

Short Communication

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Physical Characteristics of Oil from Roots and Flowers of *Mangifera indica*

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The genus *Mangifera indica* commonly known as mango belongs to family Anacardiaceae and comprises of 40 species distributed in tropical and subtropical parts of South East Asia and Latin America [1]. It is represented in Pakistan by only one cultivated species *Mangifera indica* with many varieties [2]. It is large ever green tree widely distributed throughout Pakistan, specially in Sindh, Punjab and Northern areas of this country. *Mangifera indica* has a large number of medicinal properties specially in traditional system of medicine [3].

Earlier we had reported amino acids, sugars [4], alkylgallates [5,6], triterpenes [7], saponins [8], isomer of taraxerol [9], chromones [10] and biflavone [11] from this plant.

A literature survey on oil of *Mangifera indica* reveals that only oil from seeds of this plant was used to determine the saponification value, iodine value and unsaponifiable matter [12], however, no work on the physical characteristics of the oil of roots and flowers of *Mangifera indica* has been reported so far.

The present paper describes the physical characteristics of the oil obtained from the roots and flowers by using standard methods [13]. The results are summarized in Table 1. In addition to this quantitative and qualitative analysis of the fatty acids of the oil obtained from the flower of this plant is also studied. The fatty acids were esterified with diazomethane. The methylated fatty acids were analyzed by GC-MS which revealed the presences of seven saturated and two unsaturated methylated fatty acids. The results are shown in

Table 1.

Physical characteristics	Root	Flower	Seed [12]
Acid value	39.49	17.20	-
Iodine value	38.07	35.46	46.00
Saponification value	57.22	41.38	190.00
Free fatty acid contents	04.13%	03.34%	-
Unsaponifiable matter	00.19	00.13	0.71

Table 2. The confirmation of these methylated fatty acids was carried out by the comparison of mass spectra of unknown compounds with those of NBS mass spectra library [14]. The relative retention time (RRT) and relative percentages of occurrence of their methylated fatty acids are also shown in Table 2.

TABLE 2.

Common name	Mol. formula	Mol. wt.	RRT	Relative (%)
1. Methyl laurate	C ₁₃ H ₂₆ O ₂	214	1.00	1.76
2. Methyl myristate	C ₁₅ H ₃₀ O ₂	242	1.34	7.73
3. Methyl pentadecylate	C ₁₆ H ₃₂ O ₂	256	1.64	1.29
4. Methyl palmitoleate*	C ₁₇ H ₃₂ O ₂	268	2.57	2.37
5. Methyl palmitate	C ₁₇ H ₃₄ O ₂	270	2.73	11.57
6. Methyl margarate	C ₁₈ H ₃₆ O ₂	284	3.23	1.75
7. Methyl oleate*	C ₁₉ H ₃₆ O ₂	296	3.46	40.35
8. Methyl stearate	C ₁₉ H ₄₂ O ₂	298	3.82	31.05
9. Methyl arachidate	C ₂₁ H ₄₂ O ₂	326	3.99	2.48

* unsaturated methyl esters

Key words: *Mangifera indica*, Oils, Anacardiaceae.

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Table 2. The confirmation of these methylated fatty acids was carried out by the comparison of mass spectra of unknown compounds with those of NBS mass spectra library [14]. The relative retention time (RRT) and relative percentages in co-elution of their methylated fatty acids are also shown in Table 2.

TABLE 2

Compound name	Mol. formula	Mol. wt.	RRT. Relative (%)
1. Methyl laurate	C ₂₁ H ₄₂ O ₂	328	1.00
2. Methyl myristate	C ₂₃ H ₄₆ O ₂	354	1.07
3. Methyl pentadecanoate	C ₂₅ H ₅₀ O ₂	380	1.16
4. Methyl palmitoate	C ₂₇ H ₅₄ O ₂	406	1.23
5. Methyl heptadecanoate	C ₂₉ H ₅₈ O ₂	432	1.32
6. Methyl octadecanoate	C ₃₁ H ₆₂ O ₂	458	1.40
7. Methyl stearate	C ₃₃ H ₆₆ O ₂	484	1.47
8. Methyl arachidate	C ₃₅ H ₇₀ O ₂	510	1.53
9. Methyl behenate	C ₃₇ H ₇₄ O ₂	536	1.60

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The genus *Mangifera* includes numerous species, known to be used for many purposes. *Mangifera indica* is one of the most important species, distributed in tropical and subtropical parts of South East Asia and in America [1]. It is very common in Pakistan by one or two names, *Mangifera indica* and *Mangifera sp.* [2]. It is a very important fruit tree, distributed throughout Pakistan, especially in Sindh, Punjab and Northern areas of the country. *Mangifera* is one of the most important medicinal plants, especially in traditional system of medicine [3].

Earlier we had reported mango acids, saponins [4], alkaloids [5], flavonoids [6], terpenes [7], saponins [8], tannins [9], chromones [10] and biflavones [11] from this plant.

A preliminary survey on oil of *Mangifera indica* leaves, fruit and root seeds of this plant was used to determine the saponification value, iodine value and unsaponifiable matter [12], however, no work has been published. We have now studied the oil of roots and flowers of *Mangifera indica* and reported the results.

The present paper describes the physical characteristics of the oil obtained from the roots and flowers by using standard methods [13]. The results are summarized in Table 1. In addition to the quantitative and qualitative analysis of the fatty acids of the oil obtained from the flower of this plant is also studied. The fatty acids were esterified with diazotization. The methylated fatty acids were analyzed by GC-MS which revealed the presence of seven saturated and two unsaturated methylated fatty acids. The results are shown in Table 2.

Table 1

Physical characteristics	Root	Flower	Seed [12]
Unsaponifiable matter	00.19	00.13	0.37
Free fatty acid content	04.13%	03.34%	-
Saponification value	27.22	41.28	109.60
Iodine value	38.07	33.48	46.00
Acid value	39.49	17.30	-