Research Article

SCREENING OF PRELIMINARY PHOTOCHEMICAL BETWEEN SUNDRIED AND ROASTED Solanum trilobatum L. LEAVES IN VARIOUS SOLVENT EXTRACTS

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Abstract
The research aimed at ascertaining whether the roasting method and sundried plant leaf have effect on the phytochemical properties of Solanum trilobatum as an herb. Fresh samples of the Solanum trilobatum were collected from Vellore district. Some quantity of the samples was sundried and some were roasted and milled into powder. The samples were extracted with different solvents and the extract analyzed. The presence of the phytochemical compounds in the Solanum trilobatum plant leaves indicate that the leaves whether roasted and dried or sundried has medicinal potency and may have the ability as an anti-microbial, antidiarrheal, anticancer and anti-helminthic agent. Generally, the drying and processing influenced the phytochemical contents which are major contribution to the radical scavenging activity of the cinnamom.

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1. Introduction
Since consumers, nowadays, are more concerned about their health, they focus on consuming products which boost up their immune systems. Food with high bioactive compounds content are now mostly preferred by consumers to maintain their health and keep them away from many types of diseases like cardiovascular diseases, diabetes, weight gain, etc. So, there is a new trend in the market to develop a product that combines the health benefits with good sensory properties. Some medicinal plants contain various natural antioxidants such as phenolic acids, flavonoids, tannins, etc which are associated with higher antioxidant activity compared to that of dietary plants (Bouayed et al., 2007).

The phytochemical content of herbs/spices may differ depending on the solvent used for extraction and harvesting season (Arras et al., 1992; McGimpsey and Douglas, 1994) and between geographical origins (Cervenka et al., 2006). The concentration of phytochemicals in the plant part (seed, leaf, root bark and stem bark) may not be uniform and moreover, the fresh or dried method (sun, shade, freeze and oven) used for extraction of phytochemicals may cause quantitative changes in the phytochemical constitution. Drying of medicinal herb/spice materials help to keep them for future cooking as well as reduce the risk of bacterial or fungal contamination. Since, many herbs are used in the dried form, drying process may affect their phytochemical content and radical scavenging activity. Therefore, it is necessary to determine the best method of drying to maintain or enhance the radical scavenging activity and phytochemical content.

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**Solanum trilobatum** (Family: Solanaceae) is one of the important medicinal plant, more commonly available in Southern India. **Solanum trilobatum** is an extensively used Indian traditional medicine to cure numerous diseases viz., tuberculosis, respiratory problems and bronchial asthma (Govindhan et al., 2004). **Solanum trilobatum** contains chemical compounds like Sobatum, β-solamarine, solasodine, solaine, glycoalkaloid and diosogenin. Sobatum, the partially purified petroleum ether extract of **Solanum trilobatum** was reported to be very effective in tumor reduction (Mohana and Devi, 1996). It also possesses antilucerogenic activity (Amir and Kumar, 2004). Most of the leafy vegetables are cooked before consumed by various methods such as boiling, frying and steaming. These cooking processes may cause changes in physical characteristics and chemical composition as well as bioactive compounds and antioxidant properties of vegetables. This research work was to ascertain whether the roasting methods and raw sundried leaves have effect on the phytochemical properties of **Solanum trilobatum** as an herb.

2. Materials and Methods

Sources of sample

Healthy and matured leaves were collected from Vellore district, measured and placed into a numbered polythene bags. The samples were taken back to the laboratory for subsequent measurement.

Separation of leaves

Fresh leaves of **Solanum trilobatum** was subjected to some conventional food processing techniques as reported by standard procedure.

Preparation of Sample

The leaves were sun dried in the open for 24 hours, after which they were milled into powder with a dry sterilized Panasonic blender model MX-J120P. The coarse powder were then sieved through a 2.0 mm filter and subsequently stored in an air tight sterile container until it was used. The leaves were roasted for 15 minutes, after which they were cooled and milled into powder with a dry sterilized Panasonic blender model MX-J120P. The coarse powder were then sieved through a 2.0 mm filter and subsequently stored in an air tight sterile container until it was used.

Leaf extract preparation

Hundred gram of the powdered sample was soaked in 400 ml of solvent in a sterile conical flask and covered with cotton wool. It was then plugged and wrapped with aluminum foil and shaken vigorously. The mixture was left to stand for 24 hours in a shaking water bath maintained at 40 °C. The mixture was then filtered using a clean muslin cloth and Whatman No. 1 filter paper. Thereafter, the filtrate was evaporated to dryness by means of a rotary evaporator attached to a vacuum pump. The percentage yield of each of the crude extract was determined for each solvent. The extracts were stored in refrigerator until needed for further analysis.

**Phytochemical screening of leaf extract**

Phytochemical screening of the leaf extract was carried out using the methods as highlighted below.

**Test for Flavonoids**

Ten % of dilute ammonia (5 ml) was added to a portion of an aqueous filtrate of the extract. Concentrated sulphuric acid (1 ml) was added. A yellow coloration that disappears on standing indicated the presence of flavonoids.

**Test for Cardiac glycosides (Keller-Killiani test)**

An amount of 0.5 g of extract was diluted to 5 ml in water and 2 ml of glacial acetic acid containing one drop of ferric chloride solution was then added. This was underplayed with 1 ml of concentrated sulphuric acid. A brown ring at the interface indicated the presence of a deoxysugar characteristic of cardenolides. A violet ring may appear below the brown ring, while in the acetic acid layer a greenish ring may form just above the brown ring and gradually spread throughout the layer.

**Test for Steroids**

A quantity (9 ml) of ethanol was added to 1 g of the extract and refluxed for a few minute and filtered. Each of the filtrates was concentrated to 2.5 ml in a boiling water bath. Distilled water, 5 ml was added to the concentrated solution, the mixture was allowed to stand for 1 hr and the waxy matter filtered off. The filtrate was extracted with 2.5 ml of chloroform using a separating funnel. To 0.5 ml of the chloroform extract in a test tube, 1 ml of concentrated sulphuric acid was carefully added to form a lower layer. A reddish brown interface shows the presence of steroids.

**Test for Reducing Sugars**
To the test solution, 2 ml of Fehling’s reagent was added followed by 3 ml of water, formation of Red - Orange color showed the presence of reducing sugars.

**Test for Tannins**

About 0.5 g of the extract was boiled in 10 ml of water in a test tube and then filtered. A few drops of 0.1 % ferric chloride were added and observed for brownish-green or a blue-black coloration which indicated the presence of tannins.

**Test for Alkaloids**

About 0.5 g of the extract was stirred with 5 ml of 1 % aqueous hydrochloric acid on a steam bath. A few drops of Dragendorff’s reagent were used to treat 1ml of the filtrate. Turbidity or precipitation with this reagent was taken as evidence for the presence of alkaloids.

**Test for Saponins**

About 0.5 g of the extract was dissolved in 5 ml distilled water in a test tube and shaken vigorously. Frothing which persisted on warming was observed. The frothing was mixed with 3 drops of olive oil and shaken again after which it was observed for the formation of an emulsion which was indicative of a positive result.

3. Results and Discussion

Phytochemicals are considered to be the important bioactive compounds for health benefits. The extracts which contain different classes of polyphenols are not only attractive in phytotherapy but also in the food industry. Hence, flavonoids, glycosides, reducing sugar, sterols, tannin, alkaloids and saponins were investigated.

Drying is considered as a critical factor for the postharvest management and the merchantability of herbs. The drying of herbs inhibits microbial growth and forestalls biochemical changes but, at the same time, it can give rise to other changes that affect the herb quality. In addition, the drying of herbs is often accompanied with the loss of bioactive plant leaves indicate that the leaves whether roasted and dried or sundried has medicinal potency and may have the ability as an antimicrobial, antidiarrheal, anticancer and anti-helminthic agent.

compounds, although some of the phytochemicals are more thermo stable (Herrmann et al., 1995; Bravo et al., 1998) which may possess antioxidant activity and other health promoting properties (Hossain et al., 2010).

During the screening, flavonoids, glycosides, reducing sugar, sterols, tannin, alkaloids and saponins were observed to be present in all the samples studied. Phytochemical screening in this study (Table – 1 and 2) shows the presence of some bioactive components in the leaf extract. It contains flavonoids, glycosides, reducing sugar, sterols, tannin, alkaloids and saponins. These compounds have been shown severally to be active against potentially significant pathogens including those that are responsible for enteric infections. Prashant et al. (2011) reported that the saponins, tannins and phenols have anti-diarrheal, anti-cancer and antihelmintic potency. Terpenoids have antimicrobial and anti-diarrheal potency (Cowan, 1999). Phytosterols have anti-diarrheal potency; tannins have stringent properties that hasten the healing of wound and inflamed mucous membranes (Kayser and Abreu, 2001). Alkaloids are good spasmylytic and anesthetic agents while saponins help in boosting the immune system, in lowering cholesterol levels in the blood and reducing the risk of getting intestinal cancer. Also, alkaloids are the most efficient therapeutically significant plant substance and saponins are known as antinutritional factors that can reduce the uptake of certain nutrients, including cholesterol and glucose at the gut through intra lumenal physicochemical interaction or other yet unidentified activity. Glycoside moieties such as saponins, anthraquinones, cardiac glycosides and flavonoids can inhibit tumor growth, act as an antiparasitic agent, and can be used as antidepressant (Okwu an(Okwu and Okwu, 2004). The presence of the phytochemical compounds in the *Solanum trilobatum* plant
Table – 1: Phytochemical Screening of Roasted Solanum trilobatum L. leaves in various extracts

<table>
<thead>
<tr>
<th>Phytoconstituents</th>
<th>Ethyl acetate</th>
<th>Methanol</th>
<th>Benzene</th>
<th>Ethanol</th>
<th>Chloroform</th>
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<td>Flavonoids</td>
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<td>Glycosides</td>
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<td>Reducing Sugar</td>
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<td>Sterols</td>
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<td>Tannin</td>
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<td>Alkaloids</td>
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<td>Saponins</td>
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- absent, + present

Table -2: Phytochemical Screening of Sundried Solanum trilobatum (L.) leaves in various extracts

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<thead>
<tr>
<th>Phytoconstituents</th>
<th>Ethyl acetate</th>
<th>Methanol</th>
<th>Benzene</th>
<th>Ethanol</th>
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<td>Glycosides</td>
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<td>Reducing Sugar</td>
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<td>Sterols</td>
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<td>Tannin</td>
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<td>Alkaloids</td>
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<td>Saponins</td>
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- absent, + present

4. Conclusion
On the whole, the results of the present study are promising thus indicating the utilization of the leaf of Solanum trilobatum as a significant source of bioactive components. Therefore further studies on the plant and its parts in order to isolate identify and characterize the active components to maximize the potential of this useful plant are necessary today.

5. References
8) Herrmann, K. M. 1995. The shikimate pathway: early steps in the biosynthesis