

**PRELIMINARY PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY  
OF *Guazumaulmifolia* Lamk.****P.M. Khadse**Shri RLT College of Science, Akola  
pramodkhadse12@gmail.com**ABSTRACT**

*Guazumaulmifolia* Lamk. Is a small sized tree belongs to family sterculaceae. The leaves and fruits are used by rustics of Akola district to treat gastrointestinal disorders, dermatological and pulmonary infections. Pharmacognostic studies were carried out for evaluation of drugs and to detect adulterations. It includes dermal characters like stomata, trichomes and anatomical features etc. The plant was analysed for its preliminary screening of phytochemicals. The result reveals that the presence of active constituents comprising alkaloids, glycosides and terpenoids etc. The generated datamay provide the basis of its wide use as the therapeutic agent in the traditional and folk medicine.

**Keywords:** Pharmacognostic, trichomes and *Guazuma ulmifolia*

**Introduction**

In India there is alternative system of medicine like Ayurveda, Sidha, Unani and traditional medicine has gain its importance in the recent few years of its high potential in curing various diseases with less side effects as compared to synthetic drugs. Natural products of plant and animal origin offer vast resource of new medicinal agents with potential in clinical use. The value of medicinal plants to the mankind is very proven. Nature has been a source of medicinal plants for thousand of years and an impressive number of modern drugs have been isolated from natural resources and has potential to treat diseases all over the world. The Agaskhed of Akot taluka of Akola district, Maharashtra has a pocket of numerous medicinal plants. The rustics of the area and people of nearby area have been using various plants and their parts as medicine during ultra Nakshetra to cure different ailments without knowing the efficacy or medicinal uses. The rustics of this area use the *Guazuma ulmifolia* to treat fever, flu, Gonorrhoea, sore throat, Asthma Diarrhea, Dysentery, Cancer, Hair loss diabetes etc. also used as antidote to snake bite. Therefore it is thought essential to assess the microbial efficacy of *Guazuma ulmifolia* against *Salmonella typhi*, *Vibrio parahaemolyticus*, *Bacillus subtilis*, *Candida albicans* and *Pseudomonas aeruginosa*.

**Plant Morphology**

*Guazumaulmifolia* Lamk. Is medium sized woody tree. It is commonly found in deciduous forest. It grows up to 30 m height. Leaves are alternate with two rows in assemledd flatly, leaves are ovate to lanceolate, finely toothed margin with rough texture. Leaves are covered with small star shaped hairs. Flowers are in panicles short stalked small in sized, brown to yellow colour. Fruit is capsule, rounded to elliptical. Seed are many brown coloured.

**Material and methods****Plant material**

Plant materials collected from Agaskhed of Akot taluka of Akola district during September 2022. The identification is done with the help of standard floras. (Naik 1979; Naik *et al.* 1998; Singh and Kartikayan (2001). The plant material is shaded dried, powdered stored in airtight container.

**Preparation of Extract**

Powdered obtained was subjected to successive Soxhlet extraction with increasing order of polarity i.e. Acetone (56 to 60<sup>o</sup> c), Alcohol (60 to 80<sup>o</sup> C), Petroleum ether (60<sup>o</sup> to 80<sup>o</sup> C), Methanol (65.5<sup>o</sup> C-70.5<sup>o</sup> C) and distilled water (60-70<sup>o</sup> C) Daniel, (1991).

**Test Micro- organism**

*Bacillus subtilis* MTCC (1091), *Pseudomonas aeruginosa* MTCC (708), *Candida albicans* MTCC (3971) were obtained from stock cultures of Department of Microbiology, SGBAU Amravati and maintained on Muller

Hinton agar and potato dextrose agar slant for bacteria and fungi respectively and stored at 6<sup>0</sup> C until used. To prepare suspension, the slants were incubated at 37<sup>0</sup> C for 24 hours inoculum was prepared by Mac Farland turbidity standards.

#### Antimicrobial assay

Antimicrobial activity was determined using agar well diffusion method, nutrient agar for bacteria and potato dextrose agar for fungi was used. Plant extract was dissolved in DMSO (Dimethylsulphoxide) at concentration of 2mg ml<sup>-1</sup>. Streptomycin 20 mg ml<sup>-1</sup> was used as standard. Each plate was inoculated with 20 mg ml<sup>-1</sup>. Microbial suspension having a concentration of 10<sup>0</sup> cells ml<sup>-1</sup>. 0.1 ml containing fungi were incubated at 25<sup>0</sup> c for seven days. The antimicrobial activity was observed on inhibition zone which was compared with standard, MIC was also determined by both dilution method. The culture was diluted in nutrient agar both at a

density adjusted to turbidity of 0.5 Mac Farland standards. Equal volume of each extracts nutrient broth was mixed in test tubes 0.1 ml standard inoculums was added to each test tube. The lowest concentration of extract that produce on visible bacterial growth when compared with standard regarded as MIC (Perez *et.al* 1990).

#### Observations

Fruits extracts of *Guazuma ulmifolia* shows variable antimicrobial activities against test organism. The distilled water exhibit remarkable activity against *Salmonella typhi*. The acetone fruit extract is effective against *Pseudomonas aeruginosa* and *Vibrio parahaemolyticus* the ethanol and methanol fruit extract was found to be the most effective against *Candida albicans*, *Bacillus subtilis* and *Pseudomonas aeruginosa*, while the petroleum ether fruit extract does not exhibit any activity. (Table no.1)

Table- I Antimicrobial activity of fruit extract of *Guazuma ulmifolia*

	Organisms	Zone of inhibition (mm)					
		Plant extract					
		PTF	ACF	DTF	ALF	MTF	Control
1.	<i>Salmonella typhi</i>	-	-	15	12	06	19
2.	<i>Vibrio parahaemolyticus</i>	-	15	07	09	-	17
3.	<i>Bacillus subtilis</i>	-	13	14	10	15	15
4.	<i>Candida albicans</i>	-	13	09	05	18	14
5.	<i>Pseudomonas aeruginosa</i>	-	23	13	11	13	17

Fruits extracts: PTF: Petroleum ether; ACF: Acetone; DTF: Distilled water; ALF: Alcohol; MTF : Methanol

Table- II Antimicrobial activity of leaf extract of *Guazuma ulmifolia*

	Organisms	Zone of inhibition (mm)					
		Plant extract					
		PTL	ACL	DTL	ALL	MTL	Control
1.	<i>Salmonella typhi</i>	-	-	15	12	06	19
2.	<i>Vibrio parahaemolyticus</i>	-	15	07	09	-	17
3.	<i>Bacillus subtilis</i>	-	13	14	10	15	15
4.	<i>Candida albicans</i>	-	13	09	05	18	14
5.	<i>Pseudomonas aeruginosa</i>	-	23	13	11	13	17

Leaf Extract: PTL: Petroleum ether; ACL: Acetone; DTL: Distilled water; ALL: Alcohol; MTL: Methanol.

The distilled water and alcohol leaf extract exhibit good antimicrobial activity rather than other organic solvent. The antimicrobial assay reveals that the fruit extract of *G. ulmifolia* is more effective than the leaf.

### Phytochemical screening

Phytochemical screening of *G. ulmifolia* fruit and leaf showed the presence of different groups of secondary metabolites viz. alkaloids, tannins, saponins, flavonoids, terpenoids and cardiac glycoside.

Sr.No.	Plant parts	Tannins	saponins	Flavonoids	Terpenoids	Cardiac glycosides	Alkaloids	Steroids
1	Fruit	+	+	+	+	+	+	--
2	Leaf	+	+	+	+	+	+	+

### Discussion

The preliminary phytochemical screening revealed that the leaf and fruit extracts of *G. ulmifolia* shows the presence of alkaloids, steroids, flavonoids terpenoids, saponins, which may be exhibit antimicrobial activity. Earlier workers have been reported that the phenolic compounds has the antioxidative, antidiabetic and antimicrobial activities (Arts and Hollman, 2005; Scalbeert et.al 2005). Flavonoids are a major group of phenolic compounds reported for their antiviral properties (Barnard et.al.1993), antimicrobial activity (Afolayan and Mayer, 1997).

The antimicrobial properties of *G. ulmifolia* fruit and leaf extracts were performed. The distilled water fruit exhibit remarkable activity against *S. typhi*. The acetone fruit extract is effective against *Pseudomonas aeruginosa* and *Vibroparahaemolyticus* the ethanol and methanol fruit extract was found to be the most effective against *Candida albicans*, *Bacillus subtilis* and *Pseudomonas aeruginosa*, while the petroleum ether fruit extract does not shows any activity. (Table No. 1). The antimicrobial assay reveals that the fruit extract *G. ulmifolia* is more effective than the leaf. The variations of in the effectiveness of extract against different organisms depend upon the chemical composition and membrane permeability of microorganisms for the chemical and their metabolism.

The diseases can be treated by using synthetic drugs. In recent years it is noticed that the microorganism develop resistance to these synthetic drugs due indiscriminate use of antibiotics. The phytomedicine is the only source to control or develop remedy against

such microbial strains. India has richest source of ethnomedicine. The present microbial assay proves that the diseases caused by test organisms can be controlled by fruit extract of *Guazuma ulmifolia* which may generate novel drug in future for the treatment of diseases caused by the test microorganisms.

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