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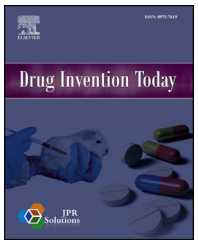

Original Article

GC–MS and HPTLC analysis of leaf extract of *Madhuca longifolia* (Koenig) Linn

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ARTICLE INFO

Article history:
Received 3 January 2013
Accepted 25 May 2013

Keywords:
M. longifolia
HPTLC fingerprint
Quercetin
GC–MS
Heterocyclic

ABSTRACT

Objective: To explore the phytochemical constituents present in the leaves of *Madhuca longifolia* (Koenig) Linn using GC–MS and HPTLC analysis.
Method: The shade-dried leaves of *M. longifolia* were extracted with ethanol, the concentrated ethanolic extracts were further subjected to GC–MS. The dried powdered leaves were taken in 50% aqueous alcohol and was refluxed, filtered and dried and used for HPTLC analysis.
Results: The fluorescent band (under 254 nm and 366 nm) at R_f 0.67 in mobile phase Toluene:Ethyl acetate:Formic acid (5:4:1) was found and the marker compound Quercetin was quantified. In GC–MS analysis about twenty bioactive compounds were identified that include the presence of phenolic acids, ketones, aldehydes, carbohydrates, heterocyclic compounds and hydrocarbons.
Conclusion: The results of the present study enhance the traditional use of *M. longifolia* which possesses several known and unknown bioactive compounds, which may be used as an effective source against various diseases.

1. Introduction

Medicinal plants are the backbone of traditional medicines, have been the subjects for very intense pharmacological studies. This has been brought about by the acknowledgement of the value of medicinal plants as potential source of new compounds in drug development. About 80% of the population in various developing countries depend on traditional medicine for human alleviation due to its fewer side effects. It is the property of most of the plant-based drugs to be simple, effective and offering a broad spectrum of activity with greater emphasis on preventive action. In addition to that large number of secondary metabolites is also produced by some of the higher plants. As a base for further pharmacological studies, there is a need to screen medicinal plants for bioactive compounds. In last century, roughly 121 pharmaceutical products were formulated based on the traditional knowledge obtained from various sources. Several

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0975-7619/$ – see front matter
http://dx.doi.org/10.1016/j.dit.2013.05.004

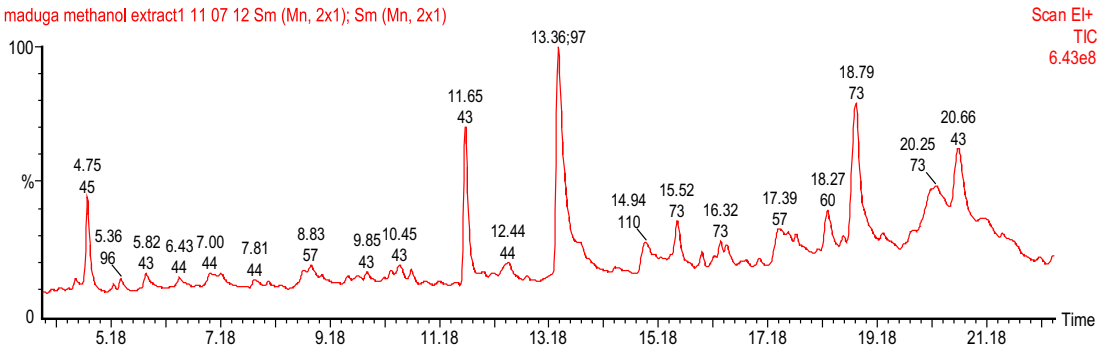

Fig. 1 – GC–MS Chromatogram (x-axis = Retention time; y-axis = % intensity/% abundance).

phytochemical screening studies have been carried out in different parts of the world.[1–8]

Madhuca longifolia, belonging to the family sapotaceae, commonly known as, Mahwa or Mahua is a medium sized deciduous tree distributed in Nepal, India and Sri Lanka. The pharmacological evaluation of the plant parts used in ethno medicine for wide variety of illness, such as epilepsy, inflammation, diabetes mellitus, analgesic activity, hydrocoele, stomach ache, skin diseases, chronic bronchitis, Cushing's disease and antiulcer have been reported.[9–17]

M. longifolia fruit pulp contains a number of triterpenoids (including α- and amyrin-acetate), *n*-hexacosanol, β-D glucoside of β-sitosterol and free sitosterol. The nut shell contains β-sitisterol glucoside and the corollas are rich source of sugars, vitamins, minerals. The seeds yield saponins 2, 3-di-o-glucopyranoside of basic acid (Saponin A and Saponin B). Trunk bark contains lupeol acetate, α-amyrin acetate, α-spinasterol, erythrodiol monocaprylate, betulinic acid and oleanolic acid caprylates. Phytochemical analysis revealed the presence of flavonoids, tannins, carbohydrates and saponins in the methanolic extract of heart wood and leaves, from the present study by using GC–MS and HPTLC, we can find out the phyto-components present in the leaf extract of *M. longifolia*.[18–23]

2. Materials and methods

2.1. Collection of plant material

The leaves of *M. longifolia* (Koenig) Linn were collected and identified from SASTRA University campus, Thirumalaisamudram, Thanjavur Dt., Tamilnadu, India.

2.2. GC–MS analysis of ethanolic extract of *M. longifolia*

2.2.1. Preparation of extract

The leaves were washed thoroughly for about 2–3 times in running tap water to remove the impurities like soil particles and adhered debris and finally with distilled water. The leaves

Table 1 – GC–MS profile of *M. longifolia*.

S. no.	Phyto-components	% Peak area	Retention time (min)	Molecular wt
1.	Propanoic acid	1.7137	3.45	74
2.	N-methoxy-N-methylacetamide	1.2522	3.73	103
3.	4,5-Dihydro-2-methylimidazole-4-one	0.3878	5.23	98
4.	Furfural	0.9659	5.35	96
5.	Butanoic acid	1.8052	5.81	88
6.	2-Furancarboxaldehyde, 5-methyl-	0.9805	7.79	110
7.	Phenol	0.2258	8.69	94
8.	2-Hydroxy-gamma-butyrolactone	0.5887	8.82	102
9.	1-Amino-2,6-dimethylpiperidine	0.5277	9.51	128
10.	2,5-Dimethyl-4-hydroxy-3(2H)-furanone	0.9096	9.84	128
11.	3H-Pyrazol-3-one, 2,4-dihydro-2,4,5-trimethyl-	2.0146	10.44	126
12.	3-Hexanone, 2,5-dimethyl-	0.3638	11.19	128
13.	4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-	12.1282	11.65	144
14.	Benzenecarboxylic acid	2.5411	12.45	122
15.	2-Furancarboxaldehyde, 5-(hydroxymethyl)-	22.5965	13.34	126
16.	Hydroquinone	3.3181	14.92	110
17.	Cyclohexanecarboxylic acid, 2-methyl-	1.6443	16.42	142
18.	D-Allose	4.0981	18.27	180
19.	1-Methyl-2-pyrrolidone-4-carboxamide	22.2759	18.80	142
20.	α-D-Mannofuranoside, methyl	19.6624	20.25	194