Quantitative estimation of Biochemical compounds of *Boswellia ovalifoliolata* Bal & Henry–An endemic, endangered and globally threatened medicinal tree taxa of Seshachalam hill range of Eastern Ghats of India.

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**ABSTRACT**

Natural products derived from medicinal plants play an important role as useful tools in pharmacological studies. In the present study laboratory evaluations were made to assess the primary and secondary metabolites of various parts of the selected plant species *Boswellia ovalifoliolata* Bal & Henry. Plant parts of same age group were collected from Tirumala hills and used for estimation of the biochemical compounds like proteins, lipids, phenols, flavonoids and tannins. The powdered plant material was used for analysis of protein content whereas the bark and gum are for lipids and tannins respectively. The results indicate that the biochemical compounds for curing various ailments and possess potential antioxidant and leads to the isolation of new and novel compounds.

**Key words:** Biochemical compounds, Medicinal plants, Proteins, Lipids, Phenols, Flavonoids

**INTRODUCTION**

Plants have been utilized as medicines for thousands of years all over the world and are a source of many potent and powerful drugs. More than 35,000 plant species are essentially infinite. The World Health Organization (WHO) estimated that 80% of the population of developing countries relies on traditional medicines mostly plant drugs, for their primary health care needs. India is endowed with rich wealth of medicinal plants and recognized more than 2,500 species which have medicinal values. Primary metabolites are of prime importance and essentially required for growth and development of plants for example; sugars, proteins, lipids and starch. Many primary metabolites act as precursors of pharmacologically active metabolites and the secondary metabolites are responsible for medicinal activity of the plant.

*Boswellia ovalifoliolata* is an endemic, endangered, globally threatened medicinal tree taxa of Seshachalam hill range of Eastern Ghats of India. The plant is over exploited for its medicinal uses. The fresh leaf juice used to prevent throat ulcers. Decoction of the stem bark 10-25 ml per day reduces rheumatic pains. The gum obtained from the trunk which is highly medicated. Gum is used to cure amoebic dysentery.

Primary and secondary metabolites have a key role in metabolic processes such as photosynthesis, respiration and nutrient assimilation. The preliminary phychochemical studies received pronounced importance because the crude drugs possess varied composition of secondary metabolites. Number of plants was screened for secondary metabolites for their medicinal value but similar studies in *Boswellia ovalifoliolata* are scanty. Hence the present study was conducted on biochemical estimation of primary and secondary metabolites viz; proteins, lipids, flavonoids, phenols and tannins of *Boswellia ovalifoliolata*.

**MATERIAL AND METHODS**

Plant parts like leaves, stem bark, flowers and gum of *Boswellia ovalifoliolata* were collected from Tirumala hills. The various plant materials were separately ground with running water to remove dust, shade dried and powdered with mortar and pestle. The quantitative estimation of primary and secondary metabolites was carried out using different protocols. The powdered plant parts of *Boswellia ovalifoliolata* were used for analysis of protein content, lipids, phenols and tannins and flavonoids.

**RESULTS AND DISCUSSION**

The present study, biochemical estimation of primary and secondary metabolites in different parts of *Boswellia ovalifoliolata* has been under taken and the resulted are present in Table 1. Total levels of protein were found to be higher in leaves i.e. 180 mg/g.d.w and lower in stem bark i.e. 0.28 mg/g.d.w. Proteins are the primary components of living organisms. The presence of higher protein level in the plants points towards their possible increase in food value or that a protein base bioactive compound could also be isolated in future.

The highest amount of total lipid content was found to be maximum in gum i.e. 0.16 mg/g.d.w and minimum in stem bark i.e. 0.01 mg/g.d.w. Lipids, a diverse group of primary metabolites, include reserve plant material such as fats, essential oils, waxes, terpenoids and oleoresins. Lipids are hydrophobic and a major components of cell membranes, which act as vital cellular messengers and serving as module to hormones and vitamins. With a strong foundation in research and development and plant lipids have developed products that work with diverse requirements like culinary, medicinal and cosmetics.

Maximum levels of phenols were present in leaves i.e. 144.9 mg/g.d.w and absent in gum. The higher amount of phenols is important in the regulation of plant growth, development and disease resistance. It can be used as fungicide, pesticides, antiseptic, and disinfectant and in the manufacture of resins. Plant phenols may interfere with all stages of cancer process. Potentially resulting in a reduction of cancer risk. Total levels of phenols were found to be higher in leaves of *Pongamia pinnata*.

The total content of tannins was found to be higher in stem bark i.e. 0.75 mg/g.d.w and lower in gum i.e. 0.01 mg/g.d.w. The growth of many fungi, yeasts, bacteria and viruses was inhibited by tannins. Apart from this tannins contribute the property of astringent activity i.e. faster the healing of wounds and inflamed mucous membrane. Number of medicinal plants was screened for biochemical compounds and *Svensonia hydrobadensis*.

The total content of flavonoids were found to be higher in leaves i.e. 124.87 mg/g.d.w and lower in gum i.e. 64.05 mg/g.d.w. Higher levels of flavonoids are found in the leaves followed by stem bark, flowers and gum. Flavonoids have been reported to possess many useful properties, including anti-inflammatory, antimicrobial, enzyme inhibition, oestrogenic, antiallergic, antioxidant and anti-tumour activity. The results of the present study attribute that the leaves of *Boswellia ovalifoliolata* are rich source of proteins, phenols and tannins whereas the bark and gum are for lipids and tannins respectively.
The presence of bioactive compounds indicates the medicinal value of the plants. Antioxidants and antimicrobial properties of various extracts from plants have recently been of great interest in both research and the food industry, because their possible use as natural additives emerged from a growing tendency to replace synthetic antioxidants and antimicrobials with natural ones. Preliminary qualitative test according to Patwardhan was useful in the detection of bioactive principles and subsequently may lead to drug discovery and development.

In order to promote Indian herbal drugs, there is an urgent need to evaluate the therapeutic potentials of the drugs as per WHO guidelines. Patwardhan mentioned that 30% of the world wide sales of drugs is based on natural products. Traditional indigenous medicine is limited to small tribal and geographical areas called “little traditions” are an excellent repository of knowledge about medicinal properties of botanical sources stated that the bioactive extract should be standardized on the basis of phytochemical compounds. Phytochemical screening of medicinal plants is very important in identifying new sources of therapeutically and industrially important compounds. It is imperative to initiate an urgent step for screening of plants for bioactive compounds. The present communication is an attempt to assess the status of phytochemical properties of various parts of Boswellia ovalifoliolata to improve the health status of people and also to use in pharmaceutical and nutraceutical products of commercial importance.

CONCLUSION

The leaves of Boswellia ovalifoliolata having valuable pharmacological properties. High content of phenolic compounds during testing indicate that the species has an antioxidant activity at higher level. The flavonoids with great intensity in this case, could through its fungicidal and antiseptic properties. The plant could be considered as part of the antioxidant, antimicrobial and hepatotoxic activity.

REFERENCES