-castus*. Hartwell (1971) says that a broth made from the herbage is used to treat "superflutities of uterus" and hardness of the liver or spleen, an elixir is used for tumors, a decoction and sitzbath for hardness of the uterus and induration of the spleen, an oil and ointment for various "hardnesses or stiffnesses", and fomentations and cataplasms for induration of the spleen, corns, and chronic indurated tumors. Parks (1937) tells us that "The leaves and blossoms are used by Latin people as a preventive against moths". Innamorati (1973) says that it is used "per le malattie delle vie urinarie e dei rene". According to Grieve (1967) "The fresh ripe berries [drupes] are pounded to a pulp and dused in the form of a tincture for the relief of paralysis, pains in the limbs, weakness, etc.", while Polunin & Huxley (1966) report its use as an anti-aphrodisiac, but carefully point out that "fresh seeds have an aromatic pungency that some consider aphrodisiac". They also report the plant's use in the treatment of eye diseases and stomach-ache and as a source of yellow dye. Uphof (1968) asserts that the "herb has been used for centuries as an antiaphrodisiac" and as the source of a volatile oil; the young twigs are used in basketry; the fruits are employed as a substitute for pepper and are also supposed to be anti-aphrodisiac; "the plant was regarded since antiquity as a symbol of chastity".

Polunin (1969) asserts that *V. agnus-castus* is a plant of "Damp
places on the littoral, by streams" in Mediterranean Europe, flowering there from June to September -- "A shrub well known since classical times and associated with chastity; it is used medicinally and is a source of a yellow dye. The fruits are used for seasoning and the twigs for basket-making". De Capite (1969) describes the leaf, stem, and root anatomy in detail and reports that an alcohol extract from the leaves is active, the ether extract even more active, and the aqueous extract inactive against Micrococcus pyogenes albus, but no activity is seen against Escherichia coli.

Lewis & Elvin-Lewis (1977), along with Arevalo (1966), repeat the statement that the seeds have supposed antiaphrodisiac properties in "decreasing libido", while Al-Rawi (1964) reports the bitter-tasting seeds are boiled in ghee and given to horses in the treatment of colic, while the entire plant is used in the treatment of eye and stomach disorders and "pains due to chills; one who has caught a cold takes a bath in water boiled with the leaves". Lust (1974) avers that the plant "exhibits hormone-like properties". Burkill (1966) states that V. agnus-castus is "a plant used by the Romans and Greeks, both internally and for poulticing", its oil containing "cineol and other substances". According to Tornabene (1891), speaking of this species: "De virtute antivenerea hujus speciei, quam veteres et praeertim Graeci extollebant, supervacaneum est loqui, cum inter res commentitias nunc habeatur. Medici laudarunt ut remedium ad hysteriam et gonorrhæam; sed hoc quoque exolatum." Hartwell (1971) reports a poultice made from the leaves useful in treating inflammatory tumors, while the poultice made from the seeds is used to treat hard tumors, hardness of the liver and spleen, scirrhus of the liver, and induration of the liver.

Trease & Evans (1972) also mention the antiaphrodisiac properties of the fruits, "formerly official in Spanish pharmacopoeia.... In 1657 the apothecary Richard Tomlinson wrote 'it cohibits the motion of the sperm, and allayes venereous fancies in the night as well as Rue seed, for which cause the Athenian matrons in their Feasts to Ceres, the better to custodite their chastity strewer their beds with its leafs'. The constituents resemble those of the European vervain." The long-used drug made from this plant is known as "agnus castus" or "semen agni casti". Dymock & al. (1893) report that "The berries [really drupes!] are imported into India and are considered to be astringent, resolvent, and deobstruent, and useful for removing obstructions of the brain and liver; they are also given for enlargement of the spleen and dropys...The seed... has been found to contain a peculiar bitter principle called Castine, a volatile acrid substance, a large quantity of free acid and fat oil. In Greece the fresh and rather unripe berries are said to be added to the must of the grape to render the wine more intoxicating, and prevent it from turning sour."

Lonicer's herbal (1679) summarizes the uses of Vitex agnus-castus in his day as follows: "Die Natur der Schaaffmülle ist zu erwärmen und zusammen zu ziehen....Der Same genützt / benimmt die

Burlage (1968) asserts, erroneously, that V. agnus-castus is a "Native of China and India". He asserts also that the seeds are "reported to be sedative and a perfume is made from the flowers". Perrot & Paris (1971) repeat that "La plante est très anciennement réputée comme anaphrodisiaque, d'où son nom. l'infusé est sédatif et antispasmodique....La plante renferme une huile essentielle, un glucoside chromogène, l'agnoside, et des pigments flavoniques". Lázaro (1921) repeats that "Los frutos se usaron como antiafrodisiacos". Bouchhez (1843) says that the plant "s'en servent pour lier les mains de leurs morts". Parsa (1949) reports that "le bain de feuilles bouillies dans l'eau est employé pour guérir les enfants qui ont attrapé froid"; also "employé contre les maladies du l'œil et les coliques" and "les graines sont données aux chevaux contre la colique une noire. Un tissu bouillie avec ses feuilles prend une teinte noire."

Bush-Brown (1963) points out that V. agnus-castus tolerates sandy soil, dry places, and city conditions. The Nehrlings (1968) affirm that it is fairly drought-resistant, more rugged than appearances would indicate, surviving heat and poor or dry soils in the bright sun, and is actually better performing under such conditions than most cultivated shrubs. The stems winterkill, but the roots send up new shoots that flower in the same year — it is
best to cut the plant back to stubs each year.

Gomma & al. (1978) found in the leaves and fruits five flavonoids (casticin, isovitexin, isovitexin xyloside, orientin, and isoorientin) and two iridoids (aucubin and agnoside). In preliminary tests these compounds showed a marked inhibitory activity against 3 bacterial pathogens. Fernandez (1947) found rubber in the roots. Schimmel (1908) found cineol, sabinene, and a quinone in the volatile oil from the leaves and this volatile oil was also analyzed by Hänsel (1910). Gibbs (1974) reports leucocyanin absent from the leaves, the HCl/methanol test negative, and negative results with the juglone test in the leaves, bark, and wood, but "a blue fluorescence" results. Kariyone (1965) found that the so-called "vitexin" from the seeds of Vitex agnus-castus differs from the "vitexin" obtained from V. lucens and so he proposes the former henceforth be known as "casticin", it being 5,3'dihydroxy-3,6,7,4' tetramethoxyflavone. He also isolated agnoside from the leaves (1964) which he says is "probably the p-hydroxybenzoic ester of aucubin" (1962). Katyuzhanskaya (1977) describes the composition of the organic acids isolated from CO₂-extracts of V. agnus-castus fruit. Belic & al. (1961) also isolated casticin from Yugoslavian material of this species. Cole & al. (1968) sprayed plants of this species with Dow latex 12-R. a styrene-butadiene latex, in two concentrations, the control plants sprayed with water. After one year the plants sprayed with the chemical in lower concentration had made significantly more growth than the controls; those sprayed with the higher concentration did not significantly increase growth, possibly owing to a slight phytotoxicity.

Alexopoulos (1940) records the fungus, Phoma viticis Celotti, on the leaves of V. agnus-castus, Voronov (1922) records Leptosphaeria casta Voronov from the dry twigs, and Thornberry (1966) lists Cercospora viticis Ell. & Ev. (a leaf-spot) and Phymatotrichum omnivorum (Shear) Dug. (a root-rot) from Louisiana, Texas, and Oklahoma. Kobayashi (1970) found that Valsa ceratosperma (Tode) Maire makes black pustules on the bark of cankered or dead stems and branches of this host in Japan. Mound & Halsey (1978) assert that it is host to the whitefly, Bemisia tabaci (Gennadius) Takahashi in Egypt; this based on a report by Azab & al. (1970).

Guinet & Sauvage (1954) cite Becibissa 409 and Lejouad 497 from Morocco; Maheshwari (1963) cites his no. 220 from Delhi, India; Patzak & Rechinger (1967) cite Sintenis 645 from Iran; and Jafri & Ghafoor, in a personal communication to me, cite Abedin 7403 from cultivation in Pakistan.

It is perhaps worth noting that the Blackwell polynomial cited by Gmelin (1796) seems definitely to belong to the synonymy of V. agnus-castus var. diversifolia (Carr.) Schelle, but the illustration given by Blackwell (1751) shows leaflets that are plainly and completely entire and therefore illustrate the typical form of V. agnus-castus L.

Material of V. agnus-castus has been misidentified and distributed in some herbaria as V. macrophylla Hort., V. negundo L.,
V. pseudonegundo Hand.-Mazz., and V. rehmannii Gürke. On the other hand, the Fogg s.n. [July 18, 1969], distributed as typical V. agnus-castus, actually represents f. latifolia (Mill.) Rehd., Griffith 6059 and Zohary, Amdursky, & Grizi s.n. [14,11,1951] are var. pseudo-negundo Hausskn., Pratt s.n. [October 7, 1964] is V. negundo L., N. Chevalier 12 is V. negundo var. intermedia (P'ei) Mold., and Stefani s.n. [10 mai 1903] is not verbenaceous. Jerabek s.n. [June 1945], cited below, is a mixture with Petrea volubilis f. pubescens (Mold.) Mold. and Herb. Missouri Bot. Gard. 116201 is a mixture with something non-verbenaceous (probably Aleurites moluccanum). The illustration in Viertel (1970) is labeled as depicting V. agnus-castus, but shows all the leaflets plainly sessile.

Additional citations: NORTH CAROLINA: Rockingham Co.: Leonard & Russ 2562 (Au--284927, B1--251048, Ld, N, Tu--179458, Ws). ARKANSAS: Nevada Co.: D. M. Moore 420469 (Ws). LOUISIANA: East Baton Rouge Par.: Taylor s.n. [May 18, 1899] (Lv). Tangipahoa Par.: H. R. Wilson 232 (Lv). OKLAHOMA: Payne Co.: Harn 56 (Au--122932). TEXAS: Bastrop Co.: Duval 134 (Au--291212). Brown Co.: McKnight 16 (Au--244321, Ld). Tarrant Co.: A. Ruth 993 (Ws). Travis Co.: Correll & Correll 34288 (Id); Harpin, Waldorf & Barkley 13081 (Bl--53477). OREGON: Benton Co.: W. M. Smith s.n. [VIII/9/1959] (Se--197037). NEXICO: Nuevo León: Etchison 55 (Au--297432). FRANCE: Boulos s.n. [17,5,1961] (Gz); Lamaroux s.n. [Provence] (T). SPAIN: Sennen 36008 (Ws). AUSTRIA: Noë s.n. (Pd). GRECCE: Kuntze s.n. [Cyclopi, 16/6/67] (W--2506585); Nitzelein s.n. [Litocharon, 8/10/1963] (Go); Saint-Lager 3 (Ba); Zuccarini s.n. (T). AEGEAN ISLANDS: Chios: Lüdtke 595 (Mu), 596 (Mu). Kos: Sauer & Sauer 13894 (Mu). ITALY: Robertson s.n. [Scala di Salonse, 1829] (T); Tenore s.n. [1840] (Mu--614). CYP-RUS: Casey 1632 (Ba). CORSICA: Aellen 1856 (Ws). YUGOSLAVIA: Dalmatia: Servola s.n. (Mu--615). Fiume: Noë 329 [Reichenb., Fl. Germ. 2289] (N). Illyria: Tommasini s.n. [Monpalcone] (Ba). Istria: Untchj s.n. [Pola, 8-9-88] (Mi), s.n. [2.8.1899] (Gz). RUSSIA: Transcaspia: Michelson 87 (Mu). MOROCCO: D. Fairchild 74 (W--1349467), 82 (W--1349471); Garnett 38/7 (Mu). EGYPT: G. Maire 141 (Gz); Romee s.n. [18,3,1968] (Gz). SOUTH AFRICA: Cape Province: Bayliss BS.5095 (W--2670629), BS.7270 (Mu). TURKEY: Manissadjian 290 (Mu), 326 (Mu); Stutz 453 (N). AFGHANISTAN: W. Griffith 6059 (Mu--1342). INDIA: State undetermined: Herb. Schreber s.n. [India orientalis] (Mu--603). CULTIVATED: Alabama: Justice 525 (Ba). Arizona: Simonian 361 (Tu--172595); Thorner s.n. [June 13, 1903] (Au). California: Jerabek s.n. [November 1944] (Sd--34534), s.n. [June 1945] (Sd--36463); McClintock s.n. [July 14, 1943] (Ba); Moran 2458 (Ba); Witham 304 (Sd--71836). Egypt: Boulos & Tanadros s.n. [Dokki] (Gz); Hassib s.n. [22/12/1927] (Gz); Mahdi 34 (Gz), 146 (Gz), s.n. [4,8,63] (Gz, Gz), s.n. [18,8,63] (Gz, Gz), s.n. [10/11/63] (Gz, Gz), s.n. [9/6,65] (Gz, Gz, Gz), s.n. [23,5,65] (Gz, Gz, Gz), s.n. [18,8,68] (Gz, Gz, Gz), s.n. [3/6/70] (Gz, Gz, Gz), s.n. [10/12/72] (Gz, Gz, Gz); Runke-witz s.n. [18/11/1933] (Gz); Sisi s.n. [22/5/1973] (Gz, Gz); V.
Täckholm s.n. [28/10/1959] (Gz, Gz); Täckholm & Elsayed 269 (Gz), 337 (Gz), s.n. [8/1/1961] (Gz, Gz), s.n. [28/11/1961] (Gz), s.n. [17/5/1962] (Gz, Gz, Gz), s.n. [24/5/1962] (Gz, Gz). Florida: Gillis 8449 (Ac, Ba, Ft, Ft); Meebold 27509(Mu); P. O. Schallert 365 (Bl--208625). Germany: Herb. Schreber s.n. (Mu--674). Kentucky: Dennistone s.n. [June 24, 1929] (Ws). Louisiana: Boyd s.n. [June 3rd 1898] (Lv); Joor s.n. [Baton Rouge] (W--2607108); Pecoy s.n. [May 19, 1899] (Lv); Pratt s.n. [May 20, 1899] (Lv). Mexico: Imboden 74 (Au--297434). New Zealand: Sykes 16/68 [Herb. Bot. Div. DSIR 173231] (Ld), 630/65 [Herb. Bot. Div. DSIR 157634] (Ac). North Carolina: Biltmore Herb. 1786 [Sept. 27, 1897] (Ws); LeClair s.n. [June 26, 1937] (N); D. Pratt s.n.[10/17/64] (Lv); P. O. Schallert s.n. [7/10/31] (Ws). Pakistan: Abedin 7403 (Kh, Ld). Poland: Baenitz s.n. [Silesia, 15.9.1910] (Gz, Gz). South Africa: Bayliss BS.4542 (Ba, N, W--2616806), BS.6236 (Mu, N, W--2744925). South Carolina: Rodgers & Mullens 67086 (Bl--215442, N, Se--234702). Texas: Hansen, Hansen, & Nee 1811 (Ws); Purvis 8 (Au--248392); R. Runyon 4258 (Au--269633, Au--269643, Au--269673), 5445 (Au--270204), 124761 (Au--269536); Saichuk 73 (Lv); Shinners 8582 (Ba). Virginia: Allard 11391 (Se--134451). LOCALITY OF COLLECTION UNDETERMINED: Happe s.n. [in Europa australi] (Mu--607); Herb. Missouri Bot. Gard. 116201 (E).

**VITEX AGNUS-CASTUS** f. **ALBA** (West.) Rehd.


West. Card. Book, caerulea agnus-castus
Sunset agnus-castus caerulea
C. K. ed. 5, blanches" fleurs as 1968; 1895; 7, 1968]
AGNUS-CASTUS rell & E. Desfontaines Sicily. 1972; 1878. 1970; 6:
The corollas are uniformly described as "blue" in this form, as opposed to the "purple", "purplish", or "lavender" of the typical form. It has been collected in flower and fruit in July. The flowers are described as being "pleasantly scented".

1979 Moldenke, Notes on Vitex 341


Gussone (1828) reports this color form of the species from Sicily. Desfontaines (1804) calls it the "vitex agnus castus à fleurs blanches" and "vitex agnus-castus blanc" (1815). Priszt (1971) lists it as cultivated in Hungary, offering seeds in exchange as his seed no. 1673. Cormann's collection, cited below, cultivated in Massachusetts, was grown from seed secured in New Jersey. The form has been collected in anthesis in September.


VITEX AGNUS-CASTUS var. DIVERSIFOLIA (Carr.) Schelle


Gerase, Herbal, ed. 3. [45]. 1975.


Linnaeus (1796) plainly accredits the polynomial cited above to "Blackwell herb. t. 139". The reference is sometimes mis-cited as occurring on "p. 1122". The Blackwell illustration (1751), however, is of the typical form of the species, the leaflets being plainly and completely entire-margined.

The Woodbury collection, cited below, was probably taken from cultivated material, although the label accompanying it does not so indicate.


VITEX AGNUS-CASTUS f. LACINIOSA (Ces.) Mold., stat. nov.


The original description of this variety is merely "Folioline laciniata. Qua e là colla specie". I have not seen any original material, so it is entirely possible that his taxon may be identi-
cal with var. diversifolia (Carr.) Schelle.

VITEX AGNUS-CASTUS f. LATIFOLIA (Mill.) Rehd.

1979

Moldenke, Notes on Vitex 343


Recent collectors describe this plant as a tomentose shrub, to 6 feet tall, with a strong aromatic odor, and numerous annual stems from a perennial base, flowering in June and August, fruiting in October. The corollas are said to have been "light-lavender" on DeWolf & Gruns 2152 and "lilac" on Fogg s.n., while Pancho says "corolla-lobes RHS [Royal Horticultural Society, London] Wisteria
Blue 640". Lawrence (1967) reports that in the southern United States this form of the species starts blooming between June 6 and 21 and ends its period of anthesis in July. Common names recorded for it are "broadleaf chaste-tree" and "broad-leaved chaste-tree". The Spring Hill Nursery (1968) describes it as a "Distinctive hardy 4 ft. shrub with star-like foliage and magnificent large, deep, lavender spire-like blooms in July and August. Delightful change of pace for the foundation". They offer it at $2.50 for a 2-foot plant or $1.65 for a 1--1 1/2-foot plant. The Nehrlings (1975) assert that it is somewhat harder than the typical form and is propagated chiefly by cuttings. They claim that *V. agnus-castus* var. *macrophylla* has still larger leaves and still deeper-colored corollas, but, lacking more definite evidence, I am regarding the latter as identical to the wild broad-leafletted form, Hatton (1960) claims that the form with broad leaflets, like the typical narrow-leafletted form, has had its seeds considered anti-aphrodisiac since ancient times. This is probably true, since, contrary to claims in horticultural literature that it is a cultivar ("cv."), it is wild and surely native throughout Mediterranean Europe and is even known in fossil form there. 

*Vitex albida* appears to be based on an unnumbered Schultes collection from cultivated material in Germany and deposited in the Munich herbarium. The specific epithet chosen implies that the corollas were whitish, but there is no evidence of this on the preserved specimen or its label.

Material of *f. latifolia* has often been misidentified and distributed as typical *V. agnus-castus* L. On the other hand, the Jerabek *s.n.* [November 1944], distributed as this form, actually does represent, instead, typical *V. agnus-castus* L.


**VITEX AGNUS-CASTUS** var. **PSEUDO-NEGUNDO** Hausskn.


Recent collectors describe this plant as a bush or shrub, 1--4 m. tall, and have found it growing along roadsides, on riverbanks and streamsides, in gravelly sandy-clay or rocky sandy-clay loam, in dry forests and desert washes, in dry depressions and low bushy woods, and in the gravel of wadi beds, at altitudes of 11--2300 meters, flowering from May to November, fruiting in March, August, September, and November. Guest & Al-Rawi (1966) assert that it is very abundant (10--20 percent) in the Asphodeletum aestiví ecologic association on gently sloping hillsides and also is common among arboresecnt species along the sides of mountain streams in the forest zone associated with Paliurus spina-christi and Nerium oleander.

The chromosome number is reported by Löve (1971) as 2n = 32, Based on Murin & Sheikh s.n. from Iraq. The Talalajs (1978) report isolating a volatile oil of possible economic importance from the plant. The corollas are said to have been "blue" on Andersen & Petersen 443 and Qaiser & Ghafoor 1525, "violet" on Ali 1074 and Qaiser 209, "lavender" on Long 417, "purple" on Ali & al. 1957, and "purple with the throat white" on Koeltz 13223.

Stewart (1972) quotes Parker to the effect that this plant is cultivated in gardens on the plains of Pakistan and is best recognized by its "cylindric panicles of bright violet" flowers. The leaflets on Rechinger 10714 are extra large, greatly resembling
those of *V. negundo* L.

Patzak & Rechinger (1967) distinguish this taxon from its close relatives in the area which it naturally occupies as follows:

Flores plerumque in inflorescentias simplices vel paniculatas dispositae; cymae sessiles vel subsessiles; folia plerumque 5--7-na.

Labium inferius corollae intus non barbatum...*V. agnus-castus*.

Labium inferius corollae intus barbatum...

*V. agnus-castus* var. *pseudo-negundo*.

Flores plerumque laxe paniculatae; cymae manifeste stipitatae; foliola plerumque 3--5-na...*V. negundo*.

Jafri & Ghafoor, in a personal communication to me, separate them similarly:

Leaflets 3--5; cymes often somewhat lax and panicked, forming a pyramidate inflorescence; flowers not fragrant...*V. negundo*.

Leaflets 5--7; cymes sessile or sub sessile, forming a sub cylindric narrow inflorescence; flowers fragrant.

Lower corolla-lobes glabrous or slightly pubescent at the base only...*V. agnus-castus*.

Lower corolla-lobes densely ciliate or pubescent...

*V. agnus-castus* var. *pseudo-negundo*.

Townsend (1972) separates them thus:

Lower lip of corolla glabrous, or with a few sparse hairs at the basal angles only...*V. agnus-castus*.

Lower lip of corolla bearded with a semicircular line of hairs at the base

Inflorescence with the lateral cymes more congested; inner surface of calyx with the intermediate veins more or less zigzag above or tending to merge into the reticulate secondary venation extending from the middle of the tube upwards; petiolo of central leaflet to 1 cm. long...

*V. agnus-castus* var. *pseudo-negundo*.

Inflorescence with the lateral cymes laxer; inner surface of the calyx with the intermediate veins straight and almost reaching the sinuses, the secondary venation at most looping-anastomosing and never reticulate in the tube; petiolo of central leaflet to 2 cm. long...*V. negundo*.

Handel-Mazzetti (1913) cites Bornmüller 1536, Handel-Mazzetti 1970, and Sintenis 1305 from Mesopotamia and lists the variety also from Iran. Jafri & Ghafoor cite S. I. Ali 1074, Azher 32 & D-5, Hamid Ali 5 & C-7, Nath 2430, Qaiser 203 & G-2, Qaiser & Ghafoor 1525, and Sultanul Abedin 6727 from Pakistan, where, they say, it is called "marwan" and flowers from May to July. They give its overall distribution as southwest Asia eastward to Afghanistan and Pakistan. Stewart (1972) cites, also from Pakistan, Aitchison 446, Harsukh 20615, Lace 3619, Patzak & Rechinger s.n., and Popov 308.

Patzak & Rechinger (1967) cite the following: IRAQ: Bornmüller 1536; Guest 800, 865, & 1953; Haley 58; Helbaek 1225 & 1786; Makki 557; Rechinger 9612, 10714, & 11246; Sutherland 16; Thesiger 1202. IRAN: Bent & Wr. 503-609; Bornmüller 5128; Grant 15895; Koelz 15444 & 18447; Rechinger 1308, 3996, 5362, & 5778; Shar 1305E; Stapf s.n.;
Stutz 959. RUSSIA: Turkmanskaya: Litw. 2407. AFGHANISTAN: Gabriel 37/3; Kerst. 265; Koelz 2090; Koelz 13223; Lindb. 1960/931; Rechinger 19268 & 32403; Volk 1320. PAKISTAN: Aitchison 446; Bhola s.n.; Harsukh 20615; Lace 3619; Popov 308; Stewart, Blatt, & Fz. 1435 & s.n. They give the overall distribution as "Asia astro-occidentalis a Turcia et Syria et Kurdistan orientem versus usque ad Afghanistan et Pakistan."

Material of this variety has been widely misidentified as typical V. agnus-castus L. or as V. negundo L.

Additional citations: EGYPT: Bot. Dept. Herb. s.n.[Kharga Oasis, Feb. 1931] (Gz, Gz). ISRAEL: Amdursky 280 (N); Zohary, Amdursky, & Grizi s.n. [14.11.1951] (Ba). JORDAN: V. Täckholm s.n. [6/8/1962] (Gz), s.n. [July 1962] (Gz, Gz). IRAQ: Agnew & Barkley s.n. [27-5-1962] (N, N); F. A. Barkley 32Ir3356 (N); Barkley & Agnew 3290 (N); Barkley, Wahab, & Oraha 6824 (N); Brahim M. 6119 (N); K. H. Rechinger 10714 (Mu). IRAN: Haltenorth s.n. [27.9.1960] (Mu); K. H. Rechinger 43617 (Mu); Rechinger & Rechinger 5778 (Ba). AFGHANISTAN: Andersen & Petersen 443 (N); Griffith 6059 (Pd); Koelz 13223(W--2193776); L. E. Long 417 (W--2189847); Podlech 16145 (Mu), 16825 (Mu), 17162 (Mu), 18545 (Mu), 18581 (Mu), 19196 (Mu), 19901 (Mu), 21692 (Mu); K. H. Rechinger 19268 (Mu), 32403 (Mu), 37025 (Mu), 37547 (Mu). PAKISTAN: Baluchistan: Abedin & Hussain 6727 (Kh); Qaiser 209 (Kh); Qaiser & Chaofer 1525 (Kh); K. H. Rechinger 29984 (Mu), 30985 (W--2637734); Rechinger, Rechinger, Aellen, & Esfandari 3996 (Ba, Mu). Northwest Provinces: Ali 5 (Kh), 1074 (Kh); K. H. Rechinger 19617 (Mu). Sind: Ali, Farrofi, & Abedin 1957 (N). West Punjab: Iman 32 (Kh).

VITEX AGNUS-CASTUS var. PSEUDO-NEGUNDO f. ALBIFLORA Mold.


VITEX AGNUS-CASTUS f. ROSEA Rehd.


The corollas on the Brown collection, cited below, are said to have been "pink" when fresh.


VITEX AGNUS-CASTUS f. VARIEGATA Mold.

Additional synonymy: Vitex agnus-castus cv. "Variegata" L. H. &
Additional bibliography: Mold., Phytologia 16: 495. 1968; Brum- 
mitt & Ferguson, Reg. Veg. 61: 190. 1969; Mold., Fifth Summ. 2: 
710, 711, 922, & 970. 1971; L. H. & E. Z. Bailey, Hortus Third 
1162. 1976.

VITEX AJUGAEFLORA Dop
Additional bibliography: Wangerin, Justs Bot. Jahresber. 56 (1): 
1937; Mold., Phytologia 16: 495. 1968; Mold., Fifth Summ. 1: 303 
Additional citations: INDOCHINA: Annam: Poilane 6844 (W-- 
2602629--cotype).

VITEX ALTISSIMA L. f., Suppl. Pl., imp. 1, 294. 1791.
Additional & emended synonymy: Mail-elou Rheede, Hort. Malab. 
Vitex trifolia major indica, fructu carnoso, floribus minoribus & 
Mailelou Rheede apud Adans., Fam. Pl. 2: 12 & 200. 1763. Vitex 
appendiculata Willd., Gesell. Naturforsch. Freunde Berlin, ser. 2, 
4: 203. 1803 [not V. appendiculata Rottb., 1885]. Vitex altissima 
Roxb. ex Wall., Numer. List [48], no. 1755, hyponym. 1829. Vitex 
appendiculata Wight ex Wall., Numer. List 86, no. 1755C. 1831.
Vitex latifolia Wight ex Wall., Numer. List 86, no. 1755C. 1831; 
Steud., Nom. Bot., ed. 2, 2: 777. 1840 [not V. latifolia Blume, 
1837, nor Lam., 1788, nor Mill., 1768]. Vitex pubescens \(\text{append-}
\text{iculata Wight ex D. Dietr.}, \text{Syn. Pl. 3: 611, in syn. 1843. Vitex}
\text{altissima Heyne ex Mold.}, \text{Phytologia 5: 197, in syn. 1955. Vetex}
1978.

Additional & emended bibliography: Rheede, Hort. Malab. 5: 1--2, 
pl. 1. 1685; Bryen, Prod. Fasc. Rar. Pl., ed. 1, 2: 106 (1688) 
and ed. 2, 2: 106. 1739; Adans., Fam. Pl. 2: 12 & 200. 1763; L. 
1788; Raesusch., Nom. Bot., ed. 3, 182. 1797; Willd., Gesell. Na-
46, 1814; Moon, Cat. Indig. Exot. Pl. Ceyl. 1: 46. 1824; Sweet, 
Hort. Brit., ed. 1, 1: 323 (1826) and ed. 2, 416. 1830; G. Don in 
Loud., Hort. Brit., ed. 1, 246. 1830; Wall., Numer. List 86. 1831; 
ed. 2, 551. 1832; G. Don in Loud., Hort. Brit., ed. 3, 246. 1839; 
3: 611. 1843; Voigt, Hort. Suburb. Calc. 469. 1845; Buek, Gen. 
Pl. Zeyl., imp. 1, 244. 1861; Gamble, List Trees Darj. Dist. 61. 
1878; Gamble, Man. Indian Trees, ed. 1, 297, 298, & 522. 1881; Tri-
Ceyl.] 69. 1885; Trimen, Handb. Fl. Ceyl. 3: 356--358. 1895; Nairne, 
92. 1978.

Additional illustrations: Rheede, Hort. Malab. 5: pl. 1. 1685; Brandis, Indian Trees, imp. 1, 503, fig. 175. 1906; Alston, Kandy Fl. [65], fig. 347. 1938; Worthington, Ceyl. Trees 348. 1959; Brandis, Indian Trees, imp. 2, 503, fig. 175. 1971.

Recent collectors describe this species as a large shrub or small to very large tree, 2.5--33 m. tall, spreading, the bole often to 1.2 m. long, the crown to 10 m. wide, the trunk fluted, 15--90 cm. in diameter, the branches compressed, channelled, drooping, the branchlets tetragonal, dark-green, sulcate, the wood smooth, heavy, weighing 58--60 pounds per cubic foot, even-textured, varying from light olive-gray to brownish-gray or grayish-brown, capable of being seasoned, quite durable in water, very tough, disease-resistant, termite-proof, polishing well, not easily split, not readily warping, the bark varying from brown or tan to dull-brown, pale orange-brown, light-tan, ochraceous, yellowish, gray, grayish-white, yellowish-gray, or "creamish-yellow", fissured or cracked longitudinally, peeling off in narrow strips 2--3 cm. wide or in 2 x 2.5 inch scales, leaving sandy-colored scars, loose, rough, yellow and fibrous within, the living bark soft, yellow or dark yellow, 5--10 mm. thick, the leaves compound, usually trifoliolate ("tripalmate"), papyraceous, acuminate, bronze-colored, usually appearing in March, the old leaves deciduous at about the same time, the inflorescence terminal, paniculate, flexuous or pendulous, the "cymes scorpioid", the flowers small, few, fragrant, the calyx pale-rusty or pale-brown, with a dull-violet base, the filaments pale-purple or white, the anthers black, the connective blackish, and the fruit drupaceous, round or spherical, about the size of a pea or 3/8ths inch long, at first green, later turning dark-blue, blue-black, purplish, purple, or black, smooth, often with small white dots, the pericarp fleshy, juicy at maturity.

The corollas are described as "white, tinged with blue" by Nairne (1894), Cooke (1905), and Sharma & al. (1978), "pale-violet or white" by Worthington (1959), or "cream-colored, with a white lip" by the Baileys (1976). Collectors also describe the corollas in various ways: "white" on Saldanha 13974, "white with prominent purple lip" on Saldanha 16938, "white, lower lip bluish-purple" on Cramer 4366, "blue" on Hladik 855, Mueller-Dombois & Comanor 67072528, Ripley 135, Stevens 472, and Sweeney s.n., "bluish" on Fosberg & Sachet 53010 and Saldanha 14365, "pale-blue" on Comanor 567 and Kostermans 23289 & 23478, "bluish-purple" on Jayasuriya 1262, "bluish-purple" on Sumithraarachchi DBS.508, "purplish-blue" on Sumithraarachchi DBS.462 and Waas 1267, "purplish-blue, lower lip blue" on Jayasuriya 1990, "purple" on Cooray 6911730R and Ramamoorthy & Gandhi F.F.P.2752, "bluish-purple with middle lobe of lower lip deep-purple" on Amaratunga 1023, "lilac" on Bernardi 14304, "violet-blue with lower lip a darker shade, white around margin" on Davidse & Jayasuriya 8393, "pale-violet" on Amaratunga 175, Bernardi 15240, and Kostermans 26007, "very light-pink, lower lobes dark-violet with a yellow stripe at base of tube,
the tube with maroon tinge" on Davidse 7338, "mauve-pink" on Amara ratunga 268, "lower lip purple, side lobes and upper 2 lobes purplish-white" on Saldanha 16553, "limb border lavender, paler within, center lavender" on Fosberg & Jayasinghe 57119, and "corolla-tube dull pale-violet, white-hairy, with darker longitudinal dashes under the lip, 4 upper petals outside pale, inside light-blue, lip outside light-blue, inside with yellow base, further up violet-blue" on Jacobs XI.K.6.

Recent collectors have encountered V. altissima on steep forested slopes and exposed windswept rocky outcrops, in dry deciduous secondary forests and dry forests in general, in evergreen or semi-evergreen forests, wet deciduous forests, intermediate forests, and "disturbed uneven forests yo 10 m. tall", in jungles and dry-zone jungles, at the edges of forests or jungles, and in the forested margins of rock outcrops, on sandy, light-colored, sandy-pebbly, or "brown-red clayey-lateritic-loamy" soil, even in regions of more than 56 inches annual rainfall, from sea level to 1100 m. altitude, in flower in January and from March to November, in fruit in April and from July to January.

Ramamooorthy & Gandhi, as well as Saldanha, report the species as "common" in Mysore, India, although the latter collector also found it only "occasional" in some localities. Ellis & al. found it growing along roadsides in Kerala, citing their nos. 20488 & 24004; Vajravelu & al. (1968) list it as "common" in Kerala, citing Joseph 17138, and (1967) "common" also in Madras, citing their no. 24106. Sebastian & Vivekanathan (1967) refer to it as "rare" in the Cheevapara region of Kerala, but as a "common tree on [the] western slopes of the Devicolam range", citing their no. 25337. Ellis (1968) found it in Andhra Pradesh, citing his no. 25554. Kurup (1978) asserts that it inhabits "tropical wet rainforests in [the] western Ghats, forming [the] top storey with Messua ferrea, Hopea parviflora, etc." Agarwal (1970) records it from "Bombay, Canara, Madras forest distr.s, Cochin (Kerala), and Ceylon". Shetty & al. (1978) refer to it as "common" and cite Rathakrishnan 37981 and Sharma 35725. Speangers & Balasubramanian (1978) found it growing in dry tropical semi-evergreen forests of southeastern India with Canthium dicoccum, Manilkara hexandra, Hemidesmus indicus, etc., in monsoon stream areas.

Gausen & al. (1967) found V. altissima "in the intermediate storey of the Toona-Garuga Series"; Ramaswamy (1967) cites his no. 2707 from Savanduruga. Kammathy & al. (1967) encountered the tree in dry deciduous forests in Mysore, citing Barnes s.n. Qureshi (1965) records it from Madras, while Gamble (1881) says that the "Tree [is] only found in the southern Sāl forests". Puri (1960) lists it from the top and middle layers of tropical evergreen forests of several luxuriant strata with an understorey of many ferns and tall herbs in northern Kanara of the western coast of Malabar; in the top storey of southern tropical wet evergreen forests in southern Coimbatore the tree is 10–25 m. tall. In Assam, Kanjilal & al. (1939) report that it ascends to 4000 feet altitude, the hard close-grained wood "valuable for building construction, furniture, carts, boats, oil-mill pestles, etc."
Nairne (1894) describes the species as "plentiful" in southern
Concan and Canara, asserting that it is "A beautiful tree when in
flower". Clarke (1885) gives its distribution as the "Deccan
Peninsula, especially the west side, up to 4000 ft., common".
Troup (1921) tells us that "The tree stands a moderate amount of
shade, especially in youth; it produces root-suckers. Growth,
according to Gamble, 8 to 9 rings per inch of radius, giving a
mean annual girth increment of 0.7 to 0.78 in." It is also said
to "regenerate anywhere around". Cooke (1958) gives its distri-
bution as only west peninsular India and Ceylon, citing Dalzell
& Gibson s.n., Law s.n., and Stocks s.n. from Concan and Dalzell
& Gibson s.n., Talbot s.n., and Woodrow s.n. from Kanara, where
he says that it is "plentiful" and "abundant" in evergreen for-
est, and that its wood is used for building purposes, furniture,
and carts, being in much demand in northern Kanara.

The Baileys (1976) give the species' distribution as Pakistan,
India, and Sri Lanka, asserting that it is a "Valuable timber
tree used in cabinet work and building construction". Agarwal
(1970) says that "It is considered very good for house-construc-
tion, flooring, in well-construction, for carts, felloes of wheels,
furniture and rarely for sleepers [=railroad ties]. It can be
tried for tool handles." Railroad ties made of this wood are
said to last 30 years.

In Sri Lanka most authors and collectors describe the species
as abundant. Thwaites & Hooker (1861) say that it is "Common in
forests, up to an elevation of 3000 feet", citing Thwaites C.P.
1958, and noting that "This tree produces one of the most valuable
timbers in the island for building and other purposes". Worthing-
ton (1959) lists it from the "low country, dry zone, but also
found elsewhere, the wood used for furniture, wagons, and railroad
ties". He collected it in the submontane region on the dry zone
border. Hallier (1918) found it in cultivation, citing his no.
C.241, deposited in the Hamburg herbarium. Trimen (1895) comments:
"A valuable timber-tree. Wood hard, heavy, close-grained, smooth,
tough, durable, grey; the carpenters distinguish several varieties.
The bark is used as a fomentation in rheumatic swellings. The
wood affords a yellow dye, which is not much employed". It would
be interesting to know if the carpenters' varieties correspond in
any way with the two taxonomic varieties here accepted.

Also in Sri Lanka Bernhardt says "arbore ovvia tota in insula
frequens, cortice claro, inflorescentiae candalabraiformes". Da-
vidse & Sumithraarachchi, as well as Comanor and Sohmer, refer to
V. altissima as "common" in the forests, but Fosberg & Jayasinghe
refer to it as "infrequent". Cooray calls it a common subcanopy
tree in low-stature evergreen forests dominated by Mischodon zey-
lanicus on reddish soil. Cramer reports it "common in open dry
country", while Fosberg & Sachet found it "common at edge of for-
est around extensive granite outcrops". Kostermans reports it com-
mon in both deciduous and evergreen forests, while Hladik reports
it "common in dry zone near irrigation tank [lake] where under-
growth has been cut"; Mueller-Dombois encountered it as com-
mon in shallow sand between outcropping rocks along roadsides; he and Jayasuriya report it "rather common in jungle forests", while he and Comanor affirm that it is a "prominent upper canopy tree at forest edges next to villu grassland". Ripley describes it as common in "flushes". Sumithraarachchi came upon it in jungles.

Sweet (1826), Don (1830), and Loudon (1832) all assert that V. altissima was introduced into English gardens from Sri Lanka in 1802. It is also cultivated in Maryland and Florida, on the basis on material imported from India by Menninger and represented by P. A. Russell 194521. Jacobs XI, 6 was collected from cultivated material in Java.


Linnaeus' original (1781) description of V. altissima is: "VITEX foliis ternatis integerrimis, panicula verticillata: spicis verticillatis, bacca trisperma. Habitat in vastis sylvis Zeylonae. König. Foliola ovata, utrinque acuminata, supra glabra, subtus pubescentia." König 77, in part, from Sri Lanka, in the Linnean Herbarium in London, is the nomenclatural holotype. It is worth noting here that Moon (1824) correctly maintains V. altissima as a distinct species separate from what he calls V. pubescens (=V. pinnata), both in Sri Lanka. The V. pubescens of Vahl, referred to in the synonymy above, is V. pinnata and it is to this taxon that Moon was obviously referring. The date of publication of the V. pubescens Heyne is erroneously given as "1824" by Santapaugh & Waugh (1963).

The Cooray 69111730R collection, cited below, was gathered as a voucher for ecologic observations. Similarly, Ripley 78, 135, & 247 were collected as vouchers for primate ecology studies. Lewis, on the label accompanying the collection cited below, comments that this "tree [is] taller and straighter than the ordinary 'milla'".

It is worth noting here that Kostermans 23478 is only very sparsely puberulent, rather than pubescent, on the lower leaf surfaces. Worthington (1959) erroneously refers to the fruits as "berries" -- they are drupes. The illustration given by Alston (1938) certainly looks more like V. negundo L. than it does V. altissima! Posberg 56373 is accompanied by a label asserting that the plant was a "somewhat depressed spreading somewhat woody herb, flowers orange, closed in afternoon, occasional in fencerow along weedy roadside" -- obviously a case of mixed labels or some other stenographic mixup. Similarly, the label with Sohmer 8237 in the New York and Washington herbaria asserts that the plant had "flowers orange". A letter to me from Dr. Sohmer, dated June 17, 1977, says "I have gone back to my field book and find that for my collection 8237 I had only the following notation down: '50 ft. high tree'. There is nothing about flower color in my notes, and
I assume that either an enthusiastic typist added the notation to the label that you saw, or it was mistakenly transferred from somewhere else."

Rheed's illustration (1685) is often cited as representing f. juv. alata, but it plainly depicts the typical adult form of V. altissima. The name, V. pinnata has been applied mistakenly to V. altissima by many authors and collectors, notably by Alston (1931, 1938) and Abeywickrama (1959) among authors and by Amaratunga, Cooray, Cramer, Dittus, Hladik, Mueller-Dombois, Mueller-Dombois & Comanor, Ripley, Sohmer, Waas, and Worthington among collectors. It has also been misidentified as V. trifolia by Sohmer, Sumithraarachchi, and others.

The Kostermans 24109 and Moldenke & al. 28188, 28189, 28220, & 28238, distributed as typical V. altissima, actually represent f. subglabra Thwaites, while Flock 362 and Rodgers MRC. 164 are V. bunguensis Mold.

Additional & emended citations: INDIA: Karnataka: Collector undetermined s.n. [Mysore] (Pd); Ramamoorthy & Gandhi H.F.P. 2752 (W--2653611); Saldanha 13974 (N), 14365 (N), 15116 (W--2653612), 16553 (N), 16938 (N); W. D. Stevens 472 (Ln--232352); Talbot s.n. [N. Canara] (Pd). Kerala: Hohenacker 115 (B, Mu--620, Mu, Mu, N, S, S), s.n. [prope Mangalore] (B); Stocks, Law, &c. s.n. [Malabar, Concan, &c.] (Br, Mu--622, N, Pd, S, W--2497091, W--2497123.

Tamil Nadu: Kostermans 26007 (W--2828795); G. Thomson s.n. [Mont. Nilghiri & Kurg] (M, Mu--621, Pd, S); R. Might 2325 (B, Mu--1344, Mu--1345, Pd, Pd, S, S). State undetermined: Wallich 1755 (Pd), 1755c (Pd). SRI LANKA: Amaratunga 175 (Pd), 268 (Pd), 1023 (Pd); Bernardi 14304 (W--2765949), 15240 (N, W--2808311); Comanor 567 (N, W--2762569), 576 (N, Pd, W--2762570); Cooray 6911730R (Ac, N, W--2612109); Cramer 4366 (W--2807756); Davidse 7338 (Ld, W--2803773), 7446 (Ld, W--2806274); Davidse & Jayasuriya 8393 (Ld, W--2808657); Davidse & Sumithraarachchi 8153 (Ld), 9075 (Ld, W--2808696); Dittus WD.69103202 (W--2765146, W--2803412), WD.71090606 (W--2805422); F. R. Fosberg 56373 (N, W--2811402); Fosberg & Jayasinghe 57119 (Ld); Fosberg & Sachet 53010 (Ld, N), 53011 (Tu); Gardner s.n. [Jaffna, C.P.1958] (Pd, Pd); Hladik 855 (Pd, W--2761100); Jayasuriya 1262 (Ac, Ld), 1990 (Ld, W--2807845); Kostermans 23289 (Ac), 23478 (Ac, N); J. P. Lewis s.n. [Mullativu] (Pd, Pd); Moldenke, Moldenke, Dassanayake, & Jayasuriya 28329 (Gz, Ld, Pd, W--2764534); Moldenke, Moldenke, & Jayasuriya 28256 (Ac, Pd, W--2764523); Mueller-Dombois 67081404 (Pd, W--2586025A), 68102114 (N); Mueller-Dombois & Comanor 67072507 (Pd, Pd, W--2586024A), 67072528 (Pd, W--2586023A); Reitz 30027 (Ac, W--2762786); Ripley 78 (Pd, W--2719624), 135 (Pd, W--2719619), 189 (Pd, W--2715939), 247 (W--2719625); Sohmer 8210 (N, W--2808328), 8237 (Lc, N, W--2807754); Sohmer & Jayasuriya 10673 (N); Sumithraarachchi DBS.462 (W--2807746), DBS.508 (W--2807761); Thwaites C.P.1598 (Pd); Waas 1267 (W--2807769); Wirawan s.n. [Wilpattu, 15.9.68] (Pd, W--2612111); Worthington 383 (K), 3235 (K), 3764 (K), 4506 (K), 4906 (K), 5013 (K), 5552 (K), s.n. [Kandy, Oct. 24, 1957] (K). THAILAND: Phengklai, Tamura, Niymodham, & Sangkachand 4269 (Z). CULTIVATED:


Phyto

Although long regarded as a separate species or as a distinct variety of V. altissima L.f. by numerous authors in the past, it seems from field observation that this taxon is merely a "juvenile form" of V. altissima distinguished by its leaves having more or less broadly winged petioles, the wings being 8—16 mm. wide, continuous, dilated, basally cordate and subamplexicaul. Such leaves are also found on the turions or "watersprouts" often produced on the periphery of the stumps of cutdown mature individuals. They may also be seen on seedlings and on the "suckers" sent up from underground runners. Some authors have also observed that the leaves on non-flowering branches of mature trees may have somewhat broader margins on their petioles than are seen on those of neighboring flowering branches on the same tree. This was confirmed by my wife and myself in the field in Sri Lanka. In our experience, however, these nowhere approach the width of the wings seen on the juvenile plants, turions, and seedlings. On seedlings the lowermost leaves may even be unifoliate. Some authors (e.g., Clarke, 1885) assert that in this juvenile form the leaves are often 5-foliolate instead of the normal 3-foliolate of mature trees.

Numerous writers describe the flowers and fruits of "Vitex alata", but it seems most likely that they are referring, not to this form, but to V. limonifolia Wall., V. peduncularis Wall. or V. peduncularis var. roxburghiana C. B. Clarke, which are the taxa regarded as "V. alata" by Kurz, Roxburgh, Schauer, and Wallich.

Agarwal asserts that "V. alata Heyne" grows in the western part of peninsular India and is "common on [the] Western Ghats in evergreen forests", the wood described as grayish-brown, moderately hard, rough, capable of being seasoned, taking a fair polish, appearing to be durable, and weighing 26 kg. per cubic foot. He adds that "Although from the available records its useful property is not found but from the specimens it appears that it can be usefully exploited for cabinet work & in construction purposes". Cooke (1958), under the name V. altissima var. alata Trim, asserts that it differs from the typical variety in having its "Petioles always rather broadly winged, widened and cordate at the base; leaflets very finely pubescent above, densely grey-pubescent beneath; flowers more laxly arranged", flowering in April and May, citing it from Concan (Nimmo s.n.), Deccan (Bhiva s.n.), "S. M. Country" (Law s.n.), and Kanara (Talbot s.n.). It would appear from this that he, at least, had seen flowering specimens with the "juvenile" leaf characters.

Dale & Greenway (1961) aver that "Vitex alata Heyne, an Indian species, has been collected from the Gogoni forest, Kwale district [Kenya]: it should not be regarded as indigenous without further collection".

Puri (1960) found what he called V. altissima var. alata in the "first storey with Lagerstroemia, Sideroxylon, and Holigarna spp. in dense evergreen tropical forests" in northern Kanara. He adds
that there "The middle storey is poor or absent; likewise ground cover except for seedlings of the trees". This implies that the trees were not only flowering, but were producing fruit and seedlings.

Sweet (1826) and Loudon (1832) agree that "V. alata Roth" was introduced into cultivation in England from the "E. Indies" in 1818, but Don (1830) gives the date of introduction as 1820.

Clarke (1885) describes "V. alata Heyne" as having "leaves 3-foliolate [but some branches, apparently of this, collected by Shuter, Law, and Stocks, have some of the leaves 5-foliolate], leaflets subsessile broadly lanceolate subentire mature glabrate above thinly pubescent beneath, wing of the petiole broad cordate at base, panicles terminal compound fulvous-villous, corolla scarcely 1/4 in., drupe 1.5 in. diam." He cites Rottler s.n. and Van Royen s.n. from Madras and Cleghorn s.n. from Mysore, commenting: "Scarcely differs from V. altissima but by the wing of the petiole, which is 1/3 -- 2/3 in. wide, continuous [in V. altissima sometimes winged upwards], dilated, cordate and subplexicaul at the base; leaflets 2 1/2 in. wide [in V. altissima 3/4 in.]".

Trimen (1895) gives the same description given by Cooke, but adds this interesting comment to the effect that "var. alata Trim... is kept as a species in Fl. B. Ind., but not given for Ceylon. Mr. J. P. Lewis informs me that it has a different habit of growth to the ordinary tree, being taller and straighter. He found a few trees only at Vavaddai and Neduchaddikulam". This, again, implies that at least Lewis had seen tall mature trees with the petiolar characters of alata.

Lam & Bakhuizen van den Brink (1921) distinguish the two taxa (regarded by them as 2 separate species) as follows:

Petioles 3.8--6.2 cm. long, winged toward the apex, the wings rotundate, altogether 0.8--1 cm. broad; leaflets somewhat pubescent beneath...........................................altissima

Petioles 7--15 cm. long, winged toward the base, sometimes also towards the apex, the wings 0.4--1.5 cm. broad; leaflets pubescent beneath...........................................alata

Nairne (1894) says for "V. alata": "scarcely differs from the last [V. altissima], but the wing of the petiole is more pronounced, and the leaflets sometimes 5, flowers pale-yellow, or tinged blue [in V. altissima white tinged with blue]. S. M. country and Wari (D.). Konkan (Lisboa)." Here, again, it is implied that flowering trees with the alata characters have been seen, and, furthermore, that the corollas differ in color.

In this connection, Dr. Richard J. Brumpton, in a letter to me dated March 28, 1975, says: "I have read with interest your report and conclusions about Vitex alata as the juvenile form of V. altissima.......Let me confess that my interest is genetic rather than taxonomic; the kind of observation which you cite begs the whole question of 'control of differentiation'. It is indeed hard to imagine the mechanism capable of switching the phenotype between juvenile and adult stages. (In this part of Britain we see an al-
lied phenomenon in that the leaves on lower branches of holly are more heavily thorned than those in the upper part of the tree.)" In this connection it is worth pointing out here again that juvenile leaves with very different morphological characters are often seen in *Acacia* and *Eucalyptus*, even with differences in phyllotaxy in some cases, and numerous juvenile forms of gymnosperms have been awarded formal nomenclatural status [vid., Rehder, Man. Cult. Pl., ed. 2 (1940) 53, 54, 59, 60] as well as the well-known case of *Moultonia singularis* Balf. f. & W. W. Sm.

Clarke (1885) says after his description of "*V. alata Heyne*": "Dalz. & Gibbs. Bomb. Fl. 201, not of Schauer, nor of Kurz", implying, I suppose, a binomial, *V. alata*, accredited to Dalz. & Gibbs and one accredited to Kurz; however, since he does not actually write out these homonymous binomials I am not recognizing them as having been effectively published and they do not appear in the synonymy given by me. *Vitex alata* Schau. is a synonym of *V. li-monifolia* Schau.; *V. alata* Roxb. is *V. peduncularis* f. juv. *roxburghiana* (C. B. Clarke) Mold.; and *V. alata* Wall. is *V. peduncularis* Wall.

The only common or vernacular names listed for *V. altissima* f. juv. *alata* are "baruna", "milla", and "winged chaste-tree". The *Mail-elou* Rheede, often included in its synonymy, apparently belongs, rather to that of typical *V. altissima* L. f.

On Worthington 2332 the lowest leaves are unifoliolate. The collections represented by Alston 1328 and Moldenke & al. 28122, 28192, & 28252 were all (according to their accompanying labels) taken from "a young plant" or a "sapling" and Moldenke & al. 28223 from "watersprouts from a cutdown stump - neighboring mature trees without broad wings". Meijer & Balakrishnan 135 bears labels reading "tree bole 15 ft., crown 20 ft., girth 6 ft., bole fluted and twisted at base, inner bark orange-brown, sapwood ochre, hard" -- obviously taken from a mature tree, but there are no inflorescences on the herbarium sheets and the leaves are all of the alata type! Most important, however, is the R. Wight collection, cited below, from India which has the broadly alate petioles of *alata* and also inflorescences in full anthesis!

Material of *V. altissima* f. juv. *alata* has often been identified and distributed in herbaria as typical *V. altissima* L. f. or as its f. *subglabra* Thwaites. On the other hand, the J. P. Lewis s.n., distributed as "*V. alata*", actually seems to be typical *V. altissima* L. f.

Citations: INDIA: Andhra Pradesh: Santapau 20799 (Xa); Santapau & Wagh 20697 [Wagh 2748] (Xa); Wagh 1306 (Xa), 2859 (Xa). State undetermined: R. Wight s.n. [Peninsula Ind. orientalis] (N). SRI LANKA: Alston 1328 (Pd); Collector undetermined s.n. (Pd); Fosberg & Ripley 51942 (Pd, W--2764803); König 77 in part [Herb. Linn. 811/3] (Ls, N--photo, Z--photo); Meijer & Balakrishnan 135 (Pd, W--2716026); Moldenke, Moldenke, Dassanayake, & Jayasuriya 28192 (Ac, Gz, Kh, Ld, Pd, Tu, W--2764435); Moldenke, Moldenke, & Jayasuriya 28223 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764478), 28252 (E, Pd, Tu, W--2764516); Moldenke, Moldenke, Jayasuriya, & Sumithraarach-
ALTISSIMA

VITEX

zeylanica Clarke ex Summ.


As cited by Goebel and Nees (19th cent.), it is not known if its identity is identical to "V. altilissima" which is described in Fl. Ceyl. 69 (1911) by Clarke & Willis.

VITEX ALTISSIMA f. SUBGLABRA Thwaites


This is a form of questionable validity. It is described as having its mature leaf-blades "quite glabrate beneath" and 5 in number. In several collections cited below they are, indeed, apparently completely glabrous on both surfaces, but in others the depressions in the veinlet reticulation beneath are microscopically puberulent much as might be seen if the hairs were all mechanically brushed off from the typical form. Most of the specimens seen by me have 3 leaflets. More field work is needed to ascertain if this form is worth maintaining. Trimen (1895) says that it "is scarcely worth notice". Clarke (1885) cites Thwaites s.n. and Walker s.n. from Sri Lanka.

It should be noted that Burman's V. zeylanica is actually a species of Stereospermum in the Bignoniaceae, but it effectively preccludes the use of the epithet, "zeylanica", by Turczaninow (1863) and therefore also by Clarke (1885). Turczaninow's V. zeylanica is based on Gardner 674 from Sri Lanka.

Recent collectors describe V. altilissima f. subglabra as a large subcanopy tree, 4-20 m. tall, the trunk 1 m. or more in girth, to 20 cm. in diameter, with steep buttresses, the bole 15 feet tall, the crown 20 feet wide, the bark "ochraceous-rosy-red" or light pinkish-brown, with many cracks, soft, 1 mm. thick, the living bark orange-brown, 3 mm. thick, the inner bark yellow when freshly cut, the sapwood ochre, the leaves 3- or 5-foliolate, the
fruit green "when mature" [more probably when immature!], borne in "bunches on scorpioid cymes". They have found it growing in jungles and jungle margins, in submontane forests on steep hill-sides, in low-stature evergreen forests dominated by *Mishodon zeylanicus* on reddish soil, "amongst cultivated land" and in "forest confines in open" in the wet zone, at low altitudes to elevations of 2500 feet. Kostermans refers to it as "common" and the Moldenkes refer to it as "rather abundant", but Bernardi claims it to be "rare". It has been collected in anthesis in January, May, and June, and in fruit in January and October. Worthington comments that in the wet zone in Sri Lanka the leaves have "very long drip-points" as compared to those in drier districts.

The corollas are said to have been "pink" on Kostermans 24109, "pale-violet" on *Amaratunga* 1343, and "pale-blue and lilac" on Bernardi 14183. Moldenke & al. 28238 exhibits one leaf with 5 leaflets; no. 28189 was taken from a tree where only some branches had somewhat alate leaves, others non-alate, and the same situation was found on the tree from which no. 28188 was taken; the trees from which nos. 28228 and 28238 were taken had many leaves exhibiting narrow wings on the petioles.

It should be mentioned that, in spite of what Clarke asserts (1885), Thwaites, in the 1861 work cited by Clarke, actually does not propose a trinomial name for the subglabrous-leaved tree. His statement (for *V. altissima*) is merely "Folia subglabra vel subtus mollis, petiolo saepe plus minus alato".

The only vernacular name specifically reported for this form is "milla".

Material of this form has been identified as typical *V. altissima* L. f. by many workers and also as *V. pinnata* L. and so distributed in herbaria. On the other hand, the *Collector undetermined s.n.* at Peradeniya and Ripley 246, distributed as this form, actually represent *f. juv. alata* (Willd.) Mold.

Additional citations: SRI LANKA: *Amaratunga* 1343 (Pd); *Balan-krishnan & Jayasuriya* NBK.886 (N, Pd, W--2720184); *Bernardi* 14183 (W--2766472); *Kostermans* 24109 (Ac, Pd, W--2716116); *Meijer* 412 (Pd, W--2718562); *Moldenke, Moldenke, & Jayasuriya* 28220 (Ac, Gz, Kh, Ld, Pd, Tu, W--2764494, Z), 28228 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764489), 28238 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764480); *Moldenke, Moldenke, Jayasuriya*, & *Sumithraarachchi* 28188 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764443), 28189 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764442); *Mueller-Dombois* 68102114 (Ld, Pd, W--2612110); *Sohmer*, *Jayasuriya, & Eliezer* 8271 (Lc, N, W--2807753); *Waas & Peiris* 540a (W--2803418); *Walker s.n.* (Ceylon) (Pd--type); *Worthington* 2528 (K), 3672 (K).

**VITEX ALTMANNI** Mold.


**VITEX AMANIENSIS** Pieper

Tanner describes this species as a tree, 8 feet tall, growing in groups, the stem single, the flowers aromatic, and the corollas "mauve". He encountered it in thickets on rich brown loam, flowering in October. He records the vernacular name, "mnegege", and asserts that the roots are used medicinally for "sharp pains in the stomach", the roots being boiled and the resulting liquid drunk.

Additional citations: TANZANIA: Tanga: Tanner 3315 (N).

**VITEX AMBONIENSIS** Gürke


Ward encountered this species in sandy soil in the green-tree veld, at 200 feet altitude, flowering in November, and describes it as a shrub, 18 feet tall, with mauve corollas. Dale & Greenway (1961) assert that in Kenya it inhabits the scrub and forest edge in the coastal districts. They record the vernacular name, "mufudu", and cite Jeffery K.152, Napier 6327, and Van Someren 64 from Kenya. Van der Schijff (1969) cites Lam 27, "C.5434", and Van der Schijff 152, 740, 2902, & 3689 from Kruger National Park. Watt & Breyer-Brandwijk (1962) list the vernacular name, "mialali", and note that the plant is a Swahili antidote for snake-bite.

Palmer & Pitman (1972) list the common names, "Amboni vitex" and "mupfumbu-pfumbu", and say that the species "enters South Africa in the north eastern Transvaal and northern Zululand, and South West Africa in the Caprivi Strip, growing in coastal and inland bush, often on quartzite ridges, in scrub forest, and in savannah. In Zululand it is a particularly common species around False Bay. In South Africa it is usually a small or medium-sized tree, either bushy or straggling, or a shrub, although in tropical Africa it is reported up to 14 m. high. The bark is rough and gray or brown, the branches slender, and the young twigs covered with yellow-brown or mustard-coloured hairs...The flowers are white, lilac or purple, or sometimes 2-coloured, with a calyx that is red-brown and velvety -- as are the bracts....The fruits, ripe about April, are large -- up to 3.8 cm. in diameter -- oval, green spotted with white when young, turning purple, with a conspicuous saucer-like calyx. They are said to be inedible." [to be continued]