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## Phytoconstituents from the Roots of *Ficus exasperate*.

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### 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  $\beta$ - 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

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## INTRODUCTION

*Ficus exasperata* is a deciduous small to medium sized tree belonging to the family Moraceae<sup>[1]</sup>. Different parts of *F. exasperata* are used as analgesic, anti-oxidant, antidiabetic, diuretic, wound healing, antiparasitic, vermifuge and for treating hemorrhoids and venereal diseases<sup>[2-6]</sup>. 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.<sup>1</sup>HNMR 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:

$\beta$ - Sitosterol: It was crystallized from petroleum ether as colorless needles, m.p- 134-136<sup>0</sup> C, gave positive color reaction with Liebermann Buchard test. The IR spectrum showed bands 2970, 2950, 2880, 1470, 1385 and 1055 cm<sup>-1</sup>. The <sup>1</sup>H NMR spectrum showed peaks at  $\delta$  0.83-1.01(methyls), 3.47 (1H broad C<sub>3</sub> $\alpha$ -H) and 5.35(1H, m, C<sub>5</sub>-H).

Bergapten: It was obtained from the hexane chloroform fraction as white needles, m.p 187-188<sup>0</sup>C, 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. <sup>1</sup>H 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 229-231<sup>0</sup>C, it exhibited bright blue fluorescence under UV indicating coumarin moiety and also showed absorbance at UV  $\lambda_{max}$  206 and 325nm. The <sup>1</sup>H NMR showed peaks at  $\delta$  6.19 and 7.93 as AB type signals assigned to H-3 and H-4 and ABX type with signals at  $\delta$  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 280-282<sup>0</sup>C and gave play of colours (pink –blue-green) in Liebermann-Burchard test for sterol. The <sup>1</sup>H 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,  $\beta$ - sitosterol, bergapten, umbelliferone, ursolic acid which were characterized by spectroscopic and chromatographic techniques.

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