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Research Note

Phyto constituents: An analysis of cinnamon (*Cinnamomum verum*) leaf extracts

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ABSTRACT : Leaf of cinnamon (*Cinnamomum verum*) commonly known as cinnamon or ceylon cinnamon was collected and extracted in 50ml of solvent *i.e.,* ethanol, methanol and aqueous, respectively. Yield of all the supernatents were measured and preliminary test for the presence of phytochemicals such as alkaloids, flavonoids, saponin, terpenoids, phenolic acid and tannins was carried out. Total phenols of all the extracts was estimated using Folic-Ciocaltue reagent with gallic acid as the reference standard. Study revealed that aqueous extracts produced more yield and high total phenols than methanol followed by ethanol. However, the phytochemical screening indicated the presence of all the phenolic compounds in leaf extracts. The extracts can further be utilized for antimicrobial activity that can later fetch utility as eco-friendly finishes.

KEY WORDS: *Cinnamomum verum,* Ethanol, Methanol, Aqueous, Yeild, Total phenols, Phyto constituents

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Man has been using herbs and plant products for treatment of various diseases since time immemorial. Indian systems of medicine have a deep root in cultural heritage and have been providing medicare using indigenously available herbs; to a large sections of population. The Regveda, one of the oldest repositories of human knowledge, mentions the use of sixty-seven plants for therapeutic use (Rahul *et al*., 2010).

India is the largest producer of medicinal herbs and appropriately called the Botanical garden of the world (Mungole, 2010). The use of traditional medicine and medicinal plants in most developing countries, as a basis for the maintenance of good health, has been widely observed. The abundance of plants on the earth's surface has led to an increasing interest in different extracts from traditional medicinal plants that might be potential source of new antimicrobial agents. Plants are found to be source of many chemical compounds, most of which are used by man.

Cinnamon (*Cinnamomum verum*) also known as cinnamon or Ceylon cinnamon is an evergreen tree whose bark and leaves are strongly aromatic. Cinnamon is indigenous to Srilanka. It was introduced to Java in 1825 and has since then been cultivated in India, also grown in Seychelles, Madagascar, Brazil, South East and other tropical countries. In India, it is confined to lower elevations of Western Ghats in Kerala and lower Nilgiris of Tamil Nadu. Most well known Cinnamon are *C. verum, C. cassia, C. burmannii, C.loureirii* and *C. zeylanicum* Bl. In English, it is called as Cinnamum, *Darusita* in Sanskrit, *Dalchini* in Bengali, Kannada and Gujarathi, *Karuva* in Malayalam, *Ilavaryam* in Tamil and *Sapna lavanga* in Telugu (Skaria, *et al*., 2007). From the literature, it is revealed that essential oils are commercially extracted from cinnamon plants and these essential oil posses fungitoxic, nematicidal and leech repelling activities.

However, the present study is the outcome of a preliminary study conducted to know the phytoconstituents of cinnamon leaf extracts using different solvents.

Extraction method:

Fresh leaf of Cinnamon (*Cinnamomum verum*) was cleaned and washed with distilled water and dried at room

temperature. Known weight of fresh leaf was crushed in 50ml of 70 per cent of ethanol, methanol and aqueous using mortar and pestle. Extract was transferred to centrifuge-tube and kept overnight for incubation at room temperature. Samples/ extracts were centrifuged at 5000 rpm for 20 minutes. Extracts were filtered using filter paper and the yield of supernatants was measured.

Total phenolic content (TPC):

Total phenol content (TPC) is expressed in terms of micrograms of GAE/µL (Singleton and Rossi, 1965). 0.01µl of supernatant was taken for determination of total phenolic content (TPC) using U.V. spectra. Total phenols in the supernatant were determined using Folin-Ciocalteu reagent with gallic acid as the reference standard.

Analysis of phytochemical constituents:

Extracts were screened for the presence of alkaloids using Wagner's test, and Dragendorff's test, flavonoids using Ammonia and Sodium hydroxide test, phenolic acids tannins by Ferric chloride, Gelatin test and Lead acetate test, saponins using Foam test, and for the presence of terpenoids using Salkowski test (Raaman, 2006; Ajayi *et al.,* 2011).

It is observed from Table 1 that the yield of extracts was maximum in distilled water (39ml/50ml of solvent) followed by methanol (38ml/50ml of solvent) and ethanol (36ml/50ml of solvent). Use of 70 per cent concentration of solvents methanol and ethanol has produced almost equivalent amount of the extracts. Irrespective of the solvent pH of the extracts was found to be acidic (5).

Table 1: Yield of extracts ml/50ml of solvent

Solvent	Yeild/50ml of solvent	pH value
E+OH (70%)	36	5
Me+OH (70%)	38	5
Distilled water	39	5

Results of qualitative screening for the presence of phytochemicals is recorded in Table 2.

Alkaloids:

Presence of surplus amount of alkaloids was indicated through Wagner's test in all the extracts. However, the test was negative for aqueous extracts with Dragendoff test.

Flavonoids:

The sodium hydroxide test for the presence of flavonoids exhibited significant results than the ammonia test that was significantly darker only for the ethanol extracts.

Phenolic acids and tannins:

Lead acetate test showed presence of these compounds in surplus amount while the other two tests exhibited negative results with almost all the solvents.

Saponins:

Saponins were present in excess in the aqueous extract followed by the ethanol extract that is indicated by foam test.

Terpenoids:

All the solvents exhibited the presence of terpenoids by Salkowski test. Hence the table summarizes that the presence of various phytochemicals is confirmed by either the tests that may be dependent on the type of compounds present in the source.

Fig. 1 represent the total phenols present in 1g fresh Cinnamon leaf extracted using 70 per cent ethanol, methanol and distilled water. Among all the supernatant, total phenols was found to be more in aqueous extract (99.3mg±1.89/1g FL) than methanol (92.4mg±2.56/1g FL) and ethanol extract (78.5mg±1.51/1g FL). This implies that, most of the phenolics present in cinnamon leaf are water soluble and can be extracted using simple and indigenous techniques for

Table 2: Qualitative screening of phyto chemical for bioactive components

Phyto chemicals	Test methods	Types of solvent		
		(70%) Ethanol	(70%) Methanol	Aqueous
Alkaloids	Wagner's test	++	++	++
	Dragendoff's test	+	+	-
Flavonoids	Ammonia test	++	+	+
	Sodium hydroxide	++	++	++
Phenolic compounds and tannins	Ferric chloride test	-	-	+
	Gelatin test	-	-	-
	Lead acetate test	++	++	++
Saponins	Foam test	+	-	++
Terpenoids	Salkowski test	+	+	+

'++': Dark colour/ppt indicating excess quantities, '+': Presence of phytochemical constituents, '-': Absence of phytochemical constituents

utilization either for consumer or for application. However, there is a need to study the types and quality of phenolics in each solvent extracts using chromatography.

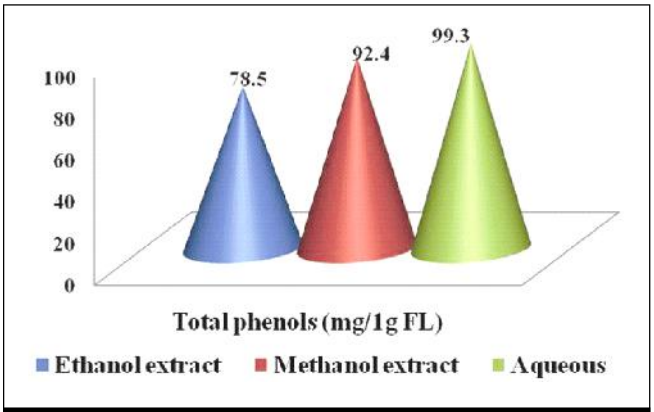

Fig. 1: Total phenols in 1g fresh leaf cinnamon leaf

Conclusion:

From the present experiment it is concluded that, the extracts of Cinnamon (*Cinnamomum verum)* found to have all the phytochemicals such as alkaloids, flavonoids, saponins, terpenoids, phenolic acids and tannins confirmed by chemical tests. Aqueous extracts produced higher yield and was found to have high total phenols than methanol followed by ethanol extract. Studies reveal the presence of antimicrobial activity in sources rich in phenolic contents. Therefore, there is a need to carryout further studies on the antimicrobial properties of the extracts so that the leaf can potentially be used in ecofriendly antimicrobial treatment of fabrics.

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