

# Fixed Oils of Mexico. IV. Napahuite (*Trichilia hirta* L.)<sup>1</sup>

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THE napahuite of Mexico is a common tree which occurs in the hot climates of Mexico. The botanical classification is *Trichilia hirta* L., family Meliaceae. The tree grows to a height of 10 to 15 feet. The fruit occurs as a small capsule of an inch or less in diameter which contains 2 or 3 small round seeds. The seeds are similar to peanuts and are covered by a reddish skin (1).

*L. hirta* is also known in Mexico by the following native names: "garbancillo"; "xhulinsis"; "cabo de hacha"; and "mata-piojo" (1).

Jamieson reports the following data on another species of *Trichilia*, *T. emetica* obtained from the East African Coast, but does not discuss *T. hirta* (2):

Specific Gravity, 15°C.....	0.931
Refractive Index N <sub>D</sub> <sup>20</sup> .....	1.4695
Saponification Number.....	195-202
Iodine Number.....	66-70
Unsaponifiables.....	0.6-0.8
Solidification Point.....	6°C.
Titer.....	44°C.

The seed of napahuite is commercialized to some extent in rural areas of Mexico. The oil is extracted by macerating the crushed seeds in hot water and separating the liberated oil which floats to the surface. Its chief use is as a hair dressing (1).

## Experimental

The sample of seed used in this work was obtained in the public market in Tapachula, Chiapas, and confirmatory small samples were gathered in the field.

Quantitative yield determinations were made on seeds crushed in a mortar and extracted with petroleum ether (B.P. 30°-60°C.) in Soxhlet extractors. Triplicate determinations gave an average yield of 46.6% of oil based on the dry weight of seed.

Larger samples of oil were prepared by milling the seeds in a Wiley mill and extracting with petroleum ether in a large Soxhlet extractor. On removal of the solvent, a fluid, reddish-yellow oil with a slightly bitter taste was obtained. The color apparently is due to materials present in the reddish outer skin of the seed.

The physical characteristics of the oil were determined by A.O.C.S. Methods (3) and the results are shown in Table I.

TABLE I  
Physical Characteristics of Napahuite Oil

Specific Gravity 25/25.....	0.9277
Refractive Index N <sub>D</sub> <sup>20</sup> .....	1.4718
Melting Point.....	0.0°C.
Melting Point of Fatty Acids.....	33.8°C.

The chemical characteristics as determined by A.O.C.S. Methods (3) are reported in Table II.

<sup>1</sup> Extract from laboratory studies of Mexican Natural Resources as part of the Mexican industrial development program conducted by the Armour Research Foundation of Illinois Institute of Technology under the sponsorship of the Banco de Mexico, S. A. This series of papers reports the results of investigations designed to establish the properties and characteristics of various native Mexican oils which are not, at present, produced on a commercial scale.

TABLE II  
Chemical Characteristics of Napahuite Oil

Saponification Number.....	198.6
Acid Number.....	3.94
Unsaponifiable Matter.....	1.97
Iodine Number (Wijs 1 hr.).....	84.1
Thiocyanogen Number.....	58.3
Acetyl Number.....	0.0
Saturated Fatty Acids.....	32.43%

The composition of the oil was calculated by A.O.C.S. Methods (3) and is reported in Table III.

TABLE III  
Composition of Napahuite Oil (%)

Linoleic Acid as Glycerides.....	31.7
Oleic Acid as Glycerides.....	33.8
Saturated Glycerides.....	32.5
Unsaponifiables.....	2.0

The composition of the saturated acid fraction of the oil will be reported in a subsequent paper.

## Discussion

The seed of the napahuite offers some promise as a source of vegetable oil for domestic consumption. The available supplies of wild napahuite are not known but local opinion in the regions where the tree grows is that fairly large quantities (in terms of local consumption) could be gathered if a market were available. At present market prices the cost of raw material to produce 1 kilogram of napahuite oil would be about \$1.90 pesos, which does not leave a great margin for competition with other domestic fats which sell for an average of about \$2 to \$2.50 pesos per kilo. It is doubtful that greater quantities of the seed would find their way into the market at the present market price for the seed. The further development of the seed commercially on a wild basis does not appear promising, but on a plantation basis it is probable that the oil could be produced at a price competitive with other domestic oils.

## Summary

The physical and chemical characteristics of the oil from the seed of the napahuite tree (*Trichilia hirta* L.) have been determined.

The composition of the oil has been calculated.

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## REFERENCES

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2. Jamieson, G. S.: "Vegetable Fats and Oils," 2nd Ed., Reinhold Publishing Corp., N. Y., 1943, p. 92.
3. Official and Tentative Methods of the American Oil Chemists' Society, 2nd Ed. (1946) A.O.C.S.