Pharmacognostical studies on leaf of *Piper betle*

K. Vasuki, R. Senthamarai, T. Shri Vijaya Kirubha, P. Balasubramanian and S. Selvadurai*

*Periyar College of Pharmaceutical Sciences for Girls, Trichy, India*

**ABSTRACT**

Plants are the principle source of raw material for plant based medicines since ancient times the traditional medicines are receiving great importance in the health care sector the world over. There is a need for the application of knowledge about medicinal plants for the purpose of authentication, detailed study and practical utilization of crude drugs. The present study deals with the taxonomy anatomy powder study pertaining to organoleptic, microscopic, fluorescence, physical constant investigations and Preliminary Phytochemical screening of *Piper betle*, Linn., We found some additional anatomical characters such as silicified cells (silica bodies), "PEARL GLANDS". These characters have not been reported in ayurvedic pharmacopiea. So these additional diagnostic characters of *Piper betle*, Linn., are recommended to make necessary inclusions in the ayurvedic pharmacopoeia.

**Key Words:** *Piper betle*, Linn, Organoleptic, Microscopic, Fluorescence, Physical constant investigations, Preliminary Phytochemical screening.

**INTRODUCTION**

*Piper betle* linn.(piperaceae)(Karpooori variety) in tamil it is called as vetrilai 1,2 is a dioecious perennial creepea plant and found in india west Bengal and malaysia3,4. it has carminative,sialagogue, antibiotic, aphrodisiac, expectorant and immune boosting properties as well as anticancer properties.

It is used in the form of an decoction in treating wounds, burns, impextigo, furuneloris, eczema, lymphangitis and juice is valuable stomatic. The roots and fruits were reported for treatment of malaria, asthma
The leaf has been reported to contain methyl piper betlol, peperol-A, piperol-B and they also have been isolated and leaf also contains hydroxyl chavicol, eugenol piper betol and the betel oil contains carvacrol, allyl catechol, chavicol, chavibetol, cineole, estragol, p-cymene, caryophyllene, cadinene. The antispasmodic action of betel oil on involuntary muscle tissue, inhibiting excessive peristaltic movements of the intestines at moderate doses. The important Ayurvedic formulations of piper betel plant are Lokantha Rasa, Puspadhava Rasal, Brhat sarwajwarahara, lanha, laghu sutaseknara Rasa, Brhat visamaj warantaka Rasa we found some additional anatomical characters such as silica bodies, pearl glands. These characters have not been reported in ayurvedic pharmacopoeia so these additional diagnostic characters of piper betle linn are recommended to make necessary inclusions in the ayurvedic pharmacopoeia.

MATERIALS AND METHODS

Piper betle leaf was collected from nursery garden in choolavandan, Madurai and authenticated by Dr. R. Arulmozhiyan, Department of horticulture, Tamilnadu Agricultural university, Coimbatore and Dr. D. Stephan, Department of botany, The American college, Madurai. Pharmacognostical studies were performed following the standard methods.

Fluorescence analysis and micro chemical tests for cell contents and cell structure were performed total ash acid insoluble ash water soluble ash water soluble extractive and alcohol soluble extractive were studied.

Macroscopic Characters
Leaves are simple alternate stipulate petiolate The petiole 0.75 to 3.8cm, ovate oblong broadly ovate cordate or obliquely elliptic entire glabrous coriaceous 10 to 18 cms long and 5 to 10 cms broad acuminate oblique and rounded base primary or srbprinary nerves usually 7 (or 5to9);Secondary nerves reach to very near the apex; tertiaries numerous.

Microscopic Characters
TS of leaf through midrib shows In adaxial epidermis multiple epidermis with a single layer of rectangular epidermal cells with thick cuticle followed by two layers of larger hypodermal cells, Apostomatic. In abaxial epidermis, rectangular cells or 10mm contacts of silica bodies occur in a stellate mass with irregular outline (Fig:2)

Small rounded cells with hypodermal cells followed by small arc of sclerenchyma(adaxial part)large barrel shaped, epidermis, followed by2(or)3 layers of collenchyma cells(abaxial part) The palisade layer are well distinguished they are double layered short wide compact cells and mesophyll cells are 3or4 layered and small lobed. Thick walled irregular secretory cells are seen with dense contents of probable an essential oil.

The leaf is dorsiventral mesomorphic even smooth and both surface with farrrly riminal midrib The midrib portion of the leaf contains thin walled compact parenchymal cells in ground tissue. The vascular bundles located at the centre of midrib portion single ovate collateral cells with destea of xylem elements and a thick arc of phloem was observed cyclocytic stomata are seen only in the lower surface secretory glandular trichomes abundant on the epidermal layer with
short stalk with buried in epidermal layer. The body is spindle shaped and hordizontall oriented it is attached to stalk at one end and it is called ad pearl glands

**Powder Characteristics**
The leaf powder ps greyish green in colour having aromatic odour and burning tate it shows following powder characteristics,
1. pearl glands in secretory glandular trichomes
2. cyclocytic stomata
3. palisade and spongy parenchyma cells
4. epidermal cells with auticlinal wall fibres.

**Preliminary phyto chemical studies**
The phyto constituents were detected carbohydrates phytosterol saponins tanmins proteins amino acids gums &mucilage flavonoids and terpenoids.

**Ash and extractive values**
Total ash, acid insoluble ash water soluble ash alcohol soluble extractive and water soluble extractive were respectively.

**Fluorescence analysis**
Fluorescence characteristics of lead under ultraviolet light are tabulated in Table-1

**MICROSCOPY OF P.betle Linn**

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**Fig-1**
Habit and of bitat of P.betle Linn

**Fig-2**
T.S. of Leaf through midrib of P.betle

**Fig-3**
Sillicified cells of epidermis in surface view of lamina (Var.Karpoori)

**Fig-4**
Cyclocytic stomata
RESULTS AND DISCUSSION

The salient anatomical characteristics of the leaf are multiple epidermis with thick cuticle hypodermal cells followed by small arc of sclerenchyma, double layered palisade cells 3-4 layered and small lobed mesophyll cells we conclude pearl gtlands silica fied cels silica bodies may be inclinded in ayurvedic pharmacopoeia.

REFERENCES