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A REVIEW ARTICLE ON ANTI-BACTERIAL & ANTI-FUNGAL ACTIVITY OF BETEL LEAF

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1. ABSTRACT :

-Piper betle (L) is a popular medicinal plant in Asia. Plant leaves have been used as a traditional medicine to treat various health conditions.

-P. betle leaves displayed high efficiency on Gram-negative bacteria such as Escherichia coli and Pseudomonas aeruginosa, Gram-positive bacteria such as Staphylococcus aureus, and Candida albicans.

- The ratio of MBC/MIC indicated bactericidal and bacteriostatic effects of P. betle leaves, while MFC/MIC values showed fungicidal and fungistatic effects.

-Aqueous and ethanol extract of the leaves of Piper betel L. Were evaluated for antibacterial activity against three Gram positive, two Gram negative bacteria.

2. INTRODUCTION :

-Higher and aromatics plants have been used traditionally In folk medicine as well as to extend the shelf life of Foods, showing inhibition against bacteria, fungi and Yeasts.[2]

-Medicinal plants are any plants with medicinal Benefits that are employed in conventional medicine Or contemporary medicines.[10]

-Piper betel leaves extracts contain large numbers of bioactive molecules like polyphenols, alkaloids, steroids, saponins and Tannins.

- The leaves extract of Piper betel Have also been reported to exhibit biological Capabilities of detoxication, antioxidation , And prevention against photosensitisation induced Biological damage.[11]

-Turally occurring herbs are being used for a long time in food and for medicinal purposes throughout the world.[9]

3. DRUG PROFILE : (Piper betel)

1. Family : Piperaceae

2. Synonym : Piper siriboal

3. Common name : Betel leaf , betel vine , betel paper .

4. Morphology : It has shiny heart shape leaves with small white flowers spikes .

5. Chemical constituents : Carophyllene , cadine , allyl acetechol , eugenol methyl ether.

Fig : Betel leaf

Table 1. Active phytoconstituents [11]

Sr.no	Component	% of component
1	Chavibetol	53.1%
2	Carophyllene	3.71%
3	Chavibetol acetate	15.5%
4	Allylpyrocatechol diacetate	0.71%
5	Chavibetol methyl ether	0.48%
6	Campene	0.48%
7	F-pinene	0.21%
8	Eugenol	0.32%
9	u-limonene	0.14%
10	a-pinene	0.21%
11	1,8-cineol	0.04%
12	Saprobe	0.23%

4. ANTI -MICROBIAL & ANTI-BACTERIAL ACTIVITY

-Antimicrobial activity was seen with respect to all the leaf extracts viz; aqueous, hexane, acetone and ethanol. [9]

-The notable antibacterial effect was observed in relation to aqueous, hexane, acetone and ethanolic extracts. All extracts were effective against the test microorganisms.

-Antibacterial testing methods can be carried out by two methods, the diffusion method and the dilution or microdilution method.[6]

-The antibacterial activity of the leaf extracts was assessed using agar well diffusion method by measuring the diameter of growth inhibition zones with 50 and 100 ul of alcholoic and aqueous extracts .[2]

-The antimicrobial activities of betel leaf extract against some mastitis bacteria such as Staphylococcus aureus and Streptococcus agalactiae has been studied based on the inhibitory zone method with the control sample of Iodip at 10% .[12]

***Defination of bacteria [13]**

Bacteria are microscopic living organisms that have only one cell. The word for just one is “bacterium.” Millions (if not billions) of different types of bacteria can be found all over the world, including in your body.

1.Streptococcus aureus

-Straptococcus aureus is a type of bacteria , that can cause infections , particularly skin infections.

-It's a commonly found on the skin & in the noses of healthy individuals.

-Staphylococcus aureus is a gram-positive bacteria that cause a wide variety of clinical diseases.

Fig : Bacterial skin infection

2.Staphylococcus [14]

Staphylococcus aureus is a major bacterial human pathogen that causes a wide variety of clinical manifestations. Infections are common both in community-acquired as well as hospital-acquired settings and treatment remains challenging to manage due to the emergence of multi-drug resistant strains such as MRSA (Methicillin-Resistant Staphylococcus aureus).

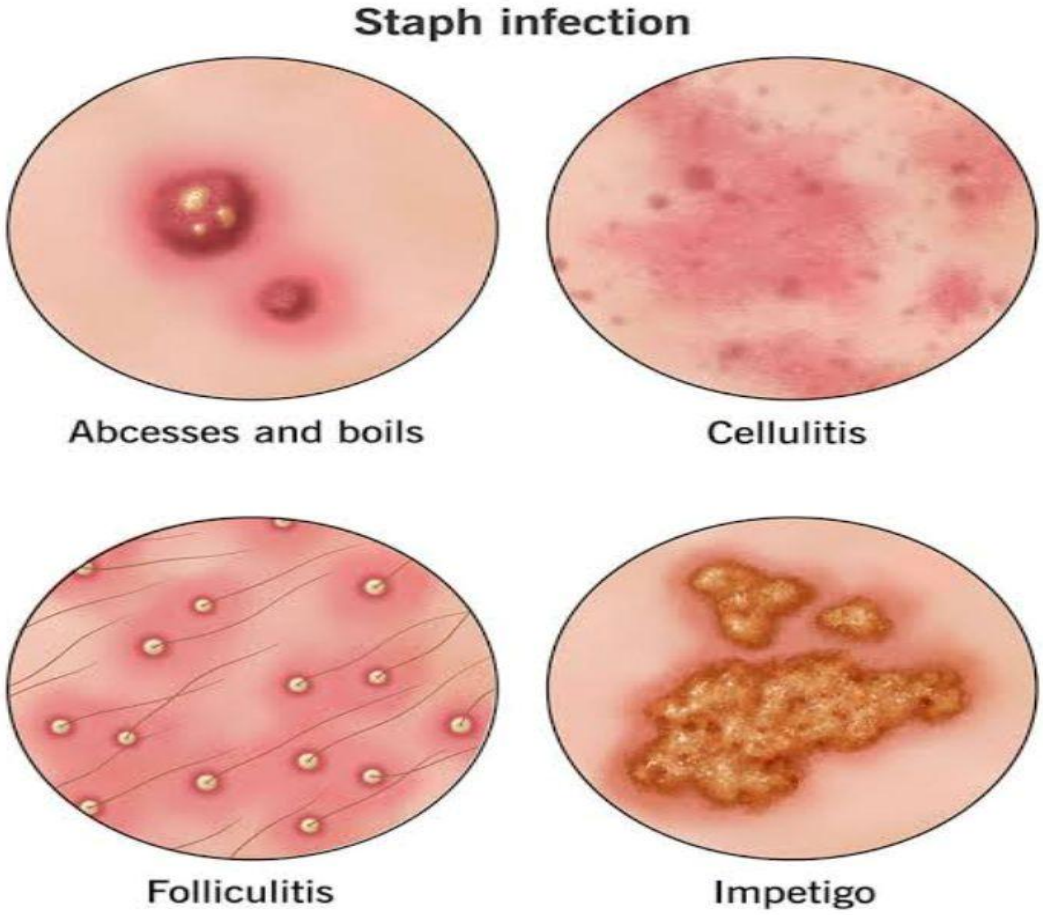

Fig : Staphylococcus skin infection

5.ANTI-FUNGAL PROPERTIES OF BETEL LEAF

-Betel leaf (Piper betel) is known for its traditional use in various medicinal practices. It has been reported to have antifungal properties, which makes it effective against fungal infections.[15]

-Numerous methods have been applied to test the antifungal properties of betel leaves including solid dilution, broth dilution, micro-dilution, well diffusion, and solid diffusion assays, resulting in minimum inhibitory concentration (MIC), minimum fungicidal concentration (MFC), and inhibition zones.[1]

Fig.Fungal infection of skin

5.CONCLUSION

-Betel leaf is a rich source of phenolic compounds, which have a wide range of medicinal applications and are responsible for a variety of health benefits.[12]

-The present investigation used a variety of extraction solvents to examine the antibacterial activity of plant extracts from Piper betle L. against Staphylococcus aureus.[10]

-Betel leaves are an important herbal cash crop in terms of botany, export potential, economic standing, pharmacology, chemical makeup, and industrial applications, as shown in the review.[4]

-The result of the study reveals that both the aqueous and alcoholic extracts were active against the strains of bacteria that are common cause of infections.[2]

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