CHAPTER-12

PHYTOCHEMICAL ANALYSIS OF *TEPHROSIA PURPUREA* PLANT FROM WASHIM DISTRICT OF MAHARASHTRA STATE

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Summary

The present research work is conducted in order to search the qualitative analysis of the plant material of *Tephrosia purpurea.* Qualitative phytochemical evaluation was carried out to test the presence of alkaloids, flavonoids, carbohydrate, tannin, saponin, amino acid, phenol and glycoside in the methanolic extracts of plant material using modified soxhlet extraction methods. The present effort is targeted on the evaluation of the phytochemicals present in the plant species.

Keyword: Tephrosia purpurea, Soxhlet apparatus, methanol, phytochemical etc.

Introduction

Tephrosia purpurea Linn. (Leguminoseae) commonly known in Sanskrit as Sharapunkha is a highly branched, sub-erect, herbaceous perennial herb. In Ayurvedic literature this plant has also given the name of "Sarwa wranvishapaka" which means that it has the property of healing all types of wounds (Deshpande et al., 2003). It is an important component of some preparations such as "Tephroli" and "Yakrifit" used for liver disorders. The roots and seeds are reported to have insecticidal and piscicidal properties and also used as vermifuge (Shivrajan and Balchandran, 1994). The roots are also reported to be effective in leprosy wound and their juice to the eruption on skin. The ethanolic extracts of *Tephrosia purpurea* possessed potential antibacterial activity. The total flavanoids

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was extracted from plant found to have antimicrobial activity. During our literature survey, we found that this plant have more potential as far as therapeutic concern (Ghaywat et al., 2021). In present research, we have tried to summarize the research studies carried out for a scientific validation of the plant and its extracts. This research certainly help to the researchers those are working on this plant for their research work.

Tephrosia purpurea is a common wasteland weed species of flowering plant belongs to the pea family that has a tropical distribution. In many parts it is under cultivation as green manure crop. *Tephrosia purpurea* is widely distributed throughout the world. It is the native plant of Africa, Southeast Asia to Australia, Western part of Pacific, China, Srilanka and India. It found in the areas of Andhra Pradesh, Haryana, Rajasthan and Tamilnadu (Nigam, 2021).

The plants are employed in large scale as a medicine to treat several kinds of diseases for the human welfare from long time. It is being used as folk medicine because of its several properties such as anticancer, antipyretic, antidiabetic, antiviral and anti-inflammatory etc. It is one of the most effective folk medicine for the treatment of inflammation as well as enlargement of liver and spleen (Shivrajan and Balchandran, 1994).

India is sitting on a gold mine of well-recorded and traditional well practiced acquaintance of herbal medicine. Herbal medicines deals with plant and plant extracts in treating diseases. These medicines are considered safer because of natural ingredients with lesser side effects. The demand for herbal products is rising exponentially throughout the world. Recently there has been a shift in universal trend from synthetic to herbal medicine. The methanolic extracts of *Tephrosia purpurea* is reported to have high phytochemicals. The purpose of present study is to characterize phytoconstituents in the various parts of *Tephrosia purpurea* and so this will help to identify the parts of the plant from which higher quantities of the phytochemicals can be derived. In India, there has been increase of interest in *Tephrosia purpurea* regarding their healing potentials for the management of a number of ailments.

A decoction of the drugs was administered in one ounce doses to cases of kidney disease with dropsy and found to posses diuretic properties in a mild degree. Powder is used for cough, asthma and respiratory diseases; a paste applied on belly to cure dyspepsia, powdered and boiled in milk is applied on leprosy and wounds. *Tephrosia purpurea* is tonic, laxative, antihelmintic to children give to purify the blood and as cordial, decoction is tonic. Root is bitter chewed to cure colic pain, used in asthma, juice is mixed with molasses and given for stomach pain applied on skin eruptions. Phytochemical screening is the initial stage in phytochemical research which aims to determine the groups of secondary metabolites found in the plants studied. The phytochemical screening method was carried out by using a reagent that can produce color to show whether there was a group of secondary metabolites. In the present work, phytochemical analyses were carried out on *Tephrosia purpurea* plant.

Material and Method

Collection of plant material: Fresh plant material of Tephrosia purpurea is collected from different parts of Washim district, Maharashtra, India. It commonly occurs in non cultivated land, along with road side. Shady moist place plant material washed under tap water for 2-3tumes to remove soil particles and dust. The plant material was shaded and dried for 12 days. After drying plant material grinded into fine powder and then transfer into airtight container with proper labeling for further use.

Preparation of Solvent Extract: The leaves, stem and root of the plant *Teph*rosia *purpurea* sample was dried and then powdered using mixer and grinder 5 gm of plant powdered was extracted in 50 ml of methanol by Soxhlet extractor. After 24 hr. It was filtered through a filter paper and then test was carried out with different reagents.

Material and Method: Qualitative phytochemical analysis of leaves, stems and root of *Teph*rosia *purpurea* is carried out and result was recorded as present (+) or absent (-) depending on the outcome of the test.

Test for Alkaloids

Wagner's' test: Add 2ml of Wagner's reagents was added into plant extract and the resulting reddish brown precipitate indicates positive test for alkaloids (Wagner, 1993).

Test for Tannins: A few drops of 0.1% ferric chloride was added and observed blackish blue or brownish green coloration indicates the presence of tannin.

Test for Saponins: Extract was added with 5ml of distilled water in a test tube and then it was shaken and the formation of stable foam indicates presence of saponin (Chen et al., 2006).

Test for flavonoids: A few drop of lead acetate were treated with extract and yellow coloration indicates presence of flavonoid.

Test for Phenol: The extract was treated with 3-4 drop of ferric chloride solution bluish black or blue green colour indicates positive test for phenol (Mace.M.D, (1963).

Test for Terpenoids: Extract was mixed in 2 ml of chloroform and concentrated H2SO4 (3ml) was carefully added to form reddish brown coloration in inner face indicates positive test for terpenoid.

Test for Amino acid: When extract in which two drop of Ninhydrin reagent added then purple color form it indicates positive test for amino acid (Yasuma. A and Ichikawa (1953).

Test for Carbohydrates

Benedict's test: Reagent was added with extract and heated on boiling water bath for 2 min reddish brown precipitate indicates the presence of carbohydrates.

Test for Glycosides: To know volume of extract 1ml of distilled water added and aqueous solution of NaOH was added and formation of yellow colour indicates positive test for glycosides.

Result and Discussion

Morphological Description: *Tephrosia is* a species of flowering plant in the family Fabaceae. That has tropical distribution. a small shrub with erect stems, typically reaching 30-80cm in height, featuring compound, imparipinnate leaves with several obovate to elliptical leaflets, producing purple to white flowers in axillary racemes, and producing flat, linear pods containing several small, rectangular seeds; the plant is often characterized by its silky hairs on the leaves and stems, with a prominent taproot system. *Tephrosia purpurea* is also used traditionally as folk medicine according to Ayurveda, the plant is anthelmintic, alexiteric, restorative, and antipyretic (Orwa et al., 2010).

Phytochemical analysis of methanol extract of leaf, stem and root of *Tephrosia* plant in which methanolic extract of leaf of *Tephrosia purpurea* shows postitive test for Alkaloids, Saponin, Terpenoid, Phenol, Amino acid and negative test for Tannin, flavonoids, carbohydrate, glycoside test. Methanolic extract of stem of *Tephrosia purpurea* shows

Figure 1: Tephrosia purpuria in natural habitat

Figure 2: Preliminary Phytochemical analysis of T. purpuria leaf, stem and root powder in methanol

positive test for Alkaloids, Tannin, Saponin and negative test for flavonoid, Terpenoid, Phenol, carbohydrate, Amino acid and glycoside. Methanol extract of root of *Tephrosia purpurea* shows of positive test for alkaloids, tanin, saponin, amino acid and negative test for flavonoid, terpenoid, phenol, carbohydrate and glycoside. The traditional medicine practice is recommended strongly for these plants as well as it is suggested that further work should be carried out to isolate, purify and characterize the active constituents responsible for the activity of these plants (Ramdas et al., 2020). The research work on *Tephrosia purpurea* plant which can be medicinally important (Pankti et al., 2020).

Conclusions

The results revealed the presence of highly important medicinally active constituents in the medicinal plant studied. Many evidences gathered in earlier studies which confirmed the identified phytochemicals to be bioactive. Several studies confirmed that the presence of these phytochemicals contribute medicinal as well as physiological properties to the plants studied in the treatment of different ailments. Therefore, extracts from these plants could be seen as a good source for useful drugs. The *Tephrosia purpurea* plant is source of secondary metabolites and the solvent choice is very important for extraction of phytochemical from plant. Thus, Tephrosia plant a promising source for discovering and manufacturing of new drugs.

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