

A Short Overview on Significance of Betel Leaf (*Piper betle*) And Its Applications

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ABSTRACT

Betel leaf (*Piper betle*) is a well-known medicinal plant found in Asia. It belongs to the family *Piperaceae*. It has many commercial applications in medical field, industrial field, and pharmaceutical field. Betel leaf is an excellent source of antioxidants, phytochemicals and has cooling and refreshing properties. There are 90 varieties of betel leaf found all over the world, of which 45 varieties are found in India. It is cost-effective, safe, and easily available in any season. Betel leaf has many properties as anti-fungal, anti-septic, anti-microbial, anti-cancer, anti-diabetic, anti-allergic, anti-fertility, anti-filarial, wound healing and anti-dermatophytic. It also prevents gastrointestinal infections due to its immunomodulatory effect. It may be useful in the treatment of diabetes by maintaining the blood sugar levels. Traditionally it is used in the religious ceremonies to celebrate the events. Betel leaf is widely used for chewing practices in most countries after commencement of the meal to improve digestion. Ayurveda suggests consuming betel leaf after the commencement of meal is wholesome as it promotes digestion, cleanses mouth, removes excessive cough and maintains weight. The review was conducted to recollect the benefits of betel leaf in order to portray the significance which will benefit the mankind.

Keywords: Betel leaf (*Piper betle*), Tambul (*Paan*), anti-fungal, anti-bacterial, antioxidant, anti-inflammatory, anti-diabetic and food spoilage

INTRODUCTION

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. It is highly abundant and inexpensive; therefore, it may promote further research in food companies and the pharmaceutical industry. Betel leaf is commonly known as betel vine. It is widely used for chewing practices in most countries, like India, for avoiding bad breath, strengthening the gums and stimulating the digestive fire. In Indonesia, betel leaves are used for the treatment of vaginal douching and used as gargle mouth

wash in India. In Srilanka, juice extracted from betel leaf is used to treat skin ailments. Betel leaves are also boiled and used as cough medicine due to their astringent taste [1].

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 texts like Bhojankutuhalam state 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 as *Tambul* or *Paan*. 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 fire [2].

In research carried out in (2017), betel leaf contains phytochemicals which show antioxidant, anti-inflammatory, anti-platelet, antithrombotic, antibacterial and antifungal properties. Phytochemicals found in the analysis of betel leaf are hydroxyl chavicol (69.46%), 4-Chromanol (24%) and Eugenol (4.86%), which has wide applications including as agents [3].

Traditionally, betel leaf is used for many diseases and disorders. It contains analgesic and cooling properties which are applied over the painful area to get relief. The juice of betel leaf is diuretic in nature, so it is used in the treatment of obstructive urination. Betel leaves are an excellent household remedy for the treatment of cough and sore throat. The leaves soaked in mustard oil can be applied to the chest area to relieve coughing and difficulty with breathing. Betel leaves play an important role in the treatment of nerve pains, nerve exhaustion and debility [4].

There are more than 90 varieties of betel leaf found all over the world of which 30 varieties are found in West Bengal and 45 are found in India. Betel leaves are grown in tropical and subtropical regions. Leaves of the plant are used in the manufacturing of perfumes, insecticides, oils and ornaments and used in the foods and spices [5].

Ayurveda describes the ideal method for the preparation of *Tambul* and its consumption. Ingredients used in the preparation of *Tambul* have medicinal values. Major ingredients are as Areca nut, Camphor, cloves, Nutmeg, Cutch tree leaves, Tail pepper and Lime powder. Each and every ingredient shows positive effect on the body. *Tambula* confers physical beauty, prosperity happiness and increases the libido [2].

The study has been undertaken to portray the significance of consuming betel leaf on regular basis in order to improve health by promoting good source of phytochemicals which enhances the immunity by retarding the growth of cancer cells, prevents DNA damage and other diseases. This may create awareness about consuming betel leaf on regular basis for improving the immunity.

LITERATURE REVIEW

Various research articles were reviewed on potential benefits of betel leaf.

Potentially betel leaf is an excellent source of anti-oxidants and has anti-microbial properties. Ethanolic compounds extracted from betel leaf showed excellent anti-microbial activity against gram negative and gram positive pathogens. The anti-bacterial activity of betel leaf is due to the presence of polyphenols which destroys the activity of spoilage causing microorganisms by increasing the shelf life of foods. Therefore, betel leaf is an excellent source of natural anti-oxidants for pharmaceutical industries in which they can be used in the medicines and food products in order to increase the potential of the therapeutic food products [6].

In a study carried out in (2019), on nutritional composition of betel leaf shows the nutritional benefits of *Piper betle*. Under the study detail analysis of the plant leaves were carried out (physico-chemical analysis, proximate analysis, nutritional assays and sensory analysis) was conducted. The study observed that dehydrated plant leaves contain more nutrients as compared to moist leaves. These dehydrated leaves can be incorporated into product formulation to enrich nutritional value of the products and to combat micronutrient deficiencies in developing countries [7].

In (2011) a study was revealed that betel leaf (*Piper betle*) has many medical applications. According to Ayurveda betel leaf is used as medicine to control parasitic infections, obesity, skin diseases, and conjunctivitis. Also juice of the plant leaves is dropped into the eyes to cure painful

affections. Consumption of betel leaf with camphor powder treats paralysis of the tongue and aids in digestion of food. But those who are *Brahma Chari* and mendicants should not eat *Tambula*. Betel leaf is not only used for medical purposes but also used in religious ceremonies. It is used as vegetable for cooking in Assam [8]. A study carried out in (2019) on uses of betel leaf in various ailments shows that betel leaf (*Piper betle*) has numerous benefits in medical field for its therapeutic actions on the body. It is the most promising commercial botanical. It was also reported that it contains important chemical constituents as chavibetol, chavibetol acetate, caryophyllene, allylpyrocatechol diacetate, campene, chavibetol methyl ether, eugenol, α -Pinene, β -Pinene, γ -Limonene, safrole, 1-8-cineol, and allylpyrocatechol monoacetate. These components act as a stimulant for its medicinal properties like anti-fungal, anti-nociceptive, anti-cancer, immunomodulatory, anti-halitosis, anti-diabetic, gastro-protective, anti-allergic, anti-fertility, anti-filarial, anti-larvicidal, wound healing and anti-dermatophytic [9]. In a study carried out in (2013) it was concluded that betel leaves are cheap, easily available, natural appetizer, digestive, mild stimulant, aphrodisiac and refresher. Not only leaves are used for the treatment but other parts of the plant are also used for various purposes in medical and pharmaceutical applications. It is also termed as “Green Gold of India” [4]. A study was carried out on commercial applications of betel leaf in (2019) and it was concluded that betel leaf has many commercial applications used in industries for making of shampoos, mouthwash, medicinal products, cosmetics, soaps, antiseptic lotions, toothpaste, personal care products and perfumes. In food industries betel leaf extract is used to protect and enhance the shelf life of the products during processing and storage. It acts as a food additive and has antifungal property which may minimize the chances of food spoilage in perishable foods. Moreover, betel leaf

extracts are least toxic and does not cause any side effects to the body [1].

CONCLUSION

It was concluded that betel leaf (*Piper betle*) is an excellent herb used in various fields and has potential benefits and applications. India has wide range of cultivation of betel leaves. Therapeutic applications of betel leaves are due to its antioxidant, anti-fungal, anti-microbial and anti-septic properties. Not only therapeutic applications of betel leaf have been popularised but it has wide range of application in the field of ancient science as well as modern science. In future betel leaf may be studied in detail with its shelf life and nutritional analysis.

Declaration by Authors

Ethical Approval: Not Applicable

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