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## Botanical Medicine Monographs and Sundry

### ON SOME USEFUL PLANTS OF THE NATURAL ORDER OF VERBENACEAE.

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A comparison of the drugs recognized by the Pharmacopoeia of a foreign country with those admitted into the Pharmacopoeia of the United States frequently reveals the fact that certain plants indigenous to or commonly cultivated in both these countries may have been deemed of sufficient importance for official recognition in one, while they are little used in the other. Such a comparison very naturally invites also to a closer inquiry into the usefulness of other plants which are botanically allied to those yielding officinal drugs. Among the pharmacopoeias which have been published during the past few years, those of France (*Codex medicamentarius*, Paris, 1884) and of Mexico (*Nueva Farmacopea Mexicana*, Mexico, 1884), are the most comprehensive in having admitted numerous drugs of vegetable origin which are comparatively unknown here. Inquiries in the direction pointed out before show that, in many cases, these drugs are the representatives of a much larger number derived from plants of the same natural order which were formerly employed in medicine, or are in popular use in their native countries as medicinal agents; and that in the same order other plants are found which are more or less valuable in the arts.

In laying before you some of the results of my inquiry, a natural order has been selected which has thus far not yielded any drug possessing very important medicinal properties, but which, nevertheless seems to be deserving of some attention, inasmuch as a number of the plants are very commonly cultivated for ornamental purposes, while a limited number of mostly homely weeds are indigenous to our country.

The natural order of verbenaceae comprises in the neighborhood of seven hundred species, which are mostly indigenous to tropical countries, only few species being at home in the temperate zones. The tropical species are mostly trees or shrubs, and are frequently aromatic, while the species of temperate climes are usually herbaceous and not fragrant, at least not to the same degree as many of those growing in the tropics.

One of the most important species is the East Indian leak tree, *Tectona grandis*, Lin.fil., which grows in Hindoostan, Siam and the Malayan Islands, attaining a height of over eighty feet., and a thickness of more than four feet. The oval or elliptic and entire leaves are two or three feet long, and are said to be useful for polishing wood owing to their roughness; they have an acidulous astringent and bitterish taste, and

are employed for their mild astringent properties, and as a purple dye. The small white flowers are fragrant, and are believed to possess diuretic properties. But the most valuable portion is the wood which on account of its hardness and durability is largely used in ship-building, and in the East also for temples and dwellings. It is of a light brown color, resinous, porous, yet heavy, a cubic foot of it weighing from forty to fifty pounds; it is nearly indestructible in water, is not attacked by worms, and far excels the best oak wood in durability. According to G. Thorns, the air dry wood yields 2-15 per cent, of ash, consisting chiefly of calcium phosphate and silica. The African teak, which is likewise valuable for its timber, is a euphorbiaceous tree, *Oldfieldia africana*.

*Gmelina arborea*, Roxburgh, is likewise an East Indian tree, the root of which has been employed in gout, and the bark in intermittent fevers. The smaller species *Gmelina parvifolia*, Roxburgh, and *G. asiatica*, Lin., possess demulcent properties, the leaves and the root being employed.

*Avicennia tomentosa*, Lin., a medium sized resinous tree, has also a mucilaginous root, while the unripe fruit has been employed as an emollient cataplasm, The allied *A. nitida*, Jacquin is known in the West Indies as black or olive mangrove; the bark is called courida bark, and is used in tanning.

*Clerodendron infortunatum*, Lin., is an East Indian shrub, the leaves and root of which are employed externally for tumors and certain skin diseases, and internally as tonics. The root of *Clerodendron inerme*, R. Brown, is of a more decided bitter taste and strong odor, and is regarded as possessing tonic and alterative properties, and as being useful in venereal and scrofulous complaints.

Of the genus *Vitex*, popularly known as chaste-tree, two or three shrubby species are not unfrequently cultivated in this country, namely, *V. Negundo*, *V. incisa* and *V. Agnus-casti*, Lin., the former two being indigenous to Asia, the last One to the basin of the Mediterranean. This is about ten feet or more high, has opposite ascending brownish gray or greenish, obtusely quadrangular downy branches and palmate, on the lower side downy leaves with five or seven lanceolate acute and entire leaflets; the bluish, purplish or whitish fragrant flowers are in sessile clusters at the end of the branches, forming an interrupted spike ten inches or more in length; the fruit is globular, blackish-brown, of about the size of black pepper, four-celled and four-seeded, and has a rather strong aromatic, somewhat narcotic odor, particularly when rubbed, and a peppery taste. The leaves are likewise pungent, and were formerly employed in many diseases as a stimulant and irritant; the fruit, however, was more frequently used for similar purposes, also as a spice in place of pepper, under the incorrect name of *semen agni casti*. Landerer (1835) found in the fruit a volatile principle, acrid and acid oil and a crystalline principle of a bitter taste, soluble in alcohol and partly soluble in acetic acid, which solutions are precipitated by alkalis and by tannin. The principle has been named *viticin* and *castin*, but its true nature has not been determined. The other species of vitex are likewise somewhat stimulating; those of the West Indies and others are arboreous, some of them being valuable for timber. The fruit of *Vitex trifolia*, Lin. is called in India *wild pepper*.

The genus *Lantana* of tropical America is well known in our gardens and represented

by a number of species bearing bright-colored showy flowers, which often change in color before they fade. Thus the prickly *L. Camara*, Lin., a native of the West Indies and of South America, northward to our Gulf States, has deep golden yellow flowers, changing to orange color and scarlet. *L. nivea*, Ventenat, in some of its varieties changes its white flowers to blue. *L. mixta*, Lin., like the preceding species indigenous to Brazil, has also white flowers the color of which passes through different shades of yellow and orange to red. Many hybrids have been produced by gardeners from these and other species, and are characterized by the striking mutation of the color of their flowers. The herbaceous portion of the lantanas is more or less agreeably aromatic, and is popularly employed in the native countries of the different species for its sudorific action and externally in fomentations and cataplasms. In addition to the species mentioned, *L. odorota*, Lin., *L. involucrata*, Lin., and *L. trifolia*, Lin., may be enumerated which with others are known in the West Indies as *wildsage*. *L. Pseudothea*, Saint-Hilaire, is probably the most important species, it being used in Brazil in place of Chinese tea, but whether it also contains theine has not been ascertained; the plant is known in Brazil as *capitão da matto* (Bentley), and as *chá de frade*, or *chá de pedestre* (Peckolt).

The widely distributed *Lippia* (*Zapania*, Lamarck), *nodiflora*, Richard, is a procumbent or ascending perennial with small whitish, yellowish or reddish flowers, possesses mild aromatic and tonic properties, and has also been employed as an antispasmodic and against snake bites. It grows in most tropical countries and is frequently met with in our Southern States in damp localities. It is known as fogfruit like the closely allied *Lippia lanceolata*, Michaux, which is a weed extending northward into Pennsylvania, Ohio and Illinois, and westward to Colorado.

The so-called lemon verbena, *Lippia* (*Aloysia*, Ortega), *citriodora*, Kunth, s. *Verbena triphylla*, L'Heritier, is a well-known ornamental shrub of our gardens and conservatories, indigenous to Peru and other parts of South America. In Mexico it is officinal under the name of *cedron*, and in France as *verveineodorante*, also known as *verveine-citronelle*. Oliva who examined the plant found in it, besides volatile oil, the usual common constituents of plants like sugar, gum, fat, tannin and coloring-matter. It is employed as an antispasmodic.

Dr. Podwissotzki ("Phar. Zeitschr. Russ[.]," 1883, p. 920) has submitted the herb of *Lippia mexicana* to analysis, and obtained tannin, a quercetin-like crystalline principle, liquid volatile oil of a lemon-like odor, and *lippiol*, a camphor melting between 25° and 30°C., having the composition of menthol, and representing the medicinal activity of the plant; it acts as a diaphoretic, nauseant and soporific. I have not had the opportunity of consulting the paper referred to as originally published, but have seen only abstracts of the same. On examining several works on Botany, general, as well as specially referring to Mexico, I was unable to find a plant of the name given by Podwissotzki. A plant having a strong somewhat lemon-like odor is *Cedronella mexicana*, Bentham, which has been admitted into the Mexicali Pharmacopoeia under the name of *toronjil*, it being used as an antispasmodic; its volatile oil is similarly employed and also as a perfume. It seems likely that Podwissotzki's researches have reference to this plant (which belongs to the natural order of Labiatae) or to *Aloysia citriodora*.

The Mexican Pharmacopoeia has admitted, under the name of *yerba dulce*, two indigenous species of *Lippia*, *L. graveolens*, Kunth, and *L. dulcis*, *Treviranus*, which are used in the form of infusion for their demulcent, pectoral and emmenagogue properties. The first-named species has oval-oblong leaves, which are rounded or somewhat heartshaped at the base, finely hairy above, and white velvety beneath. The leaves of the second species are membranous, oval or deltoid, acute, serrate, prickly, rough above and pubescent beneath. The odor is strong, somewhat resembling wormwood; the taste is refreshing and at first piquant, afterwards mild. Rio de la Loza ("Union Med. de Mex.," i, 1857) found in the plant a sweet principle, volatile, and soluble in water and alcohol, a volatile oil, a steareopten resembling camphor, etc

It will be observed that in properties and constituents these plants resemble some of the labiatae, and other Mexican species of the same genus are probably equally aromatic or more so, and are employed in the place of some of our labiate plants. Thus the common name of *salvia poblano* or *salvia real de Puebla* is applied to *Lippia callicarpiaefolia*, Kunth, which species is regarded as the Mexican substitute of the sage of our pharmacies. Another species, *Lippia origanoides*, Kunth, which is known in Mexico as *origano*, and by the Mexican Pharmacopoeia is stated to be a substitute for our common *origanum*.

The verbenas proper are well represented in our gardens as ornamental plants by a large number of varieties and hybrids produced from about half a dozen species, of which *Verbena Aubletia*, Lin., is indigenous to North America, from Virginia and Illinois southward, and westward to the Rocky Mountains, and is reputed to possess acrid and mucilaginous properties. The other cultivated species were introduced from Brazil and other parts of South America about 50 or 60 years ago, and in part at least are employed in their native countries as diaphoretics and emmenagogues. *V. erinoides*, Lamarck, *V. teucrifolia*, Martius, *V. multifida*, Ruiz, *V. chamaedrifolia*, Jussieu, *V. teucroides*, Hooker, *V. phlogiflora*, Cham., and others contribute to these ornamental plants, which are valued for their bright or delicate colors.

*V. officinalis*, Lin., is a European weed, somewhat naturalized in this country, with pinnatifid leaves, and small reddish or purplish flowers, inodorous, bitterish and somewhat astringent. It possesses mild stimulant, tonic and astringent properties, and is still recognized by the French Codex as *verveine officinale*; also by the pharmacopoeia of Mexico, though in the latter country in place of it *V. caroliniana*, Lin., is generally employed, which possesses similar properties, and is common in dry soils in our Southern States. It grows to the height of about 20 inches, has obovate, crenately dentate sessile leaves, and rather large rose-colored flowers in loose terminal spikes. The inodorous *Verbena ciliata*, Bentham, is used in Mexico in the place of hyssop.

Among the North American species the handsome blue flowering *Verb. bracteosa*, Michaux, has the reputation of being useful in scrofulous complaints; the homely blue vervain, *V. hastata*, Lin., has been employed in fevers, and in large doses acts as an emetic; and the coarse-looking white vervain, *V. urticifolia*, Lin., is reputed to be useful in various complaints, and is employed as a topical application in poisoning by *Rhus Toxicodendron*.

In some of the West Indian islands and in Central America *Stachycarpha* (*Verbena*, Lin.) *jamaicensis*, Vahl, is known as verbena, from which genus it differs mainly by its four-toothed calyx, by two barren and two fertile stamens, and by the two-parted fruit. The plant is somewhat woody, 2 or 3 feet high, has elliptic or ovate sharply serrate leaves, and produces slender spikes of small blue flowers sunk in furrows of the thickened rhachis. Like other allied plants, it is popularly used in a variety of diseases, but seems to be most useful as a diaphoretic and tonic. It is likewise used in Brazil, and, with one or two allied species, is known there as *jarbáo* and *urgeváo*.

The above notes show that the plants of the natural order of Verbenaceae possess tonic and stimulant properties, and that those growing in tropical or subtropical countries are frequently aromatic, and some of them acrid. Considering the fact that the species of the temperate climates are destitute, or nearly so, of aromatic properties, and contain bitter and astringent principles only to a limited extent, it is not surprising that they are apparently not possessed of any decided medicinal virtues, and that they have received but little attention from the pharmacist and still less from the chemist; but it is likely that many of those growing in warmer climates may open an interesting field for chemical research on the nature of their volatile oils, their bitter or acrid principles, their tannins, and possibly other constituents.

## **MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPEIA. Part 3**

BY THE EDITOR.

**Ancusa**, *Anchusa tinctoria*, Lin.; the root is used for coloring pomades.

**Angélica**, the root of *Angelica Archangelica*, Lin. Dose, in powder, 5 to 10 gm.; the infusion, 15 gm. to one liter of water.

**Angosturaverdadera**, the bark of *Galipea officinalis*, Hancock, etc. Dose of powder, 2 to 4 gm.; of extract, 0.5 to 1.0 gm.; little employed.

**Anís comun** and **Anís estrellado** are Anise and Star-anise.

**Anisillo cimarron**, *Schkuhria abrotanoides*, Roth, a Mexican composite, is anti-spasmodic.

*Anona reticulata* and *A. glabra*, Lin., Mexican custard apple. The fruit is edible; the decoction of the bark, leaves and green fruit is reputed to be astringent and used in diarrheas; the infusion of the leaves is anti-spasmodic; the powder of the seed is employed as an insecticide and is dangerous.

**Añil**, Indigo, is little used medicinally.

**Apio**, Parsley, is aperitive and used in infusion of 15 to 30 gm, to the liter.

**Árbol de la cera**, *Myricajalapensis*, Kunth, nat. ord. Myricaceae, is indigenous to the sierra of Huauchinango. The wax obtained from the fruit by boiling with water is green or yellow, according to the method. of extraction, more brittle and unctuous than bees' wax, has a feeble odor, a slightly bitter taste and a density nearly equal to that of water and melts at 43° ; but on exposure the fusing point rises to 47.5°. It is wholly soluble in boiling ether, insoluble in water, sparingly soluble in cold alcohol and dissolves in 20 parts of boiling alcohol, depositing the greater part on cooling; alkalies saponify it readily. It has probably the same composition as myrtle wax from *Myrica cerifera*. It is given internally in powder against diarrhea and jaundice, and is used for making candles, for adulterating bees' wax and as a substitute for the latter in pharmaceutical preparations. The bark of the root is acrid and astringent, and in larger doses emetic.

**Árbol de los manitas**, *Cheirostemon platanoides*, Humb. et Bonpl., nat. ord. Bombaceae, indigenous to Mexico. The flowers are used internally in epilepsy, and as an emollient in ophthalmia.

**Árbol del Perú**, *Schinus Molle*, Lin., nat. ord. Anacardaceae, grows in various parts of Mexico. The leaves, masticated, serve as a remedy for loose teeth and atonic ulcers of the mouth. The fruit, known as *Pimienta de América*, is stomachic, stimulant and diuretic; it contains a notable quantity of sugar and may be used for the production of alcohol and vinegar. The bark has astringent and balsamic properties. The gum-resin was examined by Manuel C. Jimenex, of Mexico; it forms milk-white tears, varying in size and becoming gradually reddish yellow, softens on mastication, has a bitter and sharp taste with an aftertaste resembling that of cubeb, and a disagreeable odor, becomes soft at 35° and melts at 40° giving off white fumes and an odor like frankincense. Its powder is dingy white and is easily emulsified with water. It is composed of 40 gum, 60 resin and a small quantity of volatile oil. Two or three drops of the concentrated emulsion are used for the removal of spots on the cornea.

**Aristolochia larga** and **A. redonda**, the rhizomes of the European *Aristolochia longa* and *A. rotunda*, Lin., are rarely employed as tonics and stimulants.

*Arnica montana*, Lin. The root, leaves and flowers are employed; however, *Heterotheca inuloides*, Cassini, is frequently substituted for the former. The ray florets are pistillate, the receptacle flat and alveolate, the involucrel. scales imbricate and linear, the akenes of the ray oblong and smooth, those of the disk cuneiform and downy, the lower leaves petiolate oval and dentate, and the upper ones sessile, lanceolate and entire. The chemical constituents and the therapeutic action of this plant have not been investigated.

**Aro**, *Richardia (Zantedeschia) aethiopica*, Kunth, nat. ord. Araceae. The plant is very acrid in the fresh state, the juice caustic, the leaves and root vesicating.

**Aroma**, *Acacia Farnesiana*, Willd., nat. ord. Leguminosae; indigenous to Yucatan. The fruit is astringent and yields an extract known as *jugo de acacia* and having the same properties as catechu. The flowers are very fragrant, have anti-spasmodic properties and are much used in perfumery under the name of *casia* or *cassie*.

**Arrayan**, *Myrtus Arrayan*, Kunth; indigenous to Mexico. The leaves contain a volatile oil and are used as a perfume; they are astringent and, like the bark, are used for tanning.

**Arrowroot** (the fecula of different plants), **Arroz** (rice), **Artemisia vulgar** (mugwort), **Asafetida**, **Asfalto** (asphaltum), **Azafrán** (saffron), **Azafrancillo** (safflower), **Azúcar de caña** (cane sugar) are enumerated.

**Artemisia del país**, *Ambrosia artemisiaefolia*, Lin., the hog-weed or rag-weed, common also in the United States, is used as a stimulant and emmenagogue, and is reputed to be febrifuge and anthelmintic. Dose, in powder, 2 gm.; of the extract, 0.5 to 1.0 gm.

**Atlanchana**, *Cuphea lanceolata*, Kunth, nat. ord. Lythraceae; indigenous to Mexico. The stem is herbaceous, striate, pubescent and viscous; the leaves are opposite, short-stalked, lanceolate and somewhat downy. In Puebla the plant is used by midwives as a corroborant after childbirth. The bruised fresh herb or the tincture of the dry plant is employed, after baths, as an embrocation of the back and hips. The drug is considered to be mildly astringent and anti-dysenteric.

**Azafrancillo de Mexico**, *Escobedia scabrifolia*, Humboldt, nat. ord. Scrophulariaceae, grows in the State of Guerrero. According to Dr. Altamirano (*La Naturaleza*, III, 390), the root contains the crystalline principle *escobedin* and the resinous coloring matter *azafranin*, the latter producing with sulphuric acid a blue color, changing to violet. It is used for coloring.

**Bálsamo de copaiba**, Copaiba. Brazilian and Maracaibo copaiba are used.

**Bálsamo de liquidámbar**, Sweet gum, from *Liquidambar styraciflua*, Lin., growing in the State of Vera Cruz and other parts of Mexico. The crude balsam has the consistence of turpentine, is of a gray color mixed with darker pieces and with white tears, has a strong, not unpleasant odor and a bitter warm and acrid taste, and contains fragments of bark and other impurities. It is purified by warming and straining and is then more or less transparent, whitish gray or yellowish and becomes thicker and darker on keeping. In regard to its composition, the older investigations by Bonastre, Hanbury and Creecy are mentioned, but not the more recent ones by Harrison and Flükiger. The balsam is sometimes adulterated with turpentine, and an inferior, dark colored and opaque balsam is prepared by boiling the branches with water. It is used as a balsamic stimulant in doses of 0.5 to 2.0 gm.

**Bálsamo negro**, Balsam of Peru. It is stated that *Myrospermum Pereirae*, Royle, grows in Pánuco, Huajicori, Cuautla de Morelos and in other warm sections of the Republic as well as in Central America, and that the fruit and bark of the indigenous tree are also employed. The fruit, which we have seen in 1876 and of which we have recently received specimens from Prof. Alfonso Herrera, resembles that of *Toluifera Balsamum*, Lin., as figured by Bentley and Trimen, and differs in shape from that named above; of the latter we have specimens from the late Prof. Carson, which he received from Dr. Dorat, and these agree with Bentley and Trimen's figure of the same species. It is known that Prof. Baillon considers these plants as one variable

species. The tree does not appear to be used in Mexico for the production of balsam.

**Bálsamo de Tolú** (Tolu balsam), **Bardana** (Burdock), **Bedelio** (bdellium), **Beleño blanco** and **B. negro** (hyoscyamus), **Belladona** (belladonna), **Benjuí** (benzoin), **Bistorta** (bistort), **Bol de Armenia** (Armenian bole), **Brusco** (butcher's broom), **Buchu**, and **Buglosa** (*Anchusa officinalis*) are enumerated among the drugs.