International Journal of Botany Studies
ISSN: 2455-541X
Impact Factor: RJIF 5.12
www.botanyjournals.com
Volume 3; Issue 2; March 2018; Page No. 142-145

Identification of functional groups from leaf and stem bark extract of selected species of *artabotrys*

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Abstract
Fourier Transformation Infrared Spectroscopy is a technique used for the identification of the interaction between an IR radiation and a sample. Present study revealed the functional groups from the ethyl acetate leaf and stem bark extract of *Artabotrys zeylanicus* and *A. sahyadricus* by using the techniques such as Fourier Transformation Infrared Spectroscopy (FTIR). Through this technique the ethyl acetate leaf and stem bark extract of plant has taken to analyze the detection of functional groups which are present in this plants. The presence of such functional groups also reveals the importance of this valuable medicinal plants in the field of herbal medicine for treatment of variety of ailments.

Keywords: fourier transformation infrared spectroscopy; ethyl acetate leaf and stem bark extracts; *Artabotrys zeylanicus* and *a. sahyadricus*; annonaceae

Introduction
In plants, pharmacological properties related with the chemical substances and that is man has learned to use through his long experiences for medical treatment, today cover a vast area of natural products and derivatives. Generally the genus *Artabotrys*, family Annonaceae distributed in tropical and subtropical regions, mainly in tropical Africa and Eastern Asia, contains more than 100 species [1]. The known phytochemistry of the genus *Artabotrys* includes secondary metabolites: *A. oliganthus* [2], *A. stenopetalus* [3], *A. crassifolius* [4], *A. hexapetalus* [5, 6], *A. uncinatus* [7], *A. velutinus* [8] and *A. brachypetalus* [9] showed excellent potential in reports. In this study, Fourier Transformation Infrared Spectroscopic analysis were attempted to leaf and stem bark parts of *A. zeylanicus* and *A.sahyadricus.*

Materials and Methods
Plant Identification
Leaf and Stem part of *Artabotrys zeylanicus* Hook. f. & Thomson were collected from Muthikulam, Palakkadu district, Kerala, India and *Artabotrys sahyadricus* Robi, KMP Kumar & Hareesh were collected from Kuttampuzha Forest Range, Ernakulam district, India. They were identified and authenticated by Dr. Prabhukumar KM, Senior Scientist & Head, Plant Systematics & Genetic Resources Division & 'CMPR' Herbarium, Centre for Medicinal Plants Research (CMPR), Arya Vaidya Sala, Kottakkal, Malappuram - 676 503, Kerala, India (*A. zeylanicus* 8680 and *A. sahyadricus* 8693) and voucher specimen has been deposited in 'CMPR' Herbarium, Centre for Medicinal Plants Research (CMPR), Arya Vaidya Sala, Kottakkal, Malappuram - 676 503, Kerala, India.

Preparation of Plant Extract
The fresh leaf and stem bark parts of *A. zeylanicus* and *A.sahyadricus* were washed with tap water and shade dried for two month and powdered coarsely. Then they were finely powdered mechanically using pulverizer and passed through 40 mesh sieve and stored in airtight containers. About 250g of powdered aerial and root were extracted in soxhlet apparatus with petroleum ether, chloroform, ethyl acetate and ethanol. The extract was dried under reduced pressure at low temperature (40-50°C). The last traces of the solvent were removed under vacuum drier and the solid mass obtained was stored at 4°C until further use.

FTIR Spectroscopic Analysis
FTIR spectrophotometer analysis, the extracts were centrifuged at 3000 rpm for 10 min and filtered through Whatman No. 1 filter paper. After that the extracts were scanned in the wavelength using Perkin Elmer Spectrophotometer, which was used to detect the characteristic peaks and their functional groups. The present study also observed some characteristic peaks during analysis. These peak values of FTIR were also recorded. Each and every analysis was repeated twice for the spectrum confirmation.

Result and Discussion
The crude extract of potential plants *A. zeylanicus and A. sahyadricus* has subjected to FTIR analysis for the detection and identification of functional group, which are present in this medicinal plants. The FTIR spectroscopic method was useful for characterization of crude extracts, when run under IR region ranging from 400- 4000cm-1. It results some variation in the peaks of the plant samples. The FTIR analysis of the samples was used to determine the nature of the

chemical constituents present in samples. FTIR analysis in the ethyl acetate leaf and stem bark extract of plant extract of *A. zeylanicus* and *A. sahyadricus* revealed the presence of various functional groups (Table 1-4; Fig 1-4). In this analysis results revealed the presence of Hydroxyl, Alkanes, Aromatic, Carbonyl, Carboxylic acid and Ethers in leaf part and stem part of *A. zeylanicus* and *A. sahyadricus*. This results agrees and confirm the occurrence of phytochemical constituents like alkaloids, flavonoids, phenols, terpenoids and steroids.

Table 1: FT-IR Peak value and its functional groups of ethyl acetate extract of *A. sahyadricus.* leaf part

S. NO.	FT-IR Peak Values (cm^{-1})	Functional groups
1.	2972.31	O-H STRETCHING (Hydroxyl)
		C-H STRETCHING (Alkanes)
		CH_3 STRETCHING (R-O- CH_3)
2.	1734.01	C-H STRETCHING (Aromatic),
		C-H STRETCHING (Carbonyl)
3.	1450.47	C-H STRETCHING (Aromatic, R-O-CH_3)
4.	1377.17	C-H STRETCHING (Alkanes)
		C-O STRETCHING (Hydroxyl)
5.	1242.16	C-H STRETCHING (Aromatic),
6.	1049.28	C-H STRETCHING (Aromatic)
		C-O-C STRETCHING (Ethers)
7.	945.12	C-H STRETCHING (Ethers)

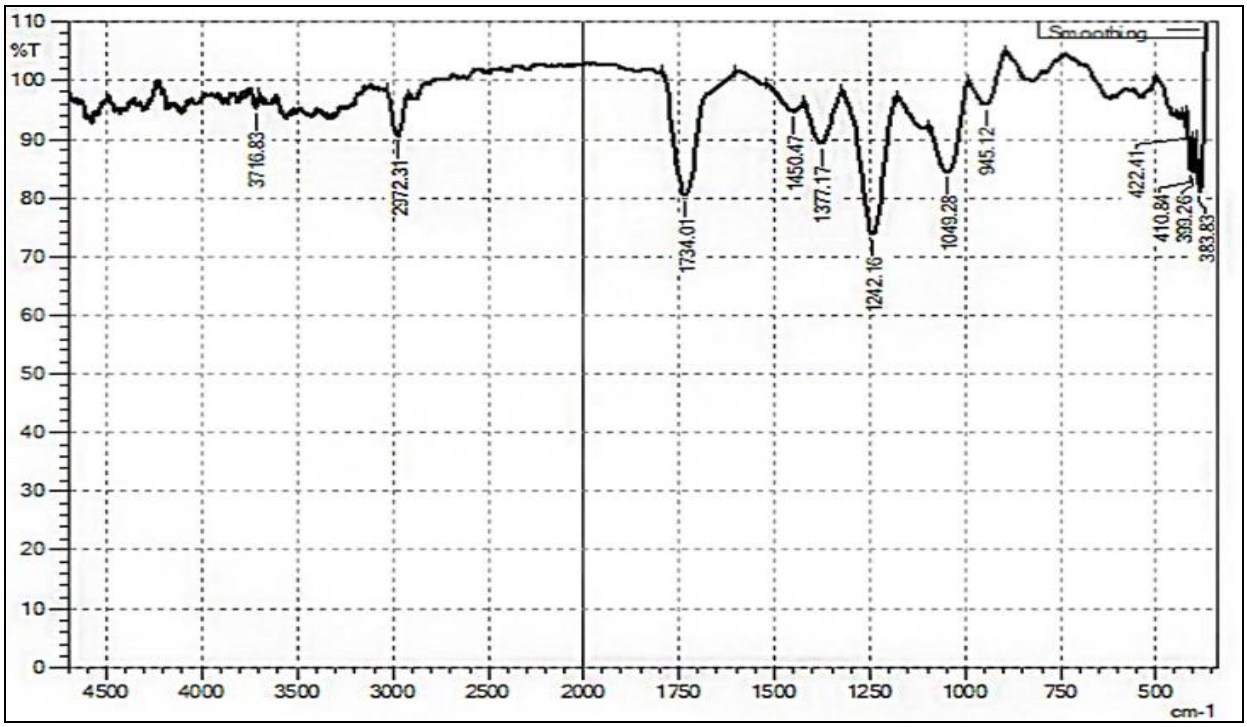

Fig 1: FT-IR spectrum of ethyl acetate leaf extract of *A. sahyadricus*

Table 2: FT-IR Peak value and its functional groups of ethyl acetate extract of *A. sahyadricus* stem bark part

S. NO.	FT-IR Peak Values(cm^{-1})	Functional groups
1.	3616.56	O-H STRETCHING (Hydroxyl)
2.	1732.08	C=O STRETCHING (Carbonyl)
3.	1249.87	C-H STRETCHING (Aromatic)
		C-H STRETCHING (Ethers)
		C-O-C STRETCHING Ethers)
4.	1056.99	C-H STRETCHING (Aromatic)
5.	952.84	C-H STRETCHING (Alkanes)
		C-H STRETCHING (Aromatic)
6.	813.96	C-H STRETCHING (Aromatic)
		C-H STRETCHING (Alkenes)
		C-H STRETCHING (Ethers)

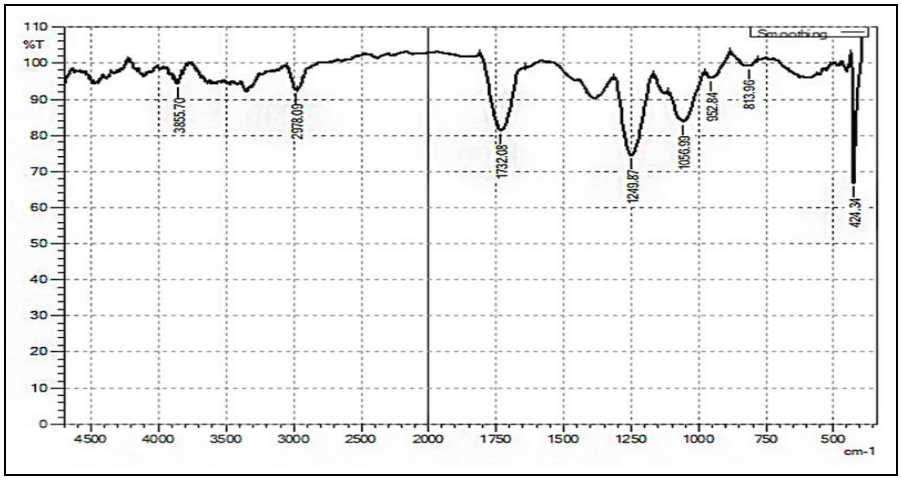

Fig 2: FT-IR spectrum of ethyl acetate stem bark extract of *A. sahyadricus.*

Table 3: FT-IR Peak value and its functional groups of ethyl acetate leaf extract of *A. zeylanicus*

S. NO.	FT-IR Peak Values(cm^{-1})	Functional groups
1.	3628.10	O-H STRETCHING (Hydroxyl)
2.	2989.66	C-H STRETCHING (Carbonyl)
3.	1728.22	C=O STRETCHING (Ethers)
		O-H STRETCHING (Carboxylic acid)
4.	1408.04	C-H STRETCHING (Alkanes)
5.	1242.16	C-H STRETCHING (Ethers)
		C-H STRETCHING (Aromatic)
		C-O-C STRETCHING (Esters)
6.	1053.16	C-H STRETCHING (Aromatic, Cyclic)
		C-O-C STRETCHING (Ethers)

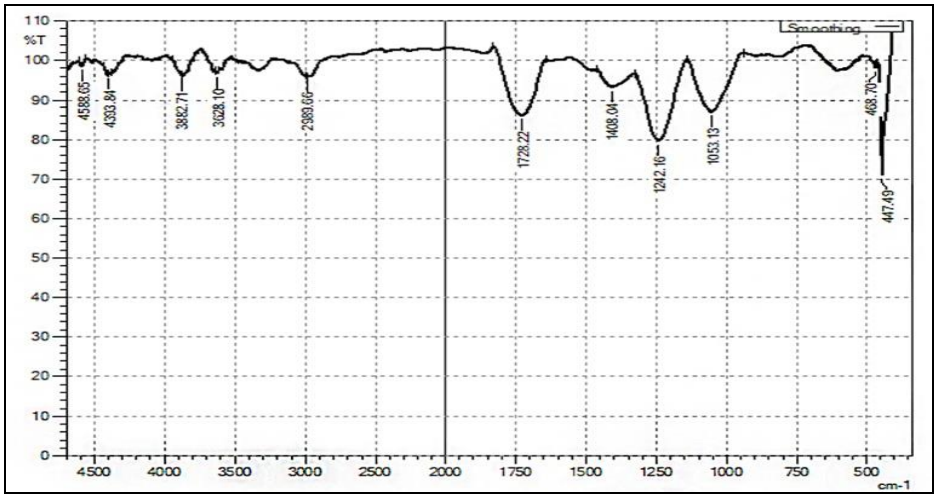

Fig 3: FT-IR spectrum of ethyl acetate leaf extract of *A. zeylanicus.*

Table 4: FT-IR Peak value and its functional groups of ethyl acetate stem bark extract of *A. zeylanicus*.

S. NO.	FT-IR Peak Values(cm^{-1})	Functional groups
1	2885.51	C-H STRETCHING (Alkanes)
		C-H STRETCHING (Carbonyl)
2	1737.86	C=O STRETCHING (Carbonyl)
		C=O STRETCHING (Esters)
3	1377.17	C-H STRETCHING (Alkanes)
		C-H STRETCHING (Hydroxyl)
4	1242.16	C-O-C STRETCHING (Esters)
5	1045.42	C-H STRETCHING (Alkanes)
		C-H STRETCHING (Aromatic)

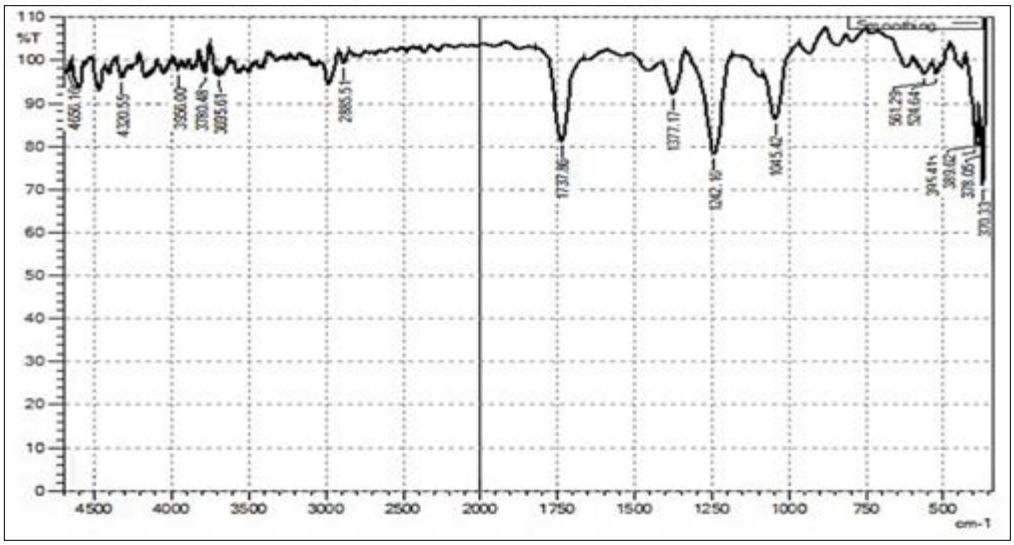

Fig 4: FT-IR spectrum of ethyl acetate stem bark extract of *A. zeylanicus.*

Conclusion

The present study give the assurance for the occurrence some of the potential bioactive compounds in this medicinal plants *A. zeylanicus* and *A. sahyadricus.* The present results also highlight the importance of this medicinal plant and their value in herbal medicine. Recent days there are many reason, which are threatening the medicinal plant diversity. Therefore the proper protection and sustainable utilization of natural resources are very important for future generation.

References

1. Stephane G, Goore Z, Ouattaraa A, Acafou T, Yapib Y. Chemical composition of the leaf oil of *Artabotrys jollyanus* from Cote Ivoire. Rev. Bras. Farmacog. 2017; 27:414-418.
2. Zana A, Ouattara J, Brice B, Antoine C, Ange B. *Artabotrys oliganthus* Engl. & Diels from Ivory Coast: composition of leaf, stem bark and fruit oils. J Essent. Oil Bear. Plants 2011; 14(1):95-100.
3. Theophilus C, Fleischer R, Waigh D, Peter G. Two novel sesquiterpenes from the stem bark of *Artabotrys stenopetalus*. J Nat. Prod. 1997; 60:1054-1056,
4. Kok K, Tan, T, Jin K, Christophe W. Phytochemical screening of *Artabotrys crassifolius* Hook. F. & Thomson (Annonaceae Juss.) Inn. J Ayurved. Sci. 2013; 1(2):14-17.
5. Florence AR, Joselin J, Shynin Brintha TS, Sukumaran S, Jeeva S. Preliminary phytochemical studies of select members of the family Annonaceae for bioactive constituents. Biosci. Discov. 2014; 5(1):85-96.
6. Jamnian S, Nusorn T, Saijai D, Rawiwun K. Flavonoid and megastigmane glycosides from *Artabotrys hexapetalus* leaves. Biochem. Systemat. Ecol. 2012; 44: 124-127
7. Tian J, Hsieh F, Rong C, Yi-Chen C, Chung-Yi C, Hang-Ching L, *et al*. The Alkaloids of *Artabotrys uncinatus* J Nat. Prod. 2001; 64:1157-1161.
8. Mahudro Y, Guy A, Alitonou H, Yedomonhan F, Tchobo O, Dedome P, *et al*. First report on chemical composition and antimicrobial activity of *Artabotrys velutinus* Scott-Elliot extracts against some clinical strains in Benin Amer. J Appl. Chem. 2016; 4(3):71-76.
9. Anne-Lise S, Sevser S, Stephan M, Kurt H. Isoquinoline alkaloids from *Artabotrys brachypetalus.* Biochem. Systemat. Ecol. 2003; 31:1447-1449.