

Anti-Microbial Activity Of Leaves Of *Ochreinauclea Missionis* -An Endemic Plant.

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Abstract: *Ochreinauclea missionis* which is commonly known as Attu-Vanji or Nirvanchi is an endemic plant which comes under the family Rubiaceae. The plant is known for its medicinal uses like piles, oedema, skin and eye diseases etc. In the present study the antimicrobial activity of the plant leaf was examined by using the Agar-well diffusion method. It was found out that the methanol leaf extract of the *O. missionis* is showed significant antimicrobial activity against *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans*.

Key words - Attu-Vanji, endemic, medicinal, Agar-well diffusion, antibacterial.

I. INTRODUCTION

From time immemorial the medicinal plants have been used as sources of medicine in almost all culture (Baquar 1995). They are known to possess different kinds of potentially valuable therapeutic agents which provide raw materials for the preparation of medicine (Fernandez 2010). In addition to this the herbal medicines are very attractive as they are cheap and eco-friendly. In general, medicinal plants are of great importance to the health of individual and communities. Endemic plants are special because they are found in only one location on the planet. Medicinal plants have the wonderful and limitless capacity to produce different types of phytochemicals in them. Of the numerous types of secondary metabolites only a few percentage of them was identified. The antimicrobial activities is the effect of these secondary metabolites. The medicinal plants possess large amount of antimicrobial agents. Even then the antimicrobial properties of many plants has not been yet evaluated. It is reported by WHO that majority of the population in the world depends on the medicinal plants for their primary health care. Eventhough India is one of the richest diversity land for medicinal plants many properties of many of the medicinal plants are kept unnoticed. Microbial resistance to many drugs is areal anxiety to the medical field. Microbial pathogens are acting as serious threat to mankind. These microbes has very active and efficient resistance mechanisms to our drugs. So the modern research using medicinal plants having anti microbial activities is increasing manifold so as to produce new resistant drugs against the microbes.

It was investigated that the resistance to frugs by various microorganisms has increased greatly in spite of the discovery of large number of new antibiotics in the last decades (Cohen 1992). A rich source of antimicrobial agents are present in various medicinal plants. In different countries the plants are used medicinally and they form a source of highly potent and powerful drugs. Due to their varied medicinal properties a large number of medicinal plant part are used for extracting raw drugs. (Srivastava, J., J. Lambert and N. Viemeyer 1996). The plants having rich secondary metabolites are also reported to exhibit anti microbial activites. Many plants are being used for cutaneous infections, urinary tract infections, , respiratory disease, and gastrointestinal disorders.

For screening antimicrobial activity as well as for the discovery of new antimicrobial compound numerous studies have been conducted with the extracts of various plants (Eloff 1998). In nature the plant-based antimicrobials represent a vast untapped source for medicine and it is the need of the time to explore them. (Farnsworth et al., 1991). From the perspective of drug development and phytomedicines the potential for developing antimicrobials into medicines are highly rewarding (Lwu et al., 1999).

Literature shows that in the past few years a number of investigations have been conducted worldwide to prove antimicrobial activities from medicinal plants. Studies of (Alonso-Paz et al., 1995) showed that the use of phytochemicals and plant extracts with antimicrobial properties is of great significance,

Plants as a source of microbial drug has to be given dual importance. In the present study we are aiming to determine the phytochemicals and antimicrobial activities of the plant *Ochreinauclea missionis* which is endemic and highly medicinal on which such work is very rare.

II. RESEARCH METHODOLOGY

Plant materials' Collection

The fresh leaves of *O. missionis* were collected from Carmel College Mala in October 2014. After proper washing for surface sterilization the leaves were chopped in to small pieces and dried in shade at room temperature for 2 weeks. Then the dried leaves were powdered and stored in air tight containers for the further investigation.

Test for Antimicrobial Activity

Agar well diffusion method or Hole plate diffusion method is used for the study. It is an important method for studying the inhibitory effect of any compound for plant extract or antibiotics, on the growth and multiplication of a particular bacterium.

Here wells were made by using a sterilized cork borer on the seeded nutrient agar in a petridish to which the test compound is added. The treated petridish were incubated at 37°C for 24 hours. After this incubation period the diameter of the inhibition zone formed around each hole was measured and the values were recorded. The antimicrobial activity was expressed as the ratio of the inhibition zone produce by the plant extract and the inhibition zone caused by the standard.

Two sets of control were used. One is positive control (Streptomycin) another one is negative control. In this study methanol extract were used for the investigation against the microbes *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *candida albicans*.

III. RESULTS AND DISCUSSION

O. missionis is an endemic medicinal plant which is used for skin diseases, eye diseases, dropsy, piles fever, oedema and haemophilic disorders. The antimicrobial activity investigation of the leaves of *O. missionis* showed that it has potent antimicrobial activity against Gram positive and Gram-negative bacteria namely *Staphylococcus aureus*, *Pseudomonas aeruginosa* and also to *candida albicans*. indicating the presence of broad-spectrum antimicrobial substance in the plant (Table 1).

Table 1. Antimicrobial activity of Methanolic leaf extract of *O. missionis*

Sl. No	Parameters	Test Result	Specification	Test Method
1	<i>Candida albicans</i>	S15 mm	MacFarland Std 0.5	Agar well diffusion method
2	<i>Staphylococcus aureus</i>	S13 mm	MacFarland Std 0.5	Agar well diffusion method
3	<i>Pseudomonas aeruginosa</i>	S12 mm	MacFarland Std 0.5	Agar well diffusion method

In preventing various diseases medicinal plants play a vital role. They are used for discovering and screening of the phytochemical constituents which are acting as an aid for the manufacturing of new drugs. The antibiotic resistance is the main problem faced by both the developing and developed countries regarding their health sector. There by the new research on medicinal plants having antimicrobial properties is gaining attention as they can contribute bioactive compounds of therapeutic value. The antimicrobial analysis of the medicinal plants are also significant and have great commercial interest for research institutes and pharmaceuticals companies for the manufacturing of the new drugs for treatment of various diseases. The antimicrobial activity of a molecule is owned to its underlying compounds which may lead to the death of the microbes. The action is that the compound may disrupt the microbial membranes or they impare the cellular metabolism. The present study has conducted to evaluate the antimicrobial activity of *O. missionis* leaf extract against the microbes namely *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *candida albicans*. Methanol extract of the plant leaf showed significant resistance against all the three selected microbes which is evident from the Table1.

It was clear from the present result that methanol extract exhibited pronounced activity against all the tested three microbes. The highest antibacterial activity as seen with methanol extract might be due to the presence of alkaloids and tannins. Broad spectrum activity of methanol extract tended to show that the active ingredients of the leaves were better extracted with methanol. Earlier studies had also shown the greater antibacterial activity of methanol extracts than other solvent extracts.

The plant extract studied could be an answer to the people seeking for better therapeutic agents from natural sources which is believed to be more efficient with little or no side effects when compared to the commonly used synthetic chemotherapeutic agents. A new indole alkaloid; neonaucline along with six known compounds Cadamine, naucledine, harmane, benzamide, cinnamide and blumenol A—were isolated from the leaves of *Ochreinauclea maingayii* (Rubiaceae) by (Mukthar *et al.*, 2012)

In present study, methanolic extract leaves of *O.missionis* having significant inhibitory action against all the selected microbes, it can be concluded that Methanolic extract of the *O. missionis*, can be effectively used for curing the microbial diseases. Hence in the present study also suggests further screening for active constituents of the leaf of the plant. From the overall results of zone of inhibition, it is clearly evident that the plant is having potential against the microbes and it may be due to the presence of its phytochemicals.

IV.CONCLUSION

Medicinal plants can be used for curing almost all type of human diseases. The reason is the presence of variety of phytochemicals in them. As there is an alarming increase in the occurrence of new diseases on earth it is the urgent need of the time to discover new antimicrobial compounds with new mode of action. These phytochemicals also helps to resist various types of microbes also. Terpenoids and tannins are responsible for the anti-microbial activities. Plants extract has the inherent capacity to act against microbes and so they can be used to fight against many infectious disease caused by various microbes. Not much studies were there in the anti-microbial part of this plant. In this present study an attempt was carried out to conduct the anti microbial analysis of the leaves of the *O.missionis*. It is extremely rare and endemic plant to W.Ghats. Such studies on this aspect of the plant is not seen in the literature. So this is the first work on this aspect of the leaf of the plant. From the present study it is clear that the methanolic extract leaves of *O.missionis* has significant antimicrobial activity against the bacteria *Staphylococcus aureus* and *Pseudomonas aeruginosa* and against the fungal strain *Candida albicans*. The result indicates that the studied plant leaf extract is an antimicrobial agent; and thus, further in vitro and in vivo antimicrobial activity studies of Methanol extracts against bacterial and fungal strains were recommended. Additionally isolation of active compounds from Methanol extracts was also recommended.

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