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PHYTOCHEMICAL SCREENING OF *TRIUMFETTA RHOMBOIDEA* JACQ

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ABSTRACT

Ethanolic extract of *Triumfetta rhomboidea* Jacq was subjected to various phytochemical tests. Preparative thin layer chromatography study of the extract was performed and active constituents were isolated. Spectral analysis of the isolated constituent shows that *Triumfetta rhomboidea (Tiliaceae*) contains carbohydrate glycosides, phytosterol, steroids, flavonoids, tannin and phenolic compounds and triterpenoids.

Key words: *Triumfetta rhomboidea* Jacq, Preparative thin layer chromatography, Phytochemical.

INTRODUCTION

Triumfetta rhomboidea is a perennial herb having important role in ancient therapy. Various parts of the plant used therapeutically are fruit, flower, leaves, bark and root. Root is tonic styptic, galactogogue, aphrodisiac, cooling, useful in dysentry and as diuretic. Pounded roots are given in the treatment of intestinal ulcer leaves, flowers and fruit are mucilaginous demulcent, astringent, and also used in gonorrhoea and against leprosy.[1-4] In the present study, active constituents of the plant were analyzed and evaluated for antibacterial activity.

EXPERIMENTAL

Phytochemical screening

Triumfetta rhomboidea jacq (tiliaceae) was procured from botanical garden of B. K.

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Mody Govt Pharmacy College, Rajkot. The leaves of *Triumfetta rhomboidea* were dried under shade and powdered with a mechanical grinder. Dried material was extracted with ethanol (90% v/v) in Soxhlet apparatus and after complete extraction (50 hr), the solvent was removed by distillation under reduced pressure and resulting semisolid mass was vacuum dried.[5-14] Ethanolic extract (EETR) of *Triumfetta rhomboidea* were subjected to preliminary phytochemical screening for the detection of various plants constituent.

Test for alkaloids

The small portion extracts were stored separately with a few drops of dilute hydrochloric acid and filtered. The filtrate was tested with various alkaloidal agents, such as Mayer's reagent (cream precipitate) and Dragendorffs reagent (orange brown precipitate).

Test for carbohydrates and glycosides

Small quantity of ethanolic extract was dissolved separately in 5 mL of distilled water and filtered. The filtrate was subjected to Molisch's test to detect the carbohydrates.

Another small portion of extract was hydrolyzed with dilute hydrochloric acid for few hours in a water bath and was subjected to Liebermann-Burchard's, legal and Borntrager's test to detect different glycosides. (Pink to red color indicates presence of glycosides).

Test for flavonoids

5 mL of dilute ammonia solution were added to a portion of aqueous filtrate of plant extract followed by addition of concentrated H_2SO_4. A yellow coloration observed in extract indicated presence of flavonoids.

Test for steroids

2 mL acetic anhydride was added to 0.5 g ethanolic extract with 2 mL H_2SO_4. The color changed from violet to blue or green in samples indicated presence of steroid.

Test for terpenoids (Salkowski test)

Five mL of extract was mixed in 2 mL of chloroform, and then concentrated H_2SO_4 (3 mL), was carefully added to form a layer. A reddish brown coloration formed at the interface indicated presence of terpenoids.

Test for saponin

About 1 mL of alcoholic extract was diluted with distilled water to 20 mL and shaken in graduated cylinder for 15 minutes. One cm layer of foam indicated presence of saponin.

Test for tannin

When extract was treated with vanillin-hydrochloric acid reagent, pink or red color was formed due to formation of phloroglucinol.

Test for protein

Mellon's reaction: Million's reagent (mercuric nitrate in nitric acid containing a trace of nitrous acid) usually yields a white precipitate on addition to a protein solution, which turns red on heating.

Test for volatile oil or essential oil

A thick section of extract was placed on a glass slide. A drop of Sudan red 3rd reagent was added and after two minutes, it was washed with 50% alcohol mount in glycerin.

Preparative thin layer chromatography

Ordinarily, microgram quantities of mixture of organic compounds are separated by analytical TLC. It is possible to scale up the quantities to milligram amount (10-50 mg) by using thicker layer (0.5-2.0 mm thickness) of the support material and by the use of larger plates (20 x 20 cm or 20 x 40 cm). Multiple developments also bring about better resolution. Preparative TLC for the isolation of marker compound from the ethanolic extract of *Triumfetta rhomboidea* leaves was performed by using solvent system toluene : ethyl acetate (9 : 1).

RESULTS AND DISCUSSION

Phytochemical screening suggests that ethanolic extract contain various constituents, which are given in the Table 1. Preparative TLC study revealed presence of compounds; COMP-01, COMP -02, COMP -03, COMP -04 and COMP -5. The compound COMP -01 to COMP -05 gives positive Knollar's and Libermann – Burchred test and the colour produced was typical of triterpences. IR spectra were also similar to triterpences. IR spectrum in the fundamental region also supported triterpene structure as the bands were noticed due to O-H stretching and C-H stretching of alkanes.

Table 1: Data showing the preliminary phytochemical screening of the two extracts of *Triumfetta rhomboidea*

Phytochemical	Presence/Absence
Carbohydrate	++
Glycosides	++
Alkaloids	--
Phytosterol and steroids	++
Flavonoids	++
Protein & Amino Acid.	--
Tannin & phenolic compounds	++
Triterpenoids	++

Table 2: IR and UV spectral data of the isolated samples

Code	IR data (cm^{-1})	UV
01	3591 (C-H stretching in alkenes), 2956 (C-H stretching in the alkanes), 1731, 1701, 1683 (C=O stretching), 1286, 1334 (C-H bending vibration in the alkynes.), 898, 794, 723 (aromatic hydrocarbons.), 1014 (diphenyl methanol) 1201 (O-H stretching in phenol)	245
02	3670 (C-H stretching in alkenes), 2956 (C-H stretching in the alkanes), 1731,1716,1683 (C=O stretching), 1222, 1271, 1340 90 (C-H bending vibration in the alkynes), 794, 729, 682 (aromatic hydrocarbons), 1222 (O-H stretching in phenol)	270
03	3151 (C-H stretching vibration in alkenes.), 2956 (C-H stretching vibration in the alkanes.), 1745,1735,1683 (C=O stretching), 1253, 1286 (C-H bending in the alkynes.) 796, 757, 723, 688 (aromatic hydrocarbons) 1253 (O-H stretching)	205
04	3006,3076 (C-H stretching in aromatic ring), 2956 (C-H stretching in alkene), 1735, 1716, 1685 (C=O stretching), 1224, 1271, 1311 (C-H bending vibration in alkyne), 793, 725 (aromatic hydrocarbons), 1224cm^{-1}(O-H stretching; phenolic)	
05	3672, 3735 (C-H stretching), 2956 (C-H stretching), 1733, 1718, 1701 (C=O stretching), 1274, 1311, 1355 (C-H bending vibration), 881, 794, 777, 723, 682 (aromatic hydrocarbons), 1213 (O-H stretching)	295

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