

GC-MS Analysis of Bioactive Compound in Ethanolic Extract of *Pithecellobium dulce* Leaves**Anil F Bobade\***

Department of Industrial Chemistry, Arts, Science and Commerce College, Chikhaldara, Maharashtra, India

**\*Corresponding Author:** Anil F Bobade, Department of Industrial Chemistry, Arts, Science and Commerce College, Chikhaldara, Maharashtra, India.**Received:** September 17, 2019; **Published:** October 04, 2019**DOI:** 10.31080/ASPS.2019.03.0412**Abstract**

*Pithecellobium dulce* has been utilized by antiquated individuals in treating various sorts of ailments due to its restorative properties. Extract of leaves is employed as a remedy for indigestion and to prevent spontaneous abortion and for gall bladder ailments and to treat both open and closed wounds. Soxhlet-extraction with ethanol and the extract analysed using a GC-MS followed by concentration in rotary evaporator. The GCMS analyse major phytochemical compounds in *Pithecellobium dulce* leaves extract. The phytoconstituents were 13Docosenamide, (Z); Cyclohexasiloxane, dodecamethyl, Cyclodecasiloxane, eicosamethyl;methyl ester exadecanoic acid, Cyclodecasiloxane, eicosamethyl, Hexadecanoic acid. L- Lysine, 1Monolinoleoylglycerol trimethylsilyl ether, Rhodopin.

**Keywords:** GC-MS; Soxhlet; Rotary Evaporator; Chemical Composition**Introduction**

*Pithecellobium dulce* is used as medicinal plant. An extract of the leaves is used for gall ailments and to prevent miscarriage. *Pithecellobium dulce* is a species of flowering as well as fruit bearing plant has family fabaceae [1]. Often planted for living fence or thorny hedge, eventually nearly impenetrable, guamachil furnishes food, forage, and firewood, while fixing a little nitrogen. The pods, harvested in Mexico, Cuba, and Thailand, and customarily sold on roadside stands, contain a thick sweetish, but also acidic pulp, eaten raw or made into a drink similar to lemonade. Pods are devoured by livestock of all kinds; the leaves are browsed by horses, cattle, goats, and sheep; and hedge clippings are often gathered for animal feed. Reported to be abortifacient, anodyne, astringent, larvicidal, guamachil is a folk remedy for convulsions, dysentery, dyspepsia, earache, leprosy, peptic ulcers, sores, toothache, and venereal disease [2]. The bark of *P. avaremotem*, the "avaremo-temo" from Brazil, is a folk cancer elixir [3]. Pods contain a pulp that is variously sweet and acid, commonly white but also red. The seed and pulp are made into a sweet drink similar to lemonade and also eaten roasted or fresh. The seeds are used fresh in curries in India. The leaves can be applied as plasters for pain and venereal sores. The plant is used for hundreds of years in Ayurvedic medicine with no reported toxicity [4].

**Material and Method****Collection of plant material**

The fresh leaves of *Pithecellobium dulce* plant were collected from Melghat region Dist-Amravati (Maharashtra) The experimental site is located between coordinates 20.91° N, 77.75°E and an altitude of 312 m in foothills of Central India experiencing the sub-tropical climate during winter season in the month December 2014 and the Authentication of plant was confirmed by botanist (Prof. S.R. Kadu, Department of Botany, Art, Commerce and Science College Chikhaldara).

**Preparation of plant extract**

The plant were dried over ambient temperature and the dried sample were grind properly and dried powder sample was extracted in Methanol at 65°C, by using soxhlet apparatus [5] and extracts were concentrated by gradually evaporating the respective solvent on rotary evaporator. The concentrated extract was collected in sterile bottles and kept in a cool and dark place prior to analysis.

**GC-MS Analysis of *Pithecellobium dulce*  
Gas Chromatography and Mass Spectroscopy**

A JEOL GCmate II benchtop double-focusing magnetic sector mass spectrometer operating in electron ionization (EI) mode with

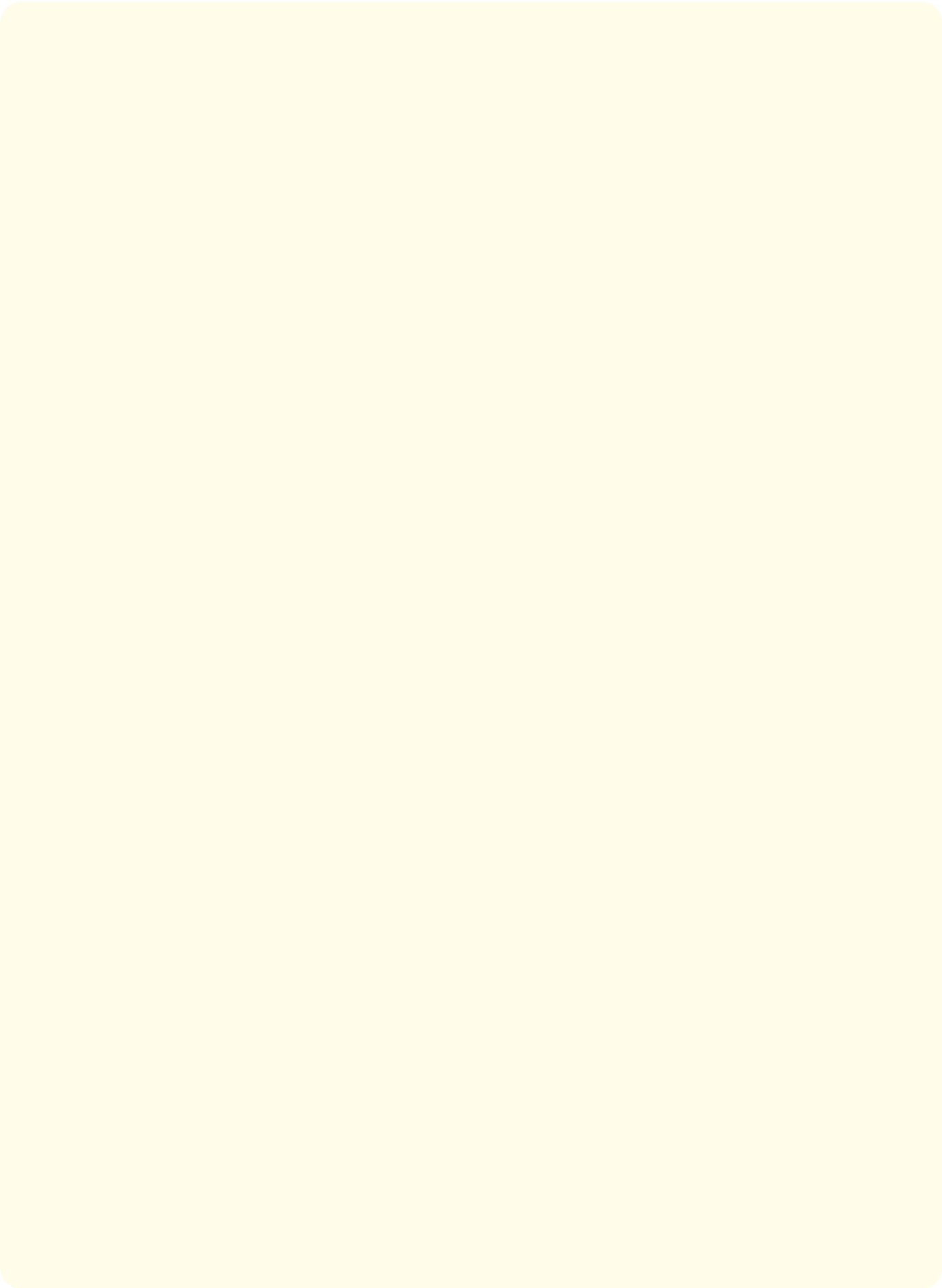
TSS-2000 [1] software was used for all analyses. Low-resolution mass spectra were acquired at a resolving power of 1000 (20% height definition) and scanning from m/z 25 to m/z 700 at 0.3 seconds per scan with a 0.2 second inter-scan delay. High resolution mass spectra were acquired at a resolving power of 5000 (20% height definition) and scanning the magnet from m/z 65 to m/z 750 at 1 second per scan.

Identification of chemical constituents

Identification of the chemical constituents was done on the basis of retention index (RI) using a mass spectra library search NIST and by com-paring the mass spectral and retention data with literature. The relative amounts of individual components were calculated based on the GC peak area (FID response) without using a correction factor.

Sr. No	Rention Time	Name of chemical constituent	Molecular Formula	Peak Area %
1	10.75	Cyclohexasiloxane, dodecamethyl	C12H36O6Si6	2.52
2	18.25	Cyclodecasiloxane, eicosamethyl	C20H60O10Si10	2.62
4	25.15	13Docosenamide, (Z)	C22H43NO	37.69
6	29.15	Hexadecanoic acid	C36H58O6	2.79
7	31.06	L-Lysine	C53H72N8O9	2.62
8	31.62	Rhodopin	C40H58O	1.48
8	32.62	Milbemycin b	C33H46ClNO7	1.46
9	33.16	1Monolinoleoylglycerol trimethylsilyl ether	C27H54O4Si2	2.13

Table 1: Chemical Composition of *Pithecellobium dulce* leaves.





## Result and Discussion

GC-MS chromatogram analysis of the Methanolic extract of *Pithecellobium dulce* Figure 1 showed major nine peaks which indicating the presence of various phytochemical constituents. On comparison of the mass spectra of the constituents with the NIST library. The various phytochemicals which contribute to the medicinal activities like Hepato protective activity, antimicrobial, antifungal, antiviral and antioxidants. The mass spectra of all the phytochemicals identified in the whole plant the most prevailing compounds were Cyclohexasiloxane, dodecamethyl [6] (2.52%); Cyclodecasiloxane, eicosamethyl (2.62%) Tetracosamethyl-cyclodecasiloxane is one of the biologically active compound possessed hepato protective activity [7] and antispasmodic, anti-rheumatic, anti-soporific baths, insecticides for mosquito control, appetizing agent, to combat indigestion, stomach pain, nausea and infection of the gall bladder [8]. Mosquito repellent compounds [9]; 13Docosenamide, (Z)- (37.69%) which shows antimicrobial activity [10]; Hexadecanoic acid (2.79%) Antibacterial and antifungal, antioxidant hypo-cholesterolemic, nematocide, insecticide lubricant, anti-androgenic flavor, hemolytic [11]; L-Lysine (2.62%) Studies show that Lysine helps build collagen in the skin. Collagen is the structure responsible for your skin's elasticity and firmness [12]; Rhodopin(1.48%) major compounds in phototrophic bacteria [13]; Milbemycin b (1.46%) is a group of macrolides chemically related to the avermectins. They are used in veterinary medicine as antiparasitic agents against worms, ticks and fleas [12]. 1Mono-linoleoylglycerol trimethylsilyl ether (2.13%) also shows Antimicrobial Antioxidant Antiinflammatory Antiarthritic Antiasthma, Diuretic [14].

## Conclusion

The phytochemical analysis of the crude extracts presence of various bioactive compounds in the *Pithecellobium dulce* justifies the use of whole plant for various ailments by traditional practitioners. However, isolation of individual phytochemical constituents will definitely give fruitful results. From the results, it could be concluded that *Pithecellobium dulce* contains various bioactive compounds. Therefore, *Pithecellobium dulce* exhibit significant support folkloric use of this plant leaves; corroborating the importance of ethno pharmacological selection of plants.

## Bibliography

1. Felker P. "Uses of tree legumes in semiarid regions". *Economic Botany* 35 (1981): 174-186.
2. Duke JA. "Ecosystematic data on economic plants". *Quarterly Journal of Crude Drug Research* 17 (1979): 91-110.
3. Hartwell JL. "Plants used against cancer. A survey". *Lloydia* (1971): 30-34.
4. Sugumaran M., et al. "Free Radical Scavenging Activity of Folklore: *Pithecellobium dulce* Benth. Leaves". *Ethnobotanic Leaflet* 12 (2008): 446-451.
5. Umesh Khandekar, et al. "Screening on antioxidant activity, antimicrobial activity and phytoconstituents of *Cyathocline lyrata* leaf". *International Journal of chemical and pharmaceutical sciences* 4 (2013): 64-68.

6. Screening Assessment for the Challenge Dodecamethylcyclohexasiloxane (D6) Chemical Abstracts Service Registry Number 540-97-6 Environment Canada Health Canada (2008).
7. Babalola OO., *et al.* "Hepato protective activity of aqueous extract of the leaves of *Hyptis suaveolens* (L.) Poit on acetaminophen induced hepato toxicity in rabbits". *Research Journal of Chemical Sciences* 1 (2011): 85-88.
8. Singh HB and Handique AK. "Antifungal activity of the essential oil of *Hyptis suaveolens* and its efficacy in bio control measures in combination with *Trichoderma harzianum*". 9 (2007): 683-87.
9. Venugopal G., *et al.* "GC-MS analysis and in silico molecular docking studies of mosquito repellent compounds from *Hyptis suaveolens* L". *International Journal of Bioassays* 1 (2012): 36-41
10. Norliana Ghajali., *et al.* "Gc-ms analysis of some bioactive components In the root extract of *ixora coccinea* linn". *International Journal of Pharma and Bio Sciences* 5 (2014): 197-203.
11. Arora Sunita., *et al.* "Gas Chromatography-Mass Spectrometry Analysis of an Endangered Medicinal plant, *Sarcostemma Viminal* (L.)R.BR. From Thar Desert, Rajasthan (India)". *Asian Journal of Pharmaceutical and Clinical Research* 10 (2017): 210-213.
12. P Yamuna., *et al.* "GC-MS analysis of bioactive compounds in the entire plant parts of ethanolic extract of *Gomphrena decumbens* Jacq". *Journal of Medicinal Plants Studies* 5 (2017): 31-37.
13. The 2nd International Electronic Conference on Synthetic Organic Chemistry: Insecticides Archived (2008).
14. Parthipan B., *et al.* "GC-MS Analysis of Phytocomponents in *Pleiospermium alatum* (Wall. ex Wight and Arn.) Swingle, (Rutaceae)". *Journal of Pharmacognosy and Phytochemistry* 4 (2015): 216-222.

**Volume 3 Issue 11 November 2019**

**© All rights are reserved by Anil F Bobade.**