International Journal of
Life Sciences
International Peer Reviewed Open Access Refereed Journal

Special Issue A 12: March 2018:191-194
UGC Approved Journal No 48951

Original Article Open Access

Evaluation of phytoconstituents of *Geodorum densiflorum* (Lam.) Schltr by using UV-VIS and FTIR Techniques.

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Manuscript details:

Available online on
http://www.ijlsci.in

ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)

Editor: Dr. Arvind Chavhan

Cite this article as:
Theng PA, Korpenwar AN and Borkar SU (2018) Evaluation of phytoconstituents of *Geodorum densiflorum* (Lam.) Schltr by using UV-VIS and FTIR Techniques, *Int. J. of. Life Sciences*, Special Issue, A12: 192-194.

ABSTRACT

Natural products from medicinal plants, either as pure compounds or as standardized extracts, provide unlimited opportunities for new drug. The present investigation conducted to produce Fourier transform-infrared (FT-IR) and ultraviolet-visible (UV-VIS) spectrum profile of *Geodorum densiflorum*. Fourier transform-infrared (FT-IR) and ultraviolet-visible (UV-VIS) spectrum profile of leaves extract in chloroform was used for evaluation. FTIR evaluation was used to detect the characteristic peak values and their functional groups. FTIR evaluation of leaves powder extract in chloroform revealed the presence of Hydrogen bonded alcohols, phenols, Alkanes, Aliphatic esters, Alkenes, Nitro compounds, Bromides and Aromatics groups. UV-VIS profile of leaves powder extract in chloroform showed the peaks at wavelength 426, 491, 536, 611 and 671 with the absorption 2.04, 2.078, 1.67, 1.37 and 2.18 respectively.

Key words: *Geodorum densiflorum,* UV-Vis, FTIR spectrum, leaves, chloroform.

INTRODUCTION

Medicinal plants are important source of inexpensive and practical drugs for people throughout the world. Medicinal plants could be used for therapeutic purpose or which are precursors for synthesis of useful drugs (Nathan *et al*., 2012). Phytochemicals are biologically active, naturally occurring chemical compounds found in plants, which provide health benefits for humans than those attributed to macronutrients and micronutrients (Hasler and Blumberg, 1999). Many data on the phyto-pharmacology have showed medicinal plants capacities in certain area of pharmacology (Osadolor *et al*., 2011) and researcher are also beginning to realize the role of medicinal plants in health care delivery (Kolawole *et al*., 2011).

Orchids comprise five subfamilies and approximately 870 genera occurring on all vegetated continents and even some Antarctic Islands (Dressler, 1981, Chase *et al*., 2003). *Geodorum densiflorum* was belongs

into family Orchidaceae. Fourier Transform Infrared spectroscopy (FTIR) gives a relevant amount of compositional and structural information in plants. Moreover, FTIR spectroscopy is an advance method to characterize and identified functional groups (Gunasekaran, 2003).

METHODOLOGY

Collection and extraction of plant material: The fresh leaves material of *Geodorum densiflorum* was collected from Amba Barwa forest, Jalgaon Jamod tehsil, district Buldhana (M.S.). Leaves material was washed thoroughly with tap water, shade dried and homogenized to fine powder and stored in airtight bottles. About 25 gm powdered plant material weighed accurately and extracted in Soxhlet apparatus by using chloroform as solvent.

Spectroscopic analysis:
About 10 mg pure solute obtained after evaporation of solvent was used for in fourier transform infrared spectroscopic evaluation. The dried 10 mg powdered extract was mixed with KBr salt and encapsulated in 100 mg of KBr pellet, in order to prepare translucent sample discs. The powder sample of each plant specimen was loaded by using a Perkin Elmer Spectrum RX1, FT/IR spectrometer, with wave number from 4400 to 450 cm^{-1} having a nominal resolution of 1 cm^{-1}. For each spectrum 64 runs were collected and averaged. Sample was placed in sample chamber and spectra were taken ATR mode. Results were plotted against wave number verses percent transmittance. *Geodorum densiflorum* leaves powder extract in chloroform was examined under UV and visible light for immediate evaluation. Plant sample extract was centrifuged at 3000 rpm for 10 minutes and filtered through filter paper (Whatman No.1) under high pressure of vacuum pump. The sample was diluted to 1:10 by using same solvents. The extract was scanned in the wavelength range from 190- 1100 nm using EQUIP- TRONICS (EQ-826) and the peaks were detected.

RESULT AND DISCUSSION

The FTIR spectrum was used to identify the functional group of different phytoconstituents based on the peak values in region of infrared radiation (4400- 450 cm^{-1}), present in chloroform extracts of leaves powder. FTIR analysis was used to detect the characteristic peak values and their functional groups. FTIR spectrum of leaves represented in fig. [1] And peak value and functional group in table [1]. FTIR analysis of leaves powder extract in chloroform revealed the presence of Hydrogen bonded alcohols, phenols, Alkanes, Aliphatic esters, Alkenes, Nitro compounds, Bromides and Aromatics groups. Phenols are of immense significance as they protect the human body from the oxidative stress, which cause many diseases including cancer, cardiovascular problems and ageing (Robards *et al*., 1999). The carboxylic acid is a functional group plays a cardinal role in living system as well as in drug design (Ballatore *et al*., 2013).

They protect the plant against water loss, avoid the leaching of important mineral by rain and protect against microorganism and harmful insects (Riederer and Markstadter, 1996). Alkenes (Ethylene) were used for artificial ripening of fruits (Bleecker and Kende, 2000).

Table 1: FTIR spectral peak value and functional groups obtained for chloroform extract of *Geodorum densiflorum* leaves.

Peak value (in cm^{-1})	Functional group	Bond	Group frequency (in cm^{-1})
3424,52	Hydrogen bonded alcohols, phenols	O-H Stretching	3600- 3200
2918,21	Alkanes	C-H Stretch	2970- 2850
1737,43	Aliphatic esters	C=O Stretch	1750- 1730
1611,51	Alkenes	C=C stretch	1680- 1600
1514,55	Nitro compounds	N=O	1550- 1490
1462,39	Alkanes	C-H	1470- 1340
1165,44	Alcohols, carboxylic acid, esters, ethers	C-O stretch	1300- 1000
888,56	Alkenes	C-H bend	1000- 650
729,59	Aromatics	C-H 'oop'	900- 690 (s)
522,62	Bromides	C-Br	650- 510

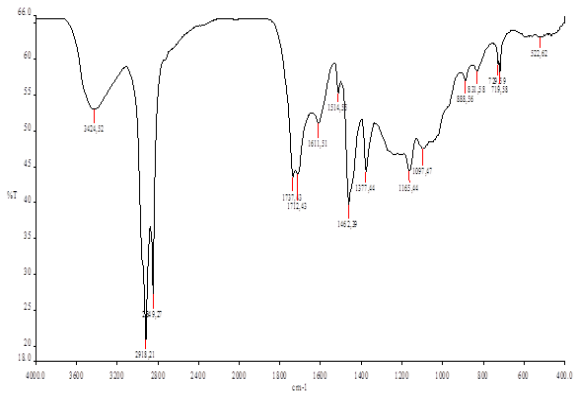

Fig.1: FTIR spectrum of chloroform extract of *Geodorum densiflorum* leaves

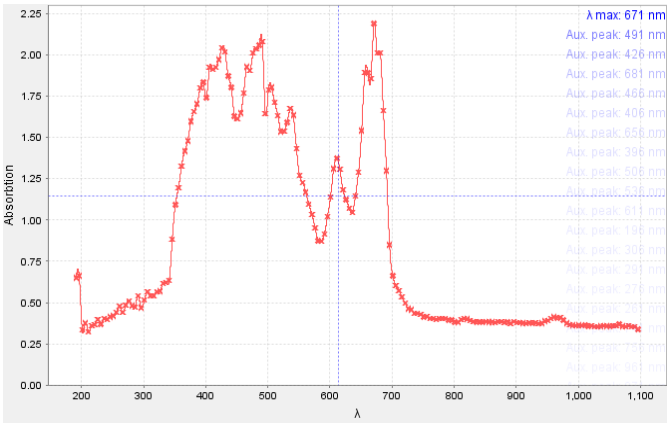

Fig. 2: UV-VIS spectrum of chloroform extract of *Geodorum densiflorum* leaves

Table 2: UV-VIS spectrum profile of *Geodorum densiflorum* leaves powder extract in chloroform.

Wavelength (λ) in nm	426	491	536	611	671
Absorbtion	2.04	2.07	1.67	1.37	2.18

The UV-VIS profile of *Geodorum densiflorum* leaves powder in chloroform was selected at a wavelength of 190 to 1100 nm. The peaks were obtained in the range of 400- 700 nm wavelength. The extract showed peaks at the wavelength of 426 nm, 491 nm, 536 nm and 611 nm and 671nm with absorption at 2.04, 2.07 and 1.67, 1.37 and 2.18 nm respectively. The result of UV-VIS analysis of leaves powder extract in chloroform was mentioned in table- [2] and figure- [2].

CONCLUSION

The results of the present study showed that *Geodorum densiflorum* leaves displayed novel phytochemical markers responsible for many biological activities. FTIR spectrum was helpful to judge medicinal materials from the adulterate and even evaluates the quality of the medicinal plant materials.

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