
PHYTOCHEMICAL ANALYSIS OF *OCIMUM SANCTUM L.* LEAF EXTRACTS

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ABSTRACT

Extracts of fresh leaves of Tulsi (*Ocimum sanctum*) were subjected for qualitative analysis for the presence of various phytoconstituents viz. phenols, flavonoids, saponins, tannin, phenol, carbohydrate, glycosides, carbohydrate, protein, and the results showed that hydromethanolic and ethanolic leaf extracts may have more medicinal values as compared to aqueous extract.

Keywords: Plant, Analysis, Phytoconstituents, Yield

INTRODUCTION

Medicinal plants are rich source of medicines and produce various bioactive molecules. More than 120 active compounds have been isolated from different medicinal plants, which are being used as herbal medicines (Venkatachala and Muthusamy, 2018). In ethno-botanical literature of India, plants are known for the potential to treat many diseases conditions (Das *et*

al., 2009). *Ocimum sanctum L.* commonly known as holy basil (Tulsi) is a herbaceous perennial, belongs to family Lamiaecae and is considered to be an important source of medicine and drugs (Joseph, 2013). *Ocimum sanctum* also shows anticancerous, antifungal, antimicrobial, antifertility, hepatoprotective, antispasmodic, cardio protective, antiemetic, antidiabetic, analgesic, adaptogenic, diaphoretic and many more properties (Borah and Biswas, 2018). Therefore, the present study was conducted to perform the extraction and preliminary phytochemical analysis of *O. sanctum* leaves.

MATERIALS AND METHODS

Fresh leaves of *Ocimum sanctum* were collected from in and around Durg district of Chhattisgarh state. The fresh leaves of *Ocimum sanctum* were shed dried and reduced to fine powder. The powder was extracted with water, hydromethanolic mixture (1:1) and ethanol. The solvent was completely evaporated at 60 °C under

reduced pressure using soxhalet apparatus. The yield of the extract was recorded in terms (w/w) of dried material and phytochemicals were analysed by using the standard methods.

Test for carbohydrate:

Boil 2 ml of Benedict's reagent with a crude extract, a reddish brown colour indicated the presence of the carbohydrates.

Test for protein:

5 mg extract was added with the few drops of biuret's reagent, shaken well and allowed to warm for 2 min. Appearance of violet colour indicated presence of proteins

Test for phenols:

2 ml of distilled water followed by few drops of 10% ferric chloride was added to 1ml of the extract. Formation of blue or green colour indicates presence of phenols

Test for glycosides:

To 2 ml of extract, 3ml of chloroform and 10% ammonia solution was added. Formation of pink colour indicates presence of glycosides.

Test for steroid:

3 drops of concentrated sulphuric

acid was added into the 5 mg extract. The formation of red colour indicates the presence of steroids.

Test for tannins:

Few drops of basic lead acetate was added in the sample solution, if brown bulky precipitate is found it means tannin are present in test sample.

Test for flavonoids:

10% solution of sodium hydroxide was added in the sample for appearance of yellow colour solution and after addition of 1ml of dilute Hydrochloric acid, the colour should change from yellow to colourless.

Test for saponins:

After addition of distilled water it was shaken for proper mixing till foam was observed.

Test for alkaloids:

To 2 ml of extract, 2 ml of concentrated hydrochloric acid was added. Then few drops of Mayer's reagent were added. Presence of green colour or white precipitate indicates the presence of alkaloids.

RESULTS AND DISCUSSION

Determination of yield percentage (%)

The yields of evaporated dried

extracts were obtained by gravimetric method (Fig.1). The percentage of yield extracts was calculated based on dry weight as:

$$\text{Yield \%} = \frac{W1 \times 100}{W2}$$

Where W1= weight of extract after Solvent evaporation; W2 = Weight of the ground leaf powder

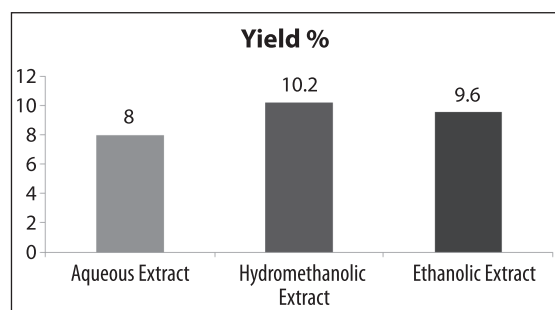


Fig. 1. The yield percentage of plant extracts of *Ocimum sanctum*

Phytochemical analysis

The pharmacological action of crude drugs and other therapeutic uses

are due to their therapeutically active constituents. Qualitative estimation for important chemical constituents was carried out and results were presented in table 2. Phytochemical analysis revealed that methnolic and hydromethanolic extracts of *O. Sanctum* contained rich source of bioactive compounds such as alkaloids, flavonoids, phenol, tannins, steroids, carbohydrate and glycoside. Aqueous extract do not contain saponin, tannins glycosides, carbohydrate and protein. Parveen et al., (2018) also observed the positive result for the presence of alkaloid, terpinoids and carbohydrate in hydromethanolic extract of *O. sanctum* plant

The phytochemical analysis revealed the importance of secondary metabolites. From this analysis hydro methanolic and ethanolic leaf powder extracts were found to have more chemical constituents compared to aqueous extracts (Kumari and

Table 2: Qualitative phytochemical screening of *Ocimum santum* leaf extracts

Phytochemicals	Aqueous Extract	Hyromethanolic Extract	Ethanolic Extract
Protein	-	-	-
Carbohydrate	-	+	+
Glycoside	-	+	+
Steroid	+	+	+
Phenol	-	+	+
Tannin	-	+	+
Saponoin	-	+	+
Flavonoid	+	+	+
Alkaloid	+	+	+

Gowda, 2019). Studies suggested that these compounds are responsible for the potent antimicrobial effects of this plant (Singh et al., 2012). Tannins have been employed medicinally as antidiarrheal, hemostatic and antihemorrhoidal compounds. Its presence in the plant may suggest the medicinal value because tannins have shown potential antiviral, antibacterial and antiparasitic effects (Farook et al., 2019). Saponins act as anti-hyperlipidemic, hypotensive and cardiodepressive properties and are responsible for the control of cholesterol (Mousavi et al., 2018). Free radical scavenging action is an important attribute of antioxidants. Flavonoids are responsible for antioxidant properties (Harichandan et al., 2019). *Ocimum sanctum* methanolic extract exhibit strong antioxidant activity compared. Phenolic phytochemicals of *Ocimum sanctum* have the potential for the prevention of many chronic-oxidation-related diseases, such as diabetes and micro- and macro-cardiovascular diseases. The high phenolic and flavonoid contents of *Ocimum sanctum* can explain its high free radical scavenging activity makes it an effective adaptogen to stress (Rahman et al., 2011)

SUMMARY

The presence of various bioactive compounds in leaves of *O. sanctum* justifies its therapeutic uses in various ailments. The

results confirm that the use of leaf extract have traditional medicinal properties and suggest that some of the plant extracts possess potential in the development of new drugs for the therapy of infectious and non-infectious diseases conditions.

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