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Preliminary Phytochemical Screening and Antimicrobial Activity of *Corbichonia Decumbens Forsk*. (Molluginaceae)

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ABSTRACT

The purpose of the study is to evaluate phytochemical and antimicrobial activity of *Corbichonia decumbens* Four solvent extracts (petroleum ether, chloroform, acetone and methanol) of *C.decumbens* leaves were investigated against antibacterial and antifungal microorganisms by using agar well diffusion method. Among the four extracts tested methanol extract had effective antimicrobial activity followed by petroleum ether. The methanol extract showed greater activity against Gram-positive,Gram-negative bacteria and fungal organisms. The study confirms the antimicrobial activitiy of *C.decumbens* leaves extracted using various solvents, and is therefore, a potential drug that requires further studies and development. Present study concluded that confirm the traditional therapeutic claims for this herb.

Key words: *Corbichonia decumbens*, Antimicrobial activity, Agar disc diffusion.

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INTRODUCTION

Medicinal plants represent a rich source of antimicrobial agents. Traditional healers claim that their medicine is cheaper, more effective and impart least side effects as compaired to synthetic medicines. In developing countries, low income people such as farmers, people of small isolate villages and native communities use folk medicine for the treatment of common infections [2]. Plants are used medicinally in different countries and are a source of many potent and powerful drugs [17] and are rich in a wide variety of secondary metabolites such as tannins, terpenoids, alkaloids, flavonoids, etc,and also showed a wide range of *in vitro* antibacterial and antifungal activities [6,7]. The family comprises about 100 species, and was previously included in the larger family Aizoaceae. The Family Aizoaceae contains 135 genera and about 1900 species. They are commonly known as “stone plants”, “carpet weeds” or “ice plant”. In the present study *Corbichonia decumbens* belongs to the family Molluginaceae was screened for their potential antimicrobial activity.

Corbichonia decumbens (Family:Molluginaceae) is a prostrate, glabrous, succulent and annual weed found almost throughout India, in cultivated and waste land. This plant is commonly distributed Africa, W. Asia, India and W. Pakistan. It is found in rocky or sandy places, in dry hot areas up to 1000 m alt. MSL An infusion of the root is taken by the Zulus of south Africa for biliousness and in larger quantities as an emetic for the same condition.This plant is used in kidney stone problems.It is used as a tonic and also used in gonorrhea. In tribels the plant leaves is crushed and taken orally in kidney stone problem.

The objective of this study is to verify the implicated antimicrobial activities of the *C.decumbens* extract and to isolate, purify and characterise the natural products contained in the plant material.

MATERIALS AND METHODS

Plant collection

Plant material was collected from Vijayamangalam,Erode district Tamilnadu, during the month of November 2012. The plant specimen was identified with Gambles *Flora of the Presidency of Madras* and the identity is confirmed with the herbarium specimen deposited in Kongunadu Arts and Science college herbarium (KASCH), Coimbatore and Madaras Herbarium, Botanical survey of India, Coimbatore .

Preparation of the extract

Plant materials (leaf) were washed with distilled water and shade dried. The dried samples were manually ground to a fine powder. The coarsely powdered parts were Soxhlet extracted with methanol for 8 h. The filtrate was evaporated to dryness under reduced pressure using rotary vaccum evaporator. The extracts were lyophilized until further use.

Preliminary Phytochemical Investigation

All the extracts were subjected to preliminary phytochemical qualitative screening to find out the presence or absence of various primary or secondary metabolites [11].

Test Microorganism for Antimicrobial Studies

Bacterial cultures Viz., *Streptococcocus faecalis, Bacillus thuringiensis, Staphylococcus aureus, Serratia marcescence, Proteus vulgaris, Salmonella paratyphi,* and *Escherichia coli* and fungus cultures Viz., *Paecilomyces lilacinus, Mucur spp,Tricoderma viride, Azospirillum lipofererum, Verticillum lecanii,* and *Penicillium* spp.) were obtained from the PSG medical college hospital, Coimbatore, India, were used as test organisms. The bacteria were maintained on nutrient broth (NB) at 37°C and fungus were maintained on Potato Dextrose Agar medium (PDA) at 28°C.

Preparation of inoculums

Stock cultures were maintained at 4°C on nutrient agar slants. Active cultures for experiments were prepared by transferring a loopful of culture to 10 ml of nutrient broth and incubated at 37°C for 24 hours for bacterial proliferation**.**

Anti-bacterial Activity

The antibacterial assay of methanolic extracts was performed by Bauer *et al* [3] . The Nutrient agar media was poured into the petridishes and were streaked with the test organism. For the agar disc diffusion method, the disc (0.5 cm) was saturated with 100 mg/ml of the extract and then placed on the upper layer of the seeded agar plate. The plates were incubated overnight at 37°C. Antibacterial activity was determined by measuring the diameter of the zone of inhibition (mm) surrounding bacterial growth. A reading of more than 6mm indicated growth inhibition. All the assays were done in triplicate and the results were given in mean ± SD. For each bacterial strain, amphicilline positive controls were used.

Antifungal Activity

The antifungal activity was tested by disc diffusion method [18]. The Potato Dextrose Agar plates were inoculated with fungal culture (10 days old) by point inoculation. The filter paper discs (5 mm in diameter) impregnated with 100 mg/ ml concentrations of the extracts were placed on test organism-seeded plates. Tetracycline was used as positive control. The activity was determined after 72 h of incubation at 28°C. The diameters of the inhibition zones were measured in mm.

RESULTS

Preliminary phytochemical screening of the extracts showed the presence of alkaloids, Saponins, terpenoids, sterols, glycosides and tannins(Table-1).The antimicrobial assay was determined with petroleum ether, chloroform, acetone and methanol extracts of

C.decumbens Leaf exhibited *in-vitro antimicrobial* activity against gram positive and gram-negative bacteria and fungi whereas significant activity was not observed with petroleum ether extract. Minimum inhibitory concentration of the active extracts has been shown in Figure 1 and 2. The lowest values were observed for petroleum ether extract and methanol extract against the bacteria and fungi. The results reveal that extracts of *C. decumbens* leaf were significantly effective against gram-positive, gram-negative and fungal micro-organism.

Table -1: Preliminary phytochemical screening *C.decumbens*

Tannin	-	-	+	+
Saponin	-	+	+	+
Resin	-	-	-	-
Flavonoids	-	-	+	-
Alkaloid	+	+	+	+
Glycoside	+	-	+	+
Steroid	-	+	+	+
Phenol	-	-	-	-
Terpenoid	-	+	+	+
Triterpenoid	-	+	+	-

Where, + = presence, - = absent.

DISCUSSION

Medicinal plants are gifts of nature to cure limitless number of diseases in human beings [4, 14].To our knowledge this study appears to be the first that actually looked at the antimicrobial effect of *C.decumbens* leaf extracts. Several studies conducted in the past three decades had focused on the antimicrobial properties of herbs, spices and their derivatives such as extracts and decoctions [1, 9, 12, 13]. Some researchers had also reported that there was a relationship between the chemical structures of the most abundant compounds in the tested extracts or essential oils and the antimicrobial activity [8, 10]. Theses results suggest the presence of either good antimicrobial potency or the high concentration of an active principle in the extract. The high degree of antimicrobial activity seems to confirm the folk therapy of infections and traditional therapeutic claims of this herb. *Carpobrotus edulis*, *C. acinaciformis, C. mellei* and *Sesuvium portulacastrum* are some of the examples of this family that showed appreciable antimicrobial activity against various microorganisms [5, 15, 16, 19].

Figure 1: Antimicrobial activity of Leaf extract of *C.decumbens* against different bacterial strains

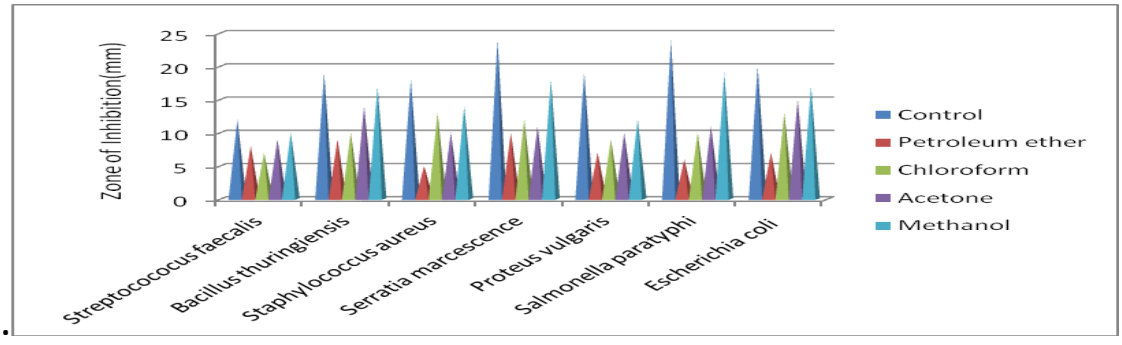

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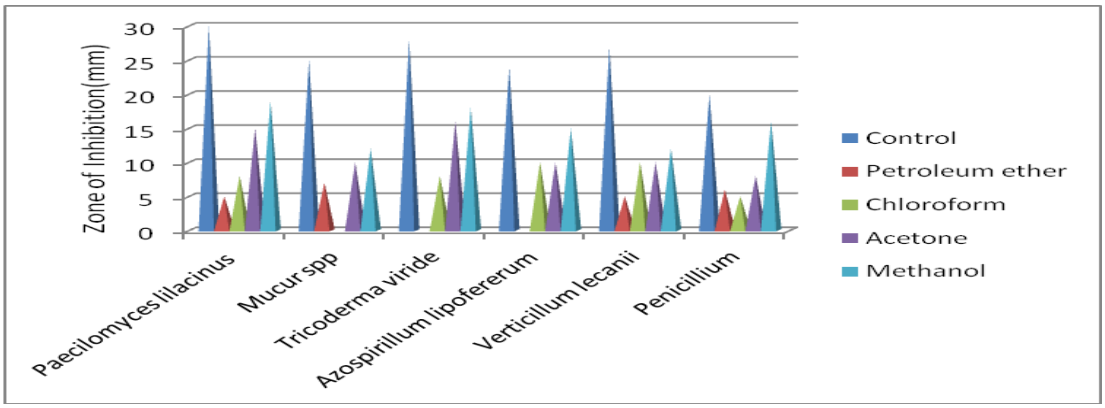
Figure 2: Antimicrobial activity of Leaf extract of *C.decumbens* against different Fungal strains.



CONCLUSIONS

These results suggest the presence of good antimicrobial potency of the high concentration of an active principle in the methanol extract. The high degree of antimicrobial activity seems to confirm the folk therapy of infections and traditional therapeutic claims of this herb.

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