**Isolation and Study of β-sitosterol the Unsaponifiable Matter from the Plant *Malachra capitata* (Linn)**

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**ABSTRACT**

The fat obtained from the shade dried plant Malachra capitata (Linn) was saponified and the unsaponifiable matter was isolated. The unsaponifiable matter was identified as β-sitosterol by chemical and spectroscopic analysis.

**Key words**: *Malachra capitata* (Linn), N.O.- Malvaceae, unsaponifiable, matter, β-sitosterol.

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**INTRODUCTION**

The plant *Malachra capitata* Linn in commonly known as Ranbhendi in Bombay. It belongs to natural order Malvaceae.

The plant occurs in thought the hotter parts of India. It is used as emollient.

Experimental

About 500 gm the plant Malachra capitata (Linn) was shade dried, powdered and extracted with petroleum ether (40-60°) in a Soxhlet extract for about 70hrs.

The petroleum ether (40-60°) extract was concentrated to a get a yellow viscous fat.

About 50 gm of the above fat was saponified by refluxing it with alcoholic potassium hydroxide. The soap thus obtained was dissolved in water and the unsaponifiable matter was recovered by extraction with ether in a separating funnel.

**Study of the unsaponifiable matter**

The ether from this ethereal extract containing the unsaponifiable matter was distilled under reduced pressure to get the unsaponifiable matter which was when dried over anhydrous sodium sulphate, gave a light yellow product.

On CH, analysis, the unsaponifiable matter analysed for molecular formula C_{29}H_{50}O, M⁺ = 414, m.p. 134-35°C and (....)_D = - 36° (in CHCl₃).

The unsaponifiable matter also responded positively to following; colour reactions, which are characteristic of steroids.

1) A Yellow colour changing to red in Salkowski reaction²,  
2) A violet red colour in Tschugajew reactions³,  
3) Intense pink colour changing to violet in Noller’s reactions⁴ and  
4) A red violet colour in Liebermann-Burchard reaction⁵.

The unsaponifiable matter showed the wave length of maximum absorbance at MeOH

\[ \lambda_{max} = 209\text{mn} \]

Significant bands were observed in the IR spectrum of the unsaponifiable matter and the structural units inferred with the help of available literature⁶-⁹ were at; 3358 (-OH), 2908 (-CH₃ · CH₂), 1640 (>C = CH stretching), 1452 (-CH₃), 1370, 1135,
The unsaponifiable matter when oxidized with chromic acid yielded an oxidation product, m.p. 133-34°C, molecular formula C_{29}H_{48}O, and M^{+} = 412, which was found to give positive Zimmermann test and confirmed the presence of 3-keto group. This observation concluded that the -OH group must be at C-3 and further confirmed that it must be secondary\textsuperscript{14}.

RESULTS AND DISCUSSION

The deep sweep in the available literature\textsuperscript{15-16} concluded that the unsaponifiable matter under examination was identical with the known compound \(\beta\)-sitosterol (m.p, Co-PC, Co-TLC) (I). The identity of the compound was further confirmed by m.p. Co-TLC with authentic sample of \(\beta\)-sitosterol. Compilation of all above facts finally identified the unsaponifiable matter as: \(\beta\)-sitosterol.

REFERENCES

2. Salkowski, E; Hoppe Sevlers, z. 57: 52 (1908).
3. Tschugajew, Chem Zig, 24: 542 (1900).