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## GC-MS analysis of bioactive components of *Ficus mollis*, vahl leaves

**V Priya and G Abinaya**

### Abstract

*Ficus mollis* is one of the medically important plants belonging to the family Moraceae. It has been used extensively by Ayurvedic practitioner in India to treat various ailments such as dysentery, snakebite, skin diseases and constipation. The aim of the study is to verify the presence of major chemical compounds and expound the chemical constituents contained in the *Ficus mollis* leaves, showed positive results for the presence of alkaloids, saponins, tannins, triterpenes and steroids. Credentials of chemical composition was conducted using the GC-MS equipped with mass detector supplied with helium. There is no literature available on GC-MS and phytochemical studies of this plant.

**Keywords:** *Ficus mollis*, GC-MS, Hexacosane, saponins, 2-Propyl

### Introduction

*Ficus mollis* is a 12 m tall semi evergreen tree, branchlets covered with yellow velvety hairs. Leaves are alternate or nearly opposite. They are elliptic-ovate to fiddle-shaped, 6-15 cm long, 3-9 cm wide, with a 5 cm long stalk. Figs occur in leaf axils, either in pairs or in clusters. They are stalk less, round, up to 8 mm across. *Ficus mollis* belongs to the family Moraceae, which consists of more than 700 species. For centuries, *F. mollis* have been used extensively by the India and Nepal to treat wounds and various diseases. Leaves, stem and roots of *F. mollis* are known to have medicinal properties and usually used separately or as a whole plant. *F. mollis* leaves are used to treat ulcers and wounds while its root is used for stomatitis, to clean ulcers and to promote granulation. The crushed leaves are applied as a poultice to treat boils. A paste made from the bark is applied as an ointment in the treatment of cuts and wounds. The stem bark is also used as astringent and tonic, to treat various skin diseases, ulcers, glandular swelling of the neck and scabies. *F. mollis* to used in treating diabetes mellitus has been described by Thapa (2001) [5]. Thus, the aim of the present study is to verify the presence of chemical compounds and to identify the phytochemical constituents of the methanol stem extract of *F. mollis* through GC-MS technique.

### Materials and Methods

#### Plant Collections

*F. mollis* stem was collected from Jawadhu hills, Tamilnadu. The plant was identified by the help of the book named Presidency of Madras written by Gamble.

#### Preparation of Powder and Extract

The leaves were shade dried for two to four weeks. After drying, it was grinded and stored in airtight container. The air dried bark powder (20g) was successively extracted by Soxhlet extraction with petroleum ether solvent. The extracts were dried and stored in a sterile container for further use.

#### GC-MS Analysis

GC-MS analysis was carried out on an Agilent system equipped with Mass Spectrometer detector and split/split less injection system. The GC was fitted with a HP-5MS capillary column (30 m X 250 m; film thickness: 0.25 m). The temperature program was as follows: injector temperature 280 °C, initial oven temperature at 50°C, then increased at 25°C/min to 300°C and was held for 10min. Helium was used as the carrier gas at 17.69 psi pressure with flow 2.1ml/min. Samples were dissolved in methanol and 1 µl aliquot was injected

automatically. MS spectra of separated components were identified based on WILEY and NIST Libraries for botanical compounds.

### Phytochemical Screening

Phytochemicals screening for alkaloids, tannins, saponins, flavonoids, steroids and terpenoids were carried out following method described by Nisar, Ali and Qaisar (2011) [6].

### Results and Discussion

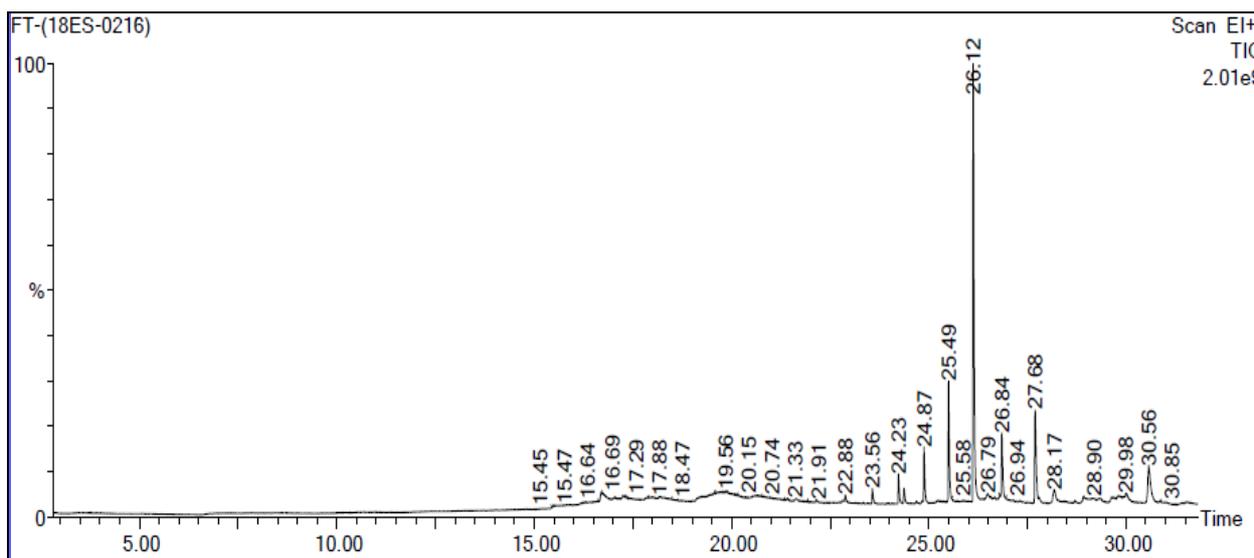
The photochemicals screening of the extracts was listed in Table 1. The phytochemical analysis of *F. mollis* leaves extract revealed the presence of alkaloids, tannins, saponins, flavonoids, steroids and terpenoids. The classes of compounds were noted for various contributions to the medicinal activity

of the plant. The GC-MS analysis of methanolic leaves extract of *F. mollis* showed the presence of many compounds (Figure 1).

**Table 1:** Phytochemical screening of methanol leaf extract of *F. mollis* Phytochemical Constituents

Alkaloids	++
Saponins	+
Flavonoids	++
Tannins	+++
Terpenoids	+++
Steroids	+++

+ weakly positive; ++ mildly positive; +++ strongly positive



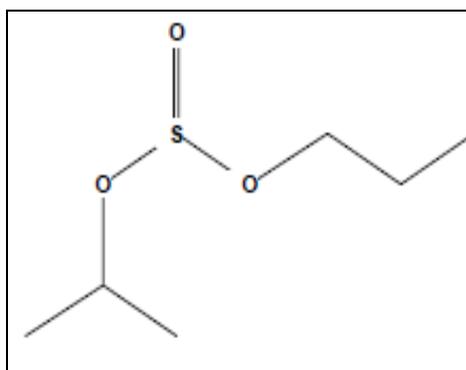
**Fig 1:** GC-MS Chromatogram of methanol leaf extract of *F. mollis*

However, only 7 compounds were positively identified using WILEY and NIST Libraries with 80-99% matching (Table 2).

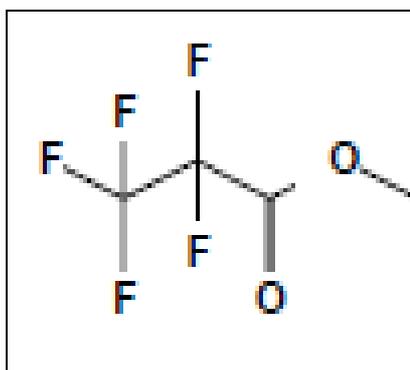
**Table 2:** GC-MS analysis of methanol stem extract of *F. mollis*

S.No	Compound Name	RT	Peak area%	Chemical formula
1	Sulfurous Acid, Octadecyl 2-Propyl Ester	24.227	2.770	C <sub>21</sub> H <sub>44</sub> O <sub>3</sub> S
2	Tetratetracontane	24.872	5.670	C <sub>44</sub> H <sub>90</sub>
3	Hexatriacontyl Pentafluoropropionate	25.493	12.307	C <sub>39</sub> H <sub>73</sub> O <sub>2</sub> F <sub>5</sub>
4	Octatriacontyl Pentafluoropropionate	25.493	48.058	C <sub>41</sub> H <sub>77</sub> O <sub>2</sub> F <sub>5</sub>
5	Octacosyl Trifluoroacetate	26.843	7.929	C <sub>30</sub> H <sub>57</sub> O <sub>2</sub> F <sub>3</sub>
6	Hexadecanoic acid, methyl ester	26.843	12.880	C <sub>17</sub> H <sub>34</sub> O <sub>2</sub>
7	Heptacosanoic Acid, 25-Methyl-, Methyl Ester	30.565	10.386	C <sub>29</sub> H <sub>58</sub> O <sub>2</sub>

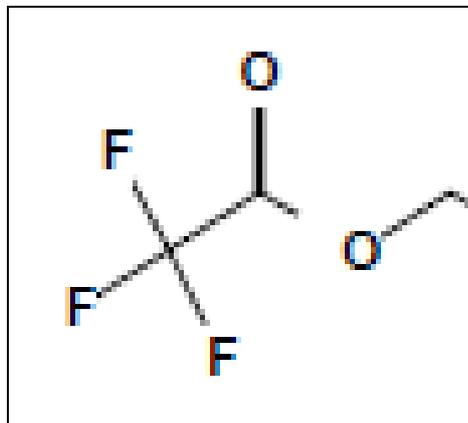
### Identified Peak Area Compounds



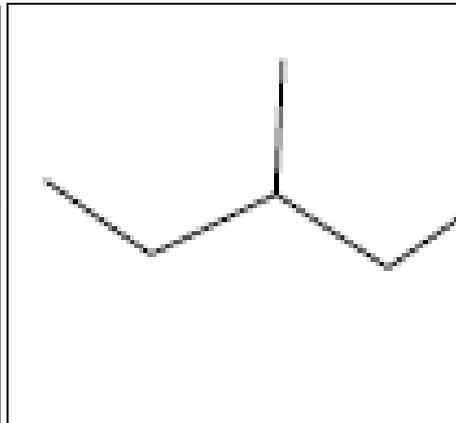
Sulfurous Acid, Octadecyl 2-Propyl Ester



Hexatriacontyl Pentafluoropropionate



Octatriacontyl Pentafluoropropionate



Heptacosanoic Acid, 25-Methyl-, Methyl Ester

Gas Chromatography-Mass Spectrometry (GC-MS) is a valuable tool for reliable identification of bioactive compounds (Johnson *et al.*, 2011) [7]. Among the identified bioactive chemicals, phenol is recommended to be an alcoholic and it may as an antioxidant, antiseptic, dye and antibacterial agent. Octadecanoic acid is suggested to be a fatty acid compound and it may used as an antioxidant and antimicrobial agent (Manorenjitha *et al.*, 2013) [8]. Thus this type of GC-MS analyses is the first step towards understanding the nature of active principles in this medicinal plant and this type of study will be helpful for further detailed study.

### Conclusion

The present study found 7 chemical constituents from methanol stem extract of *F. mollis* by Gas Chromatography Mass Spectrometry (GC-MS) analysis. The presence of bioactive compound justified the extensive use of the leaves by the traditional practitioner to treat various ailments. It could be concluded that *F. mollis* leaves contains various bioactive compounds of medicinal importance. However, further studies are needed to evaluate its bioactivity and toxicity profile.

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