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Research Article

**DETERMINATION OF BIOACTIVE COMPOUNDS FROM
PIPER NIGRUM L BY USING FT-IR SPECTROSCOPIC
ANALYSIS****S. Manjusha^{1*}, N.K.Parameswaran², R.Senthil Malar³**¹Department of Botany and Research Centre, Scott Christian College [Autonomous,] Nagercoil-629003, Kanyakumari district, Tamil Nadu, India.²Department of Biotechnology, Manonmaniam sundaranar University, Tirunelveli³Department of Zoology, Sivanthi Adithanar College, Nagercoil**Abstract:**

Plants are used medicinally in different countries and are a source of many potent and powerful drugs. The antimicrobial activities of plant extracts may reside in a variety of different components. The beneficial medicinal effects of the plant materials typically result from the combinations of secondary product present in the plant. Medicinal and spice plants are renewable raw materials. Their production is an alternative to the overproduction of traditional crops in agriculture. They also have an increasing economic importance. Spices can be defined as any dried, fragrant, aromatic or pungent vegetables or plant substances in whole, broken or ground form that contribute flavour, whose primary function in food is seasoning rather than nutrition and that may contribute relish or piquancy of foods and beverages. . In this Present Study the bioactive compounds from the plant Piper nigrum L. were determined by using FT-IR Spectroscopic methods.

Key words: Piper nigrum L., FT-IR, Spectroscopic methods

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INTRODUCTION:

Piper nigrum L. is famous as the spices king due to its pungent quality[1]. They are sometimes called Indian Long Pepper, is a flowering vine in the family Piperaceae, cultivated for its fruit, which is usually dried and used as a spice and seasoning[2,3]. It is a close relative of the black pepper plant, and has a similar, though generally hotter, taste[4]. The root and fruit of *Piper nigrum* L. is used in palsy, gout and lumbago. The fruits have a bitter, hot, sharp taste, tonic to the liver, stomachic, emmenagogue, abortifacient, aphrodisiac and digestive [5,6]. They have a pungent pepper - like taste and produce salivation and numbness of the mouth. The fruits and roots are attributed with numerous medicinal uses, and may be used for diseases of respiratory tract, *viz.*, cough, bronchitis, asthma etc. as counter-irritant and analgesic when applied locally for muscular pains and inflammation; as snuff in coma and drowsiness and internally as carminative [7,8]. The genus *Piper* L. contains more than 1000 species that they grow in tropical and subtropical rain forest, but the most well-known species are *Piper nigrum* L., *Piper longum* L. and *Piper betle* L.; 51 cultivars of *Piper nigrum* L. have been reported from the tropical and subtropical regions of India[9,10].

MATERIALS AND METHOD:

Selection of Plant material

In this present study, the plant *Piper betle* L. leaves and seeds were collected in Pechiparai Region 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.

Preparation of Plant Extracts

The leaves were cut into small pieces and seeds were made powdered using electric mixer grinder. All the samples were subjected to soxhlet extraction using

five solvents such as Acetone, Chloroform, Dimethyl sulfoxide, Ethanol and Distilled water. Each 5grams of plant material was filled separately in the thimble and extracted successively with 60ml of solvents using a soxhlet extractor for three hours. After solvent evaporation, each of these solvent extract was weighed and preserved in room temperature until further use.

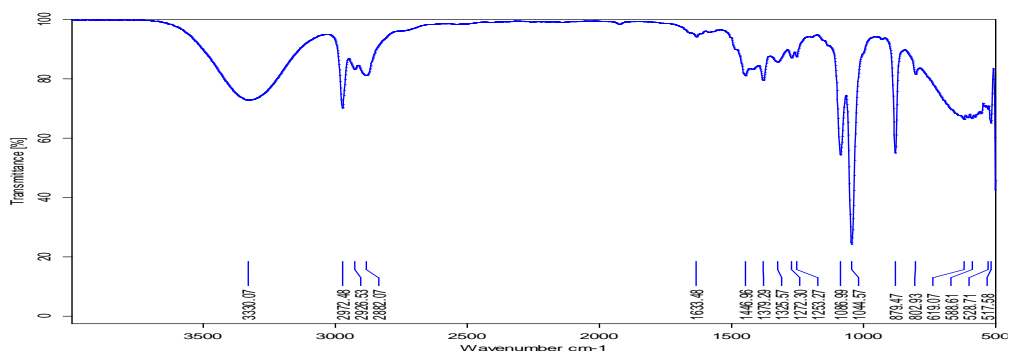
Fourier Transform Infrared Spectrophotometer [FTIR] analysis

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

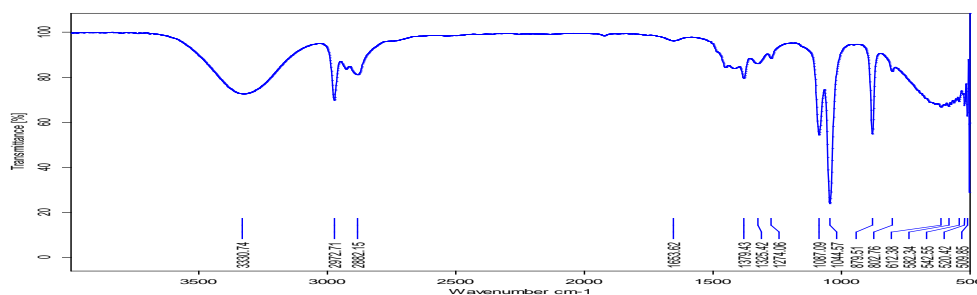
RESULTS AND DISCUSSION:

Fourier Transform Infrared Spectrophotometer [FTIR] Analysis

FTIR study was performed for the leaf and seed. In this analysis, the functional groups are detected between 400-4000 nm spectra. In this present study, the leaf of *Piper nigrum* L. contained sixteen [16] functional groups was present the peak values are 509.85, 520.42, 542.55, 582.34, 612.38, 802.76, 879.51, 1044.57, 1087.09, 1274.06, 1325.42, 1379.43, 1653.62, 2882.15, 2972.71 and 3330.74 [[Fig 1].The fruit of *Piper nigrum* L. showed eighteen 18 functional groups was present and the peak values are 517.58, 528.71, 588.61, 619.07, 802.93, 879.47, 104.57, 1086.99, 1253.27, 1272.30, 1325.57, 1379.29, 1446.96, 1633.48, 2882.07, 2926.53, 2972.48 and 3330.07 [Fig 1]. In this present study, the leaf of *Piper nigrum* L. contained sixteen 16 functional groups and major peaks were [cm⁻¹] 879.51, 1044.57, 1087.09 and 2972.71; the seed of *Piper nigrum* L. contained eighteen [18] functional groups, the major peaks were [cm⁻¹] 879.47, 1044.57, 1086.99, and 2926.53.



FTIR Chromatogram of *Piper nigrum* L. Leaf



FTIR Chromatogram of *Piper nigrum* L. Fruit

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. Species like *Piper nigrum* L., *Piper betle* L. and *Piper longum* L. ranks first in the siddha medicinal use. For most of the siddha medicinal preparation any one of the Piperaceae member being an ingredient.

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