

Preliminary Phytochemical Analysis and Estimation of Total Phenol Content of Methanolic Root Extract of *Salacia Oblonga*

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ABSTRACT

Salacia oblonga also known as 'ponkoranti' in Tamil is a woody plant, belonging to the *celastraceae* family that grows in countries like India, China, Vietnam, Malaysia and Indonesia. *Salacia oblonga* as a part of ayurvedic medicine helps to treat diseases like diabetes, asthma, joint pain. Phytochemicals are basically large and diverse secondary metabolites produced by plants, it is mainly essential for the growth, development and interaction and protection in a biotic and abiotic environment. The aim of the study is to carry out phytochemical analysis and estimation of total phenol content of methanolic root extract of *salacia oblonga*. The methanolic root extract was prepared, concentrated and stored. The extract was tested qualitatively for various phytochemicals and quantitatively for total phenols. From this study it was evident that *Salacia oblonga* root extract was rich in phytochemicals such as alkaloids, flavonoids, terpenoids and also possess a good concentration of total phenol (10.2mg GAE/gm). Phenols and flavonoids act as natural antioxidants which shield us from oxidative damage. From this study it was evident that the plant *Salacia oblonga* is rich in phytoconstituents and further studies are required to isolate the chemical constituents and explore its biological value.

Key words: *Salacia oblonga*, Methanolic root extract, Total Phenol, Phytochemical analysis, Flavonoids

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INTRODUCTION

Salacia oblonga which is also known as POKORANTI in Tamil is a woody plant, belonging to the *celastraceae* family which grows in the country like India, China, Vietnam, Malaysia and Indonesia [1]. *Salacia oblonga* helps to treat diseases like diabetes, asthma, joint pain. *Salacia oblonga* has another property such as intestinal alpha-glucosidase inhibitor activity, which helps in providing the medicinal foods for the diabetic patients [2]. It also lowers the acute glycemia and the insulinemia in the persons with the type 2 diabetes [3]. *Salacia oblonga* is mainly used in curing gonorrhoea, rheumatism, and some skin disease. The powder form of the *salacia oblonga* is used to treat itches and ear disease [4]. It also shows an inhibitory activity in serum glucose level.

Phytochemicals are the chemicals, which are naturally occurring in the plants, which gives the plant the odour and colour. The phytochemicals are usually extracted from plants and used in various biological activities. Phytochemicals in *salacia oblonga* have been tested for the free radical scavenging and ant proliferative activity against the breast cancer cell lines [5].

Extracts of *Salacia oblonga* were found to be a valuable medicine that has not only phytochemical but also anti oxidative, anti-inflammatory, anti-diabetic, anti-mutagenic properties. The adverse effect of the *salacia oblonga* was not reported in the experiment of rats, hence it gives a good safety potential in humans. The phenol content is carried out in *salacia oblonga* using liquid chromatography which is carried out spectrophotometric ally [6]. The total phenol content of the *salacia oblonga* has the ability to scavenge (DPPH) radicle, and based on the results he concluded that *salacia oblonga* has a huge amount of phenolic compounds; hence it exhibits free radical scavenging potential [7].

In any plant, growth and development is governed by primary metabolites and secondary or the phytochemicals are usually involved in the protection and maintenance and also as biocatalyst. Secondary metabolism in plants yields secondary metabolites which are a basic source of various pharmaceuticals industries owing to its medicinal properties with a targeted function [8].

In recent years, there has been a global trend towards the use of natural sources as antioxidants, involved in drug therapy and also as functional foods. In such a prevailing situation, the potent knowledge about the phytochemicals and phenolic content would pave the way for establishing *Salacia oblonga* as a better source for therapeutics. Usage of methanolic root extract of the plant for the study distinguishes the present study from the prior studies. The aim of the study is to carry out phytochemical analysis and estimation of total phenol content of methanolic root extract of *salacia oblonga*.

MATERIALS AND METHODS

Collection of Plant material

The root of the plant *Salacia oblonga* was purchased from a herbal care and cure center, Chennai. The root was cut and dried in the sun.

Extract preparation

The Sun dried root was blended into powder, sieved. About 80 grams was extracted with methanol (1: 5 w/v) at 25 degree celsius for 24 hrs. The collected extract was centrifuged at 8000 rpm for 15 minutes. Air dried, concentrated and stored in an airtight container at 4 degree celsius until further use. The phytochemicals such as alkaloids, flavonoids, terpenoids are quantitatively analysed. The total phenol content was quantitatively measured. Extracts were dissolved individually in dilute hydrochloric acid and filtered.

Phytochemical Analysis

The phytochemical analysis was done qualitatively which involved the analysis of Phlobatannins, carbohydrates, flavonoids, alkaloids and terpenoids using specific reagents.

Test for phlobatannins

1 ml of sample and 2 ml of 5% concentrated hydrochloric acid was added and boiled for

5 minutes. Red colour deposition is observed indicating phlobatannins

Test for carbohydrates

Fehling's test: 1 ml of sample and 2 ml of fehling's solution A and B was added and boiled for 3 minutes in a boiling water bath. Reddish brown precipitate was observed.

Benedict's solution: 1 ml of sample and 2 ml of Benedict's solution was added and boiled for 3 minutes in a boiling water bath. Reddish green or brown colour is formed.

Test for flavonoids

1 ml of sample was taken and 1 ml of 5% liquid ammonia solution was added and mixed. Presence of flavonoids yields a yellow colour

Test for alkaloids

2 ml of concentrated hydrochloric acid and 6 drops of hexane was added continuously to 1 ml of sample. 3 ml of picric acid was added. Creaming pale yellow colour is observed indicating alkaloid.

Test for terpenoids

To 1 ml of sample, 5 ml of chloroform was added and mixed well and 1 ml of concentrated sulphuric acid was added. Red colour change is observed.

Test for Tannins

To 5ml of the sample, a few drops of 0.1% Ferric chloride were added to 5ml of the extract. The presence of a blue black color or brownish green indicates the presence of Tannins.

Test for Diterpenes

4-5 drops of copper acetate solution was added to the extract with mild stirring. Presence of diterpenes is confirmed by the formation of Emerald green color.

Total phenolic content

Phenolic content is measured via Folin-Ciocalteu assay, an electron transfer based assay and gives us the reducing capacity which is expressed as the total phenolic content using Gallic acid as standard. 500 μ L of various concentrations -depending on solubility or fractions of extracts in water was mixed with 2.5 mL of Folin-Ciocalteu reagent (0.2 N). After a few min 2 mL of Na_2CO_3 solution (75 g/L) was added, after 120 min standing in dark, the optical density was determined at 760 nm. The total phenolic

contents were calculated and expressed as gallic acid equivalents (GAE), on the basis of the calibration curve of gallic acid.

$$C \text{ (GAE)} = c \times V / M$$

Where: c=Concentration determined from standard curve (mg/ml)

V=Volume used during the assay (ml)

M=Mass of the assay extract used (g) GAE in mg/g extract

RESULTS AND DISCUSSION

The presence of photochemical analysis is being indicated in (Table 1). There was presence of high levels of Flavonoids, phlobatannins, terpenoids, alkaloids in the methanolic extract of *Salacia oblonga*. The total phenolic content of *Salacia oblonga* was quantitatively analysed and was found to be 10.2 GAE/gm (Table 2).

From this study it shows that *salacia oblonga* has a higher content of alkaloids, terpenoids, phlobatannins. Alkaloids generally contain basic nitrogen atoms, which are naturally occurring organic compounds. Terpenoids basically show large and diverse chemicals produced by plants, it is mainly essential for the growth, development and interaction and protection in a biotic and abiotic environment [9]. Phytochemicals are the natural micronutrients which are being possessed by the plant. These plants provide micronutrients in a larger quantity. Phytochemicals play a vital role in fighting against various diseases such as diabetes mellitus, atherosclerosis, cancer etc. The phytochemicals include quercetin, phloridzin and chlorogenic acid all of which are strong antioxidants [6]. In the study done by G.K. Hughes, it shows that the family *Rutceae* which

is an Australian origin showed a high content of alkaloids, and results in several principal structural groups [10].

In our present study, *salacia oblonga* reported to have a good concentration of flavonoids. Flavonoids such as quercetin are basically found in lesser concentration and it modifies the allergens, viruses and the carcinogens in the plants [11]. In the other study done by Lien Huong Huynh, *Limnophila aromatica* herb found in southeast asia, showed high phenolic content and high flavonoid content, which shows that *L.aromatica* is used in dietary application, and reduces the oxidative stress[12]. Phenolic compounds play a major role in the organoleptic characteristics, which includes the plants-derived foods and beverages, in which among them the flavonoids are present more in the group of plant phenolics [13]. Herbal extracts with a good antioxidant and radical scavenging potential can be tested for its anticancer potential, as the prime reason that leads to cancer is the decrease in radical scavenging potential and oxidative damage. From this study it is evident that the *salacia oblonga* root extract is rich in phytochemicals and also possess a good concentration of total phenol. *Salacia oblonga* is used for treating gonorrhoea, asthma, joint pain, obesity. Thus the extract can be used as a good antioxidant.

CONCLUSION

From this study it was evident that methanolic root extract of *Salacia oblonga* is rich in phytochemicals (alkaloids, flavonoids, terpenoids) and also possess a good concentration of total phenol (10.2mg GAE/gm). Which can be a potential source for chemotherapeutic compounds used in cancer therapy? Antioxidants act as a protective shield for various disorders which arise due to oxidative stress. Various types of extractions with different solvent and methods can be employed to explore the other phytochemicals as well. The extract can be utilized as a natural agent in various pharmaceutical preparations. Further studies are needed for the isolation and identification of bioactive agents and its molecular mechanisms.

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Table 1: Preliminary phytochemical screening (Qualitative screening).

S.no	Phytochemicals	Result
1	Phlobatannins	+++
2	Carbohydrates	++
3	Flavonoids	++
4	Alkaloids	+++
5	Terpenoids	+++
6	Tannins	++
7	Diterpenes	+

Table 2: Estimation of total phenol content.

S.no	Plant extract	Concentration of mg GAE/gm
1	Aqueous cladode extract of <i>Opuntia dillenii</i>	10.2

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CONFLICT OF INTEREST

None declared.

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