



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1229604>Available online at: <http://www.iajps.com>

Research Article

**DETERMINATION OF BIOACTIVE COMPOUNDS FROM
PIPER LONGUM 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, NagercoilCorrespondence Email- nkparamesh@gmail.com

Mob: 9489154966

Abstract:

Plants, as the source of medicine, have been playing an important role in the health services around the globe. About three quarters of the world's population relies on plants and their extracts for health care. Use of herbal medicine in Asia represents a long history of human interactions with the environment. Plants used in traditional medicine contain a wide range of ingredients that can be used to treat chronic as well as infectious diseases. The medicinal value of plants lies in some chemical substances on that body. The most important of these bioactive compounds of plants are alkaloids, tannins and phenolic compounds. In this Present Study the bioactive compounds from the plant *Piper longum* were determined by using FT-IR Spectroscopic methods.

Key words: *Piper longum*, FT-IR, Spectroscopic methods**Corresponding author:****N.K.Parameswaran,**

Department of Biotechnology,

Manonmaniam sundaranar University,

Tirunelveli.

Email- nkparamesh@gmail.com

Mob: 9489154966

QR code



Please cite this article in press N.K.Parameswaran et al., *Determination of Bioactive Compounds from Piper Longum L by Using FT-IR Spectroscopic Analysis*, *Indo Am. J. P. Sci*, 2018; 05(04).

INTRODUCTION:

Members of the *Piperaceae* may be small trees shrubs or herbs[1]. The distribution of this group is the best described as pan tropical and sub-tropical of the world. There are 30 species of the genus in India and 700 species in the world[2,3]. The most well-known species is *Piper longum*. which yields most peppercorns that are used as species, including black pepper, although its relatives in the family include many other spices [4,5].

Thippali consists of dried fruits of *Piper longum* L. [Piperaceae] a slender, aromatic, creeping and perennial herb [6]. It is commonly used to treat stomach ache, bronchitis, cough and tumour. It is also applied externally to sooth and relieve muscular pains, rheumatism, paralysis and inflamed skin. Pippali contains an alkaloid piperine as chief constituent [7]. It is applied locally for muscular pain, inflammation and internally used as a carminative in conditions such as loss of appetite and sleeplessness [8]. In the Western part of India aqueous extract of the roots of *Piper longum* L. is used as food material [9]. In addition to this, there is a major role for *Piper longum* L. is preventing the cancer development in the experimental glioma model [10]. The extract of the root of *Piper longum* L. and its major compound, piperine exert anti-oxidant activity and are protective in the myocardial ischemic condition [11]. The alcoholic extract of the fruits of the plant *Piper longum* L. and its component piperine showed significant immunomodulatory and antitumor activity [12]. Piper nonaline, a piperidine alkaloid derived from long pepper, possess a mosquito larvicidal activity [13]. Piperine was the first amide isolated from *Piper* species and was reported to display central nervous system depression, antipyretic, and anti-inflammatory activity [14]. The *Piper longum* L. dried fruit's oil showed significant anti-inflammatory activity on carrageen an-induced rat paw edema [15]. Isolates from *Piper longum* L. fruit extracts showed antimicrobial activity against Gram-positive bacteria and Gram-negative bacteria [16].

MATERIALS AND METHOD:

Selection of Plant Material

In this present study, the plant *Piper longum* L. leaves and seeds were collected in Edaykode, 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 leaf 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 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.

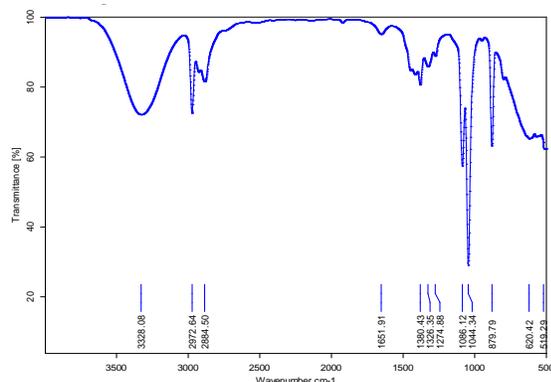
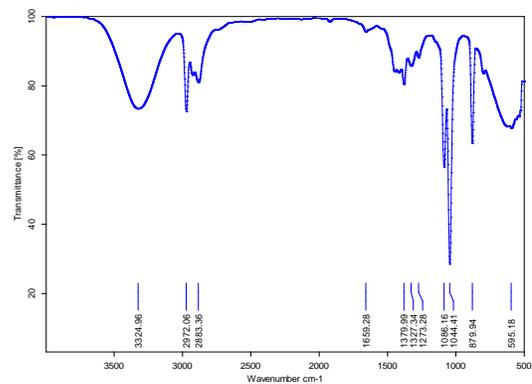
Fourier Transform Infrared Spectrophotometer [FTIR] analysis

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:

The leaf of *Piper longum* L. showed twelve 12 functional groups and the peak values are 519.29, 620.42, 879.79, 1044.34, 1086.12, 1274.88, 1326.35, 1380.43, 1651.91, 2884.50, 2972.64 and 3328.08. The fruit of *Piper longum* L. showed eleven 11 functional groups and the peak values are 595.18, 879.94, 1044.41, 1086.16, 1273.28, 1327.34, 1379.99, 1659.28, 2883.36, 2972.06 and 3324.96.

FTIR study was performed for all the leaf and seed samples. In the present study, Leaf of *Piper longum* L. contained twelve 12 functional groups, the major peaks were [cm-1] 879.79, 1044.34, 1086.12, and 2972.64; the seed of *Piper longum* L. contained eleven 11 functional groups, the major peaks were [cm-1] 879.94, 1044.41, 1086.16 and 2972.06.

FTIR Chromatogram of *Piper longum* L. LeafFTIR Chromatogram of *Piper longum* 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. Even after the establishment of allopathic medicine and advance allopathic treatments, most of the people of Kanyakumari district believes in traditional medicine system. So many number of traditional siddha practitioners in Kanyakumari district are almost allopathic medicinal practitioners. 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.

REFERENCES:

1. Thomson, G.E. 2010. Further consideration of Asian Medicinal plants in treating common chronic disease in West. *Journal of Medicinal plants Research*, 4[2]: 125.
2. Kunwar, R.M. and Bussmann, R.W. 2008. Ethnobotany in the Nepal Himalaya. *Journal of Ethnobiology and Ethnomedicine*, 4[24]: 13-18.
3. Diallo, D., Hveem, B., Mahmoud, M.A., Betge, G., Paulsen, B.S. and Maiga, A. 1999. An ethnobotanical survey of herbal drugs of Gourma district, Mali. *Pharmaceutical Biology*, 37: 80-91.
4. Edeoga, H.O., Okwu, D.E. and Mbaebie, B.O. 2005. Phytochemical constituents of some Nigerian medicinal plants. *African Journal of Biotechnology*, 4: 685-688.
5. Kirtikar, K.R. and Basu, B.D. 1984. "Indian Medicinal Plants", Periodical Expert Book Agency, New Delhi, India.
6. Satyavathi, G., Gupta, K., Ashok, and Neeraj, T. 1987. Medicinal plants of India, Vol. II, Indian council of medical Research, New Delhi.
7. Kokate, C.K., Chaudhari, G.N. and Nimbkar, A.Y. 1980. Search for anthelmintics of plant origin: activities of volatile principles of *Acorus calamus* and *Piper longum* against *Ascaris lumbricoides*, Asian Symposium on Medicinal Plants and Spices, Conference, Bangkok, Thailand, pp. 15-19.
8. Warriar, P.K., Wambia, V.P.K., Ramankutty, C. and Vasudevan, N.R. 1993. *Indian Medicinal Plant-a compendium of 500 spices*, Arya Vaidya Sala, Orient Langman Limited: Kottakal. Vol. III. p. 371.
9. Kirtikar, K.R. and Basu, B.D. 1987. *Indian medicinal plants*, International book distributors, Dehradun, India, 3: 2128-2129.
10. Umadevi, S. and Sharmila, P. 2009. Studies on the euro protective role of *Piper longum* L. in C6 glioma induced rats, *Investigational New Drugs*, 28[5]: 615-623.
11. Jagdale, S.C., Kuchekar, B.S., Chabukswar, A.R., Lokhande, P.D. and Raut, C.G. 2009. Anti-oxidant Activity of *Piper longum* L. *International Journal of Biological Chemistry*, 3: 119-125.
12. Sunila, E.S. and Kuttan, G. 2004. Immunomodulatory and antitumor activity of *Piper longum* L. and piperine. *Journal of Ethnopharmacology*, 90: 339-346.
13. Lee, S.E. 2000. Mosquito larvicidal activity of Piper nonaline, a Piperidine alkaloid Derived from long pepper, *Piper longum* L. *Journal of the American Mosquito Control Association*, 16[3]: 245-247.
14. Reddy, P.S., Kaiser Jamil, P., Madhusudhan, G. and Anjan, B. 2011. Antibacterial Activity of Isolates from *Piper longum* and *Taxus baccata*, *Pharmaceutical biology*, 39[3]: 236-238.

15. Kumar, A., Panghal, S., Mallapur, S.S., Kumar, M., Ram, V. and Singh, B.K. 2009. Anti-inflammatory Activity of *Piper longum* fruit oil. *Indian Journal of Pharmaceutical Sciences*, 71[4]: 454-456.
16. Virinder, S.P., Subash, C.J., Kirpal, S.B. and Rajani, J. 1997. Phytochemistry of genus Piper, *Phytochemistry*, 46: 597-673.