IN *VITRO* ANTIMICROBIAL ACTIVITY OF *JATROPHA CURCAS* LINN. LEAVES

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Summary

In the present study *in-vitro* antimicrobial activity of petroleum ether (40^0-60^0) and aqueous extracts of the air-dried leaves of *Jatropha curcas* Linn. was carried out by using cup-plate method on *Staphylococcus aureus* (Gram +ve) and *Escherichia coli* (Gram –ve). The antimicrobial activity of the both extracts was compared with standard drug (Benzyl penicillin). Aqueous extract showed most significant antimicrobial activity against *Staphylococcus aureus* and *Escherichia coli* when compared with standard drug.

Keywords: Antimicrobial activity, Cup-Plate method, *Jatropha curcas*.

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Introduction

The leaves of *Jatropha curcas* Linn belonging to the family Euphorbiaceae is a large shrub, 3-4 m high, native of tropical America, occurring throughout India and In Andaman and Islands known as Jangalierandi in Hindi [1]. The leaves of *Jatropha curcas* Linn. contain apigenin, vitexin and isovitexin. α amyrin, stigmasterol, stigmastenes along with two new flavonoids founds in leaves and twigs [2]. Three Deoxypreussomerins, Palmarumycins CPI, JC1and JC2 have been isolated from stem of *Jatropha curcas* Linn. [3].

Leaves are galactagogue, rubefacient, suppurative, insecticidal and are used in foul ulcers and tumors. It is successful local remedy for scabies, eczema and ringworm [4]. Literature survey reveals that there is no report available regarding antimicrobial activity of leaves *Jatropha curcas* Linn. In present investigation we have subjected the *Jatropha curcas* leaves to antimicrobial activity against various organisms by using different concentration of petroleum ether and aqueous extract.

Material and Methods

Procurement of Plant material

The leaves of *Jatropha curcas* Linn. have been collected from the local area of Nandurbar (Maharashtra). This plant is authentifying by Dr. Santosh Tayade, Dept. of Botany, Art's, Science and Commerce College, Lonkheda, Shahada, Dist-Nandurbar (MS).

Preparation of extract

Leaves were air-dried, pulverized and extracted with light petroleum ether (40-60°C) and macerated with water. Extract was dried over anhydrous sodium sulphate and solvent was removed in vacuum at 40°C by using rotary evaporator (Rotavapour Buchii, Switzerland) [5, 6]**.** Different concentrations of petroleum ether and aqueous extracts equivalent to 50 μg/ml, 100 μg/ml and 200 μg/ml were prepared.

Evaluation of Anti-Microbial activity

The anti-microbial activity of the extracts of *Jatropha curcas* Linn. leaves were performed by Agar cup-plate method [7]. The extracts and reference standard were dissolved separately in DMF (Di-methyl formamide) at concentrations of 50 μg, 100 μg and 200 μg / ml. Benzyl penicillin was used as a reference standard. Solvent control (only DMF) was also maintained throughout the experiment. The selected micro-organisms for the study of anti-microbial activity were *Staphylococcus aureus* and *Escherichia coli*.

The zone of inhibition of antimicrobial activity of various extracts of *Jatropha curcas* Linn. leaves was calculated by measuring the inhibitory effect towards the growth of microorganism around nutrient agar cup and also compared with the standard drug (Benzyl penicillin). The results were mentioned in Table no. 1.

Results and Discussion

Results of antimicrobial activity showed that aqueous extract possess potential antimicrobial activity as shown in the Table no.1. The result obtained indicates that the aqueous extract had shown maximum zone of inhibition at 200 μg/ml in both the case of bacteria. The zone of inhibition for *Staphylococcus aureus* and *Escherichia coli* was 20 mm and 19 mm respectively.

The minimum zone of inhibition at 100 µg/ml & 50 µg/ml for *Staphylococcus aureus and Escherichia coli* was 19 mm and 16 mm & 17 mm and 15 mm respectively.

The result obtained indicates that the petroleum ether extract had shown maximum zone of inhibition at 200 µg/ml in both the case of bacteria. The zone of inhibition for *Staphylococcus aureus* and *Escherichia coli* was 16 mm and 17 mm respectively. The minimum zone of inhibition at 100 µg/ml & 50 µg/ml for *Staphylococcus aureus and Escherichia coli* was 14 mm and 10 mm & 13 mm and 9 mm respectively. All the results are compared with standard antibiotics Benzyl Penicillin for antimicrobial activity.

Quantitative Chemical investigation revealed the presence of Flavonoids and Saponins in aqueous extract. Antimicrobial activity may be attributed due to the presence of flavonoids [8, 9]. The detailed chemical nature of active principle responsible for antibacterial and antifungal property is under progress.

From above result it was concluded that the antimicrobial activity of aqueous extract of *Jatropha curcas* Linn. leaves was maximum at 200µg/ml for organism *Staphylococcus aureus* and *Escherichia coli*.

Table No. 1

Antimicrobial Activity of leaves of *Jatropha curcas* Linn.

Name of Organisms	**Zone of Inhibition in mm**						
	Petroleum ether Extract			**Aqueous Extract**			**Std.**
	Concentration in µg/ml						
	50	**100**	**200**	**50**	**100**	**200**	**100**
Staphylococcus aureus (Gram +ve)	10	14	16	16	19	20	24
Escherichia coli (Gram –ve)	09	13	17	15	17	19	25

Values are average of three determinations.

Standard antibiotic Benzyl penicillin for antimicrobial activity.

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