

COMPARATIVE ANALYSIS OF FATTY ACID PROFILE OF MORINGA OLEIFERA SEED OIL FROM ARID ZONE OF RAJASTHAN

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Abstract-In the course of our research on the seed oil of desert plant, the phytochemical composition of seeds of *moringaoleifera* (moringaceae) called drum stick were studied. The seed were collected from wild growing plants at road side/waste lands and also from cultivated areas .the presence of

UV, IR and TLC techniques. Olic acid was found the major component in all the samples. The results mainly with temperature region of Pakistan , Periyakulam-1, varity of Malaysia and from peninsula origin

Key word: Moringaoleifera, seed oil ,oleic acid.

INTRODUCTION

Moringaoleifera belongs to Moringaceae family. The presence of myrosine cells, elongated, threevalved, onelocular capsule fruit and three wing seeds are important characteristics of this family. *Moringaoleifera* is one of the common medium sized tree, found in wild as well as cultivated for fruits and young flowers in kitchen gardens^{1,2,3}. The flowering and fruiting time is November to March and seeds ripening time is March to May.

It contains several phytochemicals some of which are of high interest because of their value. This tree has been reported as a boon to arid lands due to versatile unique applications⁴. Young fruits and flower buds are used as vegetable, leaves as camel fodder, seed oil in acute rheumatism, fruits in plastering bones are some of them^{5,7}.

MATERIALS AND METHODS

First of all a detailed field survey was done on the basis of literature of distribution of species in the Arid and Semi Arid zone of Rajasthan⁶. Seeds were collected in the month of April-May from different parts of Western Zone of Rajasthan. The air dried seeds were grounded and extracted with petroleum ether (40-60 degree boiling point range) at 40-60 degree Celcius, using Soxhlet apparatus. The solvent was recovered by Rota-evaporator under vacuum. The analytical values of seed oil were determined according to the procedure recommended by American Oil Chemical Society as shown in Table-1^{8,9}

The analytical TLC was carried out on 0.25 mm layers of Silica gel G using petroleum ether and diethyl ether (80:20). The spots were visualized by exposure to iodine vapor and then charring with sulphuric dichromate spray.

The Infra red spectra were recorded on Shimadzu 8201 PC (400-350cm⁻¹) Spectrophotometer and

Ultraviolet Spectra on Hitachi 320 Perkin Elmer Lambda 15 Spectrophotometer in methanol. The refractive index was recorded on Abbe Refractometer. GLC analysis were carried out with Varian Vista 6000 Gas Liquid Chromatograph using DEGS and SE-30 columns. The UV and IR Spectra showed the absence of any unusual functional group. Various TLC methods were used for further confirmation.

RESULT AND DISCUSSION

Total Saturated Fatty Acids: The total amount of saturated fatty acids were found as 7.21%. Myristic, Palmitic and Behenic acids were found absent in selected species.

Total Unsaturated Fatty Acids: The amount of oleic acid was found as 56.16% as major component. Other unsaturated acids viz. linolic and linolenic acids were also found in good amount.

Poly Unsaturated Fatty Acids (PUFA): The combined content of linolic and linolenic acid was found as 36.62%.

Category of Oil: On the basis of PUFA content the seed oil of *Moringa oleifera* is categorized as a non-drying oil.

Comparison with earlier reports: The comparisons of present findings with earlier reports were done. The richness of oleic acid (56.16%) and absence of any oxygenated fatty acid component were similar. The percentage composition of fatty acids varied in present study due to environmental factors. For example Palmitic acid was not found in our sample while it has been reported up to 12.51%. Similarly Arachidic Acid also show presence in our sample, which was not reported in earlier findings.^{10,11,12}

TABLE-1 PHYSICO CHEMICAL CHARACTERISTICS OF SEED AND OIL

| | |
|-----------------------------|--------|
| Moisture content | 1.26% |
| Oil content | 38.9% |
| Protein content | 61.60% |
| Refractive index n_D^{30} | 1.462 |
| Unsaponifiable matter | 2.18% |
| Iodine value | 140.37 |
| Saponification value | 252.0 |

| | |
|--------------|------------------------|
| Ultra violet | Usual |
| Infra red | No specific absorption |

TABLE -2 COMPONENT FATTY ACIDS OF SEED OIL BY GLC

| Characteristics Fatty Acid | Percent |
|----------------------------|---------|
| 14:0 | ----- |
| 16:0 | ----- |
| 18:0 | 4.56 |
| 18:1 | 56.16 |
| 18:2 | 19.53 |
| 18:3 | 17.09 |
| 20:0 | 2.65 |
| 22:0 | ----- |

TABLE -3 COMBINED CONTENTS OF FATTY ACIDS

| | |
|-------------------------------|------------|
| Total saturated fatty acids | 7.21% |
| Total unsaturated fatty acids | 92.78% |
| PUFA | 36.62% |
| Category of seed oil | Non drying |

CONCLUSION AND SCOPE

The seed oil of *M.oleifera* is classified as non-drying oil. Due to abundance of unsaturated fatty acids its oiliness is good. It can easily be used as food grade cooking oil as well as industrial oil. It can be recommended for large scale cultivation for beneficial outcomes of products.

Since this plant is commonly found in almost all parts of Rajasthan and requires less care, hence its cultivation on large scale for industrial applications has more advantages. It is a source of multipurpose phytochemicals including the seed oil also. Again, since the oil contains is high so applications in industrial, domestic and medicinal areas should be given attention by researchers.

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TREE GROWN IN A HOUSE

TABLE -2 COMPONENT FATTY ACIDS OF SEED OIL BY GLC

| Characteristics Fatty Acid | Percent |
|----------------------------|---------|
| 14:0 | Absent |
| 16:0 | Absent |
| 18:0 | 4.56 |
| 18:1 | 56.16 |
| 18:2 | 19.53 |
| 18:3 | 17.09 |
| 20:0 | 2.65 |
| 22:0 | Absent |

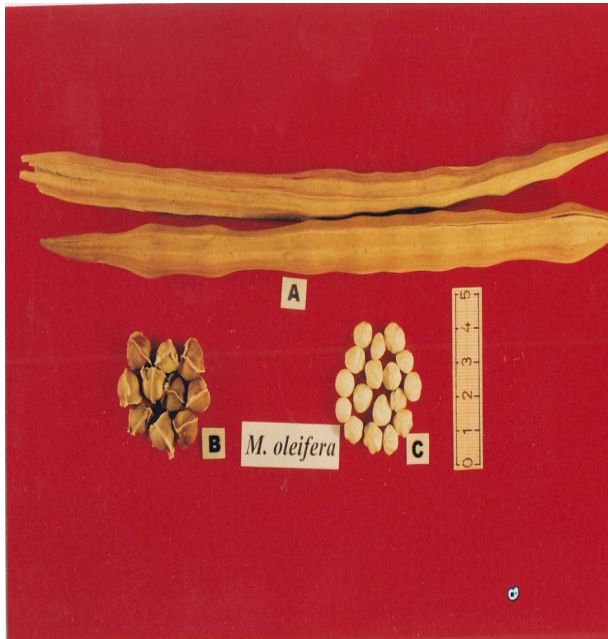


WILD GROWING TREES IN A GROUP

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