



## Antimicrobial activity of *Vitex negundo* against pathogenic bacteria

Sunita Khatak\*, Jalaj Naagar, Anuj Gupta and Deepak Kumar Malik

Department of Biotechnology Engineering, University Institute of Engineering & Technology,  
Kurukshetra University, Kurukshetra-136119, Haryana, India

Received on:21-11-2013; Revised on: 08-12-2013; Accepted on:10-01-2014

### ABSTRACT

The present investigation indicates that *C. Albicans* was most sensitive towards the methanolic extract where as *S. mutase* was least sensitive towards methanolic extract of *Vitex negundo*. The maximum zone of inhibition (28 mm) was shown by both leaf and bark chloroform and methanolic extract against *C. Albicans*. The minimum zone of inhibition (12 mm) was shown by leaf methanolic extract against *S. mutase*.

**Key words:** Antimicrobial activity, *Vitex negundo*, pathogenic bacteria

### INTRODUCTION

Medicinal plant represents a rich source of anti-microbial agents. Plants are used medicinally in different countries and are source of many potent and powerful drugs. A wide range of medicinal plants parts are used for extra as raw drugs and they possess varied medical properties, the vast majority of them have not been adequately evaluated<sup>1</sup>. Literature suggests that plants are sleeping giants of pharmaceutical industries<sup>2</sup>. *Vitex* is a fast growing edible herb which belongs to family Lamiaceae. It is considered as a valued medicinal plant in folklore, rural medicine and also ayurvedha. Leaves of *Vitex negundo* have been investigated for anti-inflammatory activity in past including its mechanism and action. Similarly, fresh leaves of *Vitex negundo* have been suggested to possess anti-inflammatory and pain suppressing activities possibly mediated via prostaglandin (PG) synthesis inhibition, antihistaminic, membrane stabilizing and antioxidant activities. The potential for developing antimicrobials from higher plant is rewarding as it will lead to development of phytomedicine to act against microbes. The secondary plant metabolites (phytochemical) with unknown pharmacological activity have been extensively investigated as a source of medicinal agents. In the background of conversation, a study was undertaken to evaluate the activity of *Vitex negundo* against pathogenic bacterial strains.

### MATERIAL AND METHODS

#### Culture collection

The various human pathogenic microorganisms were procured from Microbial Type Culture Collection (MTCC): Institute of Microbial

#### \*Corresponding author.

Sunita Khatak  
Department of Biotechnology Engineering,  
University Institute of Engineering & Technology,  
Kurukshetra University, Kurukshetra-136119,  
Haryana, India

Technology (IMTECH), Chandigarh; which included Gram-negative bacteria: *Escherichia coli* (MTCC 5704) *Pseudomonas aeruginosa* (MTCC 2295); and Yeast: *Candida albicans* (MTCC 3017).

#### Preparation of *Vitex negundo* bark extract

The bark of *Vitex negundo* were thoroughly washed with clean water and allowed for sun drying for seven days and grounded into fine powder. The 5 gm of *Vitex negundo* powder was soaked in 50 ml (chloroform and methanol) and incubated for 72 hr at room temperature. The extract was filtered with whatman filter paper. The extra solvent from the filtrate was evaporated by using water bath at 58°C. The extracts were stored at 4°C for further use.

#### Preparation of *Vitex negundo* leaves extracts

The leaves of *Vitex negundo* were thoroughly washed with water then allowed for shadow drying for four days at room temperature and grounded into fine powder. The 5gm of *Vitex negundo* powder was soaked in 50 ml of petroleum ether, chloroform, water: ethanol (1:1) and incubated for 48 hr at room temperature. The extracts were filtered with Whatman filter paper. The extra solvent from the filtrate were evaporated by using water bath (chloroform and methanol). The extracts were stored at 4°C further use.

### RESULTS AND DISCUSSION

Plants are important source for the development of new chemotherapeutic agents. In the present study antimicrobial activity of organic extracts of *Vitex* was evaluated against pathogens such as *E. coli*, *S. aureus*, *S. mutans* and *P. aeruginosa*. The study revealed *C. Albicans* was most sensitive towards the methanolic extract where as *S. mutase* was least sensitive towards methanolic extract as shown in **Table 1**. The maximum zone of inhibition (28 mm) was shown by both leaf and bark chloroform and methanolic extract against *C. Albicans*. The minimum zone of inhibition (12 mm) was shown by leaf methanolic extract

**Table 1. Antimicrobial activity of (bark and leaf chloroform and methanol extract) against pathogenic bacteria.**

Culture	Zone of inhibition (mm)			
	Chloroform extract		Methanol extract	
	Bark	Leaf	Bark	Leaf
<i>E. coli</i>	10	27	18	18
<i>C. albicans</i>	23	28	20	28
<i>P. aerogenosa</i>	18	26	14	26
<i>S. mutase</i>	23	15	17	12
<i>S. aureus</i>	13	12	26	16

against *S. mutase*. Plant based products have been effectively proven for their utilization as source for antimicrobial compounds. Rahimi *et al.* (2010) carried out *in vivo* studies on *Vitex* for the treatment of cyclical breast pain<sup>3</sup>. The present investigation indicates that *Vitex*

can be used in the development of new drugs. The identification and purification of these phytoconstituents and their antimicrobial potencies and toxicological evaluation with the view to formulating novel chemotherapeutic agents should be the future direction for investigation.

#### REFERENCES

1. Balandrin M F, Klocke J A, Wurtele E S, Bollinger W H. 1985. Natural plant chemicals: Sources of Industrial and Medicinal materials. *Science*. 228:1154-1160.
2. Hostettmann K and Hamburger M. 1991. Medicinal plants in Tropical West Africa, *Phytochem*. 30(12): 3864-3874.
3. Rahimi R, Shams-Ardekani M R, Abdollahi M. 2010. A review of the efficacy of traditional Iranian medicine for inflammatory bowel disease. *World Journal of Gastroenterology*, 16: 4504-4514.

Source of support: Nil, Conflict of interest: None Declared