



**PHYTOCHEMICALS & ANTIMICROBIAL ACTIVITY  
OF LEAVES OF *HOMONOIA RIPARIA* L.**

**RAHUL SHIVAJI PATIL<sup>1</sup>, ASHVIN G. GODGHATE<sup>2\*</sup>  
AND RAJARAM S. SAWANT<sup>3</sup>**

<sup>1</sup>Department of Microbiology, Shivaji University, Kolhapur, 416004, (M.S.) India

<sup>2</sup>Department of Chemistry, Dr. Ghali College, Gadhinglaj, 416502, (M.S.) India.

<sup>3</sup>Department of Botany, Dr. Ghali College, Gadhinglaj, 416502, (M.S.) India.

**ABSTRACT**

Present study deals with the qualitative phytochemical and antimicrobial activity of leaves of *Homonoia riparia* Lour using various extracts (Aqueous, Ethyl Acetate, n-Hexane). Aqueous extract contains more number of secondary metabolites whereas ethyl acetate extract contains a least number. Antimicrobial activity of *Homonoia riparia* leaf extract was tested against *Proteus vulgaris*, *Staphylococcus aureus*, *Salmonella typhimurium*; *Bacillus cereus* by agar well diffusion methods. The n-hexane extracts does not show inhibition against any organism while ethyl acetate extract shows a significant range of inhibitory effect against *Proteus vulgaris*, *Salmonella typhimurium*, *Bacillus cereus*.

**KEYWORDS:** *Homonoia riparia* Lour, Phytochemical Analysis, Antimicrobial Activity.



**ASHVIN G. GODGHATE**

Department of Chemistry, Dr. Ghali College, Gadhinglaj, 416502, (M.S.) India.

## INTRODUCTION

Men and animals depend on the plant for their existence. Our Environment is characterized by rich diversified plant life. Plant diversity is composed of more than 5,00,000 Botanical species<sup>1</sup>. About 20 % of the plant across the world has been submitted for Pharmacological or Biological test. A large number of Antibiotic introduced to the market are from natural or semi-synthetic resources<sup>2</sup>. Medicinal plants are of great importance to the health of individuals and communities. The medicinal value of these plants lies in some chemical substance that produces a definite physiological action on the human body<sup>3</sup>. The most important of these bioactive constituents of plants are Alkaloids, Tannins, Flavonoids and Phenolic compounds<sup>4</sup>. Therefore it has becomes extremely important to make an effort towards standardization of the plant material to be used as medicine. *Homonoia riparia* Lour, is a shrub attaining height of 1 to 3 meters. The leaves are linear- lanceolate, numerous, all closely set, 12 to 20 cm long and 1.5 to 2 cm wide, upper surface is green and shining & lower surface brown and hairy<sup>5</sup>. It is widely distributed in India, China, Malaysia, Indonesia and Philippines. It is usually inhabiting in rocky river beds<sup>6,7,8,9,10</sup>. In traditional medicine *Homonoia riparia* is good for ulcer, strangury, urinary discharges and vesicalcalculi. A decoction is given for piles, stone in bladder, gonorrhoe and used as diuretics<sup>11</sup> and posses antiurolithiatic activity<sup>12</sup>. The present study investigates the antimicrobial activities (Gram positive & Gram negative) of two different solvent extract from *Homonoia riparia* also qualitative phytochemical analysis from leaves extracts of *Homonoia riparia* which was not mentioned earlier.

## MATERIALS AND METHODS

### Collection of Plant material

Fresh leaves of *Homonoia riparia* were collected from Ramtirth area (Near the Bank of Hiranyakeshi River) of AjaraTahsil of Kolhapur district.

### Identification

The sample was authenticated by Smt. Chivalkar S.A., Department of Botany, Dr.Ghali College, Gadhinglaj, Kolhapur District.

### Preparation of Test extract

150 gm powder of dried leaves of *Homonoia riparia* was mixed with 500 ml of n- hexane and ethyl acetate separately. After filtration, the filtrate was dried and used for phytochemical test. For water extract 150 gm powder of dried leaves were mixed with 700 ml of distilled water and heat on water bath for 1/3<sup>rd</sup> of original concentration . Then it was used for further analysis.

### Test Organisms

*Proteus vulgaris* (NCIM 2813), *Bacillus cereus*(NCIM 2703), *Staphylococcus aureus* (NCIM 2654), *Salmonella typhimurium* (NCIM 2501).

### Antimicrobial activity Bioassay

Antimicrobial activity of the leaf extract of *Homonoia riparia* against various microorganisms (Table 2) was determined by using agar well diffusion method using nutrients Agar<sup>13</sup>. 1 gm leaf extract was dissolved in 10 ml n-hexane and in 10 ml ethyl acetate separately to get concentration 10 % and kept overnight for extraction. Each plate was spread with 0.1 ml of suspension. 50  $\mu$ l & 100  $\mu$ l extract were added in each well respectively. The plates were incubated at 37<sup>o</sup>C For 24 hrs. The antimicrobial activity was observed as inhibition zone.

### Qualitative Phytochemical Analysis

All the extracts of plants were individually analyzed for the various classes of phytochemicals (Table 1) using standard methods<sup>14, 15, 16, 17, 18,19</sup>.

## RESULTS AND DISCUSSION

For various extracts, chemical test was performed and the results were presented in Table 1. In the chemical test results aqueous extracts contains high number of

phytochemicals qualitatively whereas ethyl acetate extract contains very low number of secondary metabolites. The data (Table 2) revealed that ethyl acetate extracted sample with 10 % effective concentration inhibited the growth of *Proteus vulgaris* and *Bacillus cereus*

both at 50 µl & 100 µl of sample while for *Salmonella typhimurium* at 100 µl. The results obtained may support the use of *Homonoia riparia* in traditional medicine for treatment of Urinary Tract Infections, Typhoid fever and Dermal Infection.

**Table 1**  
**Qualitative Phytochemical Analysis of leaves of *Homonoia riparia***

Sr. No.	Particulars	A.E.	E.A.E.	N.H.E.
1.	Carbohydrate			
	a) Molisch's Test	-	-	-
	b) Barfoed's Test	+	-	+
	c) Iodine Test	-	-	-
	d) Benedicts Test	+	-	+
	e) Osazone Test	+	-	-
2.	Proteins			
	a) Xanthoproteic	-	+	-
	b) Biurete	+	+	+
	c) Millions	+	-	+
	d) Tannic acid Test	-	-	-
3.	Amino Acids			
	a) Ninhydrin Test	-	-	-
	b) Lead Acetate	-	+	-
4.	Flavonoids			
	a) NaOH Test	+	+	+
	b) NH <sub>4</sub> OH Test	+	+	+
	c) Mg Test	+	-	+
	d) Zn Test	-	-	-
5.	Alkaloids			
	a) Wagner's Test	-	+	+
	b) Dragendorff's Test	+	-	-
	c) Hager's Test	+	+	+
	d) Iodine Test	-	-	-
6.	Saponin			
	a) Foam Test	+	+	+
	b) Honey Comb Test	+	-	+
7.	Lignin's			
	a) Furfuraldehyde Test	+	+	+
	b) Labat Test	-	-	-
8.	Vitamin C.			
	a) DNPH Test	-	-	-
9.	Gums and Mucilage	-	-	+
10.	Tannin			
	a) Gelatin Test	-	-	-
	b) FeCl <sub>3</sub> Test	-	+	+
	c) Lead Acetate	+	-	+
11.	Fatty Acids	+	-	-
12.	Fixed Oils & Fats	-	-	-
13.	Phenolics	+	-	-
14.	Resin			
	a) Ethanolic Test	+	+	+
	b) HCl Test	-	-	-
15.	Starch			
	a) Lugol's Test	-	-	-
16.	Cardenolites	+	-	-
17.	Triterpenoids			
	a) Tschugajeu	+	-	-
18.	Flavones	+	-	-

19.	Quinones	+	+	+
20.	Flavanones	+	+	+
21.	Anthocyanin			
	a) NH <sub>3</sub> Test	-	-	-
22.	Anthraquinones	+	-	+
23.	Steroids			
	a) Chloroform Test	+	+	-
24.	Betacyanin	-	-	-
25.	Coumarins	-	+	+
26.	Acid	-	-	-
27.	Phlobatannin	-	-	-
28.	Leucoanthocyanin	-	-	-
29.	Chalcones	+	-	-
30.	Cardiac Glycosides	+	+	+
31.	Phytosterol	+	+	+
32.	Diterpene	-	+	+
33.	Emodins	-	-	-

+ = Present; - = Absent; A.E. = Aqueous Extract; E.A.E. = Ethyl Acetate Extract; N.H.E. = n-Hexane Extract

**Table 2**  
**Antimicrobial Activity of leaf extract of *Homonoia riparia***

Microorganism	Zone of Inhibition (mm)			
	n- Hexane		Ethyl Acetate	
	50 µl	100 µl	50 µl	100 µl
<i>Proteus vulgaris</i>	--	--	10	20
<i>Bacillus cereus</i>	--	--	10	24
<i>Staphylococcus aureus</i>	--	--	--	--
<i>Salmonella typhimurium</i>	--	--	--	14

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