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RESEARCH ARTICLE

Comparative Phytochemical and Physicochemical Study of Tulsi (*Ocimum sanctum*) and Haldi (*Curcuma longa*)

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ABSTRACT

Curcuma longa belongs to family and *ocimum sanctum* belongs to family lamiaceae. The phytochemical and physicochemical analysis was carried out for tulsi and haldi and haldi and a comparative study were done. Determination of total ash, acid insoluble, water soluble ash of tulsi and haldi were carried out by using standard procedure. The phytochemical screening has been done for different extract it revealed the presence of alkaloid, flavanoid, tannin, carbohydrate. Phytochemical and physicochemical parameters of Tulsi and haldi were stablished for their identification. The present study is focused on phytochemical and physicochemical study on haldi and tulsi. The qualitative physicochemical analysis was performed for the detection of secondary metabolites (viz. alkaloid, protein, tannin, saponin etc.).

Keywords: Phytochemical, Physicochemical, Tulsi, Haldi

INTRODUCTION

Medicinal plant is widely used for curing various diseases since traditional times. Different plant parts such as root, leaves, stems, seeds, or even whole plant are known to have therapeutic potentials (Deo *et al*.). The genus *Ocimum* contains 200 species of hers and shrubs (Simon J.E *et al*.). *Ocimum sanctum* belongs to family Lamiaceae are very important for their therapeutic potential. *O. sanctum,* known as Tulsi in Hindi and holy basil in English, is an erect softly, aromatic herb, or undershrub found throughout India. The leaves are 2–4 cm in length. In traditional system of medicine, the Indian medicinal plants have been used in successful management of various disease conditions such as bronchial asthma, chronic fever, cold, cough, malaria, dysentery, diarrhea, arthritis, and skin disease (Dev *et al*.). Turmeric is a golden spice which derived from rhizome of the *Curcuma longa*, which belongs to family Zingiberaceae since ancient time turmeric has been used as the principle ingredient of dishes originating from Bangladesh and India for its color, flavor, and taste (M.D. Sakib *et al*.). Turmeric consists of various molecular constituents including golden color alkaloid; curcumin has anti-inflammatory, antifungal, and antitumorous. It is also widely used as food colurant (Chairman M).

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MATERIALS AND METHODS

Sample preparation

The collected material leaves and rhizome were washed 8–10 times with running tap water, then 3 times distilled water. The material was dried in Tray dryer at 35°C and grounded with electric grinder. The powder was sieved (B.S.S. 80) and stored in air-tight container.

Preparation of extract

About 5 g of air-dried leaves and rhizome powder was macerated with 100 ml of the required solvent and kept into closed flasks for 24 h and shacked the contents on shaker for 6 h, then kept the contents for 18 h.

Phytochemical screening

The extract was analyzed by the following procedure to test for the presence of the alkaloid, carbohydrate,

Table 1: Phytochemical analysis

Parameter	Reagent	Tulsi aqueous extract	Tulsi alcohol extract	Haldi aqueous extract	Haldi alcohol extract
Alkaloid	Dragendorff's	+	+	+	+
Carbohydrate	Fehling solution	+	−	+	+
Flavonoid	HCl/Mg	+	+	+	+
Protein	Millon's reagent	−	−	+	+
Resin	Acetone	+	+	+	+
Saponin	Sodium bicarbohydrate	+	+	+	+
Tannin	Ferric chloride	+	+	−	−
Starch	Iodine solution	−	−	−	−

flavonoid, protein, resin, saponin, tannin, and starch. All observations were then recorded.

Test for alkaloid

About 2 ml extract was acidified with 2 ml HCl, then 1 ml of Dragendorff's reagent was added to it. The red-brown precipitate which indicated the presence of alkaloid.

Test for carbohydrate

Take 2 ml extract in test tube, then added 1ml equal amount of Fehling solution A and B and then boiled for sometimes. Red brick precipitate is produced.

Test for flavonoid

Sample extract was acidified with 5–10 drops hydrochloric acid and then added small pieces of Mg. Pink color is produced to the solution.

Test for protein

Sample extract is taken in test tube, then added 1 ml distilled water after this added 5–6 ml Millon's reagent. White precipitate is formed which turned red after boiling.

Test for resin

Sample extract is taken in test tube, then added 1 ml act one and then add 1 ml distilled water. Turbidity shows the presence of resin.

Test for saponin

Sample extract is taken in test tube and added few drops of $NaHCO_3$, then shake it vigorously and leave for sometimes. Honeycomb-like structure indicates the presence of saponin.

Table 2: Physicochemical analysis

Parameter Sample	LOD%	Total ash %	Water-soluble ash %	Acid-insoluble ash
Tulsi	4.14	8.6	4.20	1.0
Haldi	4.29	8.5	6.5	0.76

LOD: Loss on drying

Test for tannin

Take 2 ml extract in a test tube, then added few drops of 5% HCl and then boil it for sometimes. Green color is produced which indicate the presence of tannin.

Test for starch

Sample extract is taken a test tube and added few drops of iodine solution. Solution turns in blue color which indicates the presence of starch.

Physicochemical evaluation

In physicochemical analysis, the following parameters were done.

Loss on drying

First, we taken an evaporating dish and placed about 2 g powder in it after accurately weighed dried it at 105°C for 5 h and weighed. Repeat the same process 2 more times and weighing after 30 min a calculated using the formula (API 2006). Moisture content = average×100/weight of sample taken.

Determination of total ash

About 2 g of air-dried powder was taken in a crucible and heated at 450°C. Then, it was cooled in desiccator and weighed. The total ash was calculated with the following formula:
Total ash = average×100/weight of sample taken.

Determination of water-soluble ash

The total ash was boiled with 25 ml of water for 5 min; the insoluble matter was collected in Whatman ashless filter paper no 42 washed with hot water until the filtrate is neutral, then the filter paper transferred to crucible and ignited to constant weight, then the residue was cooled in desiccator and weighed. The total ash was calculated with the following formula:
Water-soluble ash = average×100/weight of sample taken.

Determination of acid-insoluble ash

The total ash was boiled with 25 ml of 5% HCl for 5 min, the insoluble matter was collected in Whatman ashless filter paper no 42 washed with hot water until the filtrate is neutral, then the filter paper transferred to crucible and ignited to constant weight, then the residue was cooled in desiccator and weighed. The total ash was calculated with the following formula:
Acid-insoluble ash = average×100/weight of sample taken.

RESULTS

In present study the leave of tulsi rhizome of haldi evaluated for its physicochemical and phytochemical revealed that the powder of tulsi leaves and haldi rhizome performed for moisture content , total ash, water soluble ash and acid insoluble ash and result were tabulated in Table 2. The total ash value is an indicative amount of total amount of inorganic material after complete incineration. The preliminary phytochemical screening of methenolic and aqueous extract of both plant showe the oresence of alkaloid , flavanoid, resin. Saponin.

DISCUSSION

The phytochemical and physicochemical analyses were carried out for haldi and tulsi and a comparative study was done. The phytochemical analysis showed the presence of alkaloid, tannin, flavonoid, rasin, saponin, and carbohydrate by both plants, but on the other hand, protein is present in haldi and absent in haldi. The physical parameters were used for the identification of plant.

CONCLUSION

The present physicochemical and phytochemical screening of powdered form of plant material and aqueous extract and alcoholic extract provides useful information regarding their identification. The phytochemicals which are screened could be used for standardization of medicinal plant. There are many components which are beneficial for human health such as alkaloid, flavonoid, tannin, and protein.

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