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Botanical Medicine Monographs and Sundry

PINCKNEYA PUBENS, MICHAUX.

(GEORGIA BARK.)

Natural order, Rubiaceae; sub-order, Cinchoneae.

By EDGAR HERMAN, NAUDAIN PH.G.
From an Inaugural Essay.

Michaux discovered this plant in 1791, along the banks of the St. Mary's River, Florida, and described it as follows: It grows in bogs along the banks of streams from Florida to South Carolina, near the coast, sometimes attains a height of twenty feet, though as it throws up many stems from the same root, it retains a shrub-like appearance. It has the general botanical characteristics of the Rubiaceae, the leaves are large, oval, and acute; downy on the under surface as are the flower-clusters which are borne at the end of the branches. These consist of several five-flowered fascicles of purplish spotted flowers. Calyx short, three-lobed, one of the lobes being expanded into a large ovate rose-colored leaf, which is more showy than the flower itself.

The plant is closely related to the cinchonae, and is one of the many that have been proposed as a substitute for Peruvian bark. From reports of physicians living in States where it grows, it appears to have decided anti-periodic properties, though slower in its action than cinchona bark. The genus was named in honor of Gen. Charles Pinckney, of South Carolina.

Considerable difficulty was experienced in securing a sample of the bark, but through the kindness of Mr. G. J. Luhn, of Charleston, South Carolina, a small quantity was obtained, together with several leaves and a cluster of fruit. The bark was in quills about two inches in length, from 1/16 to 1/8 inch in thickness; externally of an ash gray color, and somewhat warty; internally brownish white, of a distinctly bitter taste, and breaking with a short corky fracture.

A portion of the bark was exhausted by repeated digestion, with water acidulated with hydrochloric acid; but the acid infusion failed to give any reaction for alkaloids when tested with Mayer's test, picric acid, or phospho-molybdic acid. On concentrating a portion of this solution numerous crystals separated; they were boiled with a solution of sodium carbonate and filtered, the filtrate neutralized gave a precipitate with calcium chloride indicating oxalic acid. The insoluble residue was dissolved in acetic acid and tested with ammonium oxalate with which it gave a precipitate indicating-that the crystals were calcium oxalate.

Seventy-five grams of the bark in very fine powder were submitted to the action of petroleum benzin (which had previously been redistilled) until it was thoroughly exhausted. On distilling off the benzin a greenish, wax-like substance remained; this was treated with acidulated water (HCl), to which it yielded nothing, giving no reactions when tested for alkaloids. It was next treated with eighty per cent. alcohol, which extracted a small quantity of a yellow resinous body, soluble in ether. The residue consisted of a waxy substance associated with a small amount of chlorophyll. Fixed and volatile oils were found to be absent.

Alcoholic Extract.—The powdered bark from the benzin operation was kept at a temperature of 100° C. until all traces of benzin bad disappeared, was then thoroughly exhausted with eighty per cent. alcohol and the tincture distilled; the concentrated liquid was precipitated by an alcoholic solution of normal lead acetate, and the filtrate freed from lead by hydrogen sulphide concentrated and allowed to stand, nothing separating out; on dilution with water a slight precipitate was formed, which on agitating with ether was dissolved, and on evaporation yielded a dark brown resinous body of a slight taste, and soluble in chloroform and bisulphide of carbon.

The aqueous extract failed to give any reaction for alkaloids when tested with picric acid, phospho-molybdic acid and Mayer's test. The remaining aqueous liquid was precipitated by triplumbic, acetate, the filtrate was again freed from lead by hydrogen sulphide and concentrated; on allowing it to stand a light brown, distinctly crystalline substance was deposited, weighing about 0.15 grm., having a very bitter taste similar to that of the bark very much concentrated. It failed to reduce Fehling's solution until boiled with dilute sulphuric acid, and it was entirely dissipated by heat. The substance is a glucoside, I think, and I propose for it the name *Pinckneyin*. The precipitate by the triplumbic acetate was suspended in water and freed from lead ; on evaporating, a brownish, somewhat bitter extractive was obtained.

The plumbic acetate precipitate was suspended in eighty per cent. alcohol, freed from lead by hydrogen sulphide, concentrated, treated with water, allowed to stand some time, and the resulting precipitate collected, well washed and dissolved in ether, which left on evaporation a light yellow mass, capable of being powdered; its alcoholic solution was very astringent, and was precipitated, giving a bluish green by ferric chloride. The aqueous solution gave, with ferric chloride, a beautiful emerald green color, changed to a wine red by sodium carbonate, was not precipitated by tartar emetic, not precipitated or colored by ferrous sulphate, reduced solution of argentic nitrate, was precipitated by gelatin, and crystallized from dilute alcohol, resembling caffeotannic acid.

Aqueous Extract.-The bark from the alcohol operation was macerated with water and expressed, the liquid gave a copious precipitate with alcohol, which consisted of gum combined with brown coloring matter. On boiling a portion of the exhausted bark with water, the solution gave a blue coloration after cooling with a solution of iodine. One grm. of the bark (air-dry?) on incineration yielded .09 grm. = 9 per cent. of ash, consisting of potassium, sodium, calcium and magnesium combined as chlorides, carbonates and phosphates.

In the “American Journal Pharmacy,” February 1881, p. 981, it is stated that Dr.

Farr claimed to have detected cinchonine in pinckneya, but from my analysis I am led to think this incorrect, as I failed to discover the slightest trace of alkaloid. Owing to the limited supply of bark at my disposal I was unable to make as complete an analysis as the subject deserves.

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OIL OF GAULTHERIA IN RHEUMATISM.—Dr. H. H. Seelye reports the results obtained from oil of gaultheria given in 118 cases of acute articular rheumatism. It can be administered in capsules, alone or with salicylate of sodium, or in soda-water, but the preferred method was in an emulsion in glycerin and water. From 10 to 20 minims were given every two hours during the day, and at intervals of three hours during the night. All forms of rheumatic pain seemed remarkably influenced, but its effect was most marked in acute inflammatory cases. The tendency to cardiac complications seemed not to be increased. The success was so gratifying that further trial of the remedy was strongly urged.—*N. Y. Med. Jour.*, Nov. 8, 1884; *Med. Times.*

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RHODODENDRON MAXIMUM, LINNÉ.

(GREAT LAUREL.)

Natural Order, Ericaceae; sub-order, Ericineae; tribe, Rhodoreae.

By GUSTAV FRANK KUEHNEL, PH.G.
From an Inaugural Essay.

This plant is indigenous to the United States from Maine to Ohio, but chiefly in the mountainous parts of Pennsylvania, and southward along shaded water courses in damp, deep woods; it is a shrub or tree, 6 to 20 feet high, with handsome flowers, the corolla being bell-shaped, an inch broad, of a pale rose color, or nearly white, greenish in the throat on the upper side, and yellow or reddish spotted. The leaves are from 4 to 10 inches long, evergreen, coriaceous, alternate, elliptical oblong, or lance oblong, acute, narrowed towards the base, very smooth, unequal at the base, and with an entire, somewhat revolute, margin, near which the anastomosing veins form one or two distinct wavy lines. A quantity of the leaves were collected for me about the middle of August by Mr. Henry C. C. Maisch, a fellow-student and classmate, in the neighborhood of Cresson Springs, Pa. These were carefully dried, remote from heat and direct rays of the sun, powdered, and subjected to an examination which resulted in isolating the three constituents, according to Prof. Maisch, apparently characteristic for coriaceous leaves of ericaceous plants, viz., arbutin, ericolin and ursone; besides these principles, tannin, gallic acid, resin, wax, albumen, coloring matter and a trace of volatile oil were observed.

A portion of the powdered drug was subjected successively to the treatment of petroleum spirit, ether and alcohol, according to Dragendorff.

The solution in petroleum spirit was evaporated at the ordinary temperature; towards the close of the operation a pungent, peculiar odor, slightly irritating, was

perceptible, possibly due to a little volatile oil; a soft, semi-solid, waxy mass, of a peculiar resinous odor, was left as a residue.

The etherial liquid was allowed to spontaneously evaporate at the ordinary temperature, and the resulting residue was treated with water and filtered. The filtrate was found to contain gallic acid, by treating with acetic ether, separating and evaporating, when crystals were left which in solution darkened upon addition of solution of iron salt, but on being heated the color vanished; the liquid gave no precipitate with solution of gelatin.

The residue on the filter after treating the etherial extract with water was composed chiefly of resin, associated with chlorophyll and other coloring matter.

The alcoholic tincture obtained by macerating the powdered leaves which had been previously exhausted by petroleum spirit and ether was evaporated to an extract, which was then treated with water and filtered.

The residue left on the filter was well washed and dissolved in hot alcohol, which on cooling deposited an apparently amorphous mass, ursone; upon redissolving in alcohol, microscopic needles were obtained, which upon addition of sulphuric acid turned black, reddening the acid, and became yellow with nitric acid, giving off nitrous acid fumes.

The aqueous filtrate was concentrated, treated with acetate of lead, filtered, the filtrate freed from lead by sulphuretted hydrogen, concentrated to a syrupy consistence, again diluted somewhat, and treated with animal charcoal, then concentrated and set aside, when a deposit of acicular crystals was obtained, which proved to be arbutin. An alkaline solution of the crystals gave the sky-blue color with phospho-molybdic acid. Sulphuric acid dissolved them without change of color, but nitric acid turned yellow, with the evolution of nitrous acid fumes.

The precipitate obtained with lead acetate was suspended in water, the lead removed by sulphuretted hydrogen, the filtrate heated to expel excess of sulphuretted hydrogen, and treated with solution of gelatin, when a bulky precipitate was obtained, which, after washing with water, became black on the addition of an iron salt, thus showing it to be tannin.

A second portion of the leaves was treated with water, and the infusion boiled and strained, leaving a flocculent residue of albumen on the strainer. The clear liquid was then concentrated and treated with solution of acetate of lead, the precipitate separated by a filter, and the filtrate freed from lead by sulphuretted hydrogen; the filtrate was heated to expel excess of sulphuretted hydrogen, treated with animal charcoal to remove coloring matter, Concentrated, and set aside, when crystals of arbutin were deposited, showing the reactions mentioned above.

The lead precipitates contained tannin and gallic acid, and some arbutin was extracted from the sulphide of lead, and obtained in crystals. The mother-liquors of arbutin seem to contain ericolin.

HOP EXTRACT.

By WAYNE B. BISSELL, PH.G.
From an inaugural essay.

In discussing this subject the main object of the writer will be to bring to notice an extract of Hops made by an entirely new processs, and to compare that product with one made by myself, according to the directions given in the Dispensatory.

A very fine sample of late hops, which appeared rich in lupulin, was exhausted as thoroughly as possible with pure alcohol by percolation. The drug was then boiled in water for one hour, strained and washed. The alcoholic and watery extracts were evaporated at a very low temperature to a thick syrup and then mixed, and further evaporation carried on by means of a water bath until a product of nearly pilular consistence was obtained, in which condition the patent extract was. The product thus obtained, contained the aroma of the hop which is very easily destroyed by a high heat.

As far as could be learned, the process by which the patent extract is, made on a very large scale is as follows:

The hops taken from the bale are run through a machine, which separates the scales from the axis without breaking them much. They are now placed in a large wire cage rather loosely, and three of these cages are run into an immense boiler or “extractor” as it is called, which holds about six hundred pounds of the drug. A heavy door then is shut and barred, making everything secure. About three hundred barrels of gasoline are now pumped in by the engine, when, by means of a steam coil, heat is applied until a pressure of one hundred pounds to the square inch has been attained. The object of this high pressure is to break or crush the little glands called lupulin, which contain the valuable principle, this being taken up by the hot gasoline. As soon as the above pressure has been attained, the steam is shut off and as the heat decreases, the hot gasoline holding the extract in solution is drawn off gradually into a large boiler or tank, and as it gradually cools, the extract settles to the bottom and the gasoline rising to the top is removed and used over again on a fresh portion of hops. In the meanwhile the extract and gasoline remaining in the extractor, have been completely washed out by superheated steam and both separated as in the former case, so there is but very little waste of menstruum. The extract in the boiler on cooling to a certain temperature, is drawn off and subsequently canned, in which condition it will keep for an indefinite period, a great advantage over the hop itself, which at the end of two years is nearly useless. One pound of this extract represents. about twelve pounds of choice hops. About two thousand pounds of hops can be exhausted in these works during twenty-four hours. The only use made of this extract at present is in the manufacture of beer, for which purpose it is at present being used to a large extent in Philadelphia and New York, fully supplying the place of the ordinary hop.

On investigation quite a difference was observed between this extract and the one made by myself, the former being of an intense black color, appearing to be more oily, and containing practically no tannin or a mere trace, while in the extract made by myself between 7 per cent. and 8 per cent, of tannin was indicated by using a solution

of acetate of lead.

The amount of glucose was ascertained by Fehling's solution, and found to be in my extract 12 per cent., but in the patent extract, a little over 16 per cent. During this investigation the writer obtained results more easily from the patent extract than from the extract made by himself.

On exposing the extract made by me to a temperature of 100°C. until it ceased to lose weight, 13 per cent. of volatile matter was expelled, and at 110° C. it lost an additional 9 per cent.; becoming quite dry, darker in color, losing its aroma and breaking with little difficulty into small pieces. The patent extract exposed to 100° C. lost only .05 per cent. in weight and at 110° C., this loss was increased by only an additional .03 per cent. This high heat seemed to have but very little effect on it, either in changing its color, or destroying its odor.

The effect of different solvents on the two extracts showed a very marked difference. Water dissolved only a very small portion of the extract made by me, leaving a brown residue, which was apparently mostly resin and oil. Alcohol had only a slight effect, but dilute alcohol took up more. All of the ordinary solvents were tried, and none of them completely dissolved this extract.

The patent extract, was found to be practically insoluble in water, and also in cold alcohol, but hot alcohol held it in solution as did also benzin. It is more soluble in ether and completely soluble in chloroform. It has a very strong and rather unpleasant odor, and its taste is exceedingly bitter. A further point of interest concerning this extract is, that when it is being drawn from the storing boiler into large cans, quite frequently small white crystals are seen, but it is impossible almost to separate them. The extract without purification, so as to free it entirely from the gasoline, could not be used internally as it creates nausea, but is quite frequently mixed with sugar and formed into cakes in which condition it is used to some extent.

In conclusion, the writer would extend his thanks to W. A. Lawrence, Superintendent of the works, through whose kindness he obtained the process of manufacture as given above.

SYRUPUS PRUNI VIRGINIANA.

By J. GEORGE ENGLER, PH.G.

From an Inaugural Essay.

The bark from which this syrup is made is obtained from *Prunus serotina*, and collected in autumn. On the recent shoots it is green or olive brown, polished, and has minute orange dots; afterwards it becomes darker and on the small trunks and larger branches is of a reddish or purplish brown, with scattered, oblong, horizontal dots characteristic of the cherry. Old trunks have a scaly bark not unlike some of the pines.

The wild cherry tree rarely attains a height of more than forty or fifty feet in Massachusetts. According to Dr. Richardson it grows as far north as the Great Slave Lake, in latitude 62˚, but only attains the height of about five feet. In Maine it rises to about thirty feet, being seldom more than a foot in diameter. In western New York it grows to a great height and a large size, but along the Ohio river it is seen in its perfection, for it is found from twelve to sixteen feet in circumference and from eighty to one hundred feet high. The trunk is of uniform size and undivided to the height of about twenty-five feet. The wood is of a light red color, growing darker with age, and its medullary rays are very numerous and more closely arranged than those of most other woods. It is especially valuable in cabinet work and has of late years become very much in demand for fixtures in many pharmacies. The most beautiful portion commonly used is that where the branches begin. The bark is of a pleasant aromatic bittery leaving, when chewed, an agreeable taste in the mouth.

The U. S. P. process for preparing syrup of wild cherry is unsatisfactory on account of the unstability of the production and its liability to undergo fermentation. The remedy which suggested itself to me was the use of a quantity of either alcohol or glycerin. The object of my experiments has been to obtain a syrup that will remain permanent, under ordinary circumstances, with the smallest amount of these preservatives. To make a just comparison I first made a syrup according to the pharmacopceial formula. This syrup was made March 1st, 1884; it had a rich brownish red color, the characteristic odor of hydrocyanic acid, and a slightly bitter, astringent taste. Placed on a shelf where it was subjected to the ordinary conditions of light and heat of the store, after eight weeks a slight cloudiness was formed, followed by a noticeable amount of precipitate, and fermentation soon began. With this change the syrup began to lose its color, and after nine months had lost all resemblance to a good syrup in color and odor, and it also had a thick fungous growth at the top.

Three syrups were next made in which the glycerin was replaced by alcohol in different proportions, and three in which the quantity of glycerin was increased in different amounts. Those made with alcohol show the following results: Number one, with four drachms of alcohol to the Pint, kept almost perfectly for three months, then a slight precipitate began to form, which, after nine months standing, is quite noticeable; odor and color remain unchanged. Number two, made with one ounce of alcohol, remained unchanged somewhat longer, but a precipitate has formed. The color remains unchanged and the odor is slightly alcoholic. Number three, made with one and a half ounces of alcohol, remained permanent for a still longer time, color unchanged and a stronger alcoholic odor. The result of these three experiments with alcohol as a preservative show that this menstruum in practicable amounts is not satisfactory. The syrups made with increased quantities of glycerin showed the following results: Number four, with two ounces of glycerin to the pint, a bright syrup of beautiful color, and after standing nine months still remains unchanged. Number five, with two and a half ounces, and number six with three ounces of glycerin to the pint, gave permanent, bright syrups. The syrup was made by the following formula:

Wild Cherry bark.	5 ounces,
Bitter Almond.	5 drams,
Water.	8 ounces,
Glycerin	2 ounces,
Sugar.	24 ounces,

Made according to the pharmacopceial method a handsome syrup is obtained, permanent, and having a strong odor and taste of hydrocyanic acid. These results show that glycerin in somewhat increased amounts would make the syrup permanent.

GLEANINGS FROM FOREIGN JOURNALS.

By J. ROBERT MOECHEL.

Thorough Extraction of Vegetables.—A considerable quantity of water and sometimes application of heat is necessary for completely extracting tannin and coloring matters from plants. Dr. O. Kohlrausch, of Vienna, claims that a small amount of water is needed, and that very concentrated solutions are obtained at a low temperature, by operating as follows:

The material to be extracted is covered with water, and macerated for some time at a pressure of one atmosphere. The water penetrates the cellular tissue, dissolves the coloring matter, and, by way of diffusion, the water becomes saturated to the same degree as the liquid in the cells. Separating the liquid, and repeating the operation several times, under the same conditions, secures the complete extraction of coloring Matter—*Erfindungen und Erfahrungen, Wien*, i, 1885.

Syrup of Pineapple.—Cut 5 kilos of selected pineapples in small pieces, transfer into a bottle, add 5 kilos each of white wine and water, and macerate at a medium. temperature for several days. Boil 30 kilos of sugar with 20 kilos of water, add the strained infusion, heat to ebullition, and strain through flannel.

Syrup of Apricot.—Digest, for six days, 5 kilos each of white wine, water and ripe apricots, freed from stones and cut into small pieces; strain, press very gently, and add to the hot syrup, prepared as above of 40 kilos of sugar and 30 kilos of water. When cold, add 200 Gm. of artificial essence of apricots. —*Erfind. und Erfah.*

Shoe Blacking.—Mix 100 parts bone black, 50 parts glycerin, 5 parts oil and 10 parts of vinegar. This blacking is said to give excellent shine, and to keep the leather smooth and soft.

Transparent Glue for Porcelain.—Dissolve 75 Gm. caoutchouc, in small pieces, in 60 Gm. of chloroform; add 15 Gm. of mastic, and dissolve without heat.—*Chemiker Ztg.*, No. 14, 1885, p. 254; *Nature*, 1884, xii, p. 587.

VARIETIES.

PILOCARPUS.—Dr. Sidney Thompson has for several years been treating erysipelas locally with the fluid extract of jaborandi, and usually in the following prescription:

Rx	Jaborandi fluid extract	24 grams
	Glycerin	4 "
	Laudanum	4 "

M. Sig. Paint with a feather every four hours.

The glycerin is necessary, as the jaborandi has a tendency to produce a desquamation if used alone; the laudanum is added simply to relieve pain. *TherapeuticGazette,* Nov., 1884, p. 504.

Dr. W. W. Claybaugh has used a similar mixture, increasing the laudanum and glycerin each to 12 grams, and reports favorable results in erisypelas, in inflammation caused by croton oil, and in severe scalding of the hand by a boiling liquid; in the latter case the inflammatory action was totally prevented.—*Med. and Surg. Rep.,* Feb. 7, 1885, p. 188.

RhamnusPurshiana, De Candolle.—Limousin believes this bark, cascara sagrada, to contain chrysophanic acid, and derivatives of this compound, which cause the red color, on the addition of potassa to the resinous principles obtained by Professor Prescott (see "Amer. Jour. Phar.," 1879, p. 166), and induce the change of the yellowish color of the powdered bark when kept in an atmosphere containing ammoniacal vapors.—*Jour. Phar. Chim.*, Jan., 1885, p. 80.

USE OF OIL OF PEPPERMINT AND MENTHOL.—Dr. Brame states that oil of peppermint gives immediate relief of the pain in burns if applied after immersing the parts burned in water (*Lancet*). The itching of urticaria and mosquito bites is said to be much alleviated by the application of menthol.—*Cinc. Lanc. and Clinic.*

NEW ANESTHETIC COMPOUND.—An experimental and clinical study on a new method of producing anesthesia is the subject of a work, recently published, from the pen of M. Colombel. A combination of *atropine* (two centigrams), *morphine* (twenty centigrams), and *chloroform* (twenty grams), is the mixture recommended. Some of the surgeons at Lyons speak very favorably of its use.—*Lancet,* Oct. 25, 1884; *Quarterly Ther. Review*.

OIL OF THYME. —Camperdon (*Bull. gén. de thérapeut.*) arrives at the following deductions:
1. In therapeutical doses (three to fifteen grains), oil of thyme causes mental excitement or stimulation; hence it is a valuable diffusible stimulant in depression following anemia, in conditions of collapses, etc.
2. It is an active diaphoretic and diuretic.

3. From its direct action upon mucous surfaces it is to be recommended in catarrhal affections of the respiratory and genito-urinary tracts.
4. It is a prompt hemostatic.
5. Thyme possesses powerful antiseptic properties, and is well adapted for use in surgery.
6. It is recommended that the internal administration of the drug be supplemented by its employment in the form of baths, fumigations and inhalations—*New York Medical Journal.*