CHEMICAL STUDY OF PIPER BETEL LEAVES

ABSTRACT
Pentatriacontane, n-triacontanol, hentriacontane, stearic acid, chavicol, β and γ-sitosterols have been isolated from the leaves of Piper betel and characterised.

The leaves of Piper Betel (Vern-Pan, Banarasi) are used most frequently for chewing purposes, are reported to have various medicinal properties, as mentioned in ancient Indian Ayurvedic texts. Its action over the heart (cardiotonic effect) has prompted us to undertake a systematic chemical examination of these leaves.

The powdered leaves (1.5 kg) extracted successively with petroleum ether (40–60), benzene and alcohol, and combined petroleum ether, benzene extract yielded β-sitosterol [\(\text{C}_{29} \text{H}_{50} \text{O}_{3}\cdot \text{OH}, 3.4 \text{ (CH}_3\text{)}, 6 (>\text{C} \equiv \text{C}<), 10.45 (\Delta 22–23)\] and 11.8 (\(\Delta 5\)) \(\mu\), m.p. 136\(^\circ\), acetate 130\(^\circ\) and γ-sitosterol, m.p. 145\(^\circ\), m.m.p. 145\(^\circ\) and acetate, m.p. 141\(^\circ\).

Final confirmation of these substances was achieved by mixed melting point determination and from superimposable I.R. Hentriacontane (\(\text{C}_{33} \text{H}_{66} \text{O}_{3}\)), 3-43, 4-32, 4-98, 5-72, 5-12, 6-78, 8-16, 13-60 and 13-78 \(\mu\), m.p. 62–63\(^\circ\), n-tetracontanol [\(\text{C}_{28} \text{H}_{50} \text{O}_{3}\), 2.94 (OH), 3.51 (CH\(_3\)), 4.14, 6.89, 13.78, 14.8 \(\mu\), m.p. 71\(^\circ\), acetate, m.p. 68\(^\circ\) and a hydrocarbon which appears to be pentatriacontane [\(\text{C}_{35} \text{H}_{70} \text{O}_{3}\• 3.5, 6-9, 7-3, 13-75 and 13.9 \mu\); NMR 1.27 δ (6H, CH\(_3\)), 0.88 δ (6H, CH\(_3\))], m.p. 74\(^\circ\) (Found: C, 85.6; H, 14.5; C\(_{35}\)H\(_{72}\) requires: C, 85.3; H, 14.6%) were isolated as usual from this fraction after chromatography over alumina column. The identity of these compounds was duly established.

The saponifiable portion gave only stearic acid after lead salt–ethanol process; its identity was confirmed from S.E., I.V. data and from mixed melting point determination (69\(^\circ\)). Furthermore, ester fractionation and co-chromatography with an authentic sample of same over thin layer plates of silica gel G proved its identity finally as stearic acid. It has been also possible to identify chavicol, 3 : 5 dinitrobenzoate, m.p. 104\(^\circ\), present in the leaves of this species.

The alcoholic extract yielded a brownish powder after precipitation with ether, and this responded for the tests of cardiotonic glycosides. This showed a marked cardiotonic effect over anaesthetised dog, and is found to contain glucose units only.

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A NOTE ON "PALAEOBATHYMETRY OF THE REEF CARBONATES AT THE BASE OF TRICHINOPOLY UPPER CRETACEOUS, S. INDIA"*

"The depth at which a sediment and its associated fauna were deposited is one of the most evasive pieces of environmental evidence sought by sedimentary geologists" (Swinchatt, 1969). Paleontology offers conflicting and mutually contradictory evidence to this effect (Newmann, 1967; Hornibrook, 1968). But paleobathymetry is of importance in the reconstruction of past depositional environment in epicontinental and shelf seas. The petrographic evidence of algal micritic envelopes around carbonate skeletal fragments seems to offer a semiquantitative lead in this direction (Swinchatt, op. cit.).

An extensive sedimentological investigation of the Reef Carbonates at the base of Trichinopoly Upper Cretaceous, S. India (Rao, 1969) revealed the occurrence of algal micritic envelopes (algal borings) (Fig. 1) around

![Fig. 1. Photomicrograph of an organic fragment with algal micritic envelope. The grain is entirely corroded (dark part) and micritization has progressed even to the central part of the fragment. The surrounding spar is neomorphic in origin from the original algal micrite, × 15.](image)

2. — and —, Ibid., 1964, 2, 463.
7. Weygand, F., Ibid., 1940, 73, 1259.