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

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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.**

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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[1].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[2]. 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[3]. The most important of these bioactive constituents of plants are Alkaloids, Tannins, Flavonoids and Phenolic compounds[4]. 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[5]. It is widely distributed in India, China, Malaysia, Indonesia and Philippines. It is usually inhabitating in rocky river beds[6,7,8,9,10]. In traditional medicine *Homonoia riparia* is good for ulcer, strangury, urinary discharges and vesicalcalcutti. A decoction is given for piles, stone in bladder, gonorrhaoe and used as diuretics[11] and posses antiurolithiatic activity[12]. 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 Hiranykeshi 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 1/3rd 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[13]. 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 µl& 100 µl extract were added in each well respectively. The plates were incubated at 37^{0}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[14, 15, 16, 17, 18,19.]

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_4OH 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) $FeCl_3$ 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_3 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
Proteus vulgaris	--	--	10	20
Bacillus cereus	--	--	10	24
Staphylococcus aureus	--	--	--	--
Salmonella typhimurium	--	--	--	14

REFERENCES

1. D. Thirumalai, M, Paridhavi, M. Gowtham. A Phytochemical review on *Premna species*. International Journal of Research in Phytochemistry& Pharmacology. 1(4):196-200, (2011).
2. Mothana R.A., Lindequist U. Antimicrobial activity of some medicinal plants of the Island Soqotra. J. Ethnopharmacol. 96 (1-2): 177-181, (2005).
3. H.O. Edeoga, D.E. Okwu and B.O.Mbaebie. Phytochemical Constituents of Some Nigerian medicinal plants. African Journal of Biotechnology. 4(7): 685-688, (July 2005)
4. S.S. Sawhney, M. Amin Mir, Sandeep Kumar. Phytochemical Screening and Antioxidant properties of *Bauhinia Variegata*. International Journal of Research in Phytochemistry& Pharmacology. 2(1): 21 -24, (2012).
5. Gamble JS. The flora of the Presidency of Madras Vol . 3. Calcutta: BSI,. PP. 1333, (1957).
6. Hookar JD. Flora of British India Vol-5 London. International Book Distribution. Pp.455, (1887).
7. Henry AH, Kumary GR, Chaithra V. Flora of Tamilnaduedn 3. Coimbatore: Botanical Survey of India pp. 232, (1983).
8. Pullaiha T., Ali Maulai D. Flora of Andra Pradesh (India). Vol 2 JodhpurScientific Publisher, pp. 871-872, (1997).
9. Yogananrasimhan SN, KrishnaierSubramanyam. Flora of Chickmangalure District, Karnataka . International Book Distributors, pp.302, (1981).
10. Yadav, S.R. and M.M. Sardesai. Flora of Kolhapur District .Shivaji University, kolhapur pp.435, (2002).
11. Kirtikar KR, Basu BD. Indian Medicinal Plants, vol-3. Dehradun. Bishan Singh Mahendra Pal Singh, pp. 2272-2273, (1935).
12. Prasad KVSRG, Srnivasan KK. Evaluation of certain fractions of *Homonoia riparia* for Antiurolithiatic

activity in albino rats.Ind. J.Pcol, 29(1): 40-41, (1997).
13. Rodge, S.V. and Biradar S.D. Antimicrobial activity of *Coccinia Grandis* (L.) Voigt. Bioinfolet, 7 (1):1-3, (2012).
14. SeemaFiradouse, ParwezAlam. Phytochemical investigation of extract of *AmorphophallusCampanulatus* tubers. International Journal of Phytomedicines, 3: 32-35, (2011).
15. S.De, Y.N.Dey, A.K. Ghosh. Phytochemical investigation and Chromatographic Evaluation of the different Extracts of Tuber of *AmorphaphallusPaeonifolius* (Araceae). International Journal of Pharmaceutical and Biomedical Research 1 (5): 150-157, (2010).
16. Sunil H. Ganatra, Sweta P. Durge, Patil S.U. Preliminary Phytochemical investigations and TLC Analysis of *Ficusracemosa* leaves. Journal of chemical and Pharmaceutical Research , 4 (5): 2380-2384, (2012).
17. AshokanDamodaran and SandhyaManohar. Qualitative Screening for Phytochemicals of various solvents extracts of *Cassia alata* Linn. Leaves. Herbal Tech Industry, 11-13, Jan (2012).
18. Harborne JB. Phytochemical Methods: A guide to modern techniques of plant analysis. Chapman and Hall. New York, pp. 279. 3rdEditon. (1973).
19. Sofowora A. Medicinal Plants and Traditional Medicinal in Africa. 2nd Ed. Sunshine House, Ibadan, Nigeria : Spectrum Book Ltd; Screening Plants for Bioactive Agents pp. 134-156, (1993).