

COMPARATIVE ANTIMICROBIAL ACTIVITY OF GARLIC AND BLACK PEPPER

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Abstract

Antibacterial activity of *Allium sativum* (garlic) and *Piper nigrum* (pepper) extracts has been evaluated against against *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Escherichia coli*. Among all methanolic extracts evaluated for antimicrobial activity garlic extracts showed excellent antimicrobial activity against almost of all pathogens tested.

Key words: Antimicrobial activity, *Allium sativum*, *Piper nigrum*, *Staphylococcus aureus*.

I. INTRODUCTION

As a developing country India is represented by rich culture, tradition and natural biodiversity and it offers a unique opportunity for drug discovery research. The spices have a unique aroma and flavour which are derived from compounds known as phytochemicals or secondary metabolites (Avato et al., 2002). According to Jachas, 2007 and Singh, 2002 number of traditional natural products have been increased and much work has been done on selected ethno medicinal plants for antibacterial activity against pathogenic strains of Gram negative and Gram positive bacteria. Further, natural products as an alternative to conventional treatment in healing and treatment of various diseases have been on the rise in the last few decades. Recently Kaur et al., 2017, Yadav et al., 2018, Yadav (2018), Ved and Mohsin (2018), and Ashish and Mohsin(2018) worked on antimicrobial activity of Indian medicinal plants. This investigation was performed to evaluate. Antibacterial activity of *Allium sativum* (garlic) and *Piper nigrum* (pepper) extracts against against *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Escherichia coli*.

II. MATERIALS AND METHODS

The plant materials were collected from local area of District Shahjahanpur of Uttar Pradesh, India.

Bacterial Strains

Staphylococcus aureus (NCIM-2079)

Escherichia coli (NCIM-2064)

Pseudomonas aeruginosa (NCIM-5210)

Solvent and Media: Methanol and Nutrient Agar

Extract Preparation: Powdered plant material was used for methanolic extract through Soxhlet apparatus. Then extract was evaporated to remove methanol and dried extract was stored at 4° C for analysis.

Agar Well Diffusion Method: Bacterial cultures were swabbed over solidified nutrient agar medium. The wells were prepared using cork borer. Test samples were dissolved in different concentrations such as 25, 50 and 100 µg/ml. The 40µl sample was loaded in wells with DMSO as negative control and amoxicillin and positive control.

III. RESULTS AND DISCUSSION

Table 1 shows antibacterial activity of *Allium sativum* (garlic) and *Piper nigrum* (pepper) extracts against *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Escherichia coli*. Results shows that plant extracts were effective against all bacterial strains. Presence of phytochemicals in plant extracts is responsible for antimicrobial activity. These plants have many medicinal uses and also a nontoxic traditional medicinal plant. The results agree with observations of previous researchers (Arora and Kaur, 1999; Elonima et al., 1983). It has been found that garlic can be used as a potent inhibitor of food pathogens and would increase the shelf life of processed foods. This study opens up the possibility for the search of new antimicrobials as an alternative to the antibiotics.

Table 1: Effect of methanolic plant extracts in vitro

	CONCENTRATION OF PLANT EXTRACTS IN µg/ml					
	<i>Allium sativum</i>			<i>Piper nigrum</i>		
	25	50	100	25	50	100
<i>Staphylococcus aureus</i> (NCIM-2079)	-	10	18	-	8	14
<i>Pseudomonas aeruginosa</i> (NCIM-5210)	-	7	16	-	6	12
<i>Escherechia coli</i> (NCIM-2064)	-	5	11	-	5	10

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