

## **Phytochemical and antimicrobial evaluation of *Oldenlandia corymbosa***

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### **ABSTRACT**

*Use of plant based drugs and chemicals for curing various ailments and personal adornment is as old as human civilization. Plants and plant based medicines are the basis of many of the modern pharmaceuticals. The aim of the present study is find out the bioactive chemical constituents and to evaluate the antimicrobial activity of the methanol extract of Oldenlandia corymbosa medicinal plant. This study involves the preliminary phytochemical screening separation and Identification of compounds. The extract also was tested for antimicrobial activity by disc method. The extract of the plant showed antimicrobial activity against both gram(+) and gram(-) bacteria.*

**Key words:** *Oldenlandia corymbosa*, Antimicrobial activity, Therapeutic use, Phytochemical screening.

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### **INTRODUCTION**

In Indian system a large number of medicinal plants have been used for many centuries for treating various diseases. Medicinal plants have been used for centuries as remedies for human diseases because they contain chemical components of therapeutic value[1]. These plants have a wide variety of chemical constituents and some of them have the ability to inhibit the growth of microorganisms. Herbal medicines are widely used since time immemorial indicating that herbs are growing part of modern , high – tech medicine. India has an ancient heritage of traditional herbal medicine [2]. Medicinal plants are the source of great economic value in the Indian subcontinent. In India thousands of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific ailments has been in trend given that ancient times. The modern medicine has evolved from folk medicine and traditional system only after thorough chemical and pharmaceutical screening. The use of synthetic compounds led to a decline in the use of plant in modern medicine. Most traditional medicines are developed from nature [3].

However, synthetic medicine can cause side effects and as a result people are more favorable to use natural compounds obtained from plants. Thus plants remain a major source of medicinal compounds [4]. About 20,000 plant species are used for medicinal purposes [5]. Hence the present study has been attempted to study the antimicrobial activity of *Oldenlandia corymbosa* plant.

### **MATERIALS AND METHODS**

#### **Collection of plant materials**

Fresh parts of plant *Oldenlandia corymbosa* whole plants were collected at kolli hills in Namakkal district, Tamil Nadu. The plant materials were identified by botanically. The plant materials were shaded and dried until all the water molecules evaporated and plants became well dried for grinding. After drying, the plant materials were

grinded well using mechanical blender into fine powder and transferred into the sealed container with proper labeling.

Crude plant extract was prepared by Soxhlet extraction method. About 50g of powdered plant material was uniformly packed into a thimble and extracted with 250ml of methanol solvent is used separately. The process of extraction continues for 15 hours or till the solvent in siphon tube of an extractor become colorless. After that the extract was taken in a beaker and kept on hot plate and heated at 30-40°C till all the solvent got evaporated. Dried extract was stored in refrigerator at 4°C.

The dried extract was analyzed. The antimicrobial activity was determined using disc diffusion method[6,7] by measuring zone of inhibition in mm and comparing with standard drugs *Ciproflaxin* and *fluconazole*[8]. The extract was tested for the presence of bioactive compounds by qualitatively using standard methods [9].

## RESULTS AND DISCUSSION

Qualitative preliminary screenings of extracts were performed initially with different chemical reagents to detect the phytoconstituents present in each extract. The extract showed the presence of alkaloids, carbohydrates, saponins, tannins, glycosides, flavonoids and phenolic compounds. The results are presented in table – 1.

### Antimicrobial activity

Bacterial infection is one of the most serious global health issues in 21<sup>st</sup> century. The emergence of bacterial resistance to antibiotics is a major health problem and therefore, it is critical to develop new antibiotics with novel mechanism of action to overcome these problems[10].

Fungal related diseases may not be as common as other microbial infections but, when present, they are difficult to treat especially in immunosuppressed persons (Bryce, 1992). The treatment given by the traditional doctors often includes the administration of entire plants, or extracts of roots, stems, bark, leaves, fruits, seeds or juice of the plant [11]. The extract was observed to inhibit the growth of gram positive and gram-negative bacteria tested in vitro to suggest that plant has a broad-spectrum antibacterial activity [12].

**Table 1: Phytochemical components identified in the alcoholic extract of *Oldenlandia corymbosa***

Name of the Test	Phytochemical constituents	Methanol Extract
Mayer's Test	Alkaloids	++
Dragondraff Test		++
Wagner Test		++
Molish Test	Carbohydrates	-
Fehling Test		+
Benedict Test		-
Foam Test	Saponins	+
Lead Acetate Test	Tannins	+
Ferric chloride Test	Pseudo tannins	Condensed Tannin
Ammonia Test	Chlorogenic acid	+
Salkowaski Test	Steroidal Glycosides	-
H <sub>2</sub> SO <sub>4</sub> Test	Anthocyanin	-
Liebermann's Burchard Test	Steroidal Glycosides	+
H <sub>2</sub> SO <sub>4</sub> Test	Saponins glycosides	+
Ammonia Test	Flavonoids	+
Shinoda's Test	Flavones	-
Ferric chloride Test	Phenolic compounds	+
Sodium chloride Test	Coumarin	+
Borntrager's Test	Anthracene Glycoside	-

High : +++

Moderate : ++

Present : +

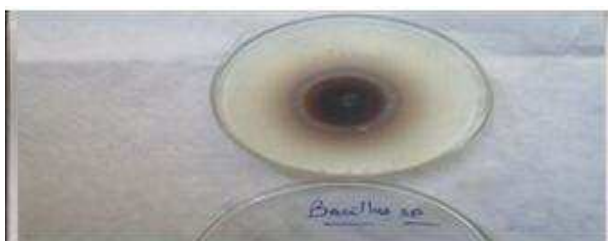
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Disc diffusion method was the method used to determine the antimicrobial activities of the pure extract from the plant[13]. Methanolic extract of *Oldenlandia corymbosa* plant shows antimicrobial activity against the tested

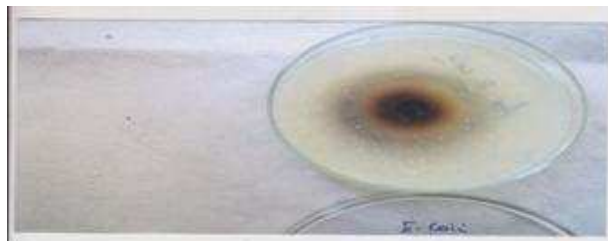
organisms in the order of *Bacillus* (27mm), *Escherichia coli*(32mm), *Klebsiella*(33mm), *Proteus*(22mm), *Pseudomonas*(26mm), *Staphylococcus aureus*(28mm), *Candida albicans*(13mm), *aspergillus niger*(12mm). In case of fungi, antimicrobial activity against tested organisms was in the order of *C.albicans* (10mm) and *A.niger*(9mm). The maximal antibacterial activity is observed against *Klebsiella* while maximal antifungai activity is found *candida albicans* (Table – 2).

Table2: Antibacterial activity of methanol extract of *Oldenlandia corymbosa*

Organism	Zone of inhibition(mm)
<i>Bacillus sp</i>	27
<i>Escherichia coli</i>	32
<i>Klebsiella sp</i>	33
<i>Proteus sp</i>	22
<i>Pseudomonas sp</i>	26
<i>Staphylococcus aureus</i>	28
<i>Candida albicans</i>	13
<i>Aspergillus niger</i>	12
Control	15



zone of inhibition measured in 27mm



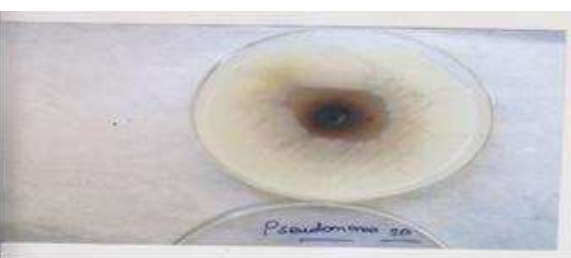
zone of inhibition measured in 32mm



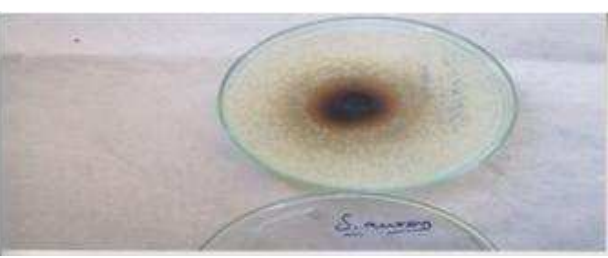
zone of inhibition measured in 33mm



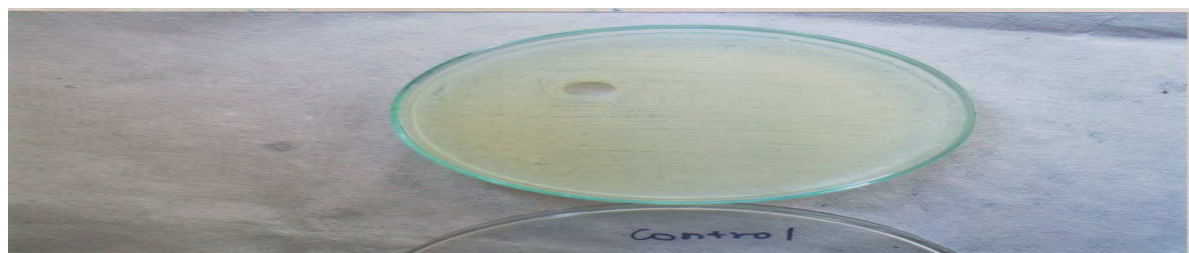
zone of inhibition measured in 22mm



zone of inhibition measured in 26mm



zone of inhibition measured in 28mm



zone of inhibition measured in 15mm (*Ciproflaxin*)

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**CONCLUSION**

The methanolic extracts of plant contains many bioactive chemical constituents including alkaloids, glycosides, terpenoids, steroids, flavonoids, and tannins. The extract of *Oldenlandia corymbosa* is subjected to antimicrobial activity against tested organisms both gram(+) and gram(-) namely *bacillus*, *Escherichia coli*, *klebsiella*, *proteus*, *pseudomonas*, *staphylococcus aureus*, *candida albicans*, *aspergillus niger*. The maximal bacterial activity is found in *klebsiella* species and fungi activity is found in *candida albicans*.

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