

### Short Communication

## Antibacterial Activity of Aqueous Extract of *Alysicarpus longifolius* (Sperng.) Wight & Arn against some Pathogenic Bacteria

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### Abstract

Medicinal plants are being used for the ailments of various diseases to the humans and animals worldwide. *Alysicarpus longifolius* is a medicinal plant was less exploited for its medicinal properties. The present study was aimed to assess the antibacterial potential of the aqueous extract of *A. longifolius* using agar disc diffusion method. The test pathogens were *Bacillus subtilis* and *Escherichia coli* susceptible to the aqueous extract of *A. longifolius* at all the tested concentrations and the antibacterial activity was ranged from 8 to 14 mm of zone of inhibition. It was observed that, the antibacterial activity of aqueous extract of *A. longifolius* was concentration dependant.

**Keywords:** Antimicrobial, Aqueous extract, *Alysicarpus longifolius*

### INTRODUCTION

Nowadays, the pathogenic microorganisms are more problematic in both medical as well as society is concern. However, these microorganisms have been controlled using various antibiotics and indiscriminate use of these antimicrobial leads to the drug resistance in those pathogenic microorganisms (WHO, 2013). Nevertheless, medicinal plants are more appropriate to manage these health hazards (Mahesh and Satish 2008). Recently, there are increasing interests on the efficacy of the medicinal plants through the study of their extracts which serve as new products (Ibrahim, 1997). The medicinal plant, *Alysicarpus longifolius* which is an herbaceous belongs to Fabaceae member and commonly known as long-leaved Alyce clover. Very limited research work has been done on this plant so far (Patil et al., 2013; Rameshkumar and Umarajan, 2013). It is worthy to investigate on antimicrobial properties of aqueous extract *A. longifolius*

against some of the human pathogenic bacteria such as a Gram positive *Bacillus subtilis* and a Gram negative *Escherichia coli*.

### MATERIALS AND METHODS

#### Plant Material

The whole plant including roots and aerial parts which was disease-free and healthy was collected in bulk from Chennai, Tamil Nadu and used for the preparation of aqueous extract.

#### Preparation of Extract

The plants were thoroughly washed and were shade dried. They were powered using a blender. Using Soxhlet extractor, and by suspending 25 grams of the powder, aqueous extract was prepared. The extract was collected, concentrated and stored in air tight bottle. It was then subjected to antibacterial activity assay.

### Preparation of Inoculums

Stock cultures were maintained at 4°C on nutrient agar slants. Active cultures for experiments were prepared by transferring a loop full of cells from the stock cultures to test tubes of nutrient broth for bacteria that were incubated at 24 hours at 37°C. The assay was performed by agar disc diffusion method.

### Agar Disc Diffusion Method

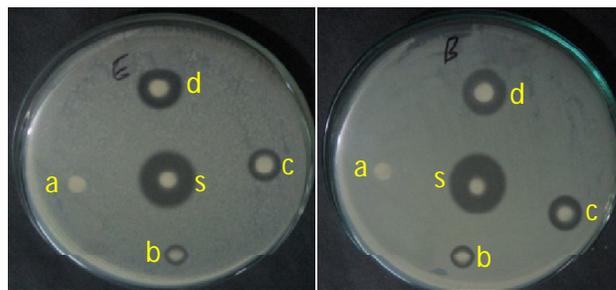
Antibacterial activity of the given sample was determined by disc diffusion method on Muller Hinton Agar (MHA) medium. The MHA medium is poured in to the Petri plates. After the medium was solidified, the inoculums were spread on the solid plates with sterile swab moistened with the bacterial suspension. The discs were placed in MHA plate with different concentrations (1000 µg, 500 µg and 250 µg) of the sample was impregnated on the disc. Streptomycin (10 µg) is taken as the standard and DMSO served as negative control. The plates were incubated for 24 hrs, at 37°C. Then the microbial growth was determined by measuring the diameter of zone of inhibition.

### RESULTS AND DISCUSSION

The aqueous extract was found to have significant antibacterial activity in the case of both gram positive and gram negative bacteria. The antibacterial activity was found to be dose dependant (Table 1; Figure 1). Aqueous extraction of medicinal plant showed various medicinal properties such as antibacterial activity, anticancer, antioxidant, etc. (Chhetri et al., 2008). Among the bacteria tested, the aqueous extract showed a significant antibacterial activity which was found to be little higher in the case of *Escherichia coli* compared to that of *Bacillus subtilis*. However, the values were compared with those of the standard Streptomycin found lesser, this may be due to the purity of the streptomycin. It was observed that, the antibacterial activity was dose dependant; while the concentration was increased the activity also increased. Kumara Swamy et al. (2012) reported that, the aqueous extract of *Bougainvillea spectabilis* flowers showed significance antimicrobial activity in both Gram positive and Gram negative bacteria. Moreover, the plant *A. longifolius* was found to have antimicrobial activity and further analyses on this line may result with future prospects.

Table 1: Antibacterial activity of aqueous extract of *A. longifolius*

S.No. Test organisms	Zone of Inhibition in mm				
	1000 µg	500 µg	250 µg	DMSO	Streptomycin
1 <i>Bacillus subtilis</i>	14	10	8	-	22
2 <i>Escherichia coli</i>	14	10	8	-	20



B: *Bacillus subtilis*

E: *Escherichia coli*

a: DMSO; b: 250 µg; c: 500 µg; 1000 µg; s: streptomycin

Figure 1: Antibacterial activity of aqueous extracts of *A. longifolius*

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