GC-MS Analysis of Fruits of Calotropis procera: A Medicinal Shrub

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Abstract

The phyto-components of Calotropis procera Linn. Fruits were screened by gas chromatography-mass spectroscopy (GC-MS) analysis. Benzene extract was prepared by soxhlet extract from the fruits of C. procera. GC-MS running time for benzene extract of fruits of C. procera was 45 min. The total number of compounds identified in benzeneic extract was 39. The major phytoconstituents present were Lupenol (12.10), n-Hexadecanoic acid (12.07), Thymol (9.86), Tetratetracontane (6.88) and Linoleic acid (6.74) Many phytosterols were also present such as Stigmasterol (0.70), beta-sitosterol (0.54) and Campesterol (0.31)

Keywords: Phyto-components, GC-MS, calotropis procera, benzene extract.

Introduction

Plants have been a rich source of medicines because having potential bioactive molecules, most of which probably participated as a chemical defense against predation or infection. Calotropis belongs to Asclepiadaceae or Milkweed or Aak family, contains many phytochemicals with potential pharmacological activities. In India C. procera has a great value because of its other uses and economical importance. Arka (C. procera) is using as drug of Ayurveda from the ancient time. The ancient name of the plant in Vedic literature was Arka alluding to the form of leaves which was used in sacrificial rites. All plant parts, viz. root, stem, leaf, flowers and fruits of C. procera are generally use in indigenous system of medicine. It shows antitumor activity and insecticidal activities. Fruits of C. procera exhibit antimicrobial and antioxidant activity. Therefore, in the present study the major fruit constituents were separated and identified through GC-MS analysis.

Material and Methods

Plant Material: Fruits of C. procera were collected from local area of Jaipur city, Rajasthan, India. They were authenticated from Herbarium, Department of Botany, University of Rajasthan, Jaipur. Voucher spiciman no. 9146 was deposited in the university.

Extraction: Mature fruits were subjected to shade drying (22°C) for two weeks and then processed at laboratory mill. Air dried coarse powder thus obtained (1 kg) was extracted with benzene in soxhlet extractor by continued successive hot extraction method. Finally the marc was collected and concentrated.

Parameters of GC-MS Analysis: GC-MS model: Perkin Elmer Autosystem XL with Turbomass, column type: PE-5MS, column material: 5% phenyl polysiloxane, column length: 30 meters, column inner diameter: 0.250 mm, flow rate (N2): 1 ml/min, temperature of injector: 250°C, temperature of detector: 280°C, temperature of source: 280°C, temperature of transfer: 280°C, programming rate: starting from 78°C for 5min. Increasing temperature with rate 10°C/min up to 280°C and hold for 20min. Retention time: 45min.

Results and Discussion

GC-MS running time for benzene extract of fruits of C. procera was 45 min. The total number of compounds identified in benzene extract was 48. The GC-MS retention time (RT) and percentage peak of the individual compounds were demonstrated in table-1, figure-1. The major phytoconstituents present in benzene extract were Lupenol (12.10), n-Hexadecanoic acid (12.07), Thymol(9.86), Tetratetracontane (6.88) and linoleic acid (6.74) Many phytosterols were also present such as stigmasterol (0.70), beta–sitosterol (0.54) and Campesterol (0.31)

Conclusion

The results reveal that the extracts have a quite number of chemical constituents, which may be responsible for many pharmacological activities. For instance, Lupenol shows anti-inflammatory, anti arthritic activity and wound healing activity, anti-cancer activity. Thymol shows strong antimicrobial activities when used alone or with other biocides such as carvacrol. Thymol can also reduce bacterial resistance to common drugs such as penicillin and also exhibits antioxidant properties. Thymol and carvacrol reduce bacterial resistance to antibiotics through a synergistic effect, and thymol also act as an effective fungicide. Thymol also exhibits strong antimutagenic effect. In addition, it has antitumor properties. Linoleic acid is using in the beauty products industry. Linoleic acid shows anti-inflammatory, acne reductive, and moisture retentive properties on the skin. Further studies are needed on these extracts in order to isolate, identify, characterize and elucidate the structure of these compounds.
### Table-1
Chemical constituents present in the methanolic extract using GC-MS analysis

<table>
<thead>
<tr>
<th>Peak#</th>
<th>R.Time</th>
<th>Area</th>
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<td>1</td>
<td>6.774</td>
<td>15747413</td>
<td>9.86</td>
<td>Thymol</td>
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<tr>
<td>2</td>
<td>8.540</td>
<td>530898</td>
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<td>BICYCLO[7.2.0]UNDEC-4-ENE, 4,11,11-TRIMETHYL-8-</td>
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