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Extraction and Phytochemical Screening of Tecoma Stans (Roots) and Trigonella Foenum-Graecum Linn. (Seeds)

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Abstract
As per WHO 80% of the Indian population depends on the indigenous and traditional system of medicine for the treatment of various diseases. *Tecoma stans* (L.) Juss. Ex Kunth. and *Trigonella foenum-graecum* Linn. are widely used traditional herbal drugs for the treatment of various disease viz., fungal infection, inflammations, heart diseases and so on. In the present paper dried root and seeds of *Tecoma stans* (L.) Juss. Ex Kunth. and *Trigonella foenum-graecum* Linn. were evaluated for extraction and preliminary phytochemical screening.

Keywords: Herbal drug, Extraction, Phytochemical screening

Introduction
Tecoma stans (L.) Juss. Ex Kunth. belongs to family Bignoniaceae, Wild throughout India, commonly known as Piliya (H), Yellow trumpetbusy, Yello bell (E). Traditionally all parts of the plant is used as medicine for the cure of the treatment of various diseases. *Trigonella foenum-graecum* Linn. belongs to family Fabaceae, Cultivated in North-Central India Commonly known as Methi (H), Fenugreek (E). Fenugreek leaves and seed are known to have major medicinal properties and have been reported to significantly reduce both blood glucose and cholesterol levels in human and animal subjects in clinical trials around the world. [1]
In Indian systems of medicine most practitioners formulate and dispense their own recipes. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world. [2] In the present paper dried root and seeds of *Tecoma stans* (L.) Juss. Ex Kunth. and *Trigonella foenum-graecum* Linn. were evaluated for extraction and preliminary phytochemical screening.

Material and Methods
Collection of herbs and their authentication
The plant parts viz., TSR: *Tecoma stans* (Roots) and TFGS: *Trigonella foenum-graecum* Linn. (Seeds) was collected in the months of September-December 2021 from the various local sites of Malwa region of Madhya Pradesh and identified & authenticated by Dr. S. N. Dwivedi, Retd. Prof. and Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, (M.P.) and

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was deposited in our Laboratory. Voucher specimen No. J/Bot/TS-R/10 & J/Bot/TFG-S/11 was allotted.

Extraction of Selected Herbs

Dried powdered plant material of TSR & TFGS were shattered and screened with 40 mesh. The shade dried coarsely powdered plant matertial (250 gms) were loaded in Soxhlet apparatus and was extracted with ethanol and water (90:10) until the extraction was completed. After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. The residue was then stored in dessicator and percentage yield were determined. [3-4]

Phytochemical screening of selected herb

The various extracts obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedures were adopted to perform the study. [5-6]

Tests for Carbohydrates

Molisch's Test

To the Sample 2-3 drops of 1% alcoholic - napthol solution and 2 ml of conc. sulphuric acid was added along the sides of the test tube. Appearance of purple to violet ring at the junction of two liquids shows the presence of carbohydrates.

Fehling Test

To the sample add fehling reagent, appearance of brick red precipitate shows presence of carbohydrates.

Test for Glycosides

Legal's Test

To the sample add 1 ml of pyridine and few drops of sodium nitropruside solutions and then it was made alkaline with sodium hydroxide solution. Appearance of pink to red colour shows the presence of glycosides.

Borntrager's Test

Sample was treated with chloroform and then the chloroform layer was separated. To this equal quantity of dilute ammonia solution was added. Ammonia layer acquires pink color, showing the presence of glycosides.

Baljet's Test

To the sample add picric acid, orange color shows presence of glycosides.

Test for Alkaloids

A small portion of the sample was stirred separately with few drops of dilute hydrochloric acid and was tested with various reagents for the presence of alkaloids. The reagents are

- Dragendroff's Reagent - Reddish brown precipitates
- Wagner;s Reagent - Reddish brown precipitates
- Mayer's Reagent - Cream color precipitates
- Hager's Reagent - Yellow color precipitates

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Test for Proteins and Free Amino Acids

Small quantities of the sample was dissolved in few ml of water and treated with following reagents.

- Million's reagent: Appearance of red color shows the Presence of protein and free amino acid.
- Ninhydrin reagent: Appearance of purple color shows the Presence of Proteins and free amino acids.
- Biuret's test: Equal volumes of 5% sodium hydroxide solution & 1% copper sulphate solution was added. Appearance of pink or purple color shows the presence of proteins and amino acids.

Test for Tannins and Phenolic compounds

A small quantity of the sample was taken separately in water and test for the presence of phenol compounds and tannins was carried out with the following reagents.

- Dilute Ferric Chloride Solution (5%) - Blue color or green color
- 10% Lead Acetate Solution - White precipitates

Test for Flavonoids

Alkaline Reagent Test

To the test solution add few drops of magnesium hydroxide solution, intense yellow colour is formed which turns to colourless on addition of few drops of dilute acid indicates presence of flavonoids.

Shinoda's Test

Small quantities of the sample was dissolved in alcohol, to them piece of magnesium followed by conc. hydrochloric acid drop wise added and heated. Appearance of pink, crimson red, green to blue color shows the presence of flavonoids**.**

Tests for Fixed Oils and Fats

Spot Test

A small quantity of sample was separately pressed between two filter papers. Appearance of oil stain on the paper indicates the presence of fixed oil.

Saponification Test

Few drops of 0.5 N alcoholic potassium hydroxide were added to a small quantity of sample along with a drop of phenolpthlein, the mixture was heated on a water bath for 1-2 hours, formation of soap or partial neutralization of alkali indicates the presence of fixed oils and fats.

Tests for Steroids and triterpenoids

Libermann-burchard Test

Treat the sample with few drops of acetic anhydride, boil and cool. Then add con. sulphuric acid from the side of test tube, brown ring is formed at the junction two layers and upper layer turns green which shows presence of steroids and formation of deep red colour indicates presence of triterpenoid.

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Salkowski Test

Treat the sample with few drop of conc. sulphuric acid, red colour at lower layer indicates presence of steroids and formation of yellow coloured lower layer indicates presence of triterpenoids.

Test for Mucilage and Gums

- Small quantities of sample was added separately to 25 ml of absolute alcohol with constant stirring and filtered. The precipitates was dried in oil and examined for its swelling property for the presence of gum and mucilage.
- To the sample add ruthenium red solution, pink color shows presence of mucilage.

Test for Waxes

To the test solution add alcoholic alkali solution, waxes get saponified.

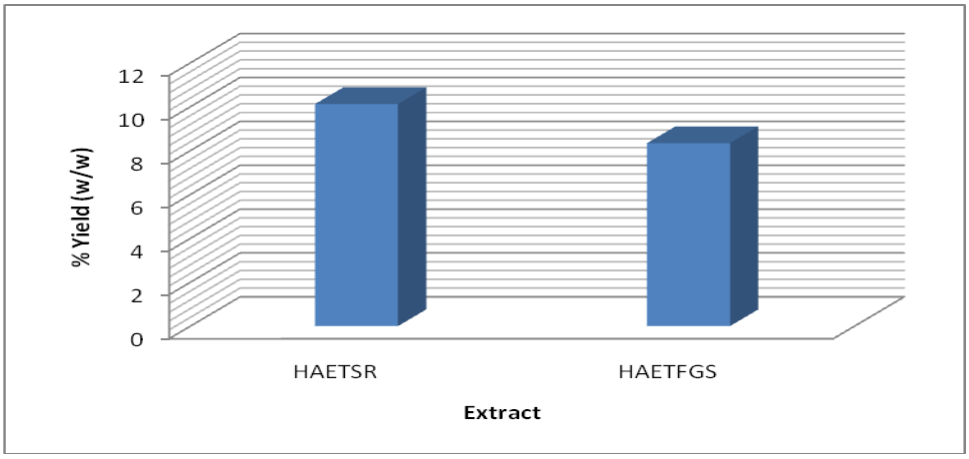
Results and Discussion

The plant parts viz., TSR: *Tecoma stans* (Roots) and TFGS: *Trigonella foenum-graecum* Linn. (Seeds) was collected and identified & authenticated. The shade dried plant material was extracted with ethanol and water (90:10) and percentage extract obtained was determined. The results are given in table 1.

Table 1: Estimation of % Yield of Extract of TSR & TFGS

S/No.	Extract	Parameters			
		Nature of Extract	Color	pH	% Yield (w/w)
1.	HAETSR	Solid	Pale white	7.0	10.12
2.	HAETFGS	Solid	Dark brown	7.0	8.34

The various extract obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedure was adopted to perform the study. The results are presented in table 2.



Graph 1: % Yield of Extract of TSR & TFGS

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Table 2: Preliminary Phytochemical Screening of TSR & TFGS

S/No.	Constituents	Extract	
		HAETSR	HAETFGS
1.	Carbohydrates	+	+
2.	Glycosides	+	+
3.	Alkaloids	+	+
4.	Protein & Amino acid	+	-
5.	Tannins & Phenolic compounds	+	-
6.	Flavonoids	+	-
7.	Fixed oil and Fats	+	-
8.	Steriods & Triterpenoids	+	+
9.	Waxes	-	-
10.	Mucilage & Gums	+	-

+ = Present; - = Absent

Conclusion

In traditional system of medicine herbal healers treat diseases using the plants which have immense medicinal potentiality. But due to lack of standardization parameters correct identification of the plant is lacking, therefore development of QC parameters is of great interest. The present work was undertaken to determined the extraction and preliminary phytochemical screening of the selected plant material.

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