

4. Weurman, C., *Acta Bot Neerl.*, 1954, 3, 100, (C.A. 1954, 48, 10131 e.)
5. Al-Delaimy K.S. and Ali S.H., *J. Sci. Fd Agric.*, 1969, 20, 660.
6. Holt, R., *Analyst., Lond.*, 1954, 79, 623.
7. Hulme A.C. and Rhodes M.J.C. in *The Biochemistry of Fruits and their Products* Edited by Hulme A.C., Academic Press, 1971, Vol. II, p. 335.

Laxminarayan Institute
of Technology and
University Department
of Biochemistry, Nagpur.
13 Sept. 1974.

PRATIMA N. SHASTRI
N, V. SHASTRI

A NOTE ON THE ESSENTIAL OIL AND OLEORESIN OF ZANTHOXYLUM RHESTA

The essential oil and oleoresin yield from carpels and the characteristics of the essential oil from the seeds of *Zanthoxylum rhesta* DC. are reported.

Zanthoxylum rhesta DC. is a middle sized tree belonging to the family Rutaceae. It is mainly distributed in the Konkan coast of the Indian peninsula and is locally known as *Kaavatte* (Kannada) and *Theppana* (Konkini). The carpels are used as a condiment by the people of Konkan area, especially in fish preparations and in coconut *chutneyes*. It is also used widely in pickles as a preservative. The bark of this tree is aromatic and is sometimes used as a substitute for lime and pepper.

The unripe carpels of this tree are strongly aromatic and taste like the rind of fresh orange. They turn light brown in colour on ripening. The seeds are round, black, smooth and shining and are about 4 mm in diameter. Ripe seeds do not have any attractive taste.

The essential oil of this spice (from the carpels and barks) has also some medicinal properties. It is astringent, stimulant and stomachic in nature. It is said to be effective against cholera, dyspepsia, diarrhoea and rheumatism¹. Roots of this tree also possess similar medicinal properties. The earlier studies^{2, 3} on this spice dealt with the yield and properties of its essential oil.

Semiripe carpels were water-distilled for about 16 hr for obtaining essential oil. Ground carpels gave only a poor yield of oil and seeds did not give any oil. Oleoresin was extracted by percolation method from ground carpels using acetone and absolute alcohol.

The data on yield and properties of essential oil and oleoresin are given below:

Carpels

Moisture % (v/w)	8.0
Essential oil % (v/w)	6.7
Oleoresin (acetone) % (w/w)	7.2
Oleoresin (alcohol) % (w/w)	10.8

Seeds

Essential oil %	Nil
Non volatile acetone extract % (w/w)	16.5

The colour essential oil is faint yellow with a clear appearance, has a characteristic lemon odour which is fruity and spicy, and also biting and pungent to taste. It is soluble in 80% alcohol in 1:3 ratio. Other properties are as follows:

Sp. gr. 30°C	0.8844
Opt. rotation (α) 30°C	10.1°
Refr. index (30°C)	1.4702
Acid value	7.60
Ester value	30.26
Saponification value	37.86
Ester content %	4.75
Combined alcohol %	2.48

Central Plantation Crops Research
Institute, Regional Station,
Vittal (S. K.) Karnataka.
29 June, 1974

C. K. MAIHAI

References

1. Watt, G., *Dictionary of Economic Products of India*, vol. VI, Periodical Experts (1882-1896), 325.
2. Rao, B.S., *J. Indian Inst. Sci.*, 1925, 8A, 174.
3. Bhargava, P.N., *Proc. Indian Sci. Congr.*, 1949, Part III, 78.

INVESTIGATIONS ON PREPARATION OF NON-DAIRY ICE CREAM

An acceptable ice cream product has been developed by using protein isolate from groundnut in place of milk solids. The cost of this product works out to about half of the milk based ice cream. It has a protein content of 7% as compared to 4% observed in the milk based ice cream.

India produces about 24 million tonnes of milk which is sufficient only to provide a per-capita consumption of 140 ml/day. The milk production will have to be doubled if the recommended requirement of 250 ml/day has to be met. It is absolutely necessary to conserve the available milk supplies through the application of modern technology. An effort has already been made to substitute skim milk powder with plant proteins in the toning of animal milk^{1, 2}. Likewise, technology has to be developed for use of plant proteins in different sweets and confectionaries based on milk in order to stretch the available supplies of milk for the vulnerable groups.

India is a tropical country and the demand for frozen foods is on the increase in recent times. Ice cream which was once considered to be a sophisticated item of food is now becoming more popular among the people. Annual production of ice cream in India during 1969 was 1,80,000 tonnes³.