Two-Stage System for Micropropagation of Several *Genista* Plants Producing Large Amounts of Phytoestrogens

Maria Łuczkiewicz[a,*] and Arkadiusz Piotrowski[b]

[a] Department of Pharmacognosy, Medical University of Gdańsk, al. Gen. J. Hallera 107, 80-416 Gdańsk-Wrzeszcz, Poland. E-mail: mlucz@farmacja.amg.gda.pl
[b] Department of Biology and Pharmaceutical Botany, Medical University of Gdańsk, al. Gen. J. Hallera 107, 80-416 Gdańsk-Wrzeszcz, Poland

* Author for correspondence and reprint requests

Z. Naturforsch. **60 c**, 557–566 (2005); received March 8, 2005

A two-stage method for *in vitro* propagation of six *Genista* species from shoot tips was developed. Multiple microshoot cultures were obtained by growing the shoot tip explants on Schenk and Hildebrandt medium supplemented with 9.84 μM 6-(γ,γ-dimethylallylamino)-purine and 0.99 μM thidiazuron. The best shoot elongation was achieved on Schenk and Hildebrandt medium containing 4.92 μM indole-3-butyric acid. The rooting of shoots brought best effects (100%) on Schenk and Hildebrandt medium with 2.68 μM 1-naphthaleneacetic acid. HPLC analysis indicated that six-month-old regenerated plants as well as the herb of intact plants produced a rich set of simple flavones (derivatives of luteolin and apigenin) and isoflavones (derivatives of genistein, daidzein, formononetin and biochanin A). Multiple microshoot cultures of all species produced no simple flavones at all. *In vitro* shoots accumulated selectively a rich group of phytoestrogens in the form of aglucones, glucosides and esters (derivatives of genistein and daidzein). Cultures obtained *in vitro* synthesized many times more isoflavones than the intact plants. In all shoots which were micropropagated the dominating compound was genistin (*e.g.* shoots of *G. tinctoria* – ca 3281.4 mg per 100 g dry weight). Possible influence of tissue differentiation on isoflavone content under *in vitro* and *in vivo* conditions is discussed.

Key words: Genista Species, Isoflavones, Multiple Shoot Proliferation