

# Studies of Some Physicochemical Properties of *Ocimum Americanum* Seed Oil from Jodhpur from Semi-Arid Zone Of Rajasthan

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**Abstract:** The scope and applications of a traditional as well as new oil depends upon its physical and chemical properties. Drying nature, saturation, chemical composition etc. are some of parameters to classify the oils into different categories. The Koettstorfer number, acid value and ester value of seed oil of *Ocimum americanum* known as ran Tulsi with some other physic-chemical values were determined and compared with standard values with a comparative view. The current paper deals with the extraction and characterization of *Ocimum americanum*, seed oil using *n*-Hexane as solvent. The plant is widely distributed in waste lands and also in our Jodhpur zone. The seeds were found to contain 8% oil. The percentages of glycerol present in triglycerides were also calculated with the help of acid value, and the percentage of free fatty acids were calculated from the ester value. An idea about the amount of NaOH, commercially known as lye needed to make sodium salt of soaps were also calculated from KOH to NaOH conversion scale.

**Keywords**— *Ocimum americanum*, seed oil, Koettstorfer number, Acid value, Ester Value, Free Fatty Acids, KOH, NaOH and Glycerol.

## 1. INTRODUCTION

A number of valuable plant products have being utilizing by the entire human and animal generation since ancient era. Among the applications of plants, phytochemicals play an important role to increase their significance even in the current scenario of allopathic drug development.

The professional services based upon clinical aspects of herbs has been flourished in past few decades due to development of innovative technologies and effective formulation of natural products. Now the pharmacists and physicians are capable to identify, analyse & respond to the challenges emerged with the spreading of professional services in facilitation of man's life. In India various climatic conditions results a rich flora which acts as a good reservoir of precious natural products.

This revolutionary awareness of medicinal herb applications would be a result of continued struggles against illnesses and learning to pursue drugs in different parts of the plants like roots, barks, seeds, fruit bodies etc.

The drugs from plant origin are a type of secondary metabolites produced as an adaptation in harsh climatic conditions. For these environmental conditions, the arid and semi-arid zone of Rajasthan and Gujarat are considered with perfect co relation. The essential and fixed oils obtained from the seeds. Some of the important metabolites of this category. The plant parts contains essential oils and the seeds contains both types of oils.<sup>1-2</sup>

In the Arid zone of Rajasthan, herbs, shrubs and trees are distributed widely. The systematic studies of their

geographical, environmental, economical, physic-chemical and applied aspects are required to explore them to get more benefit in a sustainable manner. This paper deals with the physico-chemical analysis of a lesser known wild plant found in these area, *Ocimum americanum* commonly known as Ran Tulsi and identified by its characteristic aromatic odor.<sup>3-5</sup>

It is a small shrub with specific smelling organic compounds. The botanical classification is as follows:

Family: Lamiaceae

Synonyms: *O. canum Sims.*

Vernacular Name: Ban Tulsi.

Tribal Name: Nung, Marma.

English Name: Hoary Basil, Rosary Basil.

It is an annual aromatic much-branched herb, with approximately height from 15 to 60 cm. Leaves are 2.5-3.8 cm long, elliptic-lanceolate, acute at both ends. Flowers are small, white, in rather close whorls, in spiciform racemes, up to 20 cm long. Nut lets 1.25 mm long, ellipsoid, black.<sup>6-7</sup>

*Ocimum L.* (Lamiaceae) the genus of selected plant, are native to throughout the tropics of old World and also known as a cultivated plant or an escaped weed with remarkable therapeutic potentials. *Ocimum sanctum L. (Tulsi)*, *Ocimum gratissimum L. (Ram Tulsi)*, *Ocimum basilicum L. (Ban Tulsi)*, *Ocimum kilimandscharicum Guerke*, *Ocimum americanum L.*, and *Ocimum campechianum Mill. syn. O. micranthum*. Several findings have been reported regarding the antimicrobial activity of essential oils and plant extracts of *Ocimum* species<sup>8-9</sup>. Various chemicals are reported which are effective fungicides against *R. solani*<sup>10-14</sup>.

## MATERIAL AND METHODS

### 2.1 Study area description:

Jodhpur is the second largest city of Rajasthan, popularly known as Sun city and situated centrally in the western region of the state, with a total geographical area of 22850 Sq. Km. Jodhpur district lies between 26 degrees 0 minutes and 27 degrees 37 minutes north latitude and 72 degrees 55 minutes and 73 degrees 52 minutes east longitude.<sup>15</sup>

The plant species were located at various places of Jodhpur zone and adjoining areas. Seeds were collected from matured fruits by hand picking method.

### 2.2 Extraction of oil

The extraction of fixed oil from *Ocimum americanum*, was carried out through solvent extraction method using petroleum ether in soxhlet apparatus. 100g of seeds were used for the extraction of oil after coarse grinding.

### 2.3 Percentage yield calculation

The percentage yield of the oil extract was reported as a percentage of the weight of extracts obtained from extraction relative to the weight of seeds taken.

Yield of oil extraction = (weight of oil extracted) × 100% / (weight of date seeds used)

### 2.4 Determination of the physicochemical parameter<sup>16-19</sup>

a) Acid Value: This value express the Milligrams of potassium hydroxide required to neutralize the free acids present in 1gram of the oil.

b) Saponification Value/ Koettstorfer number: It is the number of milligrams of potassium hydroxide needed to neutralize the free acids and to sponify esters present in 1g of the substance.

c) Ester Value: The number of milligrams of potassium hydroxide necessary to sponify esters present in 1g of the substance is represented as ester value of oil.

d) Peroxide value: The number of milli-equivalents of active oxygen representing the amount of peroxide contained in 1 kg of the substance.

e) Iodine value: This value indicates the quantity of halogen, calculated as iodine, which is observed by 100g of the substance under the desired condition in grams.

f) Un-saponification matter: The amount of material left after saponification which does not forms soap is called as Un-saponification matter.

## RESULTS AND DISCUSSIONS

Physical Parameters of *Ocimum americanum* are shown in Table-01 and physic-chemical properties in table-02.

Table-I

PROPERTY OF THE SEED	OBSERVED VALUES
Seed Morphology	Nut lets 1.25 mm long, ellipsoid, black.
Moisture Content	2.45%
Oil Content	8.2%
Appearance of the oil	Clear with aromatic smell



Table-II

PROPERTY OF THE SEED	OBSERVED VALUES
Acid Value [mg of KOH/g of oil]	3.6
Free fatty Acids[%]	0.19
Iodine Value [g/100 g of oil]	109.5
Saponification Value	162.2
Unsaponified Matter[%]	15%
Refractive Index(25°C)	1.48532
Relative Density of the oil	0.91372

#### Saponification Value

The saponification value of the *Ocimum americanum* oil was found to be 162.2 mg KOH/g, which is quite high so it has potential for soap production with medicinal values.

#### Ester Value

The ester value of the *Ocimum americanum* oil was found to be 154.44. As the ester value is medium of the oil so it can be kept for long period and it possess high durability indicative to the presence of short range acids.

#### Iodine value

The iodine value of *Ocimum americanum* oil was found to be 109.5g/100g which is low. The oil shows quite degree of unsaturated fatty acid.

### CONCLUSION

On the basis of above studies, the selected species has a number of evidences to be cultivated for valuable phytochemicals.<sup>20</sup>

Further the application of essential oil, fixed oil and by products would be a great economic importance, if harnessed in a proper manner.

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