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Ethnobotany and bioactive compounds present in *Trichodesma indicum* (L.) R.Br.

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ABSTRACT

Odisha is situated in the East coast of the Bay of Bengal of Indian sub-continent and lies in between 17°48'- 22°94'N latitude and 81°24'-87°29'E longitude. It is a treasure house of healing herb, which is used in Indian System of Medicine like Ayurveda, Unani etc. *Trichodesma indicum* belongs to family Boraginaceae and contains bioactive compounds like flavonoids, terpenoids, phenolic compounds and tannins. Due to presence of these compounds, it is used as a traditional medicine by the people for their health care. Leaf, root and whole plant is used to cure disease like dysentery, inflammations, cough etc. Therefore, present study highlights the importance of *Trichodesma indicum*.

INTRODUCTION

Ethnobotany is the practical uses of traditional knowledge of local people and culture ([Smita et al. 2013](#)). From the ancient time, medicinal plant plays an important role to cure diseases caused by various factor. From then plant parts are used by the people for their healthcare ([Kirtikar & Basu 1935](#)). Now a day, more interest arises towards Ethnobotany. Ethnobotanist study more on the uses of plant like as food,

medicine, clothing hunting and uses in some festivals ([Hussain et al. 2005](#)). Ethnobotanical information is not only about its medicinal uses but also it helps other people to develop and conserve the floral wealth ([Mazandarani 2006](#)). *Trichodesma indicum* ([Figure 1](#)) is a medicinal herb which is used to cure fever, inflammations, cough etc ([Rajagopal et al 2016](#)). It is found in Tropical and

Subtropical regions and grows on the road side of India and also found in stony dry wetlands ([Mangai 2018](#)). It belongs to family Boraginaceae which have about 146 genera. The genus *Trichodesma* consists of about 40-45 species. *Trichodesma indicum* is an erect, spread, branched annual herb which is about 50cm in height. The flower is violet, light blue and purple in colour arises from the axile of the leaves singly. Greenish hairy calyx is present pointed sepals. Corolla is pale blue and pointed, about 1.5cm in diameter. Ellipsoid fruit is

present enclosed by calyx ([Saxena & Brahmam 1995](#)). This plant has many names according to the local languages like ‘Chhotokalpa’ in ‘Hindi’, ‘Udhanphuli’ in ‘Gujurati’, ‘Guvvagutti’ in ‘Tamil’ and ‘Adhapuspi’ in ‘Sanskrit’ ([Hamsalakshmi et al 2018](#)). Plant has some bioactive compound which is biologically active and has direct effect on plants ([Guaadaoui et al 2014](#)). This study is based on Ethnobotany and Bioactive compound present in *Trichodesma indicum*.



Figure1: *Trichodesma indicum*

MATERIALS AND METHODS

The present work highlights the importance of *Trichodesma indicum* among the local people in Sundargarh, Mayurbhanj and Keonjhar districts of Odisha. A survey was made to get the ethnobotanical information in 2019-20 along with other flora work. The study areas are rich with different type of medicinal plant and home of diverse tribal communities. The plant was collected from

Sundargarh for the analysis of bioactive compounds.

Phytochemical assays

Phytochemical assays were carried out on different extract of different plant parts using standard procedure to identify the bioactive compounds ([Harborne 1973](#); [Trease and Evans 1989](#); [Sofowara 1993](#)).

Test of Tannin

0.5 g of dried powder sample was boiled in 10 mL of distilled water and filtered with Whatman 42 filter paper. 2 mL of filtrate was taken in a test tube and 3-5 drops of 0.1% ferric chloride solution were added. The brownish green or blue-black colouration indicated the presence of tannins.

Test for Saponin

0.5 g of dried powder was boiled in 15 mL of distilled water and filtrate with Whatman 42 filter paper. 5 mL of filtrate was mixed with 2 mL of distilled water and shaken vigorously. The stable persistent froth indicated the presence of saponin.

Test for flavonoids

6 mL of dilute ammonium solution was added to portion of aqueous filtrate of plant extract followed by addition of concentrated sulphuric acid. A yellow colouration indicates the presence of flavonoids.

Test for Terpenoids

6 mL of extract was mixed in 2.5 mL of chloroform and then 3 mL of concentrated sulphuric acid was added. A reddish-brown colouration of interface indicates the presence of terpenoids.

Test for Phenolic Compounds

0.5 g of extract was treated with 3-5 drops of 1% ferric chloride solution. Formation of bluish black colouration indicated the presence of phenolic compounds.

Test for Reducing sugar

0.5 g of plant extract was dissolved with distilled water and filtered. The filtrate was boiled with 2 drops of Fehling's solution A and B for 5 minutes. An orange-red

precipitate was obtained which indicated the presence of reducing sugar.

Test for Steroids

2 mL of plant extract was dissolved in 5 mL chloroform and then 5 mL of sulphuric acid was added. Formation of 2 phases (upper red and lower yellow with green fluorescence) indicates the presence of steroids.

Test for Alkaloids

0.5 g of crude extract was mixed with 5 mL of 1% aqueous HCL on water bath and filtered. 2-5 drops of Dragendorff's reagent were added in filtrate. The occurrence of orange-red precipitate indicates the presence of alkaloid in the sample extract.

Test for amino acids

2 mL of extract was taken and 1 mL of ninhydrin solution was added and boiled for 10-15 minutes. Formation of blue colour indicated presence of amino acids.

RESULTS AND DISCUSSIONS

Phytochemical screening was carried out in aqueous and methanol extract and the result reveals that tannin, flavonoids, phenolic compounds and tannins are present ([Table 2](#)). The plant parts like leaves, roots and whole plants are used to treat many diseases like to cure food poisoning, dysentery, fever chest pain and also used as diuretic ([Table 1](#)). Perianayagam et al. in ([2006](#)) demonstrated that the efficiency of *Trichodesma indicum* as an anti-inflammatory agent and also significantly justifies the use of plant as a non-specific anti-inflammatory agent in folk medicine. Vanitha et al. in ([2015](#)) demonstrate the petroleum ether, methanolic, ethanolic and aqueous extract which revealed that the secondary metabolites like alkaloids,

flavonoids, tannins, terpenoids, steroids, saponins, gum mucilage and glycosides are present in *Trichodesma indicum*, which suggest the possible of medicinal properties. Shukla et al. in (2019) tested *T. indicum* and

states that the plant shows promising anti-diabetic potential in plant along with good antioxidant activities.

Table 1: Ethnomedicinal uses of *Trichodesma indicum*

Plant Parts	Medicinal uses
Roots	Root paste is applied externally to cure inflammations (Mayurbhanj). The root extract is taken orally to cure dysentery and fever.
Leaves	Leaf extract (juice) is taken orally to cure food poisoning. (Keonjhar) Leaf extract is applied externally to cure ear pain and wounds. Leaf extract is used as tonic to cure chest pain.
Whole plant	The whole plant is grinded and made pills, 2-3 pills oil with water and take orally against cough. Whole plant is grinded and used for emollient and also act as diuretic.

Table 2: Phytochemical analysis of *Trichodesma indicum*

Plant parts	Extract	Bioactive compound detected
Roots	Aqueous	Flavonoids, Terpenoids and Phenolic compounds are present.
	Methanol	Flavonoids, Terpenoids and phenolic compounds are present.
Leaves	Aqueous	Tannin, Phenolic compound and flavonoids are present.
	Methanol	Tannin, Phenolic compound and flavonoids are present.

CONCLUSION

The above study reveals that *Trichodesma indicum* possess diverse bioactive compounds like tannins, flavonoids, phenolic compounds etc. Therefore, it is used traditionally by the tribal people. Hence, more study needs to do on medicinal potential and the tribal people should be

encouraged to conserve and cultivate this plant.

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