

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

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DEPARTMENT.

It has been the custom each year to publish in the A. A. C. P. Section of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, with as little editing as possible, the papers which have been read before the various conferences of teachers at the previous annual meeting of the A. A. C. P.

Suggestions have come to me from various sources that these papers, from year to year, have been taking on much more of a scientific nature than was originally intended for papers read at these meetings. The suggested thought is that all scientific papers might be presented to much better advantage in the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION, thereby leaving the time devoted to teacher's conferences available for the discussion of papers dealing more directly with teaching problems.

These suggestions have originated in our own group and I present them to you for your consideration.

Two papers read before the conference of Teachers of Pharmacognosy and Pharmacology at the 1936 Dallas meeting are presented below.—ERNEST LITTLE, *Editor*.

PRELIMINARY CHEMICAL INVESTIGATION OF THE BERRIES OF RHUS GLABRA LINNÉ.

BY G. H. MCFADDEN AND R. L. MCMURRAY.

Rhus glabra, commonly known as Sumac Berries, is defined by the United States Pharmacopœia, tenth revision, as the dried ripe fruit of *Rhus glabra* Linné, of the family of the Anacardiaceæ. The plant is popularly known as *smooth sumac* (1), *Pennsylvania sumac* (2), *upland sumac* (2), *Carolina sumac* (1), *common sumac* (1), *scarlet sumac* (1), (2), *sleek sumac* (1), (2), *senhalanac* (1), (2), *shoe-make* (1), (2), *white sumac* (1), (2), *vinegar tree* (1), (2), *mountain sumac* (2), *New England sumac* (3), *Buck's-horn tree* (1) and *der virginischer sumach* (1). The plant is indigenous to the central and eastern states of the United States. It is abundant on barren hill-sides and waste ground throughout Ohio. The berry has been official in all of the United States Pharmacopœias except the ninth and eleventh revisions.

An extensive search reveals that the literature on the chemistry of this plant is rather limited and somewhat conflicting in content. The earliest work of a chemical nature so far uncovered was that of Cozzens (4), who concluded that "the acid of the sumac is malic, and that it is nearly pure, being only contaminated with a small portion of gallic acid." However, Rogers (5) proved that the malic acid existed in sumac as calcium acid malate. Almost seventy years later Frankforter and Martin (6) carried out the first analysis of the fruit, and found two different fixed oils from different parts of the fruit. Constants were determined on the oils and the percentage of moisture, ash, tannin, calcium acid malate and non-saponifiable matter reported. Brubaker (7) made an ether extraction of the fruit and reported constants of the oil obtained by this method of extraction. In 1925 Peacock and Peacock (8) made an extended investigation of the tannin of *Rhus glabra*, and reported it to be gallotannic acid.

EXPERIMENTAL.

The berries were collected the first week of December 1935. The place of collection was in the hilly region adjacent to U. S. Highway 40, in Licking County, Ohio, at a point 37 miles east of Columbus. The entire panicles were removed from the plant and transported in sacks. After drying, the fruit was shelled out by hand, culled until the fruits were separated and the non-fruit

portion was discarded. The berries were further air-dried at 30° C., after which they were cleaned by a motor-driven fanning mill. The milling removed 12.75 per cent of refuse matter from the fruits. Approximately five pounds of the cleaned berries were ground in a No. 6¹/₂ Quaker City mill. The material was further carefully reduced to a No. 20 powder with a No. 4 Quaker City hand mill.

(a) Moisture was determined by the Bidwell-Sterling (9) method and amounted to 5.25 per cent.

(b) A Dragendorff (10) selective solvent determination was made and calculated to both the air-dried and anhydrous condition (based on a moisture content of 5.25 per cent) as follows:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Petroleum ether	12.57	13.10
Ethyl ether (absolute)	4.64	4.89
Ethyl alcohol (absolute)	11.82	12.47
Distilled water (aseptically controlled)	6.75	7.12
NaOH (0.2 per cent)	3.74	3.99
HCl (1 per cent)	3.01	3.20
(c) Crude fibre (11)	31.86	33.62
(d) Pentosan (12)	21.61	22.81

(e) An ether extraction determination (11) gave the following results:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Total ether-soluble extractive	17.27	18.22
Volatile ether-soluble extractive	0.60	0.63
Non-volatile ether-soluble extractive	16.67	17.59
(f) Total nitrogen (12)	1.32	1.39
(g) Arsenic (12)	0.00	0.00

(h) Ash determinations gave the following results:

	Air-Dried Per Cent.	Moisture-Free Per Cent.
Total ash (11)	2.55	2.69
Acid-soluble ash (11)	2.27	2.39
Acid-insoluble ash (11)	0.28	0.30
Water-soluble ash (13)	0.95	1.00
Water-insoluble ash (13)	1.60	1.69
Alkalinity of ash (13)	2.04	2.15

(i) Ash Constituents: Sand and silica were determined by the A. O. A. C. (12) method. Iron (12), manganese (12) and copper (12) were determined colorimetrically from aliquot portions of the filtrates obtained in the sand and silica determinations. From aliquots of this same solution, aluminum (12) and magnesium (12) were determined gravimetrically, calcium (12) volumetrically and zinc (12) turbidimetrically. Sodium and potassium chlorides were determined by the A. O. A. C. (12) method. Sodium (14) was determined on a concentrated solution of the mixed sodium and potassium chlorides and reported as Na₂O. By calculation from the foregoing results, the potassium was determined by difference and reported as K₂O. Chlorides (12) were determined on a specially prepared sample. Sulphur (12) and phosphorus (12) were determined on a sample prepared by the sodium peroxide fusion (12) method. The following table is a summary of the results:

	Per Cent.		Per Cent.
Sand	2.95	Cu	0.000
Silica	7.44	Zn	0.078
Fe	0.86	Na ₂ O	4.16
Al ₂ O ₃	4.67	K ₂ O	38.15
CaO	22.80	Cl	1.58
MgO	7.24	SO ₃	7.15
Mn ₂ O ₄	0.147	P ₂ O ₅	21.17

(j) The constants of the oil obtained from the petroleum-ether extractive are as follows:

Refractive Index at 20° C.	1.4719
Density at 20° C.	0.9227
Optical Rotation at 20° C.	0.0000
Acid Value (11)	8.9700
Iodine Value (11)	87.1700
Ester Value (11)	150.2300
Saponification Value (11)	159.2000

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DRUG COLLECTING AND CULTIVATION IN MISSISSIPPI.

BY W. W. BARKLEY.*

Mississippi shows quite a diversity of plant life. We find rolling, treeless prairies in the Northeastern and Jackson Prairie Belts; hardwood forests in the Northwestern section, and extensive pine forests in the southern part of the state.

As is usually the case, we find in Mississippi one ecological factor predominating, *i. e.*, the soil.

Briefly considering the more important of these factors, we find—Mississippi, lying directly east of the Mississippi River and north of the Gulf of Mexico, is somewhat more than 300 miles in length North and South. This is sufficient to produce a noticeable difference between the flora of the northern and southern parts of the state.

Mariam¹ in his "Temperature Life Zone" places the entire state within the Austroriparian area of the Lower Austral Zone (although in the extreme northeastern corner are found a number of species which properly belong in the Carolinian area of the Upper Austral Zone). The winter temperature of the coastal region is about fifty degrees Fahrenheit, while in Northeastern Mississippi there is frost much of the winter. During the summer the temperature is above eighty degrees over the whole state.

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¹ Mariam, C. Hart, "Life Zones and Crop Zones," *Bulletin No. 10*, U. S. Biological Survey.