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Regenerative capacity and phenolic acids productivity of different types of *Inula britannica in vitro* root culture systems

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The flowers of the medicinal plant *Inula britannica* L. (Asteraceae) have been used in Traditional Chinese Medicine, alongside with *Inula japonica* Thunb. (Asteraceae), for the treatment of tracheitis, bronchitis, hepatitis and alimentary tract neoplasm and its dried roots and leaves – for knife wounds, furunculosis and cough [1]. Britannin and gaillardin productivity of shoot cultures of the plant has been previously investigated [2]. Here, the effect of plant growth regulators (PGR) on the regenerative capacity of leaf, stem and root explants has been studied and further on genetically non-transformed root cultures were developed and maintained in liquid medium supplemented with PGR. The identification and semi-quantification of phenolic acids was performed by means of HPTLC and UPLC techniques. Results were compared between root samples derived from whole plant grown sterile in the basic Murashige and Skoog culture medium and the roots grown in the PGR supplemented liquid systems. It was established that roots maintained in liquid culture medium supplemented with 0.01 mg/l benzyl adenine (BA) in combination with 0.5 mg/l naphthaleneacetic acid (NAA) or indole-3-butyric acid (IBA) displayed over five times higher levels of 3,5-dicaffeoylquinic and chlorogenic acids as compared with the roots derived from the sterile whole plant. In addition, NAA supplementation, as compared with IBA and cultivation at 16/8 h photoperiod, as compared with dark growth, enhanced the production of the polyphenolic acids *in vitro*. Being ubiquitous in the plant kingdom and especially abundant in roots, due to their allelopathy functions, caffeoylquinic acid compounds also represent interest in human medicine because of their potent antioxidant, anti-inflammatory and anti-spasmodic activities. The present findings might be further used for the targeted scale-up delivery of phytopharmaceuticals of *in vitro* root systems of *I. britannica.*

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2. A Trendafilova, M Todorova, V Ivanova, D Antonova, D Dimitrov, E Wolfram, K Danova (2016) Effect of in vitro culture on the content of biologically active sesquiterpene lactones in Inula britannica shoots. CIPAM 2016, 29 May -1 June, Coimbra, Portugal.