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**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1229578>Available online at: <http://www.iajps.com>**Research Article****DETERMINATION OF BIOACTIVE COMPOUNDS FROM
PIPER BETLE L BY USING FT-IR SPECTROSCOPIC
ANALYSIS****N.K.Parameswaran^{1*}, S. Manjusha², R.Senthil Malar³**¹Department of Biotechnology, Manonmaniam sundaranar University, Tirunelveli²Department of Botany and Research Centre, Scott Christian College [Autonomous,] Nagercoil-629003, Kanyakumari district, Tamil Nadu, India.³Department of of Zoology, Sivanthi Adithanar College, Nagercoil**Abstract:**

The wide spread use of herbal remedies and health care preparations obtained from commonly used traditional herbs and medicinal plants have been raised due to the occurrence of natural products with medicinal properties. Even though pharmacological industries have produced a number of new antibiotics in the last three decades, resistance to these drugs by the microorganisms have also increased. In this Present Study the bioactive compounds from the plant Piper betle were determined by using FT-IR Spectroscopic methods.

Key words: *Piper betle, Bioactive Compounds FT-IR.***Corresponding author:**

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INTRODUCTION:

Medicinal plants play a vital role in meeting the medical and health needs of people, especially in the developing countries. In developed countries, they are used as templates for manufacturing modern pharmaceutical drugs whereas, in developing countries they are an important resource for the treatment of various maladies and illnesses, and are a major component of treatment within the primary health care systems [1]. Ethno medical practices are preferred largely because the medicinal plants are less expensive, readily available and reliable, and they are considered to have fewer side effects than the modern medicines. A few reports on ethno medicinal uses of plants by the Kani tribals were available [2-6] in the adjoining areas of Kanyakumari District [7]. Medicinal plants are being used since ancient times without knowing about their active ingredients. The healing power of certain plants was understood and accepted before mankind discovered the existence of microorganisms [8]. Herbal drugs constitute a major part in all traditional systems of medicines and are a triumph of popular therapeutic diversity [9]. In India, thousands of plant species are known to have medicinal properties and the use of different parts of several medicinal plants to cure specific ailments has been in vogue since ancient times. *Piper betle* L. is one of the popular plants which are integrated with cultural and traditional values in India. The plant is widely cultivated in different parts of India, China, Malaysia, Sri Lanka, Thailand [10] and the other Pacific Asian Nations. The plant belongs to the family *Piperaceae*. The leaves are used traditionally in treating hysteria, headache, swelling of the gum etc.,. The parts of *Piper betle* L. utilized are leaves, root, stem, stalks and fruits. *Piper betle* L. has a light yellow aromatic essential oil, with a sharp burning taste [11]. The chemical constituents and their pharmacological activities of the principle ingredients in the betle quid have been studied by many workers [12]. Betle leaves were reported to contain volatile oil such as betel phenol and chavicol [isomeric with eugenol], tannin, sugar, vitamin-C, starch and diastase [13]. Betle phenols possess the property of reducing the central nervous stimulation, sialagogue and local anesthesia. *Piper betle* L. leaves extract contains a large number of bioactive molecules like polyphenol, alkaloids, steroids, saponin and tannin [14].

MATERIALS AND METHOD:

Sample Collection

In this present study, the plant *Piper betle* L. leaves and seeds were collected in Kadyal, Kanyakumari District, Tamilnadu. An adult, fresh leaves were picked out from the plant and also the matured seed

were collected from the plants and transported to the laboratory for work.

The collected leaves were subjected to surface cleaning by rinsing the samples with sterile water, in order to remove dust particles present on the plant materials. The samples such as leaves and seeds were allowed to shade dry to remove moisture content. The dried samples were used for further studies.

Preparation of Plant Extracts

The leaves were cut into small pieces and seeds were made powdered using an electric mixer grinder. The samples were subjected to Soxhlet extraction using five solvents such as Acetone, Chloroform, Dimethyl sulfoxide, Ethanol and Distilled water. Each 5 grams of plant material was filled separately in the thimble and extracted successively with 60 ml of solvents using a Soxhlet extractor for three hours. After solvent evaporation, each of these solvent extracts was weighed and preserved in room temperature until further use.

Fourier Transform Infrared Spectrophotometer [FTIR] Analysis

The leaf and seed samples were analyzed in ATR model FTIR Spectrophotometer [Bruker Co., Germany]. The spectrum [400-4000 nm] was recorded using Attenuated Total Reflectance [ATR] technique beach measurement.

RESULTS AND DISCUSSION:

The leaf of *Piper betle* L. showed twelve functional groups were present and the peak values are 530.57, 603.67, 879.90, 1044.52, 1086.27, 1274.91, 1327.35, 1380.34, 1655.01, 2883.57, 2972.47 and 3327.52 [Fig 1]. The fruit of *Piper betle* L. showed ten functional groups were present and the peak values are 610.86, 880.12, 1044.61, 1086.33, 1275.01, 1327.63, 1380.27, 2882.96, 2972.28 and 3323.71 [Fig 2].

In the present study, Leaf of *Piper betle* L. contained twelve functional groups, the major peaks were [cm⁻¹] 879.90, 1044.52, 1086.27 and 2972.47; and the seed of *Piper betle* L. contained ten functional groups, the major peaks were [cm⁻¹] 880.12, 1044.61, 1086.33 and 2972.28. In the entire sample, four major peaks were commonly found ranging from [cm⁻¹] 879.47 - 880.12; 1044.34 - 1044.61; 1086.12 - 1087.09 and 2926.53 - 2972.71. The peak values 879.47 - 880.12 cm⁻¹ are C-H "oop" bond of aromatics groups, 1044.34 - 1044.61 cm⁻¹ and 1086.12 - 1087.09 cm⁻¹ are C-N stretch of aliphatic amines groups and 2926.53 - 2972.71 cm⁻¹ are C-H stretch of alkanes groups.

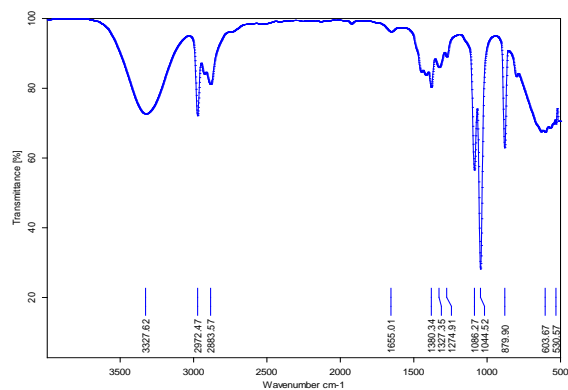


Fig: 1 FTIR Chromatogram of *Piper betle* L. Leaf

CONCLUSION:

In modern days, medicinal plants are becoming probable sources of important drugs and pharmaceutical industries. Nowadays, they have come to consider traditional medicine as a source of bioactive agents which can be used in the preparation of synthetic medicine.. Almost all the members of Piperaceae are used in the traditional medicinal system.

REFERENCES:

1. Ngari, E.W., Chiuri, L.W., Kariuki, S.T. and Hockett, S. 2010. Ethnomedicine of Ogiek of River Njoro Watershed, Nakuru- Kenya. *Ethnobotanical Research*, 8: 135-152.
2. JanakiAmmal, E.K. and Prasad, P.N. 1984. Ethnobotanical findings on *Costus speciosus* among the Kanikkars of Tamil Nadu. *Journal of Economic and Taxonomic Botany*, 5: 129-133.
3. Ignacimuthu, S., Sankarasivaraman, K. and Kesavan, L. 1998. Medico ethno botanical survey among Kanikar Tribals of Mundanthurai Sanctuary. *Fitoterapia*, 69: 409-414.
4. Prasad, P.N., Jabadhas, A.W. and JanakiAmmal, E.K. 1996. Medicinal plants used by the Kanikkars of south India. *Journal of Economic Taxonomic Botany*, 11: 149-155.
5. Viswanathan, M.B., Premkumar, E.H. and Ramesh, N. 2001. Ethnomedicines of Kanis in Kalakad Mundanthurai Tiger Reserve, Tamil Nadu. *Ethnobotany*, 13: 60 - 66.
6. Ayyanar, M. and Ignacimuthu, S. 2005. Traditional Knowledge of kani tribals in Kouthalai of Tirunelveli hills, Tamil Nadu, India. *Journal of Ethnopharmacology*, 102[2]: 246-255.

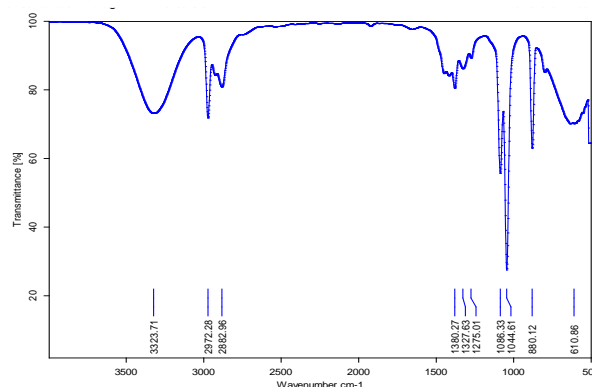


Fig: 2 FTIR Chromatogram of *Piper betle* L. Fruit

7. Gislene GF, Nascimento, Juliana Locatelli, Paulo C Freitas and Giuliana L Silva. 2000. Antibacterial activity of plant extracts and phytochemicals on antibiotic resistant Bacteria. *Brazilian Journal of Microbiology*, 31: 247 - 256.
8. WHO, 2005. Traditional Medicine Strategy. *World Health Organization*, Geneva.
9. Parekh, J., Darshana, J. and Sumitra, C. 2002. Efficacy of aqueous and methanol extracts of some medicinal plants for potential antibacterial activity. *Journal of Biology*, 29: 203-210.
10. Khanra, S. and Silpakendra P.V. 1997. "Betle Leaf Based Industry". *Nabanna Bharati*, 30[2]: 169.
11. Lei, D. 2003. Antioxidant and anti-platelet effect of aqueous inflorescence *Piper betle* L. extract. *Journal of Agriculture Food and Chemistry*, 51: 2083-2088.
12. Santhakumari, P., Prakash, A. and Puglendi, K.V. 2003. Modulation of oxidative stress parameter treatment with *Piper betel* leaf oxidative in Strepto zotocin induced diabetic Rats. *Indian Journal of Pharmacology*, 35: 373-378.
13. Majumdar, B., Chaudari, S.R. and Roy, A. 2002. Potentantiulcerogenic activity of ethanol extract of leaf *Piper betel* L. by anti-oxidative mechanism. *Indian Journal of Clinical Biological Chemistry*, 17: 49-57.
14. Andhikari, P., Chowdhury, D., Baneerji, J. and Chatterje, A. 1998. Antifertility effect of crude alcoholic extract of *Piper betle* L. stalk. *Indian Journal of Physiology and Allied Science*, 52: 22-27.