ISOLATION OF STEROID FROM *CRATAEVA NURVALA* BUCH.-HAM

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ABSTRACT

*Crateva nurvala* Buch-Ham (family : Capparidaceae) is a tree commonly known as Varuna. It constitutes a common drug of Ayurveda.

The present investigation deals with the screening and isolating chemicals of medicinal/pharmaceutical importance from the bark of varuna plants collected from different localities in India. During this chemical analysis the steroidal fraction showed the presence of β-sitosterol as one of its constituents.

The isolated β-sitosterol showed superimposable IR spectrum along with the authentic sample, that confirmed the isolation of β-sitosterol in its pure form.

KEY WORDS : β-Sitosterol, Bark, IR Spectrum)

INTRODUCTION

*Crateva nurvala* Buch-Ham (family : Capparidaceae) constitute a common drug of Ayurveda (Chopra et al., 1956). A major part of modern chemotherapy and traditional drugs are derived from higher plants (Zenk, 1979). Plant steroids are of considerable interest as starting material for the synthesis of androsteredione and androstadienedione (Asolkar et al., 1979). Cohen and Raichk (1981) and Hiramatsue et al., (1983) reported that β-sitosterol inhibit tumor formation besides that it possessed potent anti-inflammatory and anti-pyretic properties. In *Crysantheum* species β-sitosterol application promoted floral initiation (Biswas et al., 1967). Preliminary studies on the bark of *Crateva nurvala* showed that it possessed some active principle which showed significant anti-inflammatory and anti-arthritic activity. Moreover the mechanism of its action resembled to that of the corticosteroid (Das et al., 1974).

The present investigation deals with the chemical analysis of steroidal fraction of the bark of *Crateva nurvala* plants collected from various localities. The identification of this steroidal fraction and if possible its isolation in pure form have been the objectives of the present work.

Experimental : The bark from *Crateva nurvala* plants growing in Baroda,
Valsad, Bombay, Ratnagiri, Delhi, Jammu and Allahabad has been collected in the months of March to May. Bark samples were air dried and powdered. Chloroform extraction of each sample was carried out by using soxhlet. Each extract was concentrated to the desired volume and subjected to Liberman's test. The extracts which gave positive test were further subjected to preparative thin layer chromatography along with authentic samples of steroids. The steroidal fraction showed the presence of \( \beta \)-sitosterol. \( \text{Rf} \) values were calculated. Isolation of this compound was done by eluting the spots. Quantitative estimation of the sterol fraction was carried out (Das and Banerjee, 1980).

For testing purity of the steroidal fraction isolated, IR spectrum was taken and compared with IR spectrum of the authentic sample.

**RESULTS AND DISCUSSIONS**

The chloroform soluble fraction from the *Crataeva nurvala* bark gave positive Liberman’s test indicating the presence of steroid. Further, preparative thin layer chromatography confirmed that the compound isolated was \( \beta \)-sitosterol. The quantity of \( \beta \)-sitosterol obtained from the bark of various samples varied from one locality to the other as shown in Table I. Almost equal

<table>
<thead>
<tr>
<th>No.</th>
<th>Locality</th>
<th>% of ( \beta )-sitosterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Baroda</td>
<td>0.16</td>
</tr>
<tr>
<td>2.</td>
<td>Valsad</td>
<td>0.08</td>
</tr>
<tr>
<td>3.</td>
<td>Bombay</td>
<td>0.05</td>
</tr>
<tr>
<td>4.</td>
<td>Ratnagiri</td>
<td>0.012</td>
</tr>
<tr>
<td>5.</td>
<td>Delhi</td>
<td>0.09</td>
</tr>
<tr>
<td>6.</td>
<td>Jammu</td>
<td>0.17</td>
</tr>
<tr>
<td>7.</td>
<td>Allahabad</td>
<td>0.09</td>
</tr>
</tbody>
</table>
The amount of $\beta$-sitosterol was obtained in plants growing in Baroda and Jammu, while Delhi and Allahabad plants showed almost the same quantity of $\beta$-sitosterol. The *Costus* species collected from different localities also showed variation in the diosgenin content (Banerjee and Sharma 1982). The presence of $\beta$-sitosterol has been reported in *Crataeva nurvala* by Sethi et al. (1978). The amounts of $\beta$-sitosterol obtained from various bark samples showed quantitative difference which is not unexpected, since the phyto constituents are known to vary depending on ecological factors such as climate, habitat, temperature etc., under which the plants are growing at the time of collection.

The presence of $\beta$-sitosterol was confirmed by subjecting the isolated compound to IR spectrum which gave superimposable spectrum with authentic sample. (Fig 1).

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LITERATURE CITED


