

REVIEW ON BETEL PEPPER LEAF FOR ANTI INFLAMMATORY ACTIVITY

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1. ABSTRACT

Piper betel L. belong to the family Piperaceae best known as Pan. It is widely grown in Sri Lanka, India, Thailand, Taiwan and other countries in Southeast Asia. These oils can be used as raw materials in the pharmaceutical industry, perfumes, mouthwash, additives, food additives etc. The leaves are nutritious and contain ant carcinogens that show promise of producing leukemia. The current review aims to integrate the therapeutic values of Piper betel produced by research work using modern scientific methods and established scientific tools. Piper betel Linn. An important species of the Piperaceae family is the evergreen and long-lasting creeper, with heart-shaped shiny leaves that are excellent pools of phenolic compounds with anti-proliferative, anti-

mutagenic, antibacterial and antioxidant properties. Phytochemical research shows that Piper betel contains a wide variety of organic compounds that focus on plant diversity. Numerous Piper betel studies have reported that it contains essential chemical elements such as chavibetol, chavibetol acetate, caryophyllene, allyl pyrocatechol diacetate, campene, chavibetol methyl ether, eugenol, Pinene, if- Pinene, Limonene, safrole, 1- 8-cineol, and allyl pyrocatechol monoacetate. These components are considered to be stimulants due to their therapeutic properties such as 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. The current review is an attempt to highlight a variety of traditional uses and medical reports with Piper betel LL.

KEYWORDS: Piper betel, Pan, Phytopharmacology, Traditional system of medicine Ayurvedic uses, Pharmacological activity.

2. INTRODUCTION

Betel leaf is evergreen, the creeper, with a shiny, heart-shaped and white cat. The genus Piper (Piperaceae) is still widely distributed in tropical and subtropical regions of the world. Piper betel is grown in India, Sri Lanka, Malaysia, Indonesia, the Philippines, the island, and East Africa. It contains a light yellow aroma of essential oils, with a sharp taste. There are more than 90 species of betel vine in the world, about 45 of which are found in India and 30 species in West Bengal itself. It is grown in tropical and subtropical areas because of its evergreen leaves which are used for pooja / religious ceremonies and as a chewing stimulant. The leaves are chewed together in a folded pocket with areca nut (which, in combination, is commonly incorrectly called betel nut) and mineral slaked lime (calcium hydroxide).

Catechu called Katha in Hindi with other ingredients and spices may be added. Lime works to keep the active ingredient in its freebase. Freebase or alkaline form, thus being able to enter the bloodstream with less than 2 tongue absorption. The areca nut contains the alkaloid arecoline, which promotes the maturation of saliva (red saliva), and in itself does not. This compound, known as betel quid, has been in use for a few thousand years. Piper plants are used for many other purposes such as food and spices, fish bait, fish poisoning, hallucinogens, pesticides, oil, ornaments, spices, etc. It is an effective anti wormal agent and an anti-infective agent due to its bitter taste. Its aids in normalizing the digestive tract and is therefore very effective in maintaining the digestive system due to its light properties.

In addition, it helps to clear the mucous membranes of the prepared leaves and stems should be useful in treating constipation, respiratory congestion, constipation, congestion, cough and asthma. Leaf juice is formally administered to treat coughs and indigestion. Many studies to date have provided much information about Piper betel and its functions such as anti-malarial activity, anti-bacterial activity, anti-fungal research, pesticide activities, antioxidant activity, anti-diabetic activity, gastroprotective protection function, anti Nociceptive activity, cytotoxic activity, anti-platelet, etc. Piper betel blessed as an evergreen and evergreen plant, created by God and given the shape of his heart.

Anthropologists have found betel traces of wind caves in the northwest of Thailand dating back to 5500 7000 BC, which preceded formal and informal farming. There have been similar finds in Timor in Indonesia dating back to 3000 BC and in the black teeth of the human skeleton of Palawan in the Philippines dating back to 2600 BC. It had found a place in the very ancient Sri Lanka Historical Book Mahawamsa written in palli. Even today strong

betel-chewing chewers in Thailand, Myanmar, and Indonesia have been found to have black teeth for years. Archaeological evidence suggests that betel leaves are chewed together with Areca nut since ancient times and it is not known exactly when the two different stimulants first came together. Therefore, it may be difficult to determine precisely when the infamous chewing gum began.

Piper betel is a Vedic plant and its Vedic name is Saptasira and in Sanskrit known as Tambool, Nagveleri, Nagani was used as a remedy for various ailments. Tambool references occur since Vatsyayanas Kamasutra & Panchatantra down to Kalhans Rajatarngni (which may be the last of the revered Sanskrit ancient writings of historical significance). Tambool, therefore, refers to a period of about 2000 years.

In the Ayurvedic medicine system, the properties of betel leaf are described below

Guna (Quality): Laghu, Ruksha, Tikshan

Rasa (Nambitha): Tikt

Vipak (Metabolism): Katu

Virya (Power): Ushan

Prabhav (Impact): Hridya

Inflammation can be considered as a defense against biological agents including viruses, toxic compounds, and many aspects of environmental stress. Often, this highly controlled and self-limiting condition encourages the healing process. However, an uncontrolled and prolonged process, called chronic inflammation, can cause further cellular activation of the cells leading to higher cytokine release. This ongoing response may lead to pathological problems such as autoimmune diseases, diabetes, heart disease, cancer and various neurodegenerative disorders. Understanding the basics of inflammation and the manifestation of novel anti-inflammatory agents may provide promising therapies for the prevention and / or treatment of chronic inflammatory diseases. In Ayurveda, betel leaf extract is commonly used as an adjuvant and mixed with various herbs that may have better effects without its independent use as a medicine. In Sushruta Samhita tambool leaves are described as fragrant, sharp, hot, acrid and beneficial for the voice, laxative, appetizer, without which they reduce Vata and increase pitta.

3. Plant Profile

3.1. Taxonomical Classification

Kingdom: Plantae

Division: Magnoliophyte

Class: Magnolipsida

Order: Piperales

Family: Piperaceae

Genus: Piper

Species: Betel

3.2. Vernacular Names

Sanskrit: Tambool, Mukhbhushan, Varnalata

Hindi: Paan

English: Betel, Betel pepper, Betel-vine

Telugu: Nagballi, Tamalapaku

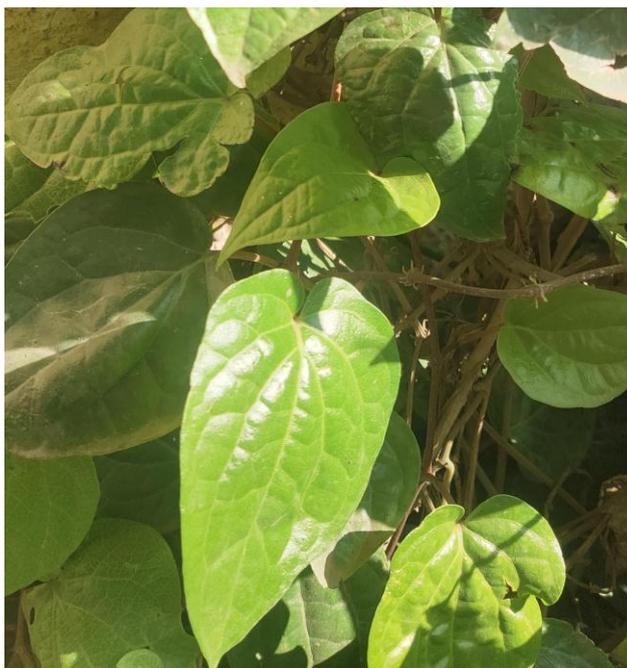
Tamil: Vetrilai

Gujarati: Nagarbae

4. Chemical Constituents of Peper Betel Leaf.

Chemical Constituents	% Of chemical constituents
Chavibetol	53.1
Chavibetol acetate	15.5
Caryophyllene	3.71
Allyl pyrocatechol diacetate	0.71
Chavibetol methyl ether	0.48
Eugene	0.32
α -Pinene	0.21
β -Pinene	0.21
Safrole	48.7
1, 8-Cineol	0.04
Allyl pyrocatechol	0.23
Monoacetate	
Tannins	0.1- 1.3%

5. Plant Description



Piper betle is a perennial, dioecious member of the Dicot family Piperaceae. Male vines are cultivated and grow vigorously up to 20 m tall, with a stem width of 1520 cm. Stems are semi-wood, green or green, cylindrical or double-pressed with dimorphic branching. This plant grows and crawls on the ground or climbs up trees with orthotropic vegetative branches through emerging roots from the huts. The roots are short, with few branches and short. The nodes are clearly swollen and the internodes are extended. The leaves are light, rotating, pointed, double-sided, petiolate 520 cm long, broad, cordate to ovate obliquely, not thick and usually uneven. Lamina is oblique at the base, slightly acuminate, acute, complete with undulate margin, glabrous, light green or dark and reticulate venation. The leaves are fragrant and the taste varies from delicious to bitter. The petiole is usually 215 cm long.

Flowering is rare, especially since plants are replanted every four or five years under cultivation. Plants bloom when they are 810 years old. The inflorescence is cylindrical, a pendulous spike and the flowers are naked, distinct, distinct, dioecious, very tall, peduncle (310 cm long) and oppositifolius. Female spikes 3.56 cm long. Male spikes are dense, cylindrical, 810 cm long, sub-pendulous, consisting of numerous unisexual bracteate flowers. The fruit is a drupe, which appears very small, often sinking into a fleshy spike. There are 1020 seeds in each fruit, but they cannot grow well. There are several variations in chromosome numbers reported on betel vine: figures $2n = 26, 32, 52, 58, 62, 78$ and 195 are

given. The most common number is $2n = 78$ for most plant species and varieties (Jose and Sharma, 1984).

5.1. Chemical Nutrients

The plant contains turpentine, P-cymene, carvacrol, chavicol and its derivatives, allyl catechol, eugenol, estragol, oxalic acid, malic acid and amino acids. The leaves contain a good amount of vitamins especially nicotinic acid, ascorbic acid and carotin. They also contain essential amounts of all the essential amino acids except lysine, histidine and arginine. The main concentration of asparagines is present when glycine and proline occur in good amounts. Essential oils of the leaf give it a pleasant aroma. B-sitosterol is present in root.

5.2. Phytochemicals

Piper betel contains a wide variety of varieties their active biological compounds concentration depends on the variety of plant, season and climate. Chemicals essential oil covers safrole present in leaf, stem, stem, root and β -phellandrene present in the fruit. The presence of hydroxychavicol acetate, allylpyrocatechol piperbetol, isoeugenol, anethole, stearic acid, methyl eugenol, carvacrol, polyphenol, alkaloids, saponin, Tannins, steroids and other compounds and is available at Piper betel. This smell of betel leaf is due to the presence of essential fats, which include phenols and terpenes. The active ingredient of piper betel oil found in the leaves is the main class of allyl benzene compounds, chavibetol, chavicol, estragole, eugenol, methyl eugenol and hydroxycatechol.

5.3. Betel Leaf Content

Betel leaves contain tannins, sugars and diastases as well as essential oils. Essential oils are a bright yellow liquid with a pleasant aroma and a sharp glow to taste. It contains phenol called chavicol which has strong anti-inflammatory properties. The alkaloid is mixed with cocaine in some ways. Betel leaf analysis shows that it contains 85.4 percent humidity, 3.1 percent protein, 0.8 percent fat, 2.3 percent minerals, 2 percent fiber. -2.3 and carbohydrates 6.1 percent per 100 grams. Its minerals and vitamin content are calcium, carotene, thiamine, riboflavin, niacin and vitamin C. Its calorific value is 44.

5.4. Bio-Active Components

The main components of Piper betel are chavibetol (53.1%) and chavibetol acetate (15.5%). Some voters have allyl pyrocatechol diacetate (0.71%), campene (0.48%), chavibetol methyl

ester (0.48%), eugenol (0.32%), α -pinene(0.21%), β -pinene (0.21%), α -limonene(0.14%), safrole (0.11%) and 1,8-cineole(0.04%). The Hexane section of the leaf stems produced four acres of pure athathic compounds form a pentadecyl hydroxytridecanoate, pentatriacontanol, methyl hexacos-7-enoate and 6, 9-heptacosa dieene14,15. The principle Piper betel chemicals were available polyphenols such as eugenol, chavicol, charvacrol, chevibetol, catechol and allyl pyrocatechol and vitamin C, which reportedly show strong antioxidant function. In addition, these polyphenols are effective their protective functions through their use high radical and immune discharge power adjustment.

6. Ethno Botanical Use of Peper Betel

6.1. The leaf

Leaf juice is served systematically to treat coughs and indigestion and as an anti- malarial activity, antibacterial activity, antifungal study, insecticidal activity, antioxidant activity, anti-diabetic activity, gastro protective activity, antinociceptive activity, cytotoxic activity and anti-platelet.

6.2. Stem

It should be helpful to treat constipation, bronchitis, cough and asthma.

6.3. The whole plant

Piper type as well used for many other purposes as food and spices, fish beast, fish, poison, hallucinogens, insecticides, oils, cosmetics, fragrant, antiwormal and anti-infectious agent because of its bitter taste. It helps to normalizing the digestive tract is therefore very much successfully maintaining a digestive system_because of its light structures.

7. Medicinal Applications

1. Piper betel leaves greased with oil are useful for breastfeeding women; is said to promote milk secret.
2. In childhood and adulthood, such leaves mixed with mustard oil, warm and a apply to the chest for treatment to reduce cough and dyspnea.
3. It restores bad breath, body odour and to prevent tooth decay.
4. It also protects and cures vaginal infections reduce vaginal itching.
5. Stop bleeding from the nose.
6. Contains vitamins such as thiamine, Niacin, riboflavin and carotene.
7. In India, the leaves are used to treat eczema, lymphangitis, asthma and rheumatism.

8. The leaf adhesive is used for cuts once wounds.
9. The roots of the black pepper used for production infertility in women.
10. Oil used for irritation of the throat, throat, bronchi, gargle and inhalation in diphtheria.
11. Leaf juice is used as a stomachic as well febrifuge.
12. Piper betel leaves are beneficial to childhood lung infections as well aging. The leaves are mixed with mustard oil warmed and placed in the bosom to live coughing and shortness of breath.
13. Limited use of leaves effective in relieving a sore throat. flat fruits or berries should be mixed with honey and is used to reduce irritation cough

8. Ayurvedic Uses

8.1. Small or Blocked Urination

Betel leaf juice is said to have abortive properties. Its juice, mixed with melted milk and low in sugar, helps to reduce urinary incontinence.

8.2. Neurological Weakness

Betel leaves are useful in treating nervous disorders. The juice of a few betel leaves, and a teaspoon of juice, acts as a good tonic. A teaspoon of this mixture can be taken twice a day.

8.3. Headache

Betel leaf has analgesic and anti-inflammatory properties. It can be used to relieve severe headaches.

8.4. Respiratory Problems

Betel leaves are useful for lung problems in childhood and old age. The leaves, soaked in mustard oil and warm, may be applied to the chest to relieve cough or difficulty breathing.

8.5. Constipation

In the case of pediatric constipation, a suppository made from betel leaf leaf dipped in castor oil can be injected into the rectum. This quickly relieves constipation.

8.6. Throat

The local use of the leaves is effective in treating sore throats. Crushed fruit or berries should be mixed with honey and taken to relieve irritating coughs.

8.7. Wounds

Betel leaves can be used to treat wounds. The juice of a few leaves should be extracted and applied to the wound. Then the betel leaf should be tied over it and tied.

9. Anti-Inflammatory Effects

Betel leaf is used as a natural home remedy for inflammation of the mouth. Dohi *et al.*, (1989), has shown that ethanolic extraction of betel leaf has been reported to have anti-inflammatory properties in non-toxic areas. To a complete model of Freund's adjuvant-induced arthritis in mice. Eugenol, one of the main components of the betel leaf has been shown to have anti-inflammatory effects in various animal models studied by various inflammogen.

Anti inflammation is part of the complex biological response of vascular tissue to harmful substances, such as pathogens, damaged cells and irritants. It is a natural defense mechanism, and is characterized by pain, fever, redness, swelling and loss of function. Studies have also shown that the hydroalcoholic leaf of the betel leaf contains nitrogen oxide scavenging effect *in vitro*. Ethanolic extracts of betel leaf have been reported to have anti-inflammatory properties in non-toxic areas, in the full model of Freund's adjuvant-induced arthritis in rats. Eugenol, one of the main components of betel leaf, has been shown to have anti-inflammatory effects in various animal models of studies with various infectious agents. The properties of betel leaf, eugenol, hydroxychavicol and alpha-tocopherol, have also been shown to improve GSH levels in rat skin and liver.

The aim of our study was to identify for the first time the potentially delayed activities in the fight against Piper betle leaf extracts known as anti-geriatric compounds. The high content of various phenolic and non-phenolic compounds and other non-phenolic compounds may influence its use, not only as part of a highly nutritious, edible plant, but also as a nutrient, to be used as prophylacticals and in the treatment of inflammatory oxidative diseases. P.betle leaf extract showed proinflammatory activity and cell function decreased by 29% rather than controlled. The results of the study suggest that the selected varieties of P.betle can be used as a natural antioxidant and one or more complementary remedies for treating inflammatory bowel disease.

10. Cancer Fighting Work

Globally, breast cancer is the most common disease in women with 1.38 million new cases a year (Eccles, et al., 2013). The high rate of death is usually caused by the prediction of the disease late, which has recently been diagnosed in the metastasis phase. This phase is characterized by high exposure of matrix metalloproteinases (MMPs), cell migration, invasion and other events associated with metastatic cascade. These conditions can not only be treated with radiation or surgery, but instead need to be improved with chemotherapeutic drugs. 10. Zulharini M et al., 2018 used methanolic extract of red betel leaf to test cytotoxic and anti-migration along the metastatic breast. Cancer. Red betel leaves (*Piper crocatum* Ruiz dan Pav) are known as biphenolic herbal medicine, as apigenin & luteolin derivatives have cytotoxic activity on cancer cells.

The study was aimed at examining the inhibitory effect of *Piper crocatum* leaving methanolic extract (PCM) on cell proliferation and migration using 4T1 cells as a metastatic breast cancer model. Using the MTT assay, PCM performed cytotoxic activity in a volume-dependent manner with an IC₅₀ value of 120 µg / ml. Wound healing tests revealed that PCM transplant activity of 4T1 cells at a concentration of 30 µg / ml. PCM produced a cytotoxic effect and anti-migration activity on metastatic breast cancer cell levels was investigated in vivo to find funny and cellular immune responses in mice vaccinated in sheep's red blood cells. *P. betel* strongly suppressed phytohaemagglutinin and stimulated the increase in blood lymphocyte in a dose-dependent manner. Decreased antibody titre and increased inflammation suppression suggest a possible immunosuppressive effect of the extract in cellular and humoral reactions in mice.

11. Side Effects

Not enough is known about the safety of oral betel nut in the short term. However, betel nut is considered unsafe when taken orally for long periods of time or in high doses. Some chemicals in betel nut have been linked to cancer. Some chemicals are toxic.

Eating 8-30 grams of betel nut can cause death. Chewing betel nut can make the mouth, lips and faeces red. It can cause side effects such as caffeine and tobacco use. It can also cause serious side effects, including vomiting, diarrhea, gum disease, salivation, chest pain, irregular heartbeat, and low blood pressure, shortness of breath and shortness of breath, heart attack, thirst, and death.

12. DISCUSSION

Piper betel plant is a rich source various nutrients and a sufficient amount of this phytochemicals and antioxidants are found in it. The lessons we have learned here show different properties to treat various diseases such as anticancer, antimutagenic, anti-amoebic, anti-giardial, anti-inflammatory, mosquito larvicidal, antimicrobial, immunomodulatory, antiulcerogenic, radioprotective, antileishmanial, antifungal activity So too to cure evil spirits, abscesses and abscesses, conjunctivitis, constipation, headache, hysteria, itching, mastitis, mastoiditis, leucorrhoea, otorrhoea, ringworm, inflammation gum, rheumatism, abrasions and cuts.

Everything possible due to the presence of hydroxychavicol acetate, allypyrocatechol piperbetol, isoeugenol, anethole, stearic acid, methyl eugenol, carvacrol, polyphenol, alkaloids, saponin, tannin and steroids in it.

Lessons and it has been proven that Piper betel leaves have anti-carcinogenic properties so cause oral cancer is not a betel leaves actually due in some carcinogenic compounds ingredients.

13. CONCLUSION

This Review leads to greater potential for drug and nutrient value. Piper betel is known all over the world and is often used as a mouth-watering remedy and is used as a powerful source of therapeutic novel value. This figure indicates that it is suitable for future use as a promising source of treatment for a variety of conditions. Therefore, the same is true of many biological functions and has great potential to emerge as a future therapeutic and nutritional solution. This review showed that (aqueous extract) green betel pepper leaf have anti-bacterial properties.

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