INVESTIGATION OF PRELIMINARY PHYTO CHEMICAL AND ANTI MICROBIAL ACTIVITY OF *TECOMARIA CAPENSIS* (THUNB) SPACH LEAVES EXTRACT

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Summary

Different extracts,petroleum ether, n-hexane, chloroform, ethyl acetate, ethanol and water of *Tecomaria capensis* (Thunb.) Spach leaves are used to study the preliminary phytochemical screening and antimicrobial activity. The different extracts explored different phytoconstituents such as Glycoside, saponin, steroids, volatile oil majorly . flavonoids, proteins, tannins, mucilages, carbohydrates and Inulin are present only trace amount. The alkaloids, amino acids, lignin and waxes are absent in all the above extracts. Activity was observed by using disc diffusion method. The chloroform extract showed significant antimicrobial activity against microorganisms used in this study. Activity was compared with negative control, Dimethyl sulfoxide (DMSO). None of the aqueous extracts showed significant activity except *E.coli*.

Key word; *Tecomaria capensis* (Thunb.) Spach, Antimicrobial activity, Disc diffusion method.

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Introduction

Tecomaria capensis (Thunb.) Spach, Bignoniaceae are commonly known as cape honeysuckle[1],is deciduous and evergreen; scrambler to small tree with a round crown.[2,3] Infusion of leaves and flowers are reported to have different activities such as Pneumonia, enteritis, Diarrhoea, Fragrance and Tonic.[4] Preliminary phytochemical screening was performed by using standard procedure and antimicrobial investigations were carried out by disc diffusion method of using different crude extracts obtained from the leaves of *Tecomaria capensis* (Thunb.) Spach. The different extracts explored phytoconstituents such as Glycoside, saponin, steroids and volatile oil majorly. Flavonoids, proteins, tannins, mucilages, carbohydrates and Inulin are present only trace amount. The alkaloids, amino acids, lignin and waxes are absent in all the above extracts. Antimicrobial activity observed by using different concentrations (10µg, 20µg) of various extracts was performed. The chloroform extract showed significant antimicrobial activity against microorganisms used in this study. Activity was compared with negative control, Dimethyl sulfoxide (DMSO).None of the aqueous extracts showed significant activity except *E.coli*.

Materials and Methods

Plant material

The leaves of *Tecomaria capensis* (Thunb.) Spach was collected from Guntur district, A.P, was authenticated by the plant taxonomist Dr. S.M.Khasim, Dept. of Botany and microbiology, Acharya Nagarjuna University, Guntur. A.P. and voucher specimen was deposited. After authentication, fresh plant material was collected in bulk, washed under running tap water to remove adhering material, dried under shade and pulverized in a mechanical grinder. The coarse powder was passed through sieve no. 60#.

Preparation of plant Extracts

The extraction of 1 kg dried coarse powder of the *Tecomaria capensis* (Thunb.) Spach leaves was carried out by continues hot percolation method process using with petroleum ether (60-80^{0}C), n-Hexane, chloroform, ethyl acetate, ethanol and aqueous respectively. They were then filtered through muslin cloth. Then the filtrates were concentrated under reduced pressure to obtain residues.

Phytochemical Analysis

Preliminary phytochemical screening of the leaves extracts of *Tecomaria capensis* (Thunb.) Spach was performed as per standard procedure.[5, 6]

Test microorganisms

Microorganisms like *Klebsiella pneumoniae, Staphylococcus subtillis, Escherichia coli and Staphylococcus aureus* were used for the screening of antimicrobial activity.

Antimicrobial screening

The antimicrobial activities of different extracts of *Tecomaria capensis* (Thunb.) Spach leaves were determined at different concentrations (10µg/ml, 20µg/ml in dimethyl sulfoxide) against microbes by agar diffusion technique using a paper disc. Microbial cultures were firmly swept over the agar (nutrient agar medium) plate using sterile cotton swab to make uniform culture lawns. The saturated disc of different concentration of test compounds was placed on agar plates. Allowed the plates to stand at room temperature for 30 minutes (pre-incubation). Inoculated plates were incubated at 37°C for 24 hr. The inhibition zones were recorded with the help of scale and the result is summarized in Table 1. Sterile dimethyl sulfoxide without plant extracts served as negative control DMSO (20µl/disc).[7, 8]

Results and Discussion

The different extracts explored different phytoconstituents such as Glycoside, saponin, steroids and volatile oil majorly. Flavonoids, Proteins, Tannins, Mucilages, Carbohydrates and Inulin are present only trace amount. The alkaloids, amino acids, lignin and waxes are absent in all the above extracts. Results were tabulated in table no 1. The antimicrobial activity of the extracts at different concentration was determined. All the six extracts at different concentration (10µg/ml, 20µg/ml in dimethyl sulfoxide) exhibited antimicrobial activity against all microbial strains tested. Results were tabulated in table no 2. Chloroform extract exhibited comparably a high degree of activity than the other extracts (petroleum ether, n-hexane, ethyl acetate, ethanol and water). In the present antimicrobial screening, 20µg/ml of all the extracts were taken for the evaluation of the activity. Chloroform extract (20µg/ml) was found to possess the broadest antimicrobial activity and, n-hexane, ethyl acetate, petroleum ether was found to be

moderately active, while ethanol and water extract didnot show considerable activity. The ethanolic extract was most effective against *K.Pnemonia and B.Subtillis* (Gram positive bacteria) with diameter of zone of inhibition 14.0mm (conc. 20µg/ml) respectively,and was least effective against E.Coli (Gram negative bacteria) with diameter of zone of inhibition 10.0mm (conc. 20µg/ml). Amongst the Gram negative bacteria, the ethanolic extract showed less activity against all the four microorganisum. Phytochemical studies on *Tecomaria Capensis* leaves revealed the presence of carbohydrates, steroids, alkaloids, glycosides, tannins, saponins, flavones, and phenolic compounds. The antimicrobial activity of *Tecomaria Capensis* may be due to one/more group of above phytoconstituents.

Table -1 Preliminary phytochemical screening of *Tecomaria capensis leaves extracts*

TEST	PET.ETHER	N-HEXANE	CHLOROFORM	ETHYL ACETATE	ETHANOL	WATER
Alkaloids	--	--	--	--	--	--
Cardiac glycosides	++	++	++	++	++	--
Saponin Glycosides	++	++	++	++	--	--
Coumarian glycosides	--	--	--	++	++	--
Carbohydrates	--	--	--	++	--	--
Flavanoides	--	--	++	++	++	++
Protein	--	--	--	++	++	--
Amino acids	--	--	--	--	--	--
Steroids	--	++	++	++	++	--
Tannins	--	--	--	--	++	--
Inulin	--	--	--	--	++	++
Volatile oil	++	++	++	++	++	--
Waxes	--	--	--	--	--	--
Mucilage	--	--	--	--	++	++

++ present, -- absent

Table -2 Anti microbial activity of *Tecomaria capensis leaves extracts*

	AVERAGEZONE OF INHIBITION (mm)												
	Pet ether		n-hexane		Chloroform		Ethyl acetate		Ethanol		Aqueous		DMSO
Micro Organism /disc 20	10µ	20µg	10µg	20µg	10µg	20µg	10µg	20µg	10µg	20µg	10µg	20µg	20µl
K.Pneumonia	07	11	07	13	09	14	07	13	07	11	--	--	--
B.Subtilis	09	13	08	13	07	14	08	12	07	10	--	--	--
E.Coli	08	12	07	12	08	10	08	12	--	9	6	9	--
S.Aureus	08	13	09	14	09	12	07	12	07	12	--	--	--

Conclusion

From the results, it can be concluded that the *Tecomaria Capensis* leaves extracts find use as narrow-spectrum antimicrobial agent after extensive investigation. Further work will emphasize the isolation and characterization of active principles responsible for antimicrobial activity of leaf extracts of *Tecomaria Capensis.*

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