

Iridoid Patterns in *Galium* L. and Some Phylogenetic Considerations

Maya Iv. Mitova^{a,*}, Mincho E. Anchev^b, Nedjalka V. Handjieva^a
and Simeon S. Popov^a

^a Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria. Fax: ++3592-700-225. E-mail: mayamit71@hotmail.com

^b Institute of Botany, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

* Autor for correspondence and reprint requests

Z. Naturforsch. **57c**, 226–234 (2002); received October 23/November 23, 2001

Galium, Iridoids, Phylogeny

From 19 species of *Galium*, members of 6 European sections of the genus, 24 compounds were isolated, namely 16 iridoid glucosides, 2 secoiridoid glucosides and 6 triterpene saponins (the later found only in *G. rivale* (Sibth. & Sm. Griseb.) The iridoid content was analyzed by thin layer chromatography – densitometry. An effort was made to clarify interspecies relationships, based on the obtained results and previous data. Generally, a nearly uniform iridoid pattern in the studied species was observed. Nevertheless, some distinctions gave reason the following chemical characters to be treated as taxonomic markers: iridoids, seco-galioside (characteristic of *G. mollugo* group), iridoids V1 and V2 (*G. humifusum* Bieb. and *G. verum* L.), 6-acetylscandoside (*G. incurvum* group and *G. verum*) and the triterpene saponins, rivalioside A and rivalioside C (characteristic of *G. rivale*). The studied species regarding to the iridoids could be attributed to three lines of evolutionary differentiation. One line is leading to the differentiation of *G. rivale*. It contains specific triterpenoids as well as iridoid acids, which show parallel development of both glyceraldehyde 3-phosphate/pyruvate and mevalonate biosynthetic routes in this species. A second line includes *G. mollugo* and *G. incurvum* species groups and the species *G. humifusum* and *G. verum*. Variety of iridoid esters, hydroxy and carboxy derivatives of iridoids and secoiridoids characterised this line. Third line comprises the remaining studied species, members of different sections and species groups. They possess a nearly identical iridoid pattern, which suggests a convergent evolution regarding to the iridoids.