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PIPER BETEL LEAF (PAAN): A TRADITIONAL MEDICINAL PLANT WITH MARKETED PRODUCTS

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Abstract:

The use of herbal medicines for the treatment of various health challenges continues to expand rapidly across the world the use of herbs is viewed as an integral part of the culture in those communities. Betel leaf (Piper betle) is a well-known medicinal plant found in Asia. It belongs to the family Piperaceae. Plant leaves are used for the preparation of traditional medicine to treat various diseases. In India, as a traditional practice, betel leaf is consumed after the commencement of a meal in order to improve digestion due to its astringent taste. Many research studies on Piper betel has chavibetol, chavibetol acetate, caryophyllene, allylpyrocatecholdiacetate are the main constituents in betel leaf with many medicinal properties like anti-warts anti-fungal, anti-nociceptive, anti-cancer, wound healing and anti-dermatophytic. betel leaf oil is used for many cosmetics preparation for Skin brightening, Cooling effect, Face mask, anti-acne etc. In this review author collect the information about benefits of betel leaf in order to portray the significance which will benefit the mankind.

KEYWORDS: Piper Betel leaf, medicinal uses, cosmetics uses, , marketed products

I. INTRODUCTION:

It is estimated that up to four billion people (representing 80% of the world's population) living in the developing world rely on herbal medicinal products as a primary source of healthcare and traditional medical practice which involves the use of herbs is viewed as an integral part of the culture in those communities¹. Betel leaf (Piper betel L.) is a heart-shaped deep green leaf associated with the Piperaceae family with more than 2000 species. Betel leaf is a perennial creeper and produced leaves with glossy nature along with white catkin inflorescence. In catkin of betel leaf, the male plant has dense and cylindrical spikes, where the female plant has pendulous spikes. The plant is attached to the host tree or support by root, which arises from each node. The cultivation is widely distributed in subtropical and tropical areas of the world. There are hundreds of different varieties of betel leaves globally, including 40 varieties from India and 30 varieties from West Bengal. The plant is dioeciously, that is male and female plants are different, but all are shade-loving perennial root climbers² In India, as a traditional practice, betel leaf is consumed after the commencement of a meal in order to improve digestion due to its

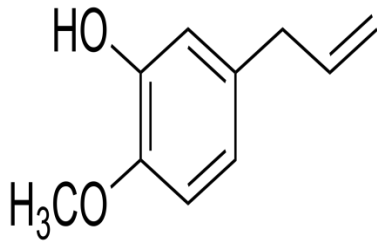
astringent taste. Ancient classical Ayurvedic text like Bhojankutuhalamstate that consumption of betel leaf is wholesome after commencement of a meal to improve digestion, reduces excessive cough accumulated in the mouth and maintains weight, cleanses the throat. In Ayurveda, a betel leaf with the addition of medicinal herbs is known Istanbul or Pan. Ayurveda describes the properties of betel leaf as it is pungent, sweet and bitter in taste, alkaline, astringent and hot. It kills the worms and kindles the fire of love as it is an aphrodisiac in nature, and also increases digestive fire³The betel leaf has a strong pungent or sweet taste with a strong aromatic spicy flavor. For example, mild to strong spicy taste in Bangla and Sanchi varieties whereas sweet taste in the Mitha variety. This taste variation among betel leaves is due to chemical compounds, nutritional compounds, and other factors⁴Piper: betel Linn. An important species used for the various pharmacological activities anti-proliferative, anti-mutagenic, antibacterial and antioxidant properties.Piperaceafamily is an evergreen and perennial creeper, with glossy heart-shaped Photochemical studies show that Piper betel contains a wide variety of active compounds whose concentration depends on the variety of the plant species. Many research studies on Piper betel has chavibetol, chavibetol acetate, caryophyllene, allylpyrocatecholdiacetate, camphene, chavibetol,methyl ether, eugenol, a-Pinene, f-Pinene, u-Limonene, safrole, 1-8-cineol, and allylpyrocatecholmonoacetate. These components are valued as a stimulant for its medicinal properties like anti- warts anti-fungal, anti-nociceptive, anti-cancer,immunomodulatory, anti-halitosis, anti-diabetic,gastroprotective, anti-allergic, anti-fertility, anti-filarial, anti-larvicidal, wound healing and anti-dermatophytic.⁵

II. PLANT PROFILE^{5,6,7}

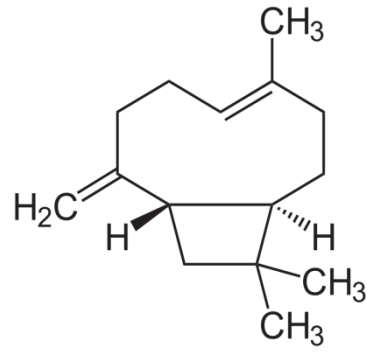


Fig: Betel leaves

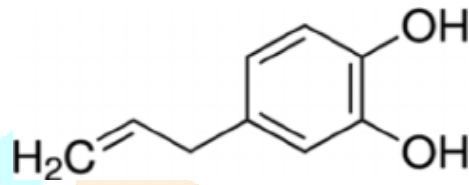
BOTANICAL NAME AND TAXONOMIC CLASSIFICATION	
BINOMIAL NAME	PIPER BETEL L
FAMILY	PIPERACEAE
GENUS	PIPER
KINGDOM	PLANTAE
DIVISION	MAGNOLIPHYTA
CLASS	MAGNOLIPSIDA
CORDER	PIPERALES
SPECIES	BETEL
VERNICULAR NAME	
MARATHI	NAGBAEL
SANSKRIT	NAGAVALLARI AVALLIKA, TAMBOOL,SAPTASHIRA, VARNALATA
HINDI	PAN
ENGLISH	BETEL, BETEL PEPPER,BETEL-VINE
TAMIL	VETRILAI
TELUGU	NAGBALLI, TAMALPAKU
GUJURATI	NAGARBAEL
CHEMICAL COMPOSITION (%)	
CHAVIBETOL	53.1
CARYOPHYLLENE	3.71
CHARVIBETOL ACETATE	15.5
ALLYLPROCATECHOL DIACETATE	0.71
CHAVIBETOL METHYL ETHER	0.48
CAMPENE	0.48
F-PINENE	0.21
EUGENOL	0.32
A-PINENE	0.21
1,8- CINEOL	0.04
SAPROBE	0.11
ALLYLPHYROCATECHOL MONOACETATE	0.23



1. Chavibitol



2. Cryophyllene



3. Allylpyrocatechol Diacetate

VARIETIES OF BETEL LEAF



Fig: Bangla



Fig: Kapoori



Fig: Banarasi

Fig: Mitha

VARIOUS USES OF BETEL LEAF ^{8,9,10,11}

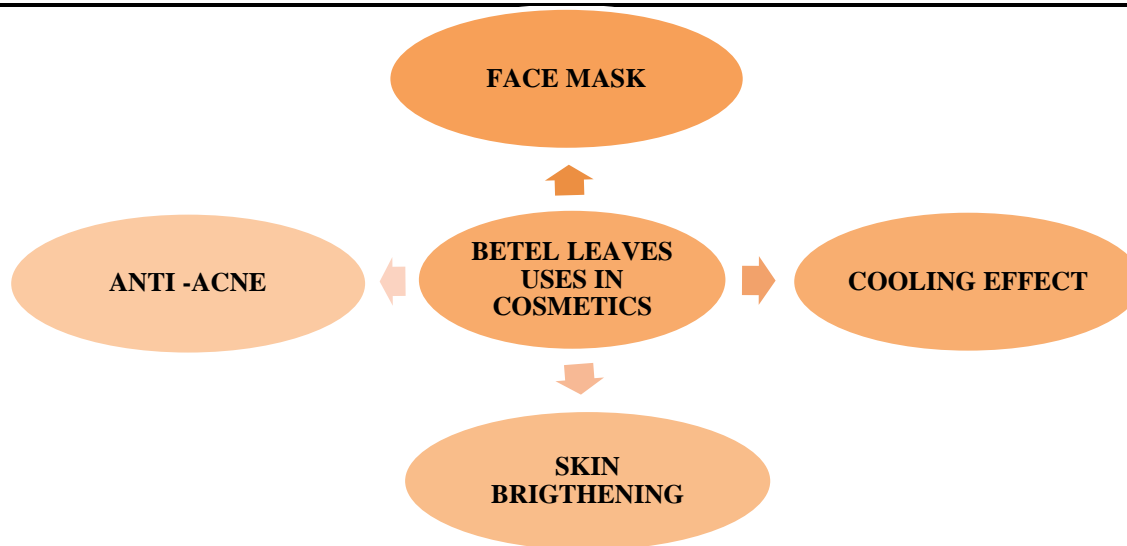
Anti diabetes activity
Anti-warts activity
Anti-bacterial
Anti- microbial
Anti- inflammatory

Weakness of nerve
Sore throat
Constipation
Brest milk secretion

**Medicinal uses
of P. Betel leaf**

Boosts digestion
Effective on gum issue
Reduce ear pain

Treats various skin disorder
Refreshes your breath
Relief depression



The use of betel leaf can be traced as far back as two thousand years. Betel leaves help to heal the following illnesses.

ANTI-WARTS ACTIVITY: ^{12,13}

Warts a small hard dry lump that sometimes grows on the face or body. Betel leaf is a major component in various ayurvedic medicines used in treating warts. These medicines are known to not leave any scarring and remove the warts completely without recurrence.

Piper betel petioles are rubbed on warts till they are shed. Mixture of lime and copper sulfate paste should be applied over the warts after five minutes should be rubbed by the stalk of the betel leaf (piper betel linn) from the base continuously till cutting of the full base of wart.

WEAKNESSES OF NERVE: ⁸

actual loss of muscle strength that reduces or prevents your ability to do numerous tasks and movements. Betel leaves play a vital role in the treatment of nervous pains, nervous exhaustion and debility. The juice of a few betel leaves, with a teaspoon of honey, will serve as a good tonic. A teaspoon of this can be taken twice a day.

SORE THROAT⁸: A sore throat is pain, scratchiness or irritation of the throat that often worsens when you swallow. Betel leaf is an excellent household remedy in the treatment of cough and sore throat.

Local application of the leaves is effective in treating sore throat. The crushed fruit or berry should be mixed with honey and taken to relieve irritating cough.

RESPIRATORY DISORDER⁸: Respiratory disorder, or respiratory disease, is a term that encompasses a variety of pathogenic conditions that affect respiration in living organisms. Betel leaves are useful in pulmonary affection in childhood and old age.

The leaves, soaked in mustard oil and warmed, may be applied to the chest to relieve cough and difficulty in breathing. Eg. Asthma

CONSTIPATION⁸: Constipation is a condition in which a person has uncomfortable or infrequent bowel movements.

In the case of constipation in children, a suppository made of the stalk of betel leaf dipped in castor oil can be introduced in the rectum. This instantly relieves constipation.

BREAST MILK SECRETION⁸: The application of leaves smeared with oil is said to promote secretion of milk when applied on the breasts during lactation.

HALITOSIS:¹⁴Halitosis is defined as oral malodor or bad breath. It is caused by gingival cervical fluid, microbial degradation of proteins, amino acids, and peptides in saliva, and sometimes food retained on teeth because of no proper brushing.

The leaves of *Piper betel* have been used traditionally for halitosis since long time.

ANTI DIABETES ACTIVITY:A serious disease in which a person's body cannot control the level of sugar in the blood. Betel leaves possessing nutraceuticals for preventing diabetes mellitus in patients. Demonstrated the possibility of betel extracted by hot water extract for treatment for type 2 diabetes patients.

ANTIOXIDENT ACTIVITY¹⁵: Betel leaf extract containing polyphenols compounds like catechol, allylpyrocatechol responsible for antioxidant activity. Observed that the methanolic extracts of the betel leaves possess reducing power, DPPH radical and superoxide anion scavenging and deoxyribose degradation activities. Have reported scavenging H₂O₂, superoxide radical and hydroxyl radical by aqueous extract of betel leaves.

ANTI CANCER EFFECT¹⁵:Disease in which abnormal cells divide uncontrollably and destroy body tissue. The betel leaves have also been reported to own anti carcinogenic properties and it destroys tobacco carcinogens due to existence of the bioactive components as hydroxychavicol and chlorogenicbioactives

ANTI ULCER¹⁶:A sore that develops on the lining of the esophagus, stomach or small intestine. Study showed a significant healing effect on NSAID induced peptic ulcer in albino rats. The healing action was attributed to the free radical scavenging activity of the plant extract. APC, one of the phenol constituents showed significant protection against indomethacin induced ulcers in Sprague-Dawley rats. The protection was correlated with ant oxidative and mucin protecting properties.

ANTI MALARIA²⁰:A serious disease in hot countries that you get from the bite of a small flying insect (a mosquito). *Anopheles stephensi* and *Culex fatiga* were more effective in protecting against bite than recognized mosquito-producing citronella oil in essence of *Piper betel*. The crude methanol extract of *Piper betel* leaves (50–400 mg/kg) was investigated for its antimalarial activity against *Plasmodium berghei* (NK65) during early and established infections.

GASTRO PROTECTIVE ACTIVITY¹⁷:Gastrointestinal diseases affect your gastrointestinal (GI) tract, from mouth to anus. The Sri Lankan *Piper Betel* leaf mines in rats were investigated in 2004 by Arambewela et al. The Hot Water Extract (HWE) and Cold Ethanolic Extract (CEE) at 3 different doses (200, 300 and 500 mg kg⁻¹) are used to assess the gastric protective effect of the two components in rats to cause ulcer. HWE and CEE oral administration provided information on a dose-age dependent activity and substantial protection against stomach injury due to absolute ethanol. The HWE raised (by 49%) the mucus content that is attached to the gastric mucosa wall substantially. The maximum dose of HWE was not a major acidic (total as well as free) or pH acidic inhibition in this research.

ANTI DEPRESSANT¹⁸:A mood disorder that causes a persistent feeling of sadness and loss of interest. Any member of a class of drugs prescribed to relieve depression. There are several major classes of antidepressant drugs, the best known of which include the tricyclic antidepressants, monoamine oxidase inhibitors (MAOIs), and selective serotonin inhibitors (SSRIs). Other important groups include the norepinephrine reuptake inhibitors (NRIs), the serotonin-norepinephrine reuptake inhibitors (SNRIs), and the atypical antidepressants, a disparate group of agents that possess unique structural features and mechanisms of action.

ANTI-HYPERCHOLESTEROLEMIC¹⁹: Hypercholesterolemia is a dominant risk factor for atherosclerosis and cardiovascular diseases. In this study the putative antihypercholesterolemic and anti-oxidative properties of an ethanolic extract of Piper betel and of its active constituent, eugenol, were evaluated in experimental hypercholesterolemia induced by a single intraperitoneal injection of Triton WR-1339 (300 mg/kg b.wt) in Westar rats.

Hypercholesterolemia rats receiving the Piper betel extract (500 mg/kg b.wt) or eugenol (5 mg/kg b.wt) for seven days orally, all these parameters were significantly better than those in salinetreatedhypercholesterolemic rats.

MARKETED PRODUCTS

<p>TOOTH PASTES</p>	
<p>BETEL LEAF ESSENTIAL OIL</p>	
<p>BETEL LEAF POWDER</p>	
<p>FACIAL CREAM</p>	
<p>HAIR OIL</p>	

MOUTH FRESHENER	
BETEL LEAF SHARBAT	

CONCLUSION:

It is quite evident from this review that betel leaf contains a number of phytochemicals which is used for therapeutic application. India has wide range of cultivation of betel leaves. the plant or its individual parts used for various types of disorders like anti- cancer, anti- diabetes, anti- inflammatory, antioxidant, anti-microbial and anti-septic property.. This review also discussed the conventional and modern used of betel leaf.

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