The Structure of a Ring-A-seco-nor-Triterpenol from Hoya australis Leaf Wax

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The main triterpenol, isolated from the alcohol fraction of very old green leaves of Hoya australis R. Br. ex Traill, has been identified as 3,4-seco-3-nor-olean-12-en-1-ol by mass spectral and NMR data.

In a previous publication the isolation and partial structure of a new β-amyrin-derived seco-nor-triterpenol from the leaf wax of Hoya australis was described [1]. Recently we isolated related compounds from the leaf wax of other Hoya species [2], one of which was identified as the C₄(23)-saturated seco-A-acid methyl ester of β-amyrin [3].

Results and Discussion

With the knowledge of the mass spectral behaviour of the above mentioned triterpenoid seco-acids and of now available literature on the mass spectrometry of seco-ring-A-triterpenoids [4, 5] we again interpreted the analytical data of the seco-nor-triterpenol from Hoya australis and concluded that it has the depicted structure.

The mass spectral fragment m/z 369, characteristic for seco-A-derivatives [4] is formed by the loss of C₅H₉O, the upper remainder of ring A comprising the carbon numbers 1 and 2. The hydroxyl group is thus located on this part. Because NMR data point to a methyl group next to it, it must be on C₁. Location of the hydroxyl group on the other part of the A-ring, e.g. on C₄ is ruled out as no C-3 fragment bearing oxygen is lost which would then be the case.

Although this structure represents a new natural occurring triterpenol, its structural features are not new. The C₄(23)-saturated configuration is rather unusual in the respect that most natural ring-A-seco-derivatives instead have a C₄(23) double bond. But also our C₄(23)-saturated seco-acid methyl esters isolated from Hoya lacunosa leaf wax [3] and the 3,4-seco-lup-20(29)en-30ic acid methyl ester isolated from Caralluma bauhartii (belonging to the family of the Asclepiadaceae too) by Castro et al. [5] have an isopropyl group at C₅. The hydroxyl group at C₁ has been found earlier in isocalaminthadiol, a 3,4-seco-ursene isolated from the genus Satureia (Labiatae) by Romeo et al. [6].

The accumulation in the wax of old green leaves of Hoya species of pentacyclic triterpenoids, the derived 3-ketones, the 3,4-seco-acid methyl ester derivatives and the C₁-hydroxy-seco-nor-alcohols (23) makes it likely that these compounds — in this order — represent intermediates of a biogenetic oxidative route leading to ring-A degraded triterpenoids.

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