

ANTIMICROBIAL ACTIVITY OF SELECTED HERBAL EXTRACTS

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ABSTRACT: Methanolic extract of oleoresins of *Araucaria bidwilli* Hook: and aerial parts of *Cytisus scoparius* Linn. Were screened for antimicrobial activity against two bacterial strains-*Bacillus subtilis* (Gram Positive) and *Escherichia coli* (Gem negative), and two fungal strains – *Candida albicans* and *Cryptococcus neoformans* by two-fold serial dilution technique. The results showed that all the microorganisms used were sensitive to the extracts. The minimum inhibitory concentrations (MIC) for *A. bidwilli* were found to be 31.25 µg/ml for *Bacillus subtilis* and 500 µg/ml for all other organisms used in the study. In case of *C. Scoparius*, the MIC values were 250 µg/ml for *B. Subtilis* and 500 µg/ml for all the other strains used. However, in comparison the ampicillin (MIC: 62.5 µg/ml), and Amphotericin-B (MIC: 125 µg/ml), the activities of both the extracts were less except *A. bidwilli* against *B.Subtilis*.

INTRODUCTION

During past few years, as a result of intense concern will all aspects of ecology, there has been a renewed interest in natural drugs. In recent past, many works have been carried out in the field of plant-based antimicrobials. In the present work, two plants, which are locally available in Nilgiris district, have been selected to study their antibacterial and antifungal activities.

Araucaria bidwilli Hook. (Fam: Araucariaceae) is a tall dioecius, densely branched tree that grows in cool climate and at higher altitudes.¹ it is a local plant for The Nilgiris, where the tribal people use the leaves of this plant for treatment of insomnia.

Cytisus scoparius Linn. (Fam: Fabaceae/Papillionaceae) is a yellow broom foliage very dark green garden shrub. The tribal people of the Nilgiris are using this plant for diuretic and emetic properties and also in cardiovascular disorder.² In the present

study, both these plants were selected for study of antimicrobial properties.

MATERIALS AND METHODS

Plant Drug

The oleoresin of *A. bidwilli* and aerial part of *C. Scoparius* were collected during winter season in and around Ootacamund and authenticated by Medicinal plants collection unit, Government Arts college, Ootacamund. The collected plant parts and oleoresin were dried at room temperature, powdered and stored in desiccator until further use.

Preparation of Extracts

The Oleoresin (100 g) of *A. bidwilli* was extracted with methanol (300 ml) by maceration for 48 hours³ and dried under reduced pressure. The aerial parts of *C. scoparius* (100 g) were extracted using methanol (300ml) by Soxhlation-technique.³ the extract was dried under reduced. Pressure. Both the dried extracts were stored in desiccator.

Test Organisms

Two bacterial strains, *Bacillus subtilis* (Gram Positive) and *Escherichia coli* (Gram negative) and two fungal strains, *Candida albicans* and *Cryptococcus neoformans* were used for the assessment of antibacterial and antifungal activities of the extracts.

The bacterial strains were grown on nutrient agar and fungal strains were grown on saboraud's dextrose agar. Twenty four hours old cultures of bacteria and 36 hours old cultures of fungi were used for the study.

Serial Dilution technique⁴

Testing was done in seeded broth containing 10⁶ to 10⁷ colony – forming units per ml (cfu/ml). The crude extracts were taken at different concentrations ranging from 100,500,250, 125,62.5,31.25 µg/ml to determine MIC by using seeded broth as diluent. Similarly, standard drugs ampicillin and amphotericin-B were prepared at same concentrations as used in plant extracts. DMSO was used as solvent system for extracts as well standard drugs in the experiment.

The study involved a series of six assay tubes for the test compounds against each strain. In the first assay tube, 1.8 ml of seeds broth was transferred and 0.2 ml of test solution was added and mixed thoroughly to obtain a concentration of 1000 µg/ml for the extracts. To the remaining five assay tubes, 1 ml of seeded broth was transferred and then from the first assay tube, 1 ml content was pipetted out into the second assay tube and this was mixed thoroughly. This type of dilution was repeated up to 6th assay tube serially. The

same procedure was followed for standard drugs. All these experimental manipulations were carried out under absolute aseptic conditions. The experiments were done in triplicate. The assay tubes were then incubated at 37 ± 1°C (for bacterial strains) and 27 ± 1°C (for fungal strains) for 48 hours and resultant turbidities were measured using turbidity meter and MIC was calculated. Solvent controls were also observed for inhibitory action. DMSO did not show any inhibition.

RESULTS AND DISCUSSION

Results of Antimicrobial screening of the methanolic extract of oleoresin of *A. bidwilli* and *C. scoparius* were measured in terms of MIC (Figure-1.) The extracts showed antimicrobial properties on all the above-mentioned microorganisms. The methanolic extracts of oleoresin of *A. bidwilli* showed better antimicrobial activity against gram positive Organisms – *B. Subtilis* (MIC: 31.25 µg/ml), which was better than the standard drug, ampicillin. The methanolic extract of aerial parts of *C. scoparius* also exhibited good activity on all the strains used (MIC: 250 µg/ml for *B. subtilis* and 500 µg/ml for all other strains), but its activity was less than standard drugs. The activities of *A. bidwilli* on the Gram-negative organism (*E.coli*) and on both fungal strains (MIC: 500 µg/ml) were less than the standard drugs.

Hence, the antibacterial activity of methanolic extract of oleoresin of *A. bidwilli* and aerial parts of *C. scoparius* may be worthwhile in future to carry out the activities over a wide range of pathogenic microorganisms.

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