

# Periodic Research

## Classification of Selected Medicinal Plant Leaves of *Aegle Marmelos* Corr.

### Abstract

Plants play one of the most important role in our ecosystem But the rapid decline in the variety of plants is an issue which demands our immediate attention. *Aegle marmelos* corr. Is a member of the plant family Rutaceae, which is prominent contributor to the medicinal plants used in the indigenous system of medicines. Plants also play a major role in ayurvedic and modern forms of medicine. There is an urgent need to identify and classify the medicinal plants. The genus *aegle* is peculiar to the Rohilkhand region and consists only one endemic specie, *Aegle mormelos* corr. Though two more species are found to grow in the Indo-malaya region.

**Keywords:** Medicinal Plants, Essential Oil, *Aegle Marmelos* Corr.

### Introduction

Leaf is the most important feature of a plant when you are studying the properties of a plant like plant nutrition, plant composition, plant soil water relationship, plant protection measures, crop ecosystems, respiration rate, transpiration and photosynthesis. Leaf identification can be considered an important step in the process of conservation of plant diversity. So there is a need for a reliable and efficient leaf recognition system to identify the various plant species and conserve them.

*Aegle marmelos* corr, is a small medium sized deciduous tree armed with straight sharp axillary thorns, 2-3 c.m. long, alternate, 3 foliate rarely 6 foliate, petiol 3-6 cm long terete. Leaf lets 5-10 by 3- cm, ovate or ovate lanceolate, crenate, acuminate membranous, pellucid – punctulate, the lateral membranous, pellucid – punctulate, the Glateral opposite, subsessile, the terminal long petiolules

### Aim of the Study

Medicinal use of plant *Aegle Marmelos* Corr. known as 'Bel' and its chemical composition.

### Therapeutical

The Plants *Aegle marmelos* 'Bel' is a medicinally important plant. Each part of the plant is being used as medicine for the cure of various diseases. The unripe fruits regarded as astringent, digestive, stomach and is prescribed in diarrhoea and dysentery, often proving effectual in chronic diarrhoea. The riped fruits are restorative, astringe laxative good for health and brain. The dried ripe pulp is astringent and used in dysentery.

The root used in the cure of lever due to "tridosha", pain in the abdomen palpitation of heart, urinary troubles, hypochondriasis, melancholi, removes "diarrhoea, gastric irritability in infants and intermittent fever.

The leaves are made into poultice used in the treatment of ophthalmia and eye infection the fresh juice diluted is praised in calarrhs and feverishness and juice with black peper is given in ansarca with costiveness and jaundice.

A water distillate from flower is said to be aledipharmic. An image of the leaf can be captured using a digital camera and the scanned image can then be analyzed by using a task specific computer program.

Flowers Greenish white, sweet scenting, about 3 cm across 2-sexual in short axillary panicles, calyx flate, pubescent, petals 4 spreading oblong thick gland –dotted much exceeding the sepals imbricate stameans numorus, anthers elongate, apiculate filaments free of fascicled, opiculate filaments tree or fascicled, inserated round an inconspicuous disk. Overy aovid, cell 10-20, style terminal short deciduous stigma capilate.



**Neeta Gupta**

Lecturer,  
Deptt. of Chemistry,  
N.K.B.M.G. College,  
Chandausi

Fruit 10-15 cm diameter globose, grey or yellowish rind woody seeds numerous, oblong compressed with a woody mucous testa, embedded in orange coloured sweet.

### Identification Methods

There are several methods which can be used to identify plant leaves and other materials. Some of the widely used methods for identification are spectroscopy. Chemical identification and optical identification spectroscopy measures the interaction of the molecules with electromagnetic radiation which can be used for the identification of leaves. Each fraction after fractional distillation was examined by this layer chromatography and fraction number was also examined by gas liquid chromatography.

In order to get a pure sample each fraction was subjected to column chromatographic separation over alumina by suitable solvent system. Similar fractions were mixed on the bases of identical spots on the T.L.C. plates and the same Rf. Index. Finally the purity of some fractions were examined by gas liquid chromatography.

The component present in each fraction was identified by preparing different derivatives and comparing these with those mentioned in literature, Carbon hydrogen estimation colour tests, gas liquid chromatography and infra-red spectroscopy were also used in the identification of some these fractions.

### Antibacterial and Antifungal Activities of Essential Oil and Some of Its Constituents

The activity of the essential oil and some of its constituents were observed against some bacteria and fungi, and are summarized in following table.

**Table**

**Anti Bacterial and Antifungal Activities of Essential Oil and Some of Its Constituents**

Sr. no	Property	Value
1	Yield	1%
2	Sp gravity at 25°C	0.92
3	Ref index at 25°C	1.52
4	Optical rotation at 25°C	+4.123
5	Acid value	1.98
6	Ester value	6.82
7	Ester value after acetylation	16.23
8	Carbonyl value	26.32

### Investigation

The fresh leaves of the plant were collected from Badaun (Ganga region of Rohilkhand) and essential oil, thus obtained was found to possess following physico-chemical properties.

200 ml of the oil was fractionated under reduced pressure and three fractions were collected at different temperature ranges

Sr. No.	Boiling Range (c)	Ref Index(25°C)	Volume ml
1	35-70		130
2	71-90		35
3	Residue		35

Since the fractional distillation is not an accurate method for fractionation.

Sr. no	Bacteria or Fungi	Essential oil	Limonene	Citroellal	Fugenal	Citral
1	E.Coli	b	b	a	e	d
2	Microsporium Gypseum	a	a	a	a	e
3	Pseudomonas	a	a	a	a	e
4	Salmonella typhi	a	a	a	a	e
5	Shigella Flexneri	a	b	a	a	e
6	Staphylococci	b	b	a	a	d
7	Trichophyton mentagrophytes	a	a	a	a	e
8	Trichophyton rubrum	a	a	a	a	a

- No zone of inhibition o.e.not sensitive.
- Slightly sensitive (Zone of inhibition 0.1-0.3 cm)
- Sensitive (zone of inhibition 0.3-1 cm)
- Moderately sensitive (zone of inhibition 0.3-0.5cm)
- Highly sensitive (zone of inhibition (0.5 cm -0.8 cm)

### Experimenta

The fresh leaves of the plant were collected from Badaun (Ganga Basin of Rohilkhand) and essential oil was obtained from steam distillation in a copper still fitted with condenser. The pale yellow coloured oil was obtained in 0.69 % yield

### Physico Chemical Properties

The Physico chemical properties of the oil were determined by materials and method.

### Identification of Fractions

#### Fraction no (1) (a)

By semicarbazones, Oxime and oxidation methods

#### Fraction no (1) (b)

By Maleic anhydride adduct Nitroso chloride tetrabromide and colour test

#### Fraction no (1) (c)

Maleic anhydride adduct Nitrosite and dicarboxylic acid from adduct.

#### Fraction no (1) (d)

Cincole resarcinol addition compound addition compound with HBr Iodol addition compound.

#### Fraction no (1) (e)

Oxidation, liquid chromatography

#### Fraction no (2)

Semicarbozone, reduction product and oxidation product

#### Fraction no (3)

Semicarbozone, 2:4 dinitro Phenyl hydrazone, addition compound with acetone, and citronellyl-naphthocin-Choninic acid.

#### Fraction no (4)

Phenyl urethane, L- Naphthyl urethane and oxidation product

#### Fraction no (5)

Semicarbozone 2:4 Dinitro phenyl hydrozone., Thiosemi-carbozone.

#### Fraction no (6)

Semicarbozone 2:4 Dinitro phenyl hydrozone, and p-Nitro phenyl hydrozone.

**Fraction no (7)**

Phenyl urethane 3:5 Dinitro-benzoate, Allophanate

**Fraction no (8)**

Phenyl urethane, Benzoate piperazine.

**Fraction no (9)**

Nitrosite, Nitrosochloride, Nitro-benzyl amine Dihydrochloride.

**Gas Liquid Chromatography of the Oil**

Gas liquid chromatography of the oil was carried out at different conditions and columns. The column of carbowax 20 m 5% in chromosarb p was one of the suitable column for the oil.

**Discussion**

The author had isolated characterized ethyl n-amyl ketone, 5.25%, methyl n- heptyl ketone, 3.75% citronellal, 10% citral and 6% cumaldehyde. The author has reported the presence of L-d- phellandrene, 20%, d- limonene, 10%, 1:8- cineole, 2.5%, p-cymene, 11.50%, linalool, 3.75%, eugenol 6.0% and B- caryophyllene, 7.5%

Above observations give an idea that the compounds of the oil are more effective than that of oil itself.

**References**

1. Aswal, B-5 :- Less known medicinal uses of three plants from kumaon Himalaya (India). Indian Journal of forestry, V15(1) p – 76-77(1992)
2. Devi, m.v.n. Nagendra, p.p. and Kalirajan, K infrared spectral studies on siddha drug pavala parpam. International journal of pharma and biosciences 1(4), 474-483(2010).
3. Miiller, J:- convective drying of medicinal aromatic and spice plants ; a review steward postharvest review 3(4),(2007).
4. Singh, R.H. and Singh, K.P. perspectives in plant drug research ancient science of life, V 9(3), 154-158 (1990).
5. Vasantha, M, Bharthi, V.S. and Dhamodharan, R medical image feature extraction, selection and classification, International journal of Engineering science and Technology, Vol 2(6) 2071-2076.