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PHYTOCHEMICAL EVALUATION AND PHARMACOLOGICAL SCREENING OF HIBISCUS SYRIACUS LEAVES EXTRACT

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ABSTRACT

Many of the phyto-constituents were traditionally reported for dreadful aliments, are nowadays found to exhibit interesting bioactivity and have cardinal output. One noticeable striking example is use of plant *Hibiscus syriacus* in various ailments. The plant parts are reported to have medicinal value and used by local community in various diseased conditions. The thirst of present work is to isolate active constituent from leaves of the plant *Hibiscus syriacus*. Extraction of leaves of plant was carried out by soxhlet apparatus. Phytochemical analysis was conducted to identify nature of chemical constituent present in the plant. Isolation and identification was conducted by chromatographic techniques. Isolated fractions were characterized using data obtained from spectral analysis. Novel biologically active natural products will continue to serve as lead compounds for drug development and is biochemical probes for the discovery of pharmacological and biochemical process.

KEYWORDS: *Hibiscus syriacus*, chloroform extract, antipyretic.

1. INTRODUCTION

Natural product form plant, animal and minerals are the basis of the treatment of human disease. Today's estimate demonstrated about 80% of people in the developing countries still relay on the traditional medicine based largely on species of plants and animals for their primary health care.[1] Medicinal plants are nature's gift to human beings to make disease free healthy life. It plays a vital role to preserve our health.[2] They have stood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. The nature has provided a

complete ware house of remedies to cure ailments of mankind. The chemical constituents present in them are a part of the physiological functions of living flora and hence they are believed to have better compatibility with the human body.[3] A natural product is a chemical compound or substance produced by living organisms found in nature that usually has a pharmacological or biological activity for use in pharmaceutical drug discovery and drug design. Herbal medicine remedies have noticed their cardinal existence in the treatment of human diseases since the existence of human civilization. Historically, majority of the new drugs have been generated from natural origin as secondary metabolites as well as the compounds derived from natural products.[4]

Medicinal plant *Hibiscus syriacus*, belonging to family *Malvaceae*. Commonly known as Korean rose. The whole plant as well as parts of the plant are traditionally claimed for various ailments. *Hibiscus syriacus* is highly tolerant of air pollution, heat, humidity, poor soil and drought. The leaves are diuretic, expectorant and stomachic. It is also used in the treatment of itch and other skin diseases, dizziness and bloody stools accompanied by much gas. Chemical constituents present in the plant are flavonoid, saponins, alkaloids, n-alkane, beta-sitosterol, vannilic acid, p-coumaric acid, caffeic acid, amino acids, gallic acid, quercetin, borneol, caryophyllene oxide, endesmol etc.[5,6]

2. MATERIALS AND METHODS

2.1 Collection of plant

The fresh leaves of *Hibiscus syriacus* were collected from local region of Lal Bagh.

2.2 Authentication of Plant material

Authentication of the leaves of *Hibiscus syriacus* was done by Deenadayalan K., Botanist, HOD of Biology, Sri Jagadguru Renukacharya Rajajinagar College, Bengaluru - 560010

2.3 Preparation of extract

The collected leaves were washed with tap water and air dried under the shade in house for 25-30 days. After complete drying, the leaves are powdered by mixer grinder to obtain fine powder. 100 gms of the dried powder were extracted successively in soxhlet apparatus using chloroform, methanol as solvent, and the extraction was continued until the solvents in the thimble became clear. After each extraction the solvent was recovered and the extract was concentrated by using rota vapour at 70^0C. Aqueous extraction was also carried out. The concentrated extract was stored in desiccator and further subjected to Preliminary

phytochemical investigation, isolation and pharmacological screening.

2.4 Phytochemical analysis

All the three extracts were subjected to qualitative chemical investigation to check the presence of various chemical constituents in the extract.

2.5 Thin layer chromatography

Thin layer chromatography was performed to identify and isolate chemical constituent present in extract of *Hibiscus syriacus*. Chloroform: ethyl acetate: ethanol: glacial acetic acid (6: 2: 2: 2) was used as mobile phase.

2.6 Column Chromatography

Isolation of constituents was done by using column chromatography. Silica gel G 60-120 mesh size was used as stationary phase. Slurry of silica gel was prepared by addition of appropriate mobile phase. Chloroform: ethanol: ethyl acetate: glacial acetic acid (6:2:2:2) was used as mobile phase.

2.7 Spectroscopic analysis

Isolated fractions were subjected to spectral analysis. Fractions were characterized using data obtained from Infrared, NMR and MASS spectroscopy.

3 RESULTS AND DISCUSSION

3.1 Physicochemical evaluation

Sl. No.	Total ash	LOD	Acid insoluble ash	Water soluble ash
1	1.48	1.95	1.66	0.91

3.2 Phytochemical analysis

Phytochemical analysis reveals that only chloroform extract showed presence of carbohydrate, glycosides, steroids, flavonoids. Among which steroids and flavonoids were hypothetically found to be responsible for pharmacological activity. Hence, chloroform extract was used for further study.

3.3 Chromatographic Analysis

Identification and isolation of constituents from chloroform extract was carried out by using thin layer and column chromatography. Two fractions obtained from column were collected, dried, and used for further analysis.

3.4 Spectral data

Isolated compound 1- IR V_{max} (neat cm^{-1}) 3371.92-OH, 2851- CH, 1650- C=C, 3231.15-Cyclic olefinic, 1020-Cycloalkane. 7.782, ^{1}H NMR ($CDCl_{3,\ 400\ MHz}$): δ 7.782 s-aromatic proton, δ 0.879-0.859 (d) - aliphatic CH_2 terminal, δ 1.254 (s) angular CH_3 at $C_{18,}$ δ 4.053 (s)-OH, δ 2.291-2.339 (t) - aliphatic CH_3 Mass, molecular ion peak 412.

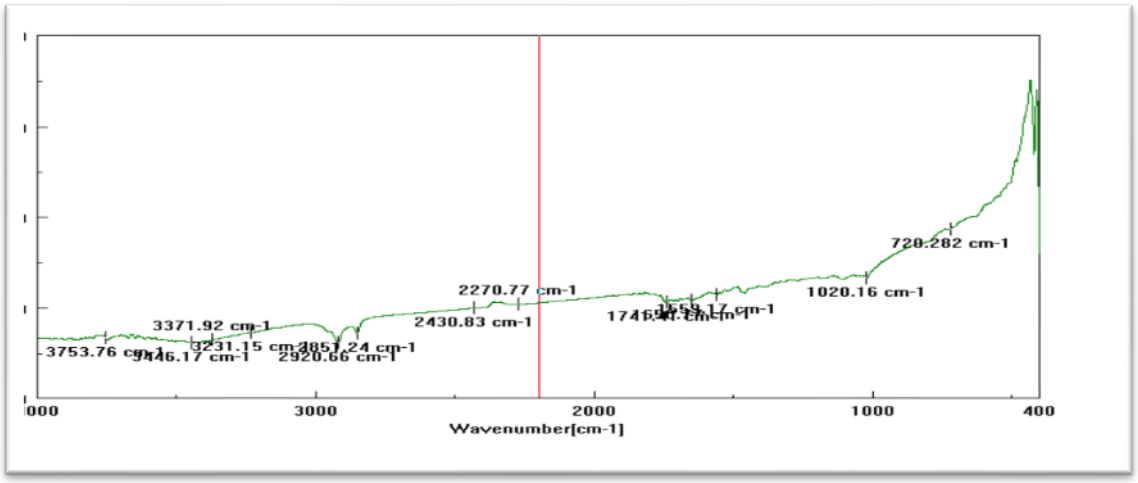


Fig. 1: IR spectra of isolated compound 1.

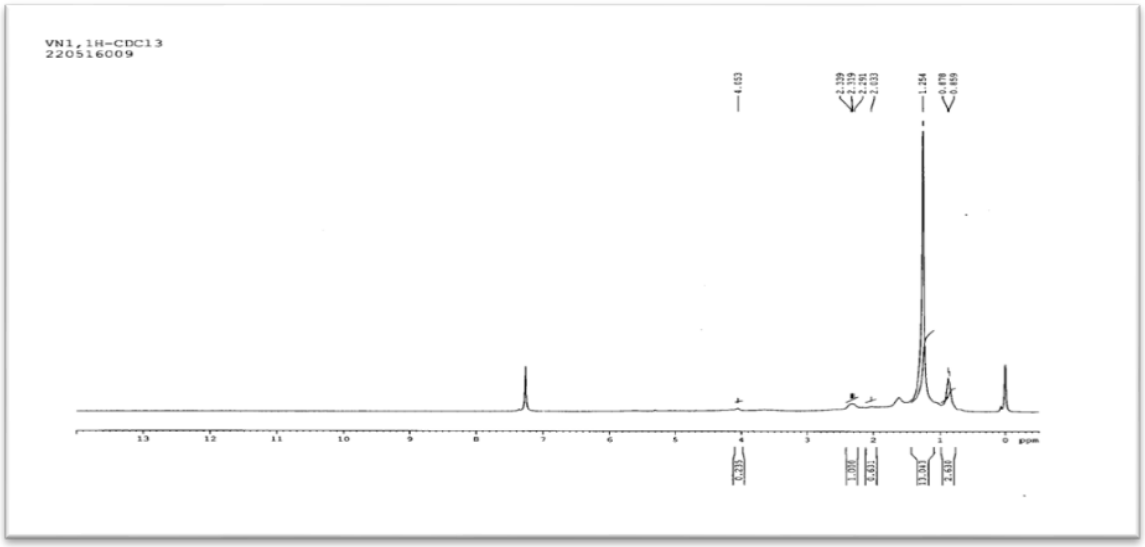


Fig. 2: NMR spectra of isolated compound 1.

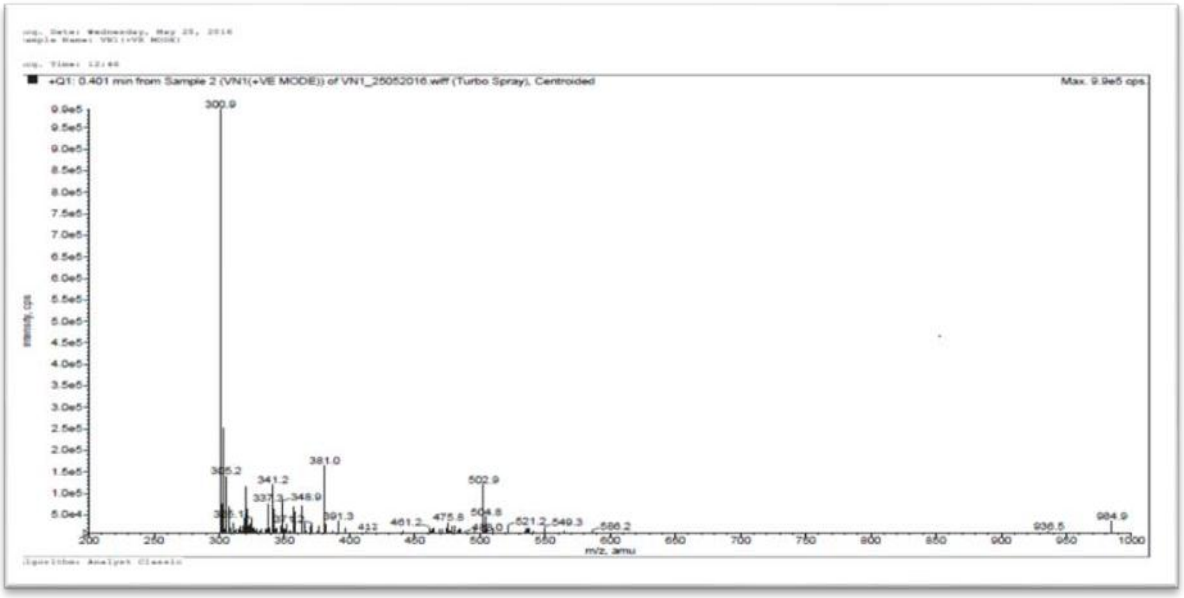


Fig. 3: MASS spectra of isolated compound 1.

Isolated compound 2- IR V_{max} (neat cm^{-1}) 3415.31-OH, 1736.50- C=O, 1612.2 C=C, 674.963- aromatic C-H bending ^{1}H NMR ($CDCl_{3,\ 400\ MHz}$): δ 2.74 OH proton, δ 7.282 Aromatic proton, Mass, molecular ion peak 286.

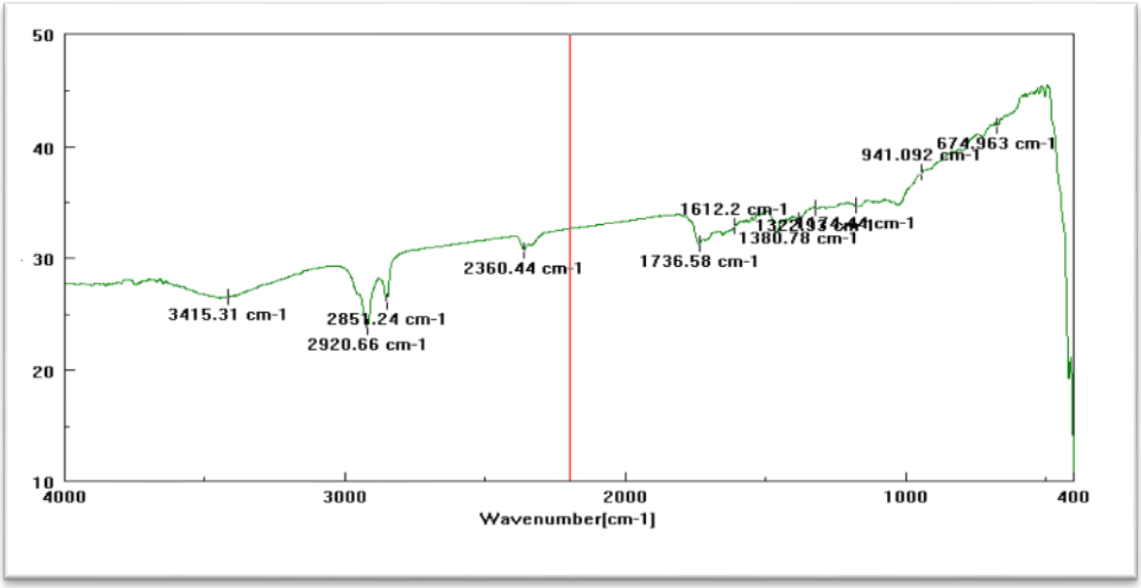


Fig. 4: IR spectra of isolated compound 2.

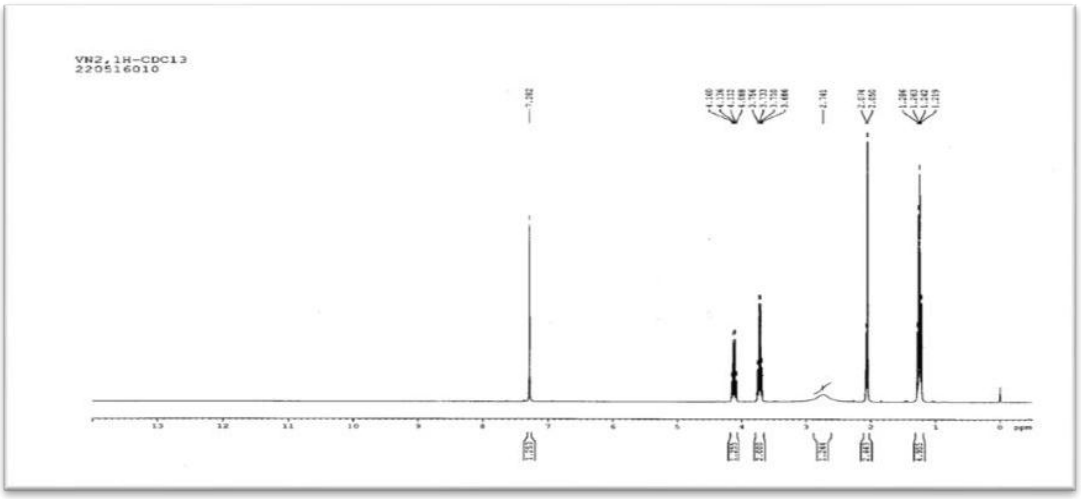


Fig. 5: NMR spectra of isolated compound 2.

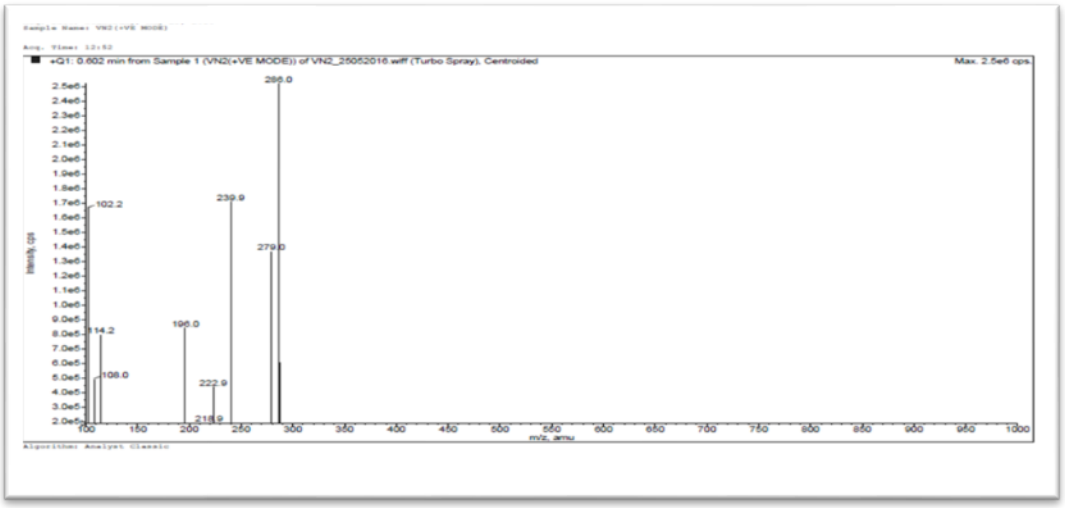
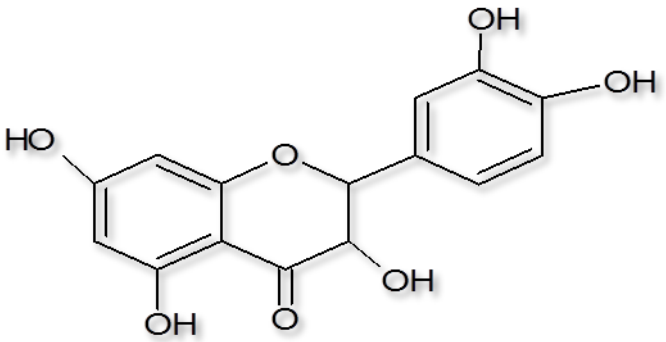
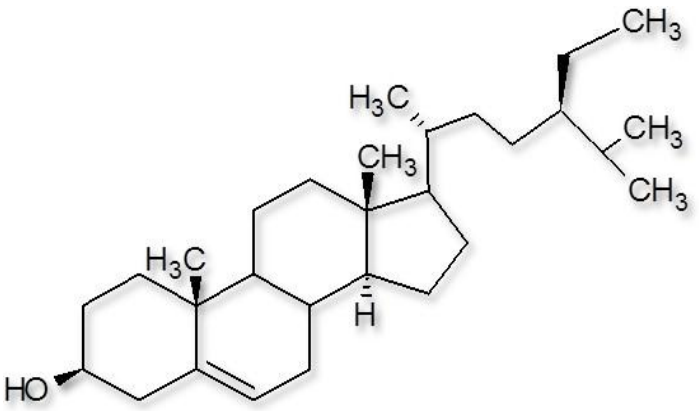


Fig. 6: Mass spectra of isolated compound 3.

Beta-sitosterol



Flavonoids



CONCLUSION

Phytochemical analysis reveals that chloroform extract showed presence of steroids and flavonoids which were hypothetically found to be responsible for pharmacological activity. From phytochemical, chromatographic and spectral data it was concluded that Beta-sitosterol and Quercetin are the possible structure of isolated compounds.

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