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Studies on Azadirachta Indica against Fever, Wound Infection and Vaginal Infection

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Abstract: ***Due to changed life style and changed environment of Indian society we are suffering through different types of infections such as fever, wound infection, vaginal infection, skin infections etc. In this case we are always taking antibiotics for cure but it creates side effects on our body. To fulfil our same need we can go for natural remedies that are Azadirachta indica. In the present research, antibacterial activity and antifungal activity of Neem leaf extract were determined by using Disc diffusion method. Extracted Neem leaf effectively inhibited fever causing Salmonella typhi and wound infection causing staphylococcus aureus with inhibition zone 15mm and 17mmrespectively. Also showed 28mm inhibition zone against Candida species which is mainly known for vaginal infection.***

Key words: Azadirachta indica, antibacterial activity, Antifungal activity

1. Introduction

Nature is the medicinal plants house of natural remedies to cure all diseases of humans beings. From ancient time, the natural or herbal remedies are still the backbone of medicines. Extracts of herbal plants contains active substances such as primary metabolites (carbohydrates, fats, proteins)and secondary metabolites (Alkaloids, flavonoids, steroids, polyphenols) therefore they acts as a anti-pyretic, anti-malarial and anti-tumour, anti-ulcer, anti-diabetic (Patil et.al.,2013)and antioxidant (Sinha K.C. et. al.,1981).

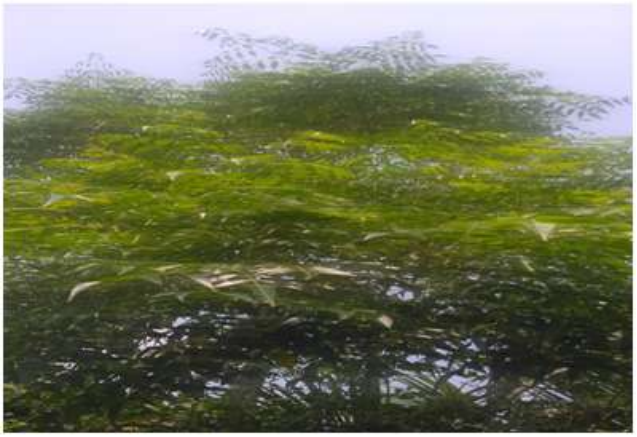

Figure I: Neem tree [Azadirachta indica]

Neem tree [Azadirachta indica] belongs to mahogany family, Meliaceae. It is mostly found in tropical and semi-tropical regions. It has native from India and Burma, fast growing tree, height ranges from 15-40m(Ali B.H,.et.al.2005;Sinha K.C,.et.al.1981). Neem leaf acts as a household pesticide in Indian tradition from ancient time. Neem have been used to control leprosy and respiratory disorders in children (Schmutterer H.1995) the neem leaf extract is also used in relieving fever, thirst, nausea, vomiting and skin diseases(Biswas K,.et.al.,2002; Pillai N.R,. et.al.,1981).

In the present research, antibacterial activity and antifungal activity ofAzadirachta indica is determinedagainst fever, wound infection and vaginal infection.

2. Methods and Materials

Sample collection:- The selected neem plants (Azadirachta indica) leaves were collected from garden of SMM college, Murgud (M.H). The collected leaves were identified and used for further investigation.

Methanol neem Leaf extract: The collected leaves dried and powdered and allowed soxhlet for successive extraction with methanol. In this method, 50g of dried leaf powder were taken in a separate container with 250ml of methanol and kept for 24 h on shaker, then filtered thruogh filter paper and the filtrate was collected.

Purity of Methanol Leaf extract: Forquality control, the neem extract was cultured on nutrient agar (NA) to determine its purity.

Isolation and identification of test microorganisms:- Cultures of the test microrganisms used for antimicrobial and antifungal study were obtained from the Dept. of Microbiology, SMM, Murgud. All the test organisms were cultured on nutrient agar slant. The cultures were maintained by sub-culturing periodically and preserved at 4^{O}C prior to use.

3. Antimicrobial Screening

Agar well diffusion method

In this method, isolated and identified microorganisms were spreaded on sterilized Nutrient agar medium plates and wells were prepared with the help of sterilized cork borer. Neem leaf extract were added in the prepared wells. Plates were incubated at 37^{O}C for 24-72hrs. Zone of inhibition of microbial growth around each well is measured and the susceptibility is determined.

MIC determination

The MIC values were determined by broth dilution assay of microdilution assay. In this various cerntrations of the alcoholic Neem leaf extracts (200mg/ml, 150mg/ml,100mg/ml, 50mg/ml, and 25mg/ml) were prepared. 0.1ml of standardized test organism of Controls was equally set up by using solvents and test organisms without extract. The tube with least concentration of extract without growth after incubation was taken and recorded as the minimum inhibitory concentration.

4. Result

As per the observations,no growth of microorganisms observed on nutrient agar medium plates which indicates excellent quality of Leaf extract of Azadirachta indica. They showed more inhibition zone against *Staphylococcus aureus* and *Salmonella typhi* while *Bacillus subtilus* and *Escherichia coli* are less susceptible to neem leaf extract(Table:-I)andalsoleaf extractshowed more inhibition zone against *Trichoderma species* and *Candida species* while *Aspergillus species* and *Penicillium species* are less susceptible to neem leaf extract(Table:-II).Minimum inhibitory concentration was determined by microdilution assay. 50mg/ml was the MIC for selected microorganisms.

Figure II: Collected Neem leaves and dried powder

Table I: Antibacterial activity of Neem leaf extract

Sr. No	Name of Bacterial culture	Zone of inhibition (mm)
1	*Staphylococcus aureus*	16
2	*Salmonella typhi*	15
3	*Bacillus subtilus*	8
4	*Escherichia coli*	5

Table II: Antifungal activity of Neem leaf extract

Sr. No.	Name of Fungal culture	Zone of inhibition (mm)
1	Candida species	28
2	Trichoderma species	23
3	Aspergillus niger	18
4	Penicillium notatum	15

5. Discussion

Now a days synthetic drugs are famous in society to use in any disease but they gives side effects. Hence, drug development should be plant based compounds in meeting this demand for newer drugs with minimal side effects. P.R.Patel;2013 reported effectively the antimicrobial activity of alcoholic extract of Neem bark against a variety of pathogens while in our study we used effectively Neem leaf extract against different bacteria and fungi. P.jadeja.,2005 showed Leaf and bark extract of Azadirachta indica more inhibition zone against Vibrio cholerae and Bacillus subtilis, while in our study Neem leaf extract showed effective inhibition zones against Staphylococcus aureus and Salmonella typhi.Sinha K.C 1981 showed antifungal activity of neem extract against Candida albicans while in our study candid a species showed 28mm inhibition zone and These results was also supported by (S.Bajaj et al., 1999).

6. Conclusion

Azadirachta indica leaf extract is an important source ofprimary and secondary metabolite compounds having anti-microbialand anti-fungal properties. The results indicated that using neem leaf extract we can cure fever, wound infection and vaginal infection.

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