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## GC MS studies on the methanolic extract of the leaves of *Careya arborea*

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### Abstract

*Careya arborea* commonly called wild guava belongs to the family Lecythidaceae. It has got good medicinal value. The plant has been traditionally used in the treatment of tumours, bronchitis, skin diseases, epileptic fits, astringents, antidote to snake venom, etc. The present study was carried out to identify the phyto constituents present in the methanolic extract of the leaves of *Careya arborea* by GC MS analysis. From the GC MS analysis ten compounds were identified.

**Keywords:** *Careya arborea*, Lecythidaceae, Phyto constituents, GC MS analysis

### 1. Introduction

*Careya arborea* which is commonly called wild guava belongs to the family Lecythidaceae. It is a medium sized deciduous tree, exhibiting dark grey colour [1]. It is widely available in Indian subcontinent, Afghanistan, China etc. [2]. *Careya arborea* has a long history of being used for a variety of medicinal uses. The phytochemical work on the plant indicated the presence of different phytoconstituents, justifying the traditional use of the plant. The whole plant is used as an astringent, demulcent, anti-pyretic, anti pruritic, used in treating cough, cold and eruptive fever small pox [3]. It is also used to treat scorpion stings [4]. The flowers are used in treating fever [5]. Fruits are also used as a digestion promoter [6]. Leaf paste and pulp is used to treat ulcers and root is used for the treatment of Tuberculosis [7, 8]. *Careya arborea* also possess anti-tumour effect [9, 10], N-nitroso diethyl amine induced hepato carcinogenesis [11] CNS depressant [12], anti-coagulant [13], anti-oxidant [14] properties. Qualitative chemical tests revealed the presence of terpenoids, flavonoids, alkaloids, saponins and tannins in the stem bark of plant.

The methanolic extract of *Careya arborea* stem bark was evaluated for its hepato protective and anti-oxidant effects in Wistar Albino rats. The results showed that the methanolic extract possess potent hepato protective and anti-oxidant activities [16].

Anti-microbial activities of methanolic extract were carried out using disc diffusion methods with Gram positive and Gram negative bacteria and some fungal species. The result showed broad spectrum anti-microbial activity against all tested micro-organisms [17].

The methanolic extract of bark showed anti-tumour and anti-oxidant activity [18]. The methanolic extract of bark also significantly reduced castor oil induced diarrhoea in mice i.e., it shows anti-diarrhoeal activity [19].

The present study deals with the GC MS analysis of the phyto components on the methanolic extract of leaves of *Careya arborea*.

### 2. Materials and Methods

Leaves of *Careya arborea* were collected from the pathanamthitta district, Kerala. Leaves were thoroughly washed and dried in shade for 10 days. Dried leaves were made into coarse powder using mechanical blender and stored in air tight container till further use. The coarsely powdered leaves of *Careya arborea* were extracted with methanol. This methanolic extract was used for GC MS analysis.

### 3. GC MS Analysis

The analysis of samples were carried out on GC/MS 7890 A Agilent GCMS instrument with DB wax column Rtx – 5ms (30m x 0.25mm x 0.25µm). The carrier gas used was Helium and the flow rate of the carrier gas was 0.8 ml/min. Injection volume was 1 µl at a concentration of 1mg/ml of the sample. The injector temperature and detector temperature was maintained at 250 °C and 200 °C and the split ratio was 25:1. The initial oven temperature was 80 °C for 2 min and then increased by 10 °C/min (i.e. 80 °C to 200 °C). This temperature was gradually increased by 4 °C/min (i.e. between 200 °C and 270 °C).

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The Mass Spectra ionization voltage was 70 eV and the total time taken for the analysis was 47 min. Each peak in the chromatogram was identified based on the retention index and also by comparing the fragmentation pattern of the compounds with the mass spectra in the NIST data base (Adams 2012).

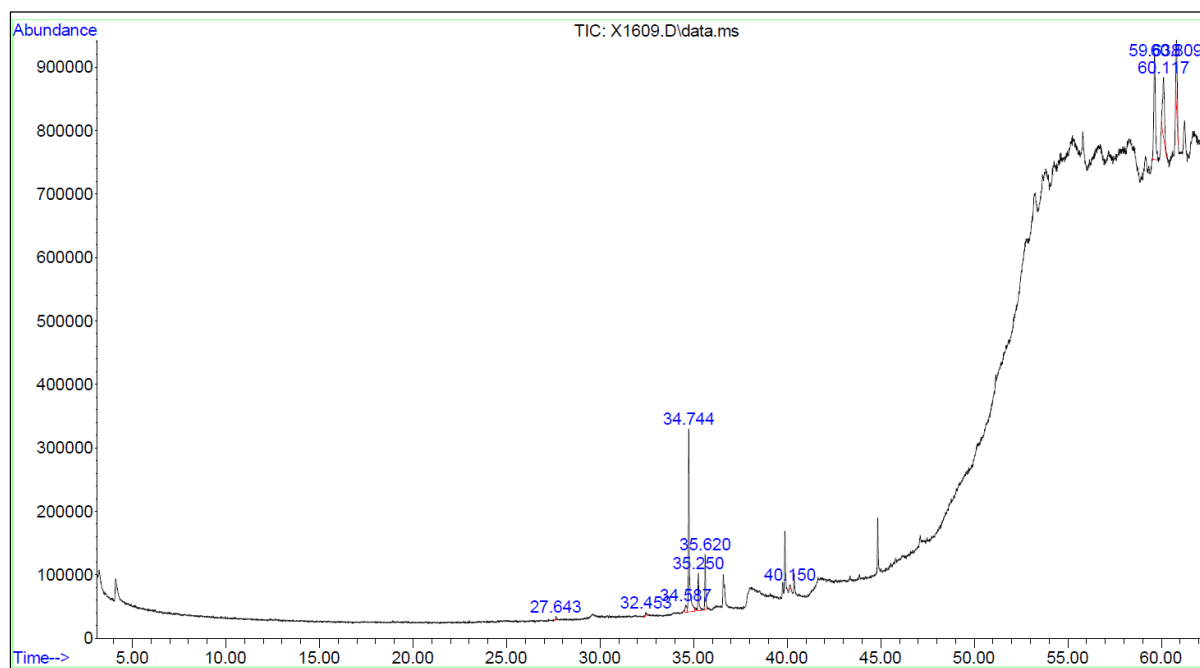
#### 4. Results and Discussions

GC MS analysis was carried out in the methanolic extract of *Careya arborea*. Ten phytochemicals were detected. The ten

compounds along with their retention time and peak area are given in table 1. From the GC MS study, the compounds that are present in larger amounts are Bicyclo [3.1.1] heptane,2,6,6 trimethyl-, (1.alpha.,2.,beta.,5.alpha.), (28.04%) which is anti-microbial, Oleic acid (26.74%) which is anti-bacterial, 2-Piperidinone, N-[4-bromo-n-butyl]- (17.52%) which has got anti-microbial and anti-oxidant properties, Tricosane which has anti- bacterial and anti- fungal properties (11.63%), and 11-Tetradecen-1-ol acetate(7.30%).

Table 1

S. No	Name of the compounds	Retention time(min)	Peak area (%)
1.	1,3,3-trimethyl-2-(1-methylbut-1-en-on-1-yl)-1-cyclohexene	27.64	0.41
2.	Methyl trans-9-(2-butylcyclopentyl)nonanoate	32.45	0.55
3.	1-[.alpha.-(1-adamantyl)benzylidene]thiosemicarbazide	34.59	2.03
4.	Bicyclo[3.1.1]heptane,2,6,6-trimethyl-,(1.alpha.,2.beta.,5.alpha.)	34.74	28.04
5.	1,19-Eicosadiene	35.25	5.58
6.	11-Tetradecen-1-ol acetate	35.62	7.30
7.	Heptadecanoic acid,heptadecyl ester	40.15	0.20
8.	Oleic acid	59.64	26.74
9.	2-Piperidinone,N-[4-bromo-n-butyl]-	60.12	17.52
10.	Tricosane	60.81	11.63



#### 5. Conclusion

GC MS is a direct and fast analytical approach for the identification of phytochemicals. It is one of the best technique to identify the constituents of volatile matter, long chain and branched chain hydrocarbon, alcohols, acids, esters etc. The GC MS analysis of methanolic extract of leaves of *Careya arborea* reveals the presence of ten compounds. Thus this type of GC MS analysis is the first step towards understanding the nature of active principles in the medicinal plants and this type of study will be helpful for further detailed study. However, isolation of individual phytochemical constituents and subjecting it to biological activity will definitely give fruitful results. It could be concluded that *Careya arborea* contains various phyto compounds and some of them have got good bioactivity. So it is recommended as a plant of pharmaceutical importance. An extensive research and development work should be undertaken on the plant and its products for better economic and therapeutic utilization

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