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PHYTOCHEMICAL PROFILING OF ETHANOLIC LEAVES EXTRACT OF *COMMELINA BENGHALENSIS* L.

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ABSTRACT

Plants are a rich source of secondary metabolites with interesting biological activities. *Commelina benghalensis* L. is a traditional medicinal plant and the leaves have tremendous medicinal values. In the present study ethanolic leaf extract of *Commelina benghalensis* was analyzed using Gas Chromatography–Mass Spectrometry (GC-MS) and the compound structures were identified with help of National Institute of Standards and Technology (NIST) library. GC-MS analysis of test plant revealed the presence of 11 bioactive compounds. Among them 3-dodecene, 1-hexodeconol, 9-eicosene and Tetratriacontane are important bioactive compounds which act as essential drugs for dangerous diseases and disorders and other compounds are used in antimicrobial, anti-inflammatory, antioxidant, cytotoxicity and cancer preventive activities.

KEYWORDS: *Commelina benghalensis*, GC-MS, Bioactive compounds.

INTRODUCTION

Medicinal plants are the source of many potent and powerful drugs. The plant derived drugs are healthier and safer alternate to the synthetic drugs.[1] Different parts of medicinal plants like root, stem, flower, fruit, seed etc. are used to obtain pharmacologically active constituents. Medicinal activities of plants can be attributed to the secondary metabolites such as alkaloids, flavonoids, glycosides, tannins, terpenoids and essential amino acids present in these plants. These active principles are isolated for direct use as drugs, lead compounds and or pharmacological agents.[2] Even today compounds from plants continue to play a major

role in primary health care as therapeutic remedies in many developing countries.[3] Standardization of plant materials is the need of the day. Several pharmacopoeia containing monographs of the plant materials describe only the physicochemical parameters. Hence the modern methods describing the identification and quantification of active constituents in the plant material can be useful for proper standardization of herbals and its formulations. Also the WHO has emphasized the need to ensure the quality of medicinal plants products using modern controlled technique and applying suitable standards.[4] Nowadays there was a number of dramatic advances in analytical techniques including TLC, UV, NMR and GC-MS that were powerful tools for separation identification and structure determination of Phytochemicals. In GC-MS used to identify the bioactive constituents of long chain hydrocarbons, alcohols, acids, esters, alkaloids, steroids, amino and nitro compounds etc.,

Commelina benghalensis L is an annual or perennial herb with fleshy creeping stems that root daily at the nodes and grows as a weed in tropical and subtropical countries including eastern, western, central and southern Africa and belongs to the family Commelinaceae. The plant useful to diuretic, febrigual and anti-inflammatory effects, cure swellings of the skin, leprosy, laxative, sore eyes, sore throats leaves are used as human food, as medicine for infected wounds.[5] Hence the present study focused on Phytochemical profiling of Ethanolic Leaves Extract of *Commelina benghalensis* using Gas chromatography and mass spectrometry.

MATERIALS AND METHODS

Collection and Authentication of Experimental Plant: Fresh, healthy and young leaves of *Commelina benghalensis* L. were collected from their natural habitat of Saliyamangalam in Thanjavur district, Tamilnadu, India and authenticated by professionals in Department of Botany, St. Joseph's College, Tiruchirappalli and Tamilnadu, India. The herbarium number of the plant is S001.

Preparation of Extract: The dried andpowdered leaves of *Commelina benghalensis* L.(500 g) were extracted using soxhlet extractor by evaporating with 75% ethanol. The soxhlet extraction was carried out for 3 days and the extract was collected. The excess ethanol was evaporated by using vacuum evaporator. The sample is evaporated to dryness under boiling water bath at 55°C.

Gas Chromatography-Mass spectrometry (GC-MS) analysis: The GC-MS analysis was carried out using a Clarus 500 Perkin- Elmer (Auto System XL) Gas Chromatograph

equipped and coupled to a mass detector Turbo mass gold – Perking Elmer Turbomas 5.2 spectrometer with an Elite-1 (100% Dimethyl ply siloxane), 300 m x 0.25 mm x 1 µmdf capillary column. The instrument was set to an initial temperature of 110°C, and maintained at this temperature for 2 min. At the end of this period, the oven temperature was raised upto 280°C, at the rate of an increase of 5°C/min, and maintained for 9 min. Injection port temperature was ensured as 250°C and Helium flow rate as 1 ml/min. The ionization voltage was 70 eV. The samples were injected in split mode as 10:1. Mass Spectral scan range was set at 45-450 (mhz). The chemical constituents were identified by GC-MS. The fragmentation patterns of mass spectra were compared with those stored in the spectrometer database using National Institute of Standards and Technology Mass Spectral database (NIST-MS). The percentage of each component was calculated from relative peak area of each component in the chromatogram.

Identification of Compounds: The identity of the components in the extract was assigned by the comparison of their retention indices and mass spectra fragmentation patterns with those stored on the computer library and also with published literatures. National Institute of Standards and Technology library sources were also used for matching the identified components from the plant material.

RESULTS

GC-MS analysis of ethanolic leaves extract of *Commelina benghalensis* clearly showed the presence of eleven compounds with their molecular weight (MW), molecular structure and biological activities are presented in Table-1. The GC-MS chromatogram of the eleven peaks of the compounds detected was shown in Figure 1 and the components corresponding to the peaks were determined as follows: 3-dodecene, 1-hexodeconol, Phenol 2,4 bis(1,1dimethyl ethyl), Hexadecen1ol,trans 9, 9eicosene, 9,10 anthracenedione, tetracosane, 1,4 Benzenedicarboxylic acid, bis (2ethylhexyl) ester, 13Docosenamide, Tetratriacontane, Tetracosane 11 decyl etc.,

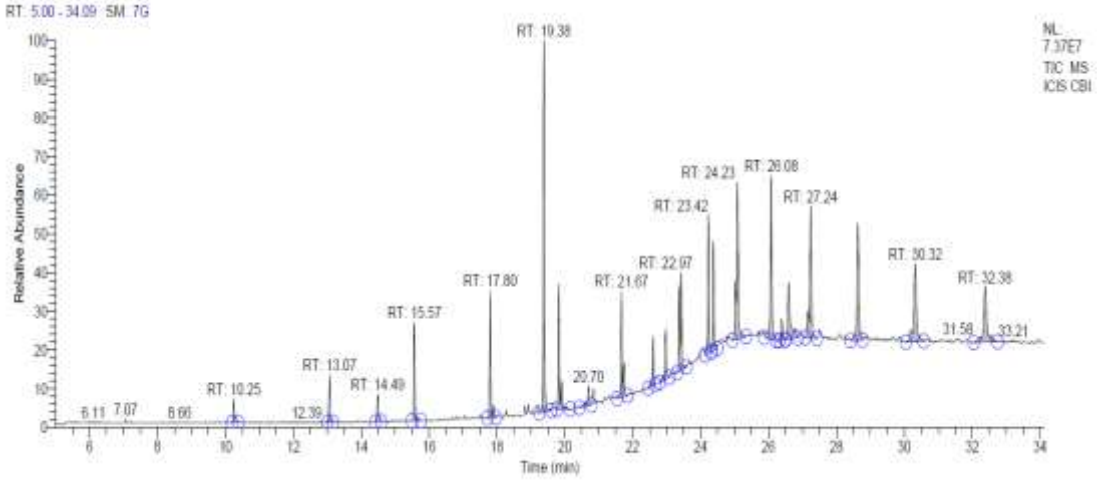
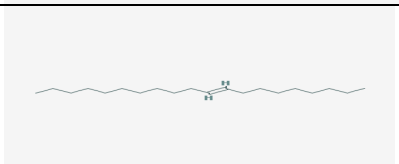
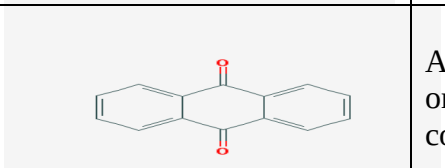
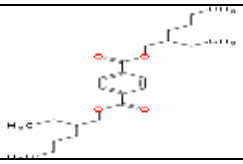
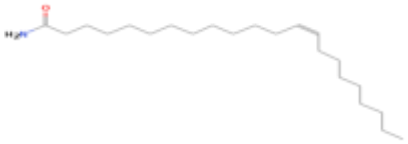
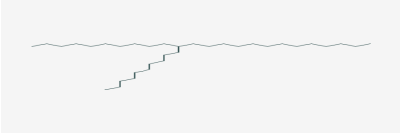


Fig 1. GC-MS CHROMATOGRAM OF *Commelina benghalensis* L.

Table 1. GC-MS Analysis of *Commelina benghalensis* L.

Name of the compound	Structure	Nature of the compound	Molecular Weight	Activity
3-dodecene		Alkene	168	Antibacterial
1-hexodeconol		Fatty alcohol	240	Antimicrobial, anti-inflammatory
Phenol 2,4 bis (1,1dimethyl ethyl)		Phenolic ester	206	Antibacterial, antioxidant
Hexadecen1ol,trans9		Fatty alcohol	240	Antimicrobial, anti-inflammatory
9eicosene		Long chain fatty acid	280	Antibacterial, cytotoxicity
9,10 anthracenedione		Aromatic organic compound	208	Antibacterial, antioxidant ,anticancer

tetracosane		alkane	338	Antibacterial, cytotoxicity
1,4Benzenedicarboxylic acid, bis (2ethylhexyl) ester		Dicarboxylic acid ester	390	Antimicrobial Antifouling
13Docosenamide, (Z)		amide	337	Antimicrobial
Tetratriacontane		alkane	478	Antimicrobial,anti oxidant, Anticancer
Tetracosane 11 decyl		alkane	478	Antimicrobial.anti oxidant

Source: - Dr. Duke's Phytochemical and Ethno botanical Databases

DISCUSSION

Plants are integral part of human civilization. Medicinal plants are also been relied upon by over 80% of the world population for their basic health care needs. Drugs based on the Plants are of prime importance for several remedies in traditional and conventional medicine throughout the world and serves as a substitute for drug supply in modern medicine.[6] Medicinal plants with therapeutic properties are used for the treatment of many infectious diseases of humans as they contain many bioactive phytochemical constituents which are of curative effects. By consuming medicinal plants, can boost the immune system and increase antioxidant activity in humans. The high level of use as a medicinal plant due to easily available, cheap and relatively no side effects.[7]

1-hexodeconol is otherwise called as palmityl alcohol.1-hexadecanol is a fatty alcohol which are used in the cosmetic industry as an opacifier in shampoos or as an emulsifier or thickening agent in the manufacture of skin creams and lotions (pharmaceutical preparations).[8] It is one of the active ingredient in some "liquid pool covers".

Anthraquinone also called anthracenedione or dioxoanthracene, is an aromatic organic compound. The term anthraquinone, however, almost invariably refers to one specific isomer, 9, 10-anthraquinone.Alizarin is a synthetic dye derived from 9, 10-anthraquinone. Which is used as a bird repellant on seeds, and as a gas generator in satellite balloons.[9] It has also been mixed with lanolin and used as a wool spray to protect sheep flocks against kea attacks in New Zealand.[10]

Tetracosane, also called tetrakosane, is an alkane hydrocarbon .Tetracosane showed some cytotoxic activity against AGS, MDA-MB-231, HT-29 and NIH 3T3 cells.[11] It also used as a good antibacterial activity.

Dioctyl terephthalate (bis 2-ethylhexyl) benzene-1,4-dicarboxylate is an organic compound is a general purpose plasticizer that is considered safer than *ortho*-phthalate plasticizers due to its excellent toxicological profile. The terephthalates exhibit none of the peroxisome proliferation of liver enzymes that some *ortho*-phthalates have shown in several studies. It has uses in applications like extrusion, calendering, injection molding, rotational molding, dip molding, slush molding and coating.

Erucamide or 13 Docosenamide is an unsaturated long chain carboxylic acid amide is used as a slip agent, anti-fogging or lubricant for plastic films (polyolefin) which can be used in food packing material. It is used as a dispersant in printing and dying. It is used in paper and textile industry for water-proof as well as corrosion inhibitor in oil wells. It is used for the synthesis of organic chemicals and surfactants used in detergent, ore floating agent, fabric softener, anti-static agent, germicide, insecticide, emulsifier, anti-caking agent, lubricant and water treatment agent.

CONCLUSION

The present study focused on identification of several constituents present in the ethanolic leaves extract of *Commelina benghalensis* L. This type of GC-MS analysis is the first step towards understanding nature of active compounds in this medicinal plant and helpful for the further detailed study. In this plant contains various bioactive compounds justifies the use of the whole plant for various ailments by traditional practitioners.

REFERENCES

1. Dineshkumar G, Rajakumar R. (2015).GC-MS Evaluation of bioactive molecules from the methanolic leaf extract of *Azadirachtaindica*(A. Juss). *Asian J. Pharm. Sci. Technol*, 5, 64-9.
2. Kumaradevan G, Damodaran, R, Mani P, Dineshkumar G, and Jayaseelan T. (2015) Phytochemical Screening and GC-MS Analysis of Bioactive Components of Ethanol Leaves Extract of *ClerodendrumPhlomidis* (L.). *Am. J. Biol. Pharmaceu. Res.*, 2(3), 142-148.
3. Smolinske and Susan C. (1992) "Handbook of Food, Drug, and Cosmetic Excipients", CRC Press. pp. 75–76.
4. Sharma P, Kaushik S, Jain A, Sikarwar SM. (2010). Preliminary phytochemical screening and HPTLC fingerprinting of *Nicotianatabacum* leaf. *J. Pharm. Res*, 3(5): 1144-1145.
5. Hasan SM, Hossain MM, Faruque A, Majumdar MEH, Rana MS, Akter R. (2008) Comparison of antioxidant potential of different fractions of *Commelina benghalensis* Linn. *Bangladesh J. Life Science*, 20(2): 9-16.
6. Dineshkumar G, Rajakumar R. (2016) Gas chromatography-Mass Spectrometry analysis of bioactive components from the ethanol extract of *Avicennia marina* leaves. *Innovare Journal of Science, 4(4): 9-12.*
7. Chandra A, Singh RK, Tewari L. (2004) Antioxidative potential of herbal hypoglycemic agents in diabetes—an overview. SFRR Indian Bulletin. 3: 24–26.
8. Smolinske, and Susan. C. (1992). "Handbook of Food, Drug, and Cosmetic Excipients", CRC Press. pp. 75–76.
9. Vogel, A. (2005), "Anthraquinone", *Ullmann's Encyclopedia of Industrial Chemistry*, Weinheim: Wiley-VCH
10. *Dudding, Adam (29 July 2012).* "How to solve a problem like a kea". *Sunday Star Times. New Zealand*. Retrieved 11 November 2014.
11. Shaikh Jamal Uddin, Darren Grice & Evelin Tiralongo. (2012), Evaluation of cytotoxic activity of patriscabratine, tetracosane and various flavonoids isolated from the Bangladeshi medicinal plant *Acrostichumaureum. Pharmaceutical Biology*, 50(10): 112-114.