

Phytochemical Screening and Green Synthesis of Silver Nanoparticles Using extracts of *Thunbergia coccinea* Wall

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Abstract: World plant biodiversity is the largest source of herbal medicines which are being used since the ancient ages in traditional health care system. Phytoconstituents are the natural bioactive compounds found in plants. The present study was carried out to screen phytochemicals like carbohydrates, tannins, steroids, saponins, alkaloids and flavonoids in the leaf and floral extract of *Thunbergia coccinea* wall. Phytochemical screening of extracts was carried out according to the standard method. The ethanolic extract of both parts of the plant were qualitatively screened for phytochemicals by using standard procedures which revealed the presence of various important bioactive chemical entities.

Keywords: *Thunbergia coccinea*, Phytoconstituents, Ethanolic extract, Chemical techniques

1. Introduction

India is one of the country in the world with a rich biodiversity. Over 400,000 species of flowering plants exist on this planet and of these, an estimated 250,000 could be found in the tropics. Plants have always been known to be a traditional source of medicines since they contain secondary metabolites of high chemical diversity [6].

Medicinal plants are widely used treat different diseases in different parts of the world. As a part of complementary and alternative medicine (CAM) [7], a number of phytomedicines, including those obtained from Indian plants. Numerous phytochemicals with potential or established biological activity has been identified.

Thunbergia is a genus of tropical flowering plant which belong to Acanthaceae family. It has about 200 species [9] which may be annual, perennials and shrubs. *Thunbergia coccinea* wall. is commonly known as Scarlet clock vine or Red clock vine [3]. Phytochemistry deals with a variety of organic substances accumulated in plants. In which it reveals the presence of constituents which are known to exhibit medicinal as well as physiological activities [4].

The objective of this study was to carry out preliminary phytochemical analysis. The medicinal plant contain some active organic compounds which provide physiological action in the body. They are called Phytochemicals [10]. The phytochemical analysis of the plants is very important commercially and has great interest in pharmaceutical companies for the production of the new drugs for curing of various diseases.



Figure 1: *Thunbergia coccinea*

1.1 Scientific classification

Kingdom - Plantae
Division - Angiosperms
Class - Eudicots
Order - Lamiales
Family- Acanthaceae
Genus- *Thunbergia*
Species - *Thunbergia coccinea*

2. Materials and Method

2.1 Collection of plant material

During the exploration of ethno-medico-botanical survey[1], the leaf and floral extract of *Thunbergia coccinea* were collected from Kothagiri, Nilgiri Dt, Western Ghats, Tamilnadu, India. The authenticity of the plant was confirmed in Botanical survey of India, Southern regional Centre, Coimbatore by referring the deposited the specimen. The voucher number of the specimen is BSI/SRC/5/23/2017/Tech.

2.2 Preparation of extract

The fresh materials were collected and washed in a tap water for 5 min [2]. Leaves and flowers were washed separately and dried at shade for 2 weeks. The dried sample were ground to make coarse powder and stored in a polythene containers at room temperature. The powdered leaves and flowers were extracted at room temperature successively by soxhlet apparatus using hydroethanol in the ratio of 1:4. The above sample was stored in the cold. Phytochemical screening of the extracts was carried out according to the standard methods [5].

2.3 Phytochemical Screening

Phytochemical analysis of the test samples was carried out according to standard methods given by Saklaniet al. 2011, Fransworthet al. 1985, Lutterodtet al. 1999, Marjorie 1999, Weisser et al. 1966 & Ogbulieet al. 2007 [8]. The preliminary qualitative phytochemical analysis was carried out to identify the secondary metabolites present in hydroethanolic extract of leaf and flower part of *Thunbergia coccinea*.

3. Result

The result of phytochemical analysis of *Thunbergia coccinea* presented in the table 1. The result reveals that some of the phytochemical analyzed were present in the extracts of the *Thunbergia coccinea*. Tannin, Phenols, Saponins and Cardiac glycoside have shown the higher activity in both leaf and flower. Alkaloids, Steroids, Proteins and Phytosterols are also present in both leaf and flower extract. Flavonoids, Carbohydrate, Amino acids and reducing sugar are found absence in both the plant parts. Comparison of both leaf and floral extract have shown the best activity in the leaf extract.

Table 1: Screening of *Thunbergia coccinea* for Phytochemicals

S.No.	Parameters	Leaf	Flower
1.	Alkaloids	+	-
2.	Flavonoids	-	-
3.	Carbohydrate	-	-
4.	Amino acid	-	-
5.	Tannin	+++	+
6.	Reducing Sugar	-	-
7.	Steroids	++	+
8.	Phenols	+++	+
9.	Saponins	+++	+

10.	Protein	++	+
11.	Phytosterols	++	+
12.	Cardiacglycoside	+++	++

4. Discussion

The present study has screened the phytochemical properties of leaves and flower extracts of *Thunbergia coccinea*. The presence and absence of the phytoconstituents depends upon the plant sample and the physiological properties including taxa. The medicinal properties of the plant extracts are due to the presence of various secondary metabolites such as tannin, phenol, steroids, saponin, alkaloids etc. thus the preliminary screening test may be useful and lead to the detection of bioactive principles and drug discovery. The present study has revealed the presence of phytochemical properties *Thunbergia coccinea* particularly the leaf extracts

Tannins are phenolic compound and so the high presence in this study may have been contributed by phenols. Plants that have tannins as their main components are astringent in nature and are used for treating intestinal disorders such as diarrhoea and dysentery. Saponins exhibit structure depend biological activities. In the study saponin showed its presence. In the present study of two different parts of *Thunbergia coccinea* extracts showed the presence of phenolics in high concentrations. Therefore the future study has been planned to quantify the concentration of the compounds.

5. Conclusion

It has been concluded that the extracts of *Thunbergia coccinea* leaf and flower extract contains various phytochemicals. The present study consist of many useful phytocompounds having important biological properties. It is hoped that the result of this study would lead to find out some compounds which would use to generate new, more potent antibacterial drugs with different mechanism of action.

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