International Journal of Life Sciences
International Peer Reviewed Open Access Journal

Special Issue A16, March 2021
ISSN:2320-7817(p) 2320-964X(0)

Research Article Open Access

GC-MS analysis of *Careya arborea* Roxb. Stem bark extracts in Chloroform and Ethyl acetate

Ingle SS[1] and Patil US[2]

[1]Department of Botany, Yashwantrao Chavhan Arts & Science Mahavidyalaya, Mangrulpir, Dist. Washim.
[2]Professor and Head, Department of Botany, Bharatiya Mahavidyalaya, Amravati (MS.).

Manuscript details:

Available online on http://www.ijlsci.in
ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)

Cite this article as:
Ingle SS and Patil US (2021) GC-MS analysis of *Careya arborea* Roxb. Stem bark extracts in Chloroform and Ethyl acetate, *Int. J. of. Life Sciences*, Special Issue, A16: 129-133.

Article published in Special issue of National Conference on "Recent Trends in Science and Technology-2021 (RTST-2021)" organized by Department of Environmental Science, Shri. Dnyaneshwar Maskuji Burungale Science & Arts College, Shegaon, Bhuldhana, and Department of Botany Indraraj Commerce and Science College Shillod, DIst. Aurangabad, Maharashtra, India date, February 22, 2021.

ABSTRACT

The *Careya arborea* Roxb. is species of tree belong to Lecythidaceae family, native to the Indian subcontinent. The local name is "Lahan Kumbha or CChota kumbha" in English wild guava. It is wildly grow in Melghat, Maharashtra, India. Different plant parts are used in folk medicine by tribals. Basically, the plant fruits are used to treat asthma as well as chronic bronchitis. To evaluate different medicinal property, secondary metabolite as well as compound identification, the GC-MS is very useful. The identification of chemical compound is based on peak area, retention time, molecular weight and molecular formula. Chloroform extract of *Careya arborea* Roxb. Stem bark analyzed by GC-MS shows the presence of compound like- Trichloromethane and Ethyl acetate extract revealed the existence of Propanoic acid, 2 oxo-, Ethyl ester, Methanol, (Methyl- ONN-Azoxy,acetate (Ester) and 1,2-Propanediol-2- Acetate.

Keywords: *Careya arborea,* Lahan Kumbha,Melghat, Maharashtra, GC-MS.

INTRODUCTION

The stem bark, leaves and fruits of *Careya arborea* Roxb. are used in Ayurveda in the treatment of ulcers, hemorrhoids, tumors etc. The tree grows in deciduous forests and grasslands of India. Known as Katabhi in Sanskrit, it is a medium sized deciduous tree growing up to a height of 15 meters, with thick, dark grey bark having shallow cracks Flowers are yellowish white, large and foul-smelling. The *Careya arborea* Roxb. is species of tree belong to Lecythidaceae family, native to the Indian subcontinent. The local name is "Lahan Kumbha or CChota kumbha" in English wild guava. It is wildly grow in Melghat, Maharashtra, India. Different plant parts are used in folk medicine by tribals. Basically the plant fruits are used to treat asthma as well as chronic bronchitis. Stem bark of *Careya arborea* Roxb. is used in the treatment of bronchitis

(Kirtikar *et al.* 1975). They occur in thick, swollen, hard, terminal spikes **(**Warrier *et al.* 2005). The bark of the tree is used to treat sores in intestine and is also effective in bed sores (Bhat *et al.* 2014). The bark of the root is used to treat Vata and Kapha (Shiddamallayya *et al.* 2010). Juice of the bark is applied internally to treat ear pain (Bhandary *et al.* 1995). The dried stem bark of *Careya arborea* Roxb. is one of the most important components of medicated water "Vethuvellam" used by a woman to take a bath after delivery to overcome her body weakness (Rajith *et al.* 2010). In some cases, screening tests have been performed for extracts in different solvents, which gives preliminary information about the content of various classes of compounds in seaweed (Whankatte and Ambhore 2016). Ambhore and Whankatte (2016), Whankatte and Ambhore (2016). The history of very important ethnomedicinal uses such as calyx and stem bark juice are used to treat cough and cold (Bedi, 1978).

MATERIALS AND METHODS

The material of *Careya arborea* Roxb. (Stem bark) was collected in fresh condition from the northern part of Melghat, Amravati District, Maharashtra, India. The authentication of plant done by well known taxonomist Dr. S. M. Bhuskute Principal, Bhavbhuti Mahavidyalaya, Amgaon, district Gondia, Maharashrra. Voucher specimen has been deposited at Bhartiya Mahavidyalaya, Amravati, Maharashtra. The stem bark were washed under running water and dried under shade then ground into a fine powder using blender and stored in plastic bottle at room temperature.

Extract preparation:

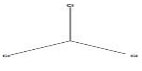
The extraction of soluble compounds from *Careya arborea* Roxb. (Stem bark) was done by the Soxhlet extraction method with analytical grade solvents Chloroform and Ethyl acetate. The extracts obtained from the above process was evaporated and stored in cap glass vials. Chloroform and Ethyl acetate extract of *Careya arborea* Roxb. (Stem bark) was subject to Gas Chromatography and Mass Spectroscopy analysis from Sophisticated Instrumentation facility (SFI), School of Advance Science, Chemistry Division, VIT University, Vellore, Tamilnadu and result were obtained. The extract obtained from *Careya arborea* Roxb. (Stem bark) were subject to GC-MS for the determination of bioactive compounds.

RESULTS AND DISCUSSION

In this work, GC-MS analysis of *Careya arborea* Roxb. (Stem bark) was carried out to identify possible chemical compound present in stem bark of *Careya arborea* Roxb. which wildly used by tribal medicine man to treat asthma and respiratory tract infections. Chloroform extract of *Careya arborea* Roxb. Stem bark analyzed by GC-MS shows the presence of compound like- Trichloromethane. The active compound with their retention time, Peak area%, molecular formula, molecular weight, probable structural formula and activity is reported in table no. 1.

On the basis of data obtained from GC-MS analysis the determination of determination of possible chemical compounds from *Careya arborea* Roxb. (Stem bark) Ethyl acetate extract reveal the seven peaks. These seven peaks indicate the presence of seven chemical compounds. The GC-MS chromatogram of seven phytochemical compounds detected shown in Fig. 2. On the comparison of mass spectra of the constituents provided by NIST seven phytoconstituents were characterized and identified. Ethyl acetate extract of *Careya arborea* Roxb. (Stem bark) analysed by GC-MS shows the presence of phytocompounds like Ethyl acetate, Propanoic acid, 2 oxo- , Ethyl ester, Methanol, (Methyl- ONN-Azoxy,acetate (Ester) and 1,2- Propanediol-2- Acetate.

Table -1. GC-MS analysis of *Careya arborea* Roxb. (Stem bark) Chloroform extract.

Sr. No	Retenation Time	Peak area (%)	Compound Analyzed	Molecular formula	Molecular weight	Probable structural Formula	Activity reported
1	2.87	7.50%	Trichloromethane	$CHCl_3$	118		Anesthetic agent

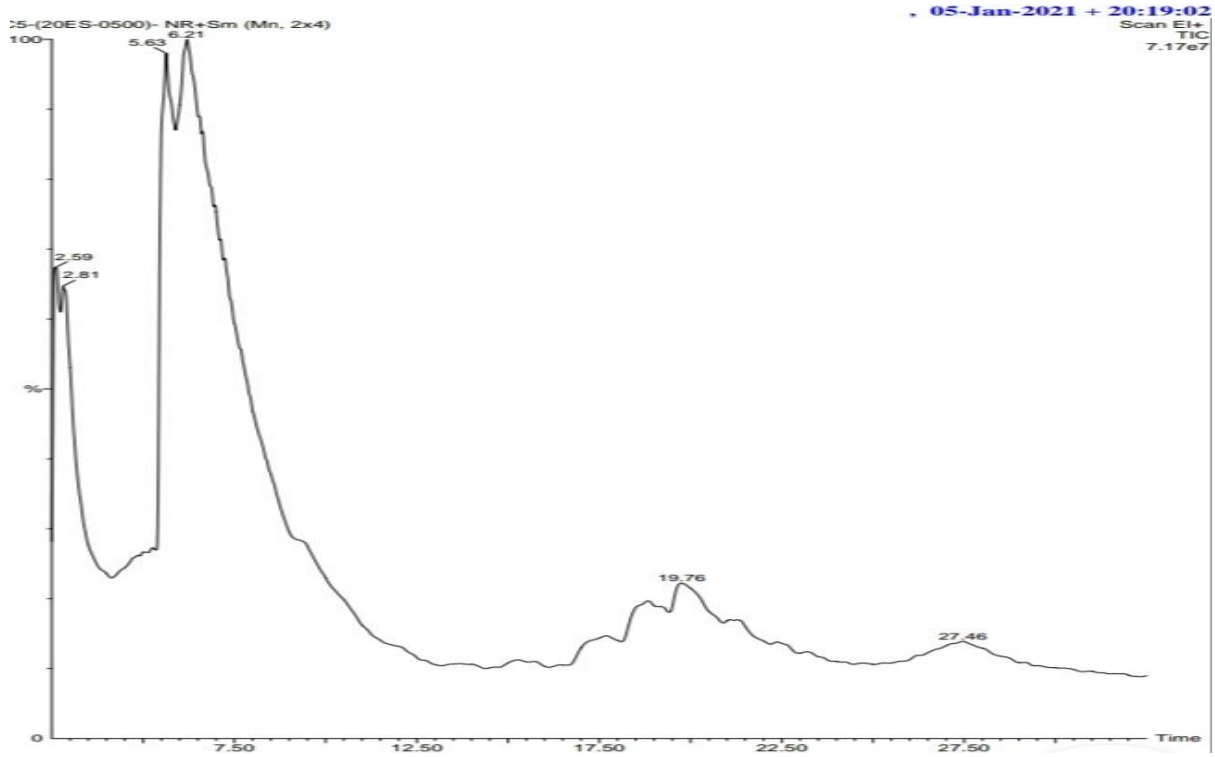
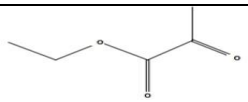
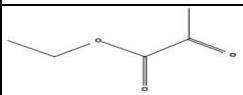
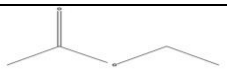
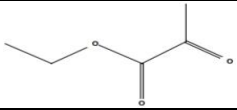
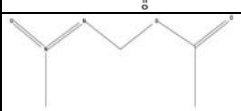
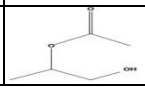


Fig. 1 The GC-MS chromatogram of *Careya arborea* Roxb. (Stem bark) Chloroform extract.

Table -2. GC-MS analysis of *Careya arborea* Roxb. (Stem bark) Ethyl acetate extract.

Sr. No	Retention Time	Peak area (%)	Compound Analyzed	Molecular formula	Molecular weight	Probable structural Formula	Activity reported
1	5.63	15.32%	Ethyl Acetate	$C_4H_8O_2$	88		Antibacterial
2	5.68	6.36%	Propanoic acid, 2 oxo-, Ethyl ester	$C_4H_8O_3$	116		Antiinflamm-atory,
3	5.75	7.97%	Propanoic acid, 2 oxo-, Ethyl ester	$C_4H_8O_3$	116		Antiinflamm-atory,
4	6.10	29.76%	Ethyl Acetate	$C_4H_8O_2$	88		Antibacterial
5	6.37	26.77%	Propanoic acid, 2 oxo-, Ethyl ester	$C_4H_8O_3$	116		Antiinflamm-atory,
6	6.99	5.94%	Methanol, (Methyl-ONN-Azoxy,acetate (Ester)	$C_4H_8O_3N_2$	132		Antiseptic
7	7.13	7.85%	1,2- Propanediol-2- Acetate	$C_5H_{10}O_3$	118		Cleansing, Antiperspirant

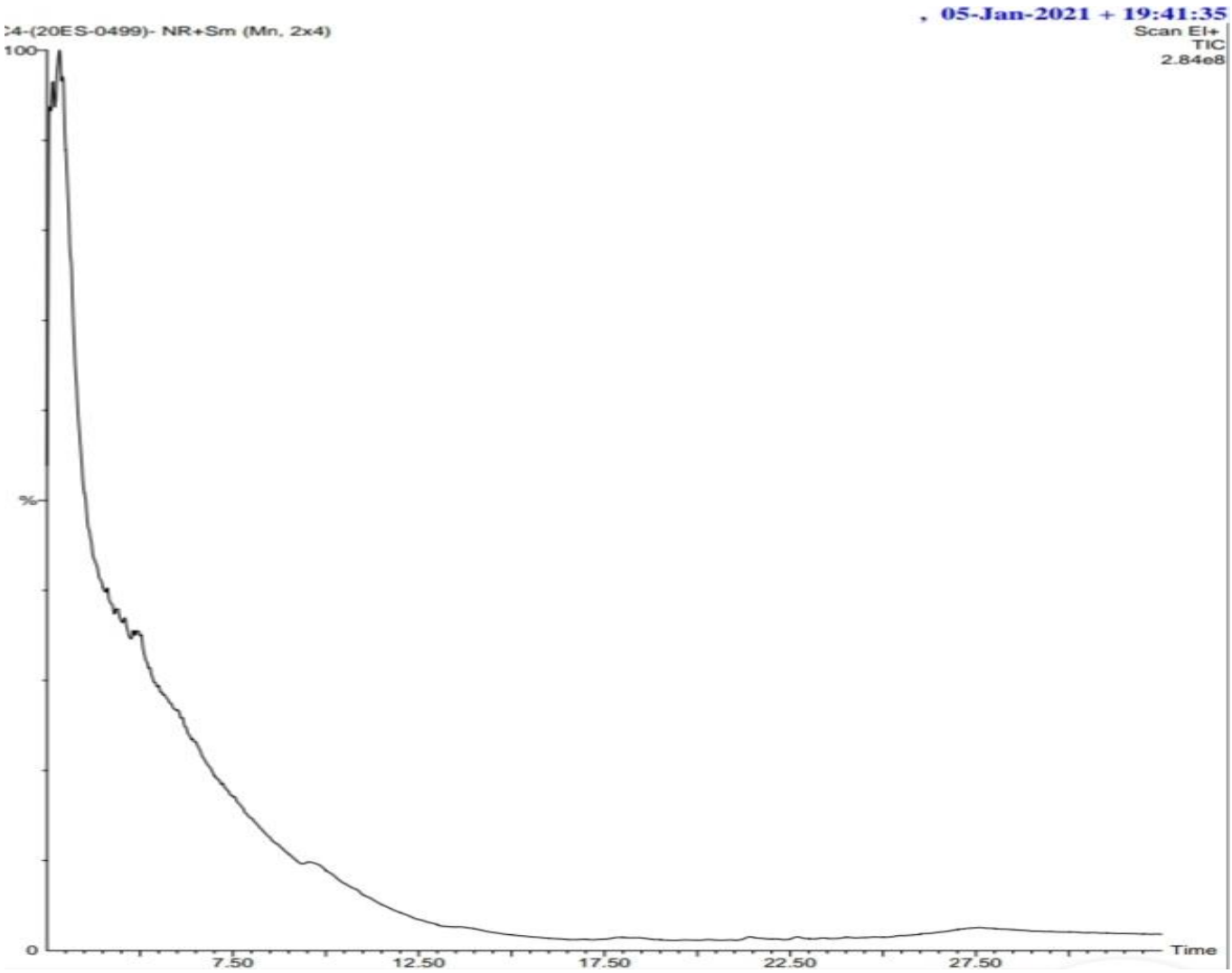


Fig. 2 The GC-MS chromatogram of *Careya arborea* Roxb. (Stem bark) Ethyl acetate

The active principles with their retention time, Peak area%, molecular formula, molecular weight, probable structural formula and activity is reported in table no.2.

CONCLUSION

The study concludes that the *Careya arborea* Roxb. (Stem bark) is highly effective and more curability as antiseptic, antibacterial, anesthetic, Antiinflammatory and cleansing property. This type of GC-MS analysis is step towards understanding the medicinal components in the plant showing biological activity, and research should be undertaken for detailed study of plant for therapeutic utilization.

Acknowledgement

Authors are grateful to Dr. S. M. Bhuskute Principal, Bhavbhuti Mahavidyalaya, Amgaon, district Gondia, M.S. for his kind help in identification of plants specimens. The immense thank also extended to the traditional healers of Melghat, Maharashtra for their co-operation during the course of study.

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

Ambhore JS and Whankatte VR (2016) Phytochemical screening of some macro marine algal species collected from raigad coast of konkan Global Journal of Bio science and Biotechnology. 5 (3) 378-380.

Bedi S (1978) Ethnobotany of Ratan Mahal Hils, Gujarat, India. *Economic Botany*, 32 (3): 278-284.

Bhandary M, Chandrashekar K and Kaveriappa K (1995) Medical Ethnobotany of the Siddis of Uttara Kannada, Karnataka, India. *Journal of Ethnopharmacology*,47(3):149-58.

Bhat P, Hegde GR, Hegde G and Mulgund GS (2014) Ethnomedicinal plants to cure skin diseases—An account of the traditional knowledge in the coastal parts of Central Western Ghats, Karnataka, India. *Journal of ethnopharmacology*, 151(1):493-502.

Kirtikar KR and Basu BD (1975) Indian Medicinal Plants. Vol.2, 2nd edn, Bishen Singh Mahendra Plal Singh, Dehrsdun, India. 894-895.

Rajith N, Navas M, Thaha AM, Manju M, Anish N and Rajasekharan S (2010) A study on traditional mother care plants of rural communities of South Kerala. *Indian Journal of Traditional Knowledge,* 9(1):203- 8.

Shiddamallayya N, Yasmeen A and Gopakumar K (2010) Medico-botanical survey of Kumar parvatha Kukke subramanya, Mangalore, Karnataka. *Indian Journal of Traditional Knowledge*, 9(1):96-9.

Wankhatte VR and Ambhore JS (2016) Study of phytochemical screening and antioxidant activities of Cladophora glomerata Linn. Collectrd from Raigad coast of Konkan (M.S.) India J. Sci. Nat.7:659-663.

Whankatte VR, Ambhore JS (2016) Phytochemical screening and antioxidant activity of Ulva lactuca. Int J Curr Res. 2016; 8:38265-9

Warrier PK, Nambiar VPK and Ramankutty C (2005) Indian Medicinal Plants, Volume 1, (Orient Longman Private Ltd, Hyderabad), 380-382.