

B051 Low molecular plant constituents as novel suppliers for characters in cladistic phylogenetic analyses: alkaloids in the Convolvulaceae

Thomas Schimming^a, *Kristina Jenett-Siems*^a, *Ludger Witte*^{†b}, *Daniel F. Austin*^c and *Eckart Eich*^a

^a Freie Universität Berlin, Institut für Pharmazie (Pharmazeutische Biologie), Königin-Luise-Straße 2-4, D-14195 Berlin, Germany.

^b Technische Universität Braunschweig, Institut für Pharmazeutische Biologie, Braunschweig, Germany. ^c Conservation and Science Department, Arizona-Sonora Desert Museum, 2021 N. Kinney Road, Tucson, AZ 85743, USA.

The Convolvulaceae comprise 54 genera and about 1850 species showing cosmopolitan distribution with its centre in the tropics. Systematic uncertainties mainly exist regarding intrafamilial (tribal) relationships. A cladistic analysis of the family based on morphology included 128 characters such as habit, vegetative morphology and anatomy, reproductive structures, embryo features and chromosome numbers (1). To date, this family has not yet been the subject of broad molecular phylogenetic work. However, preliminary attempts in this direction were presented recently (2). Since convolvulaceous species produce a wide variety of alkaloids such as pyrrolidines, tropanes, pyrrolizidines, ergolines, 140 alkaloid characters of 8 different structural types (including the 4 above-mentioned ones) were chosen for a cladistic assay performed by PAUP/MacClade. 120 species taken from 29 genera were analysed by GC-MS.

The broad and differential occurrence of tropane alkaloids (simple tropanes, aliphatic and aromatic tropanol esters) in the different genera and tribes turned out to be of distinct significance. Moreover, pyrrolizidine alkaloids as well as ergoline alkaloids are valuable markers in certain clades of the family. Combined cladistic phylogenetic analysis of both, phytochemical and morphological characters should be promising.

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B052 Secondary metabolites of willow *Salix alba* L. and *Salix fragilis* L. vary in different regions of central Balkan peninsula

I. Ionkova^a, *V. Ganey*^b, *St. Ninov*^a, *V. Tzvetanova*^a, *I. Paskaleva*^b and *T. Stefanov*^b

^a Faculty of Pharmacy, Department of Pharmacognosy, Dunav Str. 2, 1000 Sofia, Bulgaria ^b Faculty of Medicine, Department of Biochemistry, Zdrave 2, 1000 Sofia, Bulgaria.

Salix alba L. (White willow) and *Salix fragilis* L. (Crack willow) are closely related species with a widely sympatric distribution throughout Europe (1). The lack of clear-cut diagnostic characters, together with the fact that intermediate morphological forms largely dominate in the field and that interspecific controlled crosses are possible lend support to the hypothesis that *S. alba* and *S. fragilis* may hybridise frequently in nature (2). Phytochemical determination of tannins and total flavonoids are interesting markers to document metabolic diversity within and between populations from pure species and hybrids as defined by morphology and genotyping.

The samples (leaves, catkins and branches) from different population and their hybrids from different regions of central Balkan peninsula were collected during different stages of vegetation. Total phytochemical were extracted and the amounts of flavonoids and tannins were analysed. Flavonoid and tannin contents varied between 1-5 and 5-21%, respectively. The main flavonoids are isoquercitrin and naringin and its glucosides.

Our results provide detailed information about the metabolic diversity in natural populations of *S. alba* L. and *S. fragilis* L. and their hybrids. The data derived from our phytochemical and morphological analysis may be helpful to study genetic diversity and DNA polymorphism in both willow species.

References: 1. RD Dixon and NL Palva (1995) Plant Cell, 7, 1085 2. R. Tegelberg, R. Julkunen-Titto (1999), Joint Meeting, Leiden, Netherlands, July 26-30, Book of Abstracts.