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N-METHYLFLINDERSINE FROM *SPATHELIA SORBIFOLIA*

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Key Word Index—*Spathelia sorbifolia*; Rutaceae; *N*-methylflindersine; chemotaxonomy.

Abstract—The isolation and taxonomic significance of *N*-methylflindersine from *S. sorbifolia* is discussed.

The Taxonomic Position of Spathelia.

The Jamaican plant now known as *Spathelia sorbifolia* (L.) Fawc. & Rendle was first validly described as *Spathe* P. Browne and then as *Spathalea* L. Linnaeus[1] revised the generic name to *Spathelia* and, as most later authors adopted this name for the genus, it has been conserved over *Spathe*, and *Spathalea* is superfluous. *Spathelia simplex* L. is the type species but the oldest specific epithet is '*sorbifolia*' and this must be used.

As the concept of natural order or family evolved during the first half of the last century, the circumscription of these groups changed. *Spathelia* was associated with several poorly related genera in Terebinthaceae.[2] When these genera were redistributed, Bentham and Hooker[3] placed *Spathelia* in Simarubeae (Simaroubaceae). Engler and Prantl[4] later outlined a clear and detailed concept of Rutaceae in which they included *Spathelia* in a monotypic subfamily Spathelioideae, Engler being influenced by the presence of secretory cavities to distinguish Rutaceae and Simaroubaceae.

Two further genera, from tropical South America, have been described in this affinity. *Sohnreyia* Krause was placed in Rutaceae, subfamily Toddalioideae by Engler and Prantl,[5] and *Diomma* Engler ex Harms was placed rather uncertainly in Simaroubaceae but was confirmed in that family by Cronquist.[6]

An intensive study of two species of *Diomma* comparatively with *Sohnreyia* and *Spathelia* has shown, on the basis of several anatomical and morphological characteristics, that these genera should be included in the subfamily Spathelioideae.[7] Melchior in Engler[8] has accepted this view.

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[2] DE CANDOLLE, A. P. (1825) *Prodromus* **2**, 84.
[3] BENTHAM, G. and HOOKER, J. D. (1862) *Genera Plantarum* **1**, 308, 315.
[4] ENGLER, A. and PRANTL, K. (1897) *Die natürliche Pflanzenfamilien* **III** [4], 111, 172.
[5] ENGLER, A. and PRANTL, K. (1931) *Die natürliche Pflanzenfamilien* **19A**, 187.
[6] CRONQUIST, A. (1945) *Brittonia* **5**, 469.
[7] STERN, W. L. and BRIZICKY, G. K. (1960) *Mem. N.Y. Bot. Gard.* **10**, 38.
[8] ENGLER, A. (1964) *Syllabus der Pflanzenfamilien* **2**, 265.

Up to this point, with the exception of one species of doubtful identity from Mexico, all species of *Spathelia* had been described from the northern Caribbean (Jamaica, 2 species; Cuba, 10 species; Bahamas, 1 species). Cowan and Brizicky[9] at the same time as describing 2 new species from Venezuela, transferred *Sohnreyia excelsa* and both species of *Diomma* to *Spathelia*, a genus when thus more broadly construed of 18 species.

Chemical Constituents of Spathelia sorbifolia

We have isolated several chromones from this plant.[10] Chromones had not previously been encountered in the Rutaceae,[11] and, to our knowledge, there has been no other report of chromones from this family. However, we have also isolated a seco-ring A tetranortriterpene from *S. sorbifolia*.[12] These degraded triterpenes with a seco-ring A are commonly found in the Rutaceae[13] and there have been only two reports,[14] both from the Meliaceae, of such compounds in another family. We now report the isolation of the 2-quinolone, *N*-methylflindersine.[15]

Chromatography on alumina of the benzene extract of the roots, followed by preparative TLC of the fractions gave, in addition to previously isolated chromones,[10] a compound of m.p. 83–5°. The NMR spectrum shows bands for a 2,2-dimethylchromene [δ 1·51 (6H); 5·57 and 6·82 (1H doublets, J 10 Hz)], an *N*-methyl (δ 3·70) and four aromatic protons in the range δ 7·10–8·15. The IR spectrum (ν_{max} 1640, 1613 and 1580 cm^{-1}) shows absorption for a 2-quinolone,[16] in addition to that for the chromene. These data suggest that the compound is *N*-methylflindersine, previously prepared from flindersine,[15] but not reported as a natural product. This was confirmed by comparison with an authentic sample prepared from flindersine.

The isolation of *N*-methylflindersine provides strong support for the classification of *Spathelia* in the Rutaceae.[17,18] As indicated in the taxonomic discussion above, *Spathelia* is aberrant in the Rutaceae. The discovery of chromones in both *Spathelia* and *Neochamelae* (*Cneorum*, Cneoraceae)[19] serves to maintain a link between these two families in the order Rutales.[18]

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