

Unusual Coumarin Patterns of *Pelargonium* Species Forming the Origin of the Traditional Herbal Medicine Umckaloabo

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The coumarin patterns of *Pelargonium sidoides* DC. and *Pelargonium reniforme* CURT., forming the origin of the herbal medicine “umckaloabo”, were analysed and compared for therapeutic equivalence. For both species, members of tri- and tetraoxygenated coumarins almost exclusively were present in the respective metabolic pools. However, the roots of *P. sidoides* and *P. reniforme* expressed conspicuously distinct coumarin variations, with umckalin, its 7-*O*-methyl ether, 7-acetoxy-5,6-dimethoxycoumarin, 6,8-dihydroxy-7-methoxycoumarin, 6,8-dihydroxy-5,7-tetramethoxycoumarin, artelin and three unique coumarin sulfates as uncommon metabolites of this class of secondary products of *P. sidoides*. Furthermore, the highly oxygenated but known coumarins fraxinol, isofraxetin and fraxidin were associated with the new 8-hydroxy-5,6,7-trimethoxycoumarin as representatives of *P. reniforme*. Of the twelve identified coumarins only the two species shared the ubiquitous scopoletin and the unique 6,7,8-trihydroxycoumarin. From the oxygenation patterns it is evident that the majority of these *Pelargonium* coumarins match the recently established basic structural requirements for marked antibacterial activity, i.e. the presence of a methoxy function at C-7 and an OH group at either the C-6 or C-8 position. The current data on the coumarin profiles of each *Pelargonium* species also indicate a previous erroneous identification of the plant material claimed to be *P. reniforme*. Absence and presence of umckalin and its 7-*O*-methyl ether defines *P. reniforme* and *P. sidoides*, respectively.