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## SCREENING FOR THE ANTIMICROBIAL POTENTIALS OF SOME OF THE PLANT EXTRACTS AND PHYTOCHEMICAL ON THE TEST ORGANISMS



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### A B S T R A C T

The antimicrobial activity of the plant extract and phytochemicals was evaluated on the test microorganisms. The test microorganisms utilized were some of the gram positive and gram negative bacteria. Extracts from the following plants were utilized: 1. *Allium cepa* L. (Dungali), 2. *Allium Sativum* L. (Lasan), 3. *Anethum Sowa* L. (Suwa), 4. *Brassica campestris* L. (Sarsav), 5. *Coleus amboinicus* Lour. (Ajamo) The phytochemicals such as Benzoic acid, Eugenol and Cinnamic acid were utilized. The highest antimicrobial potentials were observed for extracts of ajamo, sarvav, suva, Lasan and Dungali respectively which inhibited 72.7% of Test microorganisms. The results obtained with *Pseudomonas aeruginosa* was particularly interesting since it was not inhibited by suva Lasan, Dungali, ajamo and sarsav.

**Key words:** Plant extract, phytochemicals, antimicrobial activity.

#### INTRODUCTION

Plants have been a valuable source of natural product for maintaining human health and nowadays more intensive studies for natural therapies are done. The use of plant compounds for pharmaceutical purposes has gradually increased worldwide. According to WHO (1) medicinal plants are the best source to obtain a wide variety of drugs. About 80% of individuals from developed countries used traditional medicines which are derived from the medicines plants. Hence it is essential to investigate such plants to study their property, safety and efficiency.

#### MATERIALS AND METHODS

Microbial test sample:

Gram positive bacteria

1. *Bacillus subtilis* 2. *Bacillus cereus* 3. *Bacillus megaterium* 4. *Staphylococcus aureus* 5. *Candida albicans* Gram negative bacteria 6. *Salmonella typhi*

7. *Shigella* spp. 8. *Pseudomonas aeruginosa* 9. *Proteus vulgaris* 10. *E. coli* 11. *Enterobacter aerogenes*

#### Culture media and phytochemical solutions:

Brain Heart Infusion (Hi-media), Mueller Hinton agar (Hi-media), Filter paper disc (6mm diameter), [these discs were saturated with plant extract (50 micro L)]. Phytochemical solutions were purchased of CDH grade i.e. Benzoic acid, cinnamic acid, Eugenol.

**Plant Extract** The methodologies of Harbone(2) and Wagner et al(3) were used to process ethanolic extract(1:1) from five plants of our interest. The following lists of the plant of our interest were done plant parts used for extraction were as follows:

1. *Allium cepa* l. (Dungali) (Dungali-stripped and dried leaf was used for preparing extract) 2. *Allium sativum* L. (Lasan) (Dried buds of lasan was

TABLE 1  
Antimicrobial activity of plant extract by agar diffusion method

Test Organism Common names	<i>Allium cepa L.</i> (Dungali)	<i>Allium sativum L.</i> (Lasan)	<i>Anethum sowa L.</i> (Suwa)	<i>Brassica campestris</i> (Sarsav)	<i>Coleus amboinicus</i> (Ajamo)
Zone of Inhibition in mm					
1	6	10	12	6	9
2	5	9	10	5	10
3	5	6	8	6	12
4	9	5	10	12	6
5	10	10	12	8	10
6	5	8	6	5	5
7	8	6	5	10	5
8	5	5	6	6	5
9	6	9	5	10	8
10	5	6	6	6	5
11	8	6	6	5	9

(+) Susceptibility (Inhibition zone >= 7mm)  
(-) absence of susceptibility

TABLE 2  
Antimicrobial activity caused by phytochemicals through agar diffusion method.

Test Organism	Benzoic acid	Cinnamic acid	Eugenol
ZONE OF INHIBITION IN MILLIMETRES			
1	8	12	10
2	8	8	8
3	10	8	8
4	5	5	10
5	10	5	10
6	6	9	5
7	6	6	6
8	5	6	6
9	6	6	5
10	10	8	5
11	6	10	5

used to prepare extract) 3. *Anethum sowa L. (suwa)* (Dried seed powder was used to prepare the extract) 4. *Brassica campestris L. (sarsav)* (Dried leaf was used to prepare extract) 5. *Coleus amboinicus Lour. (Ajamo)* (Dried seed was used to prepare extract)

**PROCEDURE:** Screening procedure The bacterial test cultures of gram positive and gram negative bacteria were grown in Brian Heart infusion liquid medium at 37 °C for 12-14 hours at a concentration of 10<sup>8</sup> cells/ml. Then the cultures were transferred by inoculating on the surface of Mueller-Hinton agar plates. Filter paper disc (6mm

in diameter) was saturated with either extract or phytochemical (50 microL) were placed on the surface of the agar plate and each of the plates were incubated at 37<sup>0</sup> C for 24 hours. After this period, observe the plates for the zone of inhibition in mm. Zone of inhibition greater than 7 mm were considered susceptible to extract or phytochemical. The controls were the solvents used for each extract and phytochemical which showed no zone of inhibition.

**RESULT ANF DISCUSSION** Evaluation of the antimicrobial potential of plant extracts and phytochemicals. The data's related to antimicrobial activity of plant extract and phytochemicals are presented in Table 1 and Table2

**Test organisms** 1. *Bacillus subtilis* 2. *Bacillus cereus* 3. *Bacillus megaterium* 4. *Staphylococcus aureus* 5. *Candida albicans* 6. *Salmonella typhi* 7. *Shigella* spp. 8. *Pseudomonas aeruginosa* 9. *Proteus vulgaris* 10. *E. coli* 11. *Enterobacter aerogenes* The extract from Dungali, Lasan, Suva, Sarsav, Ajamo presented antimicrobial to most of the test organisms. The extracts of Ajamo, Sarsav, Suva, Lasan, Dungali presented antimicrobial activity i.e. they were able to inhibit 8 (72-7%) types of test organisms of our interest. One of the microorganisms that showed susceptibility to all these extracts was *Candida albicans*. The susceptibility of this yeast to different plant extracts has been documented in the literature (5, 6, 7, 8, 9)

Some of the extracts of phytochemicals tested were active against *B.subtilis*, *B.cereus*, *B.megaterium*. Such results were not totally unexpected since these bacteria form resting spores and are more resistant to environmental conditions. The microorganism *E. coli*, which is already known to be multiresistant to drugs was also resistant to the plant extracts. It was susceptible only to Benzoic acid, Cinnamic acid.

**R E F E R E N C E**

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