GC-MS Analysis of the Ethanolic Extract of the whole Plant *Drosera indica* L.

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Received: 17th February, 17; Revised 29th April, 17, Accepted: 15th May, 17; Available Online:25th May, 2017

ABSTRACT

The present study is carried out to explore the phytoconstituents present in the ethanolic extract of the whole plant *Drosera indica* L. by GC-MS analysis. Methods: The ethanolic extract of the whole plant of *Drosera indica* L. is used for the GC-MS analysis. JEOL GCMATE II GC-MS (Agilent Technologies 6890 N Network GC system for gas chromatography) is used for the analysis. The compounds are identified by the gas chromatography coupled with the mass spectrometry. The molecular weight and structure of the compounds of test materials are ascertained by interpretation of the mass spectrum of GC-MS using the database of National Institute Standard and Technology (NIST). Results: GC-MS analysis of *Drosera indica* L. reveal the presence of the nine biological active compounds which include phytol, 4 methyl-4-nonadecene, 4,5,7-Trihydroxyisoflavone, 1,2-Benzene dicarboxylic acid, bis [2-methyl propyl] ester, Tetra decanoic acid, Eicosane, 2,6,10,14,18–pentamethyl, Tetracosane, Lochnerine and methyl-n-hexadecylketone. Conclusion: The results specify that the ethanolic extract of the whole plant, *Drosera indica* contains various bioactive compounds and therefore has various medicinal properties which can be used for the treatment of various diseases.

Keywords: GC-MS analysis, Phytoconstituents and *Drosera indica* L.

INTRODUCTION

Plants are the richest sources of secondary metabolites with varying biological activities. These secondary metabolites are the important source with a variety of structural arrangements and properties. Volatile compounds play an important role in health care systems by the medicinal plants. Volatile compounds are identified by the GC-MS analysis. Recently GC-MS analysis is increasingly applied for the analysis of medicinal plants and this technique prove to be a valuable method for the analysis of nonpolar components and volatile essential oil, fattyacids, lipids and alkaloids.

*Droseraindica* L. is an annual, insectivorous, herbaceous plant native to tropical countries of the world and consists approximately of 170 species. This is used in several clinical manifestations including loss of memory, defective eyesight, infertility, overall body weakness and incidence of early aging. It is also used for the treatment of diseases like bronchial asthma, rheumatoid arthritis and nervous disorders.

The secondary metabolites likephenolics and flavonoids from the plants are reported to be potent free radical scavengers. *Drosera indica* L. are reported for the presence of flavonoids in them. The present study is carried out to find the bioactive chemicals from *Drosera indica* L. by GC-MS analysis.

MATERIALS AND METHODS

Collection of plant material

The plant specimens (whole plant) for the proposed study are collected from Wagamon hills, Idukki district, Kerala, India. The plant is taxonomically authenticated from Jawaharlal Nehru Tropical Botanical Garden And Research Institute, Palode, Thiruvananthapuram district, Kerala, India, with the voucher number (JNTBGR/PS/215/2015, No-76853).

Sample extraction

Dried powdered (whole plant) material of *Drosera indica* is subjected to the solvent extraction for 16 hours with the solvents of increasing polarity such as petroleum ether, chloroform, ethyl acetate, ethanol and water. 50 g of dried plant powder is extracted in 250 ml of each solvent and kept in a shaker for 72 hrs. Extraction is repeated with the same solvent till the clear colourless solvent is obtained. Each time before extracting, with the next solvent the residue is dried thoroughly to remove the solvent used. Finally the extract is evaporated and stored at 0-4°C in an air tight container for further use.

GC-MS analysis

The ethanolic extract of the whole plant of *Drosera indica* L. is used for the GC-MS analysis. 2 ml of the ethanolic extract of the whole plant of *Drosera indica* L. is dissolved in HPLC grade methanol and subjected to GC and MS. JEOL GCMA TE II GC-MS (Agilent Technologies 6890 N Network GC system for gas chromatography). The column (HP5) is fused silica 50 m x 0.25 mm I.D. Analysis conditions are 20 min, at 100°C, 3 min at 235°C for column temperature, 240°C for
injector temperature, helium is the carrier gas and split ratio is 5:4. The sample (1 μl) is evaporated in a split less injector at 300°C. Run time is 22 min. The compounds are identified by gas chromatography coupled with mass spectrometry. The molecular weight and structure of the compounds of test materials are ascertained by the interpretation of mass spectrum of GC-MS using the database of National Institute Standard and Technology (NIST). The mass spectrum of the unknown component is compared with the spectrum of the known components stored in the NIST library. By making use of this the name, molecular weight and structure of the components of the test materials is ascertained.

**RESULTS AND DISCUSSION**

Mass spectrometry becomes a vital tool in the hands of the organic chemists and biochemists because of its potential to supply the definitive, qualitative and quantitative information on molecules based on their structural compositions. Gas chromatography is attached to a Mass Spectrometer (GC-MS) enables mixture of small molecules mainly organic compounds of low molecular weight (<600) which can be analysed. The GC-MS analysis shows the presence of nine compounds in the ethanol extract of the whole plant,
activities like antioxidant, antibacterial, antifungal, antidiabetic and anticancer activities.

**CONCLUSION**
The results of the study clearly indicate the presence of active principles with the pharmacological activities in the ethanolic extract of *Drosera indica* L. So, this can be effectively used to treat diseases like cancer, diabetes mellitus, arthritis and inflammation.

**ACKNOWLEDGMENT**
We, the authors are thankful to the Chancellor, Chief Executive Officer, Vice Chancellor and Registrar of Karpagam University for providing facilities and encouragement to carry out our work.

**CONFLICT OF INTEREST**
We declare there is no conflict of interest.

**REFERENCES**


