

CHEMICAL COMPOSITION OF OIL FROM *MORINGA OLEIFERA*

by

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Summary. Yield and chemical characteristics of *Moringa* oil from *Moringa oleifera* were determined. The results were compared with the oil from *Moringa aptera* and *Moringa concanensis*. It was observed that the chemical composition of *Moringa oleifera* is comparable to that of the *Moringa concanensis*.

Introduction. *Moringa* oil is obtained from the seeds of *Moringa oleifera*. The species is indigenous to semi-tropical regions, including Indo-Pakistan sub-continent, Central and South America and the West Indies (5). In India and elsewhere, it has long been known as the horse-radish tree on account of typical flavour of its roots. The usual range of characteristics of oil are: specific gravity at 15.5°C, 0.913-0.919; refractive index at 40°C 1.4653-1.4668; saponification value, 186-187; iodine value, 67.7-72.2; acid value, 0.9-2.3; and unsaponifiable matter, 0.9%(5,7).

The oil has been used in cosmetics, for cooking and as an enflourage (5). The pressed cake or meal, possessing bitter taste, could be used as a fertilizer (5). The oil of *Moringa oleifera* and *Moringa aptera* are commercially termed as "ben oil" and are highly valued as lubricants for delicate machinery. The oil has strong power of absorption and retention of odours, and has therefore been employed in perfumery (7).

Experimental. *Moringa* seeds were collected from the Pakistan Forest Institute Campus. Seeds were cleaned and ground in the laboratory into a fine powder. *Moringa* oil was extracted (soxhlet) from the seeds with petroleum ether (40°-60°C). The purification, physico-chemical characteristics and the estimation of fatty acids of the oil were carried out with the methods given by Jamieson, Jacobs and Rosenthaler (3,5,8) respectively.

Results and Discussion. The yield of oil was found to be 21%. It is much less than the yield (40%) reported in case of seeds of *Moringa pterygosperma* and *Moringa aptera* (6). Its colour after purification with activated charcoal remained yellowish on account of some pigments extracted with petroleum ether, which slightly influenced the taste of the oil.

The physico-chemical constants of *Moringa oleifera* oil estimated are compared below with those of oil from *M. oleifera* and *M. aptera* reported in literature.

The oil obtained, through solvent extraction had low iodine value and high acid value. It was also inferior in flavour as compared to those obtained through expression, whose values have been reported in the literature.

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Physical constants	<i>Moringa oleifera</i>	<i>Moringa oleifera</i> reported	<i>Moringa aptera</i> reported
Acid value	9.50	0.74	0.50
Saponification value	189.73	186.40	188.20
Iodine value	67.03	68.00	71.20
Specific gravity at 15° C	0.919	—	0.912
Hehner value	84.92	—	—
Peroxide No.	80.00 milliequivalent/ 1000gm.	—	—
Squalene content	71.82 milligram/100gm.	—	—
Unsaponifiable matter	1.12	1.5%	—

The chemical composition of the oil is compared below with that of *M. oleifera* and *M. concanensis* as reported in literature.

Name of constituent	<i>Moringa oleifera</i> (Percent)	<i>Moringa oleifera</i> reported (Percent)	<i>Moringa concanensis</i> reported (Percent)
Saturated fatty acid	19.90	—	—
Unsaturated fatty acid	75.10	—	—
Oleic acid	67.48	68.9	64.40
Palmatic acid	3.40	3.6	9.57
Linoleic acid	3.40	3.8	—
Stearic acid	10.50	10.8	10.60
Behenic acid	—	6.3	7.83

It would be evident that the chemical composition of *Moringa oleifera* oil is comparable to that of *Moringa concanensis* oil and other commercial *Moringa* oils (1,2,7,9). The palmatic acid content (3.4%) is low as compared to (9.57%) reported in the case of oil of *Moringa concanensis* (9). However, these values fall in the agreeable range prescribed by Jamieson (4).

Conclusion. The following conclusions can be drawn from this study.

- (1) The solvent extraction yielded good recovery of oil.
- (2) The physico-chemical characteristics of *Moringa oleifera* oil compare well with those of oils from other *Moringa* species.
- (3) This oil was not inferior in quality when purified.

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