ejpmr, 2018,5(9), 327-329

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

COMPARISON OF ANTIMICROBIAL PROPERTY OF FICUS RACEMOSE AND NYCTANTHES ARBOR - TRISTIS

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Article Received on 05/07/2018 **Article Revised on 25/07/2018** **Article Accepted on 14/08/2018**

ABSTRACT

Medicinal plants represent a rich source of antimicrobial agents. The traditional medicine involves the use of different plant extracts of bioactive constituents.[1] The present study was undertaken with an objective to find out the antibacterial activity of *Ficus recemosa* Linn and *Nyctanthes arbor-tristis* leaves against microorganisms.

KEYWORDS: *Ficus recemosa*, *Nyctanthes arbor- tristis*, umber, night jasmine, antimicrobial property, disc diffusion.

1. INTRODUCTION

Apart from synthetic antimicrobial agents, natural or herbal antimicrobial agents are now stepping forward in Cosmetic and cosmecutical industries.[1] Natural ingredients have been used for centuries for skin care purposes. Nowadays, they are becoming more prevalent in formulations, due to consumers' concerns about synthetic ingredients/chemical substances. The main benefits reported for plant extracts, used in skin care, include antioxidant and antimicrobial activities and tyrosinase inhibition effect.[2]

Plants produce a whole series of different compounds which are not of particular significance for primary metabolism, but represent an adaptive ability of a plant to adverse abiotic and biotic environmental conditions. They can have a remarkable effect to other plants, microorganisms and animals from their immediate or wider environment. All these organic compounds are defined as biologically active substances, and generally represent secondary metabolites, given the fact that they occur as an intermediate or end products of secondary plant metabolism. These secondary metabolites, apart from determining unique plant traits, such as: color and scent of flowers and fruit, characteristic flavor of spices, vegetables, they also complete the functioning of plant organism, showing both biological and pharmacological activity of a plant.[3]

Antibacterial secondary metabolites are usually classified in three large molecule families: phenolics, terpenes and alkaloids.[4]

1.1. OBJECTIVE

Comparison of antimicrobial activity of *Ficus recemosa* Linn and *Nyctanthes arbor-tristis* leaves against microorganisms, (*Staphalococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa* and *Candida albicans)* with standard antibiotic (Tetracycline).

2. MATERIAL AND METHODS

- ***Ficus racemose***

2.1. Botanical descripition: Scientific name: Ficus racemosa.

Common name: Indian fig, Umber, Udumbara, Gular fig, Cluster fig, Country fig, Cluster Fig Tree, Goolar.

Family: Moraceae.

Chemical constituents of leaves: Tetra triterpene, tannins, glauanol acetate, racemosic acid.[5]

- ***Nyctanthes arbor-tristis***

2.2. Botanical descripition Scientific name: Nyctanthes arbor-tristis.

Common name: Tree of Sorrow, Night Jasmine, Coral Jasmine, Parijathak, Parijaat, Harsingar, Shephaali.

Family: Oleaceae[6]

Chemical constituents of leaves: Leaves contain D-mannitol, β-sitosterole, Flavanol glycosides, Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, Tannic acid, Ascorbic acid, Methyl salicylate, Amorphous glycoside, Amorphous resin, Trace of volatile oil, Carotene, Friedeline, Lupeol, Mannitol, Glucose, Fructose, Iridoid glycosides, Benzoic acid.[7]

2.3. Collection and authentication of herbs: The leaves of *Ficus racemose* (umber/ cluster figs) and *Nyctanthes arbor-tristis* (night jasmine) were collected from local garden in Nagpur.

The leaves were authenticated botanically, from the Department of Botany of Rashtrasant Tukdoji Maharaj Nagpur University.

3. METHODOLOGY

3.1. Extraction of herbs

The fresh leaves of Umber and Night jasmine were washed, cleaned and subjected to air dried in shade under normal environmental conditions for 3-4 days. The leaves were charged into Soxhlet apparatus, and sequential Soxhlation of herbs was carried out on the basis of polarity of solvent, i.e; first from Water, then alcoholic and later acetone. The extraction with each solvent was carried out up to 25-30 cycles. Solvent was evaporated to obtained pure extract.[8]

3.2. Phytochemical analysis of herbs

The phytochemical analysis of the herbs were carried out and are noted in table no: 1.

Table 1: Phtochemical evaluation of herbs.

SR. NO	HERBS		Phytochemical Tests for Herbs		
			For tannins	For phenolics componds	For terpen oids
1	Umber	Water	+	+	+
		Alcoholic	+	+	+
		Acetone	-	-	-
2	Night jasmin	Water	+	+	+
		Alcoholic	+	+	+
		Acetone	-	-	-

3.3. Antimicrobial assay of *Ficus recemosa* Linn and *Nyctanthes arbor-tristis*

Anti microbial activity of herbal extract was examined before incorporation in the product using Disc diffusion method and zone of inhibition were noted.[9]

3.3.1. Procurement of organism

The standard bacterial cultures used for this study were proccured from MTCC. The cultures were subcultured and grown in nutrient agar medium.

3.3.2. Microorganisms used

Pseudomonas aeruginosa, *Staphylococcus epidermis*, *Candida albicans*, *Staphylococcus aureus* Standard antibiotic disc (tetracycline) was used for the control. Similarly all the other bacterial cultures were introduced in the plates and test samples were introduced and mark properly. All the above procedure was carried out in a laminar flow and in aseptic chambers. Plant extracts were tested in different concentration as 0.05% and 0.1%.[9]

3.3.3. Zone of Inhibition

The zone of inhibition was observed on the next day (approx. after 24 hour), it was measured in millimeters with the help of scale. The zone of inhibition of extracts is mentioned from Table no.: 2-5.

Table 2: Comparison of Zone of inhibition for 0.05% aqueous extracts of herbs against organism.

Zone of inhibition (mm)				
Sr. no	ORGANI SMS	CONTR OL	UMB ER	NIGHT JASMINE
1	C. albicans	30	**14**	10
2	P. aeruginos a	30	**12**	-
3	S. epidermid is	22	**14**	10
4	S. aureus	30	**16**	8

Table 3: Comparison of Zone of inhibition for 0.1% aqueous extracts of herbs against organisms.

Zone of inhibition (mm)				
Sr. no	ORGANI SMS	CONTROL	UMBER	NIGHT JASMINE
1	C. albicans	34	**16**	10
2	P. aeruginosa	26	**14**	-
3	S. epidermidis	24	**16**	10
4	S. aureus	24	**16**	12

Table 4: Comparison of Zone of inhibition for 0.05% alcoholic extracts of herbs against organisms.

Zone of inhibition (mm)				
Sr. no	ORGANI SMS	CONTROL	UMBER	NIGHT JASMINE
1	C. albicans	30	**14**	10
2	P. aeruginosa	26	**12**	-
3	S. epidermidis	20	**14**	8
4	S. aureus	24	**10**	8

Table 5: Comparison of Zone of inhibition for 0.1% alcoholic extracts of herbs against organisms.

	Zone of inhibition (mm)			
Sr. no	**ORGANI SMS**	**CONTROL**	**UMBER**	**NIGHT JASMINE**
1	C. albicans	36	**16**	12
2	P. aeruginosa	32	**16**	-
3	S. epidermidis	22	**14**	12
4	S. aureus	20	**12**	8

4. RESULT

Umber was seen effective against all the microorganisms, but the zone of inhibition was more and prominent in 0.1% aqueous concentration as well in 0.1% alcoholic concentration, i.e; 16mm. When compared with standard (Tetracycline) it was observed that with increase in concentration there was no significant difference in zone of inhibition of both aqueous and alcoholic concentration.

5. DISCUSSION AND CONCLUSION

The extracts haves also been reported to possess significant medicinal and pharmacological properties like antimicrobial, anti-oxidant and anti- cancer, etc. the antimicrobial assay was reported in- between 0.08%-1% for these herbs, therefore an intermediate concentration as 0.05% and 0.1% was selected common for these two herbs.

As mentioned, the antimicrobial assay was carried out of herbs Umber and Night jasmine leaves against microorganisms, where Umber showed better antimicrobial action than Night jasmine. Further in terms of concentration in both aqueous and alcoholic extracts of Umber there is no significant difference in both the cases.

If the concentration is still increased, then the activity may be increased. Finally, it is concluded that, Umber extract at higher concentration may give better result.

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