

## SUMMARY.

The observed effects of saponin herein reported are as follows: It has some hemolytic action, it does not produce nausea, but does affect the nervous system, and produces diarrhea when given by injection. The leaf juice and fresh aguamiel contain very small quantities of the saponin.

## BIBLIOGRAPHY.

- (1) Charles Dolley, *Therapeutic Gazette*, March 15, 1911.
- (2) Solmann's *Pharmacology*, W. B. Saunders & Company.
- (3) A. W. Van de Harr, "Galacturonic Saponins and Salts," *Berichte* (1923), 3041-3061.

---

QUALITY OF JAPANESE PEPPERMINT OIL PRODUCED IN  
FLORIDA.\*<sup>1</sup>

BY. B. V. CHRISTENSEN AND LOVELL D. HINER.

It appears that the cultivation of Japanese peppermint (*Mentha arvensis var. piperescens*) was first begun on the island of Hondo, and for many years the industry was restricted to this area. Late in the 19th Century, immigrants from Hondo to the more northern island of Hokkaido carried with them propagating stock from the mint fields of their native land. With this stock they established the first mint plantations in Hokkaido, which by 1906, had so far surpassed Hondo in Japanese mint oil production that it produced about 92% of that produced in Japan. For many years Japan has produced a large proportion of the world's supply of natural menthol and this product has been one of its most important commercial commodities.

Just how and when Japanese peppermint was introduced into the United States is not certain. However, during the past ten or twelve years cultural experiments have been carried on in various parts of the United States.

A few years ago an experimental plot was established at Mont Verde, Florida, by an industrial concern, using large quantities of natural menthol, apparently for the purpose of determining the best location in the United States for the cultivation of this plant to furnish their needs. This project was discontinued in 1926 on account of the low menthol content of the oil and apparently this firm decided that Florida was not the location in which to attempt cultivation on a large scale. This, with one or two other attempts, seemed to convey the impression that the results obtained in the hotter sections of the United States, such as Florida, indicated that Japanese mint oil produced in these sections ran low in menthol. It was also supposed that the menthol content gradually decreased from year to year and that the percentage of combined menthol was relatively high.

The Bureau of Plant Industry in Washington, D. C., became interested in the possibilities of this plant and in February 1927, it was proposed by A. F. Sievers of that Bureau that the College of Pharmacy, University of Florida, coöperate with the Bureau of Plant Industry in carrying out cultural tests in Florida with Japanese peppermint. Rootstock was furnished by the Bureau and the first planting was

---

\* Produced in Medicinal Plant Garden, University of Florida.

<sup>1</sup> Scientific Section, A. Ph. A., Miami meeting, 1931.

made in the spring of 1927. From this parent stock, identical and clean strain has been kept and in the tabulations which follow is designated as "Washington." Due to a lack of distilling equipment, the crops produced in 1927 were dried and shipped to Mr. Sievers for distillation and analysis of the oil. Later, crops were distilled here and samples of oils were sent to Mr. Sievers for analysis. These oils were also analyzed in the pharmacognosy laboratory, U. of Fla., and results were exchanged with Mr. Sievers for checking.

In the spring of 1928, rootstock of Japanese peppermint was also obtained from G. A. Russell of Greensboro, North Carolina. From this parent stock identical and clean strain has also been preserved and the results of tests as indicated in the following tabulations are designated "North Car."

TABLE I.—YIELD AND PROPERTIES OF JAPANESE PEPPERMINT OIL (WASHINGTON STOCK).

	1927.*	1928.*	June. 1929.	Oct.	July. 1930.	Oct.
Per cent yield (dry basis)	2.81	1.37	.....	.....	.....	.....
Per cent yield (green basis)	.....	0.292	0.424	0.557	0.331	0.419
Yield, oil per acre (lbs.)	.....	21.5	29.4	4.6	29.3	5.9
Sp. gr. at 25° C.	0.8953	0.8934	0.8929	0.8927	0.8958	0.8943
Index refraction at 20° C.	1.4598	1.4586	1.4556	1.4569	1.4536	1.4530
Opt. rotation at 25° C.	.....	-38.92	-38.35	-38.31	-34.15	-34.74
Sap. No.	22.4	11.4	12.62	17.05	18.55	18.32
Free menthol (%)	65.56	69.10	68.45	66.75	69.19	59.93
Combined menthol (%)	6.24	3.90	3.50	4.73	5.11	5.04
Total menthol (%)	71.80	73.00	71.95	71.48	74.30	64.97

TABLE II.—YIELD AND PROPERTIES OF JAPANESE PEPPERMINT (NORTH CAROLINA STOCK).

	1928.*	June. 1929.	Oct.	1930.*
Per cent yield (green basis)	0.376	0.482	0.339	0.180
Yield, oil per acre (lbs.)	21.78	15.6	5.00	8.00
Sp. gr. at 25° C.	0.8981	0.8933	0.8935	0.8951
Index refraction at 20° C.	1.4774	1.4607	1.4616	1.4541
Opt. rotation at 25° C.	-39.68	-37.44	-38.60	-38.15
Free menthol (%)	66.95	62.25	64.40	64.10
Combined menthol (%)	4.9	3.51	3.38	3.75
Total menthol (%)	71.85	65.76	67.78	67.85

\* Crops combined for distilling because of small quantity of material.

#### DISCUSSION.

According to *Schimmel Report*, 1924, page 67, the average percentage of menthol in some Japanese mint oils produced in New York was 73. From data recorded by Finnemore, "Essential Oils," page 779, on oils produced in Japan it appears that the menthol content ranges from 78 to 92%.

The average menthol content of Japanese mint oils produced thus far, as indicated in Tables I and II, from Washington stock is 71% and from North Carolina stock is 67%. From this it appears that the menthol content of oils produced in this locality does run a little lower than that of oil produced in other sections.

It does not appear from the data above that there is a gradual decrease from year to year in menthol content. The data does indicate seasonal variations, which

occur in all localities. The menthol content, therefore, appears to be consistently maintained.

According to Finnemore, page 779, the range of menthol as esters in mint oil produced in Japan is from 1.5% to 7%. In Florida oils the menthol as esters falls within this range. Neither does the data indicate a gradual increase in combined menthol, as has been supposed to be the case. It further appears that the percentage of combined menthol of oils produced here is lower than that of oils produced in northern sections of U. S., where it has ranged in some instances from 6 to 11%. From this it appears that the combined menthol in southern oils is relatively low.

The yield of oil per acre is very low in this locality. Theoretically the annual yield per acre should be high, due to the possibility of producing two crops on account of the long growing season. However, it is to be noted that the second crop has been consistently very small and field observations indicate that this plant is inclined to rest after the first harvest and does not produce a vigorous growth during the latter part of the season. Field data also indicates that this plant gradually weakens from year to year. From both Washington and North Carolina stock, the first crops were healthy and vigorous. During the past and present seasons the stand was very poor and plants apparently very much weakened. This may be partially due to soil conditions as well as seasonal conditions, but there is considerable evidence which indicates that the plants do not adapt themselves well to the hot climate.

#### CONCLUSIONS.

1. Indications are that the menthol content of Japanese peppermint oils produced in the South is somewhat low.
2. No indication of a gradual decrease in menthol content from year to year.
3. The menthol as esters appears to be relatively low in Japanese mint oils produced in this locality.

---

#### THERAPY IN HOSPITALS.

"Physical Therapy in Hospitals for Veterans" was one of the subjects of the session of the Council on Medical Education, Licensure and Hospitals, at which Dr. Harry E. Mock, chairman of the Council on Physical Therapy, American Medical Association, presided. The subject of the first paper was "Physical Therapy in Army Hospitals." The paper was written by Dr. Patterson, Surgeon General of the United States Army, and read in his absence by Dr. Garrey. Dr. MacEachern discussed the paper. Both the paper and the discussion stressed the importance of physiotherapy and emphasized the fact that this treatment should be under the direction of a competent medical man. It deplored the fact that in many instances this treatment is being used by untrained and uninformed individuals who may do a great deal of harm by its unwise use.

The second paper, "Occupational Therapy, Its Aims and Developments," was read by Mr. Thomas B. Kidner, of New York. Mr. Kidner told of the growth of occupational therapy, and said that a very important step has been taken by the American Occupational Therapy Association in the establishment of a registry of qualified occupational therapists to which any doctor or hospital superintendent may refer with the assurance that any person on the registry is capable. Mr. Kidner said that standards were established before any attempt was made to register any one, and that a great deal of difficulty had been avoided by this procedure. Dr. Gaenslen of Milwaukee, and Dr. Clopton of Hines, Ill., discussed the paper, agreeing in the main with what Mr. Kidner had said. Dr. Coulter, of Northwestern University, raised the question of the commercial aspect of occupational therapy in Veterans' Hospitals.