Medico-Ethno Botany and HPLC Analysis of *Capparis zeylanica* Linn. from Western Melghat Region Amravati. (MS) India

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Abstract **- Medicinal plants have a history as long as the human civilization. Early Chinese, Indians Hebrews and Egyptian have left us many written records illustrating the medicinal properties of various plants. Ayurveda, one of the most celebrated ancient Hindu systems of medicine is almost wholly based on the plants. Drugs or medicine are obtained from practically all parts of the plants. World plant biodiversity is the largest source of herbal medicine and still about 60-80 % world population rely on plant based medicine and being used since ancient ages as traditional health care system. It is now clear that the medicinal value of *Capparis zeylanica* Linn. lies in the bioactive phytochemical constitute that produce definite physiological effect on human body. These natural compounds signify the base of modern drugs as we use today. The HPLC analysis of *Capparis zeylanica* Linn in methanolic extracts showed presence of essential bioactive phytochemicals.**

Index Terms **- Medico-ethno botany, HPLC Analysis, *Capparis zeylanica* Linn.**

INTRODUCTION

No one knows exactly how many different medicinal plants are used in the world today, but we do know that medicinal plants are enormously important in both traditional and Western medicine. Ethnobotany, the study of traditional plant use, is a field of growing interest among life science researchers and pharmaceutical companies looking to develop new and more effective drugs[6]. HPLC analysis of *Capparis zeylanica* Linn shows the phytochemicals present insights into how effective are the plants on specific ailments and understanding how and why they are effective. This is one of most important aspect of investigation in this field which can lead to the development of new medicines [1-4,6-8].

The Western Melghat region is rich with biodiversity and the forest is mostly of Dry Mixed Deciduous type and one of the important forests of Maharashtra in India. The vegetation varies considerably with the change in altitude , soil , temperature , humidity and rainfall. The average rainfall varies from 1300 mm to 1450mm , the temperature range varies from 13^{o}c to 41 ^{o}c and humidity varies from 48 % to 100 %. The soil is also of different types like Alluvial, Lateritic, Gritty-loam and Clayey [5]. *Capparis zeylanica* Linn. is a many branched thorny, sub-scandent climbing shrub. Plants are 2-3 m in height, armed with 3-6 mm long, leaves are elliptic or broadly lanceolate, base rounded, apex mucronate, flower profuse, pinkish white, later turning pink, berries are globular or elliposide, 3-4 cm in diameter, and seeds are globase, embedded in white pulp. For the present investigation, the plant material was collected from Western Melghat region of Amravati District (MS).

MATERIAL METHODS

Medico-ethnobotany

Ethnomedicinal uses: *Capparis zeylanica* Linn have high medicinal importance. *Capparis zeylanica* Linn found to be use in medicine since ages by various ethnic communities. During the present study, the ethnomedicinal importance of *Capparis zeylanica* Linn was identified and extracted from the local tribals and rural local peoples and medicine men of Melghat region. The collected data was then interpreted in light of the recent development in the field and presented here. Traditionally it was found that *Capparis zeylanica* Linn use by local tribes as Antidote against snake bite. The local tribes and medicine men of Melghat region also prescribe this plant to cure, swelling of testicle, sores and boils. The local tribes

and medicine men of this region also use this plant leaf extract and fruits to get relief from cholera, colic problems and neuralgia.

The HPLC analysis was done at 254 nm and chromatogram was analyzed on HyStar version software of HPLC. The methanolic extracts were use for analysis and 20 ml sample was injected for analysis. The results obtained for the HPLC analysis are presented below in the form of chromatograms and their tables containing peak numbers, retention time and peak area. The chromatograms were correlated with the available data to identify the components present in the given samples.

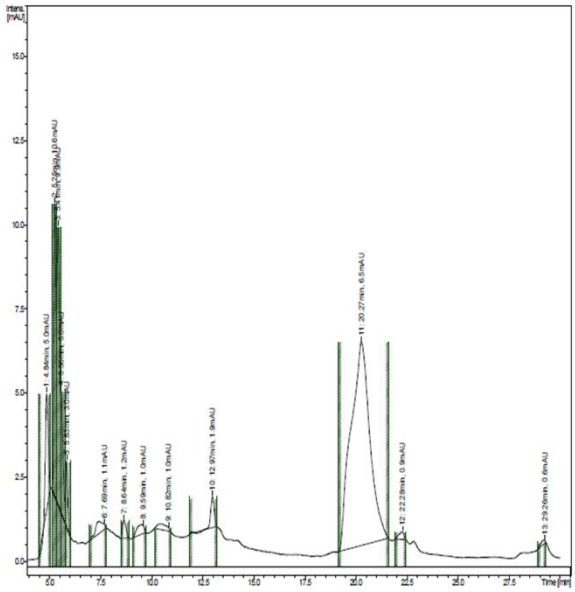


Fig. 1 HPLC chromatogram of *Capparis zeylanica* Linn sample

HPLC analysis of *C. zeylanica* leaf powder:

The HPLC chromatogram showed presence of 13 peaks in the methanolic extracts (Fig. 1.1). The peak numbers, retention time (min) and peak height is presented in table 1.2 For the same analysis, as no standard was taken, the results were compared with available data. On the basis of retention time and peak height, it was found that, the plant contain Rutin (RT – 5.83), Quercetin (RT – 9.72) and Caffeic acid (RT-10.82).

Table- I HPLC results for the *Capparis zeylanica* Linn sample

Peak No.	RT (Min)	Peak Height (mAU)	Identification
1	4.84	4.98	ND
2	5.25	10.61	ND
3	5.41	9.93	ND
4	5.56	5.04	ND
5	5.83	2.97	Rutin
6	7.69	1.08	ND
7	8.64	1.20	ND
8	9.72	1.05	Quercetin
9	10.82	0.99	Caffeic acid
10	12.97	1.91	ND
11	20.27	6.51	ND
12	22.28	0.86	ND
13	29.26	0.59	ND

ND: Not Detected

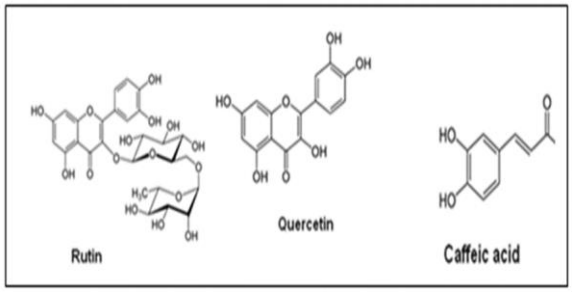
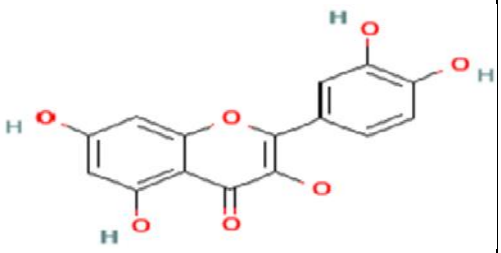
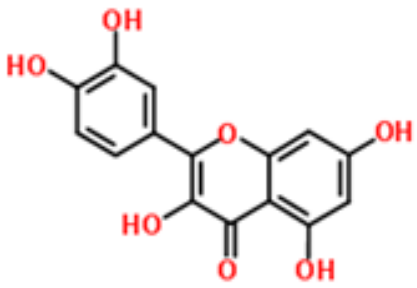
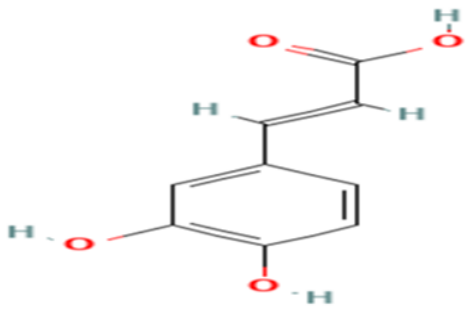


Fig. 2. Compounds identified on the basis of HPLC analysis

Table II Details of compounds identified

Sr. No.	Name and Structure	Features
01	Rutin 	Rutin is a rutinoside that is quercetin with the hydroxy group at position C-3 substituted with glucose and rhamnose sugar groups. It has a role as a metabolite and an antioxidant Its IUPAC Name 2-(3,4-dihydroxyphenyl)-5,7-dihydroxy-3-[(2*S*,3*R*,4*S*,5*S*,6*R*)-3,4,5-trihydroxy-6-[[(2*R*,3*R*,4*R*,5*R*,6*S*)-3,4,5-trihydroxy-6-methyloxan-2-yl]oxymethyl]oxan-2-yl]oxychromen-4-one The molecular formula: $C_{27}H_{30}O_{16}$ and Molecular Weight 610.5

02	Quercetin 	Quercetin is a flavonoid and is a regular component of a normal diet. Extracts of quercetin have been used to treat or prevent diverse conditions including cardiovascular disease, hypercholesterolemia, rheumatic diseases, infections and cancer but have not been shown to be effective in clinical trials for any medical condition. Quercetin as a nutritional supplement is well tolerated and has not been linked to serum enzyme elevations or to episodes of clinically apparent liver injury. Its IUPAC Name: 2- (3,4-dihydroxyphenyl)- 3, 5, 7-trihydroxychromen -4-one. The molecular formula: $C_{15}H_{10}O_7$ and molecular weight: 302.2357
03	Caffeic acid 	Caffeic Acid: is an orally bioavailable, hydroxycinnamic acid derivative and polyphenol, with potential anti-oxidant, anti-inflammatory, and antineoplastic activities. Upon administration, caffeic acid acts as an antioxidant and prevents oxidative stress, thereby preventing DNA damage induced by free radicals.Its IUPAC Name: (*E*)-3-(3,4-dihydroxyphenyl)prop-2-enoic acid. The molecular formula: $C_9H_8O_4$ Molecular Weight: 180.16

SUMMARY AND CONCLUSION

The HPLC chromatogram of *Capparis zeylanica* Linn methanolic extracts showed presence of 13 peaks. On the basis of retention time and peak height, it was found that, the plant contain rutin (RT – 5.83), Quercetin (RT – 9.72) and Caffeic acid (RT- 10.82). Form the results of the present investigation it can be concluded that, *Capparis zeylanica* Linn having ethno medicinal potential and are being used by various local tribal and local communities to treat various ailments. They are rich in phytochemical and during present investigation showed presence of active compounds like Rutin, Quercetin, and Caffeic acid. Due to presence of such bioactive compounds,. Having rich availability of plant chemicals the *Capparis zeylanica* Linn plants under study can be use to treat various diseases. By further purification of the individual compounds and assessing their bioactivity, they could be utilizing in the formulation of new potential drugs.

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