



ANTIMICROBIAL AND ANTIOXIDANT ACTIVITY OF THREE MEDICINALLY IMPORTANT CAPPARIS SPECIES FROM WESTERN MELGHAT REGION DHARNI (MS) INDIA

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Abstract

Capparis plant species are used since long time ago in Ayurveda and unani for their ethnomedicinal potential. Traditionally used of Capparis species for various ailments like arthritis, anemia, dropsy, and gout. And also the fruit of Capparis species have good nutritional value due to the fruits are used in making pickle and curry. Capparis species contain an enormous amount of the antimicrobial and anti-oxidant activity against bacterial pathogens and new research suggest a possible use of Capparis plant species as a source of natural antioxidant and antimicrobial agents.

Keywords: Capparis zeylanica L and Capparis Grandis L and Capparis deciduas (forsk) Edgew. Crude quantification, Antimicrobial and antioxidant activity.

INTRODUCTION:

The present paper is focused on the crude quantification, antimicrobial and antioxidant activity of *Capparis zeylanica* L and *Capparis grandis* L and *Capparis deciduas* (forsk) Edgew. All the three plant species are ethnomedicinally important. And the species have potential for curing various ailments also like arthritis, anemia, dropsy, and gout etc. Some tribal healers administered *C. grandis* on

asthma, wounds and burns. It was also given as blood tonic.

MATERIALS AND METHOD

Material collection and sample processing

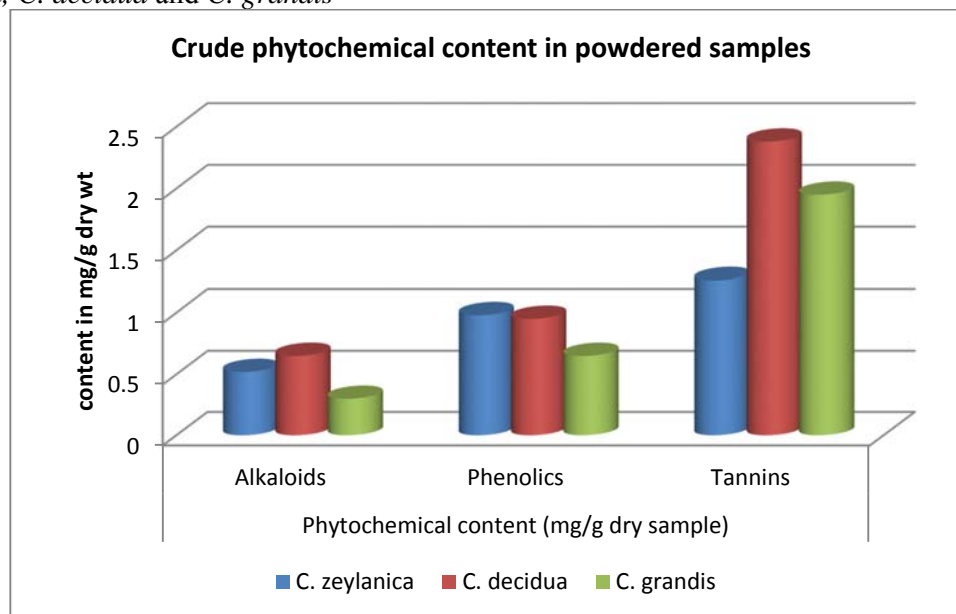
The plant material was collected from the local forest area and identified taxonomically (Dhore M A 2002) (Naik 1998). In the Department of Botany Shri Vasant Rao Naik College Dharni Dist. Amravati (MS). The voucher specimen was deposited in the departmental herbarium. The branches of the plant are properly washed in tap water and then rinsed in distilled water. The rinsed branches are dried under shade for 12-15 days and powdered for further experimentation.

RESULT

The crude quantification of major phytochemicals was done as per Harborne J. B. (1992). The quantitative analysis of alkaloids, phenolics and tannins was done. It was found that the plant is rich in phytoconstituents and possesses high amount of tannins followed by phenolic compounds. All the samples also have significant amount of alkaloids (table- 1). The comparative account of quantitative analysis of *C. zeylanica*, *C. decidua* and *C. grandis* are presented in fig. 1.

Table 1- Crude content of major phytochemical in powder samples of *C. zeylanica*, *C. decidua* and *C. grandis*

Samples	Phytochemical content (mg/g dry sample)		
	Alkaloids	Phenolics	Tannins
<i>C. zeylanica</i>	0.52	0.98	1.26
<i>C. deciduas</i>	0.65	0.95	2.38
<i>C. grandis</i>	0.30	0.65	1.95

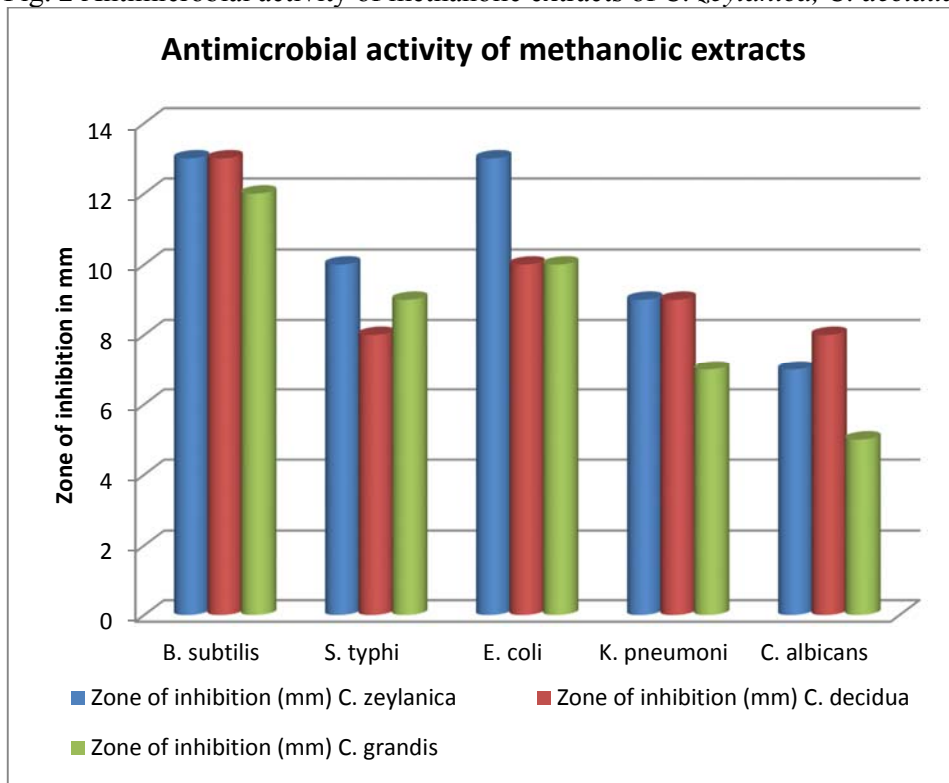
Fig. 1- Comparative presentation Crude content of major phytochemical in powder samples of *C. zeylanica*, *C. decidua* and *C. grandis***Antimicrobial Activity:**

After the crude quantification analysis of the powdered drugs of all three plants were tested for their antimicrobial potential. It was found that, all three gives moderate antibacterial and antifungal activity against tested

microorganisms. The results of antimicrobial activity are presented in the table 2 It was found that among, all three samples the methanolic extracts of *C. decidua* showed highest antimicrobial activity. It was followed by *C. zeylanica* and *C. grandis*

Table- 2 Antimicrobial activity of methanolic extracts of *C. zeylanica*, *C. decidua* and *C. grandis*

Microorganisms	Zone of inhibition (mm)		
	<i>C. zeylanica</i>	<i>C. decidua</i>	<i>C. grandis</i>
<i>B. subtilis</i>	13	13	12
<i>S. typhi</i>	10	8	9
<i>E. coli</i>	13	10	10
<i>K. pneumoni</i>	9	9	7
<i>C. albicans</i>	7	7	5

Fig. 2 Antimicrobial activity of methanolic extracts of *C. zeylanica*, *C. decidua* and *C. grandis***Antioxidant activity:**

The powder drugs of *C. zeylanica*, *C. decidua* and *C. grandis* were also tested for their antioxidant potential. The powder of each plant sample was made into extracts (methanolic and

aqueous) and tested their antioxidant activity as % of inhibition of lipid peroxidation with α -tocopherol as standard antioxidant. The results obtained are given in table 3. the antioxidant activity are reported by Ahamed et al 2007.

Table- 3 Antioxidant activity of methanolic and aqueous extract of *C. zeylanica*, *C. decidua* and *C. grandis*.

Plant	Extract	% of inhibition of lipid peroxidation			
		100 mg/ml	200 mg/ml	300 mg/ml	500 mg/ml
<i>C. grandis</i>	ME	12.45	18.26	29.33	48.35
	AE	8.57	14.45	22.63	35.90
<i>C. zeylanica</i>	ME	13.25	26.85	34.28	58.50
	AE	10.45	16.83	25.76	40.68
<i>C. decidua</i>	ME	11.40	18.66	27.50	39.60
	AE	7.75	15.82	22.65	32.30
α -tocophenol		20.15	32.25	45.60	70.28

ME = methanolic extract, AE = Aqueous extract

The results showed that, all the samples tested were found to have significant antioxidant activity; it is also comparable to standard antioxidant α -tocopherol. In all tested samples, all the methanolic extracts showed higher antioxidant activity than their respective counterpart aqueous extracts. In all samples, the methanolic extract of *C. zeylanica* showed highest antioxidant potential, followed by *C. grandis* extracts and the least antioxidant activity was found in *C. decidua* extracts. It was also observed that, the antioxidant activity is concentration dependent and it increases with increase in concentration of extract (table-3).

DISCUSSION

After phytochemical analysis of the powdered drugs of all three plants were tested for their antimicrobial potential. It was found that, all three gives moderate antibacterial and antifungal activity against tested microorganisms. The results of antimicrobial activity are presented in the table 2. It was found that among, all three samples the methanolic extracts of *C. zeylanica*. showed highest antimicrobial activity. It was followed by *C. decidua* and *C. grandis* (fig. 2).

The powder drugs of *C. zeylanica*, *C. decidua* and *C. grandis* were also tested for their antioxidant potential. The powder of each plant sample was made into extracts (methanolic and aqueous) and tested their antioxidant activity as % of inhibition of lipid peroxidation with α -tocopherol as standard antioxidant. The results obtained are given in table 3. The biological activities of any plant or plant extracts are basically due to presence of various phytochemical compounds in it. The plants selected for present study have rich phytochemical composition and also showed significant antimicrobial and antioxidant properties. Yang Yu et al., 2006, Lather et al., 2010 Ahemad et al 2007, Sini et al., 2011, Garg et al., 2011, Mohammad et al., 2012 also presented various biological activities of *Capparis* species in past.

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