

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Phytoconstituents from the Roots of *Ficus exasperate*.

Sunitha Katta*, Suhasin Ghanta, Ganapaty Seru, and Naga Vennela Ikkurthi.

Department of Pharmacognosy and Phytochemistry, GITAM Institute of Pharmacy, GITAM University, Rushikonda, Visakhapatnam, Andhra Pradesh, India.

ABSTRACT

Ficus exasperate is traditionally used by rural folk for the treatment of various skin infections and also as wound healing drug. The authors have made an attempt to provide a scientific support to the folklore claims hence the roots are examined chemically which afforded β - sitosterol, bergapten, umbelliferone and ursolic acid. The coumarins like bergapten and umbelliferone are known for treating skin infections, occurrence of these coumarins may be responsible for its activity.

Keywords: *Ficus exasperate*, Roots, Coumarins, Skin infections

*Corresponding author

INTRODUCTION

Ficus exasperata is a deciduous small to medium sized tree belonging to the family Moraceae^[1]. Different parts of *F. exasperata* are used as analgesic, anti-oxidant, antidiabetic, diuretic, wound healing, antiparasitic, vermifuge and for treating hemorrhoids and venereal diseases^[2-6]. The plant is also reported to treat throat pain, asthma, dyspnea and eczema. Though *F. exasperata* is widely used in traditional medicine, its chemistry is not explored. In view of this, the authors have examined the roots of *F. exasperata* for its chemical constituents.

MATERIALS AND METHODS

Column chromatography and TLC were carried out using silica gel (60-120 mesh) and silica gel G (Acme) respectively. Visualization of the TLC plates was done by spraying 5% methanolic sulphuric acid. Melting points were recorded by Boietus melting point apparatus. UV spectra were obtained on systronics UV spectrophotometer, IR spectra were recorded on BUCK scientific -500 spectrophotometer using KBr pellets.¹HNMR spectra were taken on BRUKER AM 400 with TMS as an internal standard.

Experimental

Collection of the plant material:

The plant material was collected from Western Ghats of Karnataka and the identity was established by Dr. M. Venkaiah, Department of Botany, Andhra University, Visakhapatnam.

Extraction of the plant material:

Air dried powdered roots (1.2Kg) of *Ficus exasperata* was subjected to extraction with methanol for 6 hrs. The procedure was repeated for 3 times. The extract was concentrated and dried under vacuum to get a residue of 22.14 gms. The extract was diluted with respective solvents and screened chemically.

RESULTS AND DISCUSSION

Characterization of the isolated compounds:

β - Sitosterol: It was crystallized from petroleum ether as colorless needles, m.p- 134-136⁰ C, gave positive color reaction with Liebermann Buchard test. The IR spectrum showed bands 2970, 2950, 2880, 1470, 1385 and 1055 cm⁻¹. The ¹H NMR spectrum showed peaks at δ 0.83-1.01(methyls), 3.47 (1H broad C₃ α -H) and 5.35(1H, m, C₅-H).

Bergapten: It was obtained from the hexane chloroform fraction as white needles, m.p 187-188⁰C, gave yellow colour for coumarin test and red colour for furanoid test indicating the presence of furanocoumarin. UV spectrum showed absorption bands at 224,252,270 and 308 characteristic of furanocoumarin. ¹H NMR revealed the presence of lactone and furan rings and aromatic methoxy group. The identity was further confirmed by the comparison with an authentic sample through m.m.p and co-TLC.

Umbelliferone: It was crystallized as colorless crystals from chloroform fraction, m.p 229-231⁰C, it exhibited bright blue fluorescence under UV indicating coumarin moiety and also showed absorbance at UV λ_{max} 206 and 325nm. The ¹H NMR showed peaks at δ 6.19 and 7.93 as AB type signals assigned to H-3 and H-4 and ABX type with signals at δ 7.52, 6.87 and 6.70. The identity was further confirmed by the comparison with an authentic sample through m.m.p and co-TLC.

Ursolic acid: It was obtained from methanol-chloroform fraction as crystalline flakes, m.p 280-282⁰C and gave play of colours (pink –blue-green) in Liebermann-Burchard test for sterol. The ¹H NMR revealed the presence of seven methyl groups, olefinic proton and carboxylic acid group. The identity was further confirmed by the comparison with an authentic sample through m.m.p and co-TLC.



CONCLUSION

The chemical examination of chloroform extract of the roots of *Ficus exasperata* afforded four compounds, β - sitosterol, bergapten, umbelliferone, ursolic acid which were characterized by spectroscopic and chromatographic techniques.

ACKNOWLEDGEMENT

The authors thank the management of GITAM University for providing necessary laboratory facilities for carrying out this work.

REFERENCES

- [1] Chopra RN, Nayar SL, Chopra IC. Glossary of Indian Medicinal Plants, CSIR, New Delhi, India. 1956:234
- [2] Adewole SO, Naicker T, Ojewole JA. Afr J Tradit Complemnt Altern Med 2011; 8:275-83.
- [3] Woode E, Poku RA, Ainooson GK, Boakye-Gyasi E, Abotsi WK, Mensah TL. J Pharmacol Toxicol 2009; 4:138-51.
- [4] Woode E, Poku RA, Abotsi WK. West Afr J Pharm 2011; 22: 75-81.
- [5] Taiwoi A, Adebesin OA, Funmilayo A. Res 2010 ;2 :80-3.
- [6] Bafor EE, Omogbai EK, Ozula RI. Acta Pol Pharm 2011 ; 68 : 541-7.