## **Plants and their Pathogens**

## LS.3.P120 Evaluation of polyphenol and isoflavon profile correlated with antioxidant capacity of *Genistella sagitallis* and *Genista tinctoria* extracts

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Reactive oxygen and nitrogen species have been involved in many physiological and pathological processes which cause tissue damage. Non-enzymatic antioxidants such as polyphenols prevent the negative effect of oxidative stress to different cellular biomolecules such as proteins and DNA.

Genistella sagittalis and Genista tinctoria are species widespread in the Romanian spontaneous flora, traditionally used for their tinctorial, nutritional and medicinal properties (antihepatotoxic, hormonals, diuretic etc.), due to polyphenols (including isoflavons) among others. To evaluate the polyphenolic profile of these species were analyzed the aerial parts. The total polyphenolic content (TPC) was obtained by modified Folin-Ciocalteu method. The identification and quantification of isoflavons was made by LC/MS. In addition, the evaluation of relative antioxidant activity was made by DPPH, ABTS, ORAC, SNP (growth of silver nanoparticles by the extracts of polyphenols) methods [1,2,3,4]. By LC/MS we have determinated the presence of free isoflavons (daidzein, genistein, formononetin) and their 7-O-glycosides (daidzin, genistin, ononin) "Table1". Genista tinctoria had an increased level of genistin, genistein and daidzein along with formononetin and ononin [5]. Genistella sagittalis was remarked due to a higher content of genistin. TPC values expressed in Gallic Acid Equivalents (mg GAE/g) were 35,5±021 for Genista tinctoria and 5,7±0,35 for Genistella sagittalis. ORAC assay (mM TE/g) showed 65,84±2,04 for Genistella sagittalis and 68,12±1,77 for Genista tinctoria. The results of DPPH assay (mM TE/g) consisted in 24,72±0,94 for Genistella sagittalis and in 236,83±7,84 for Genista tinctoria. ABTS assay (mg TE/g) showed a value of 94,44±5,09 for Genista tinctoria and one of 40,49±4,88 for Genistella sagittalis. The growth of silver nanoparticles (SNP)based method for evaluating the antioxidant capacity of polyphenolic compounds was also used [5]. The reduction of Ag<sup>+</sup> to spherical silver nanoparticles (SNPs) by polyphenols in the presence of trisodium citrate and siver seed produced a very intense absorbtion band of SNPs at 423 nm. The absorbance of SNPs allows the quantitative spectrophotometric detection of polyphenols. Using this method there were found 0,38 ±0,74 µg GAE/g for Genistella sagittalis extract and 0,51±0,63 Genista tinctoria extract [2].

The results of this method was correlated with those of another electron transfer (ET)-based TAC assay (Folin-Ciocalteu), hydrogen atom transfer (HAT)-based (ORAC), and mixed ET/HAT-based (ABTS, DPPH) assays.

Statistical Analysis was performed using Excel software. Results were expressed as the mean  $\pm$  standard deviation (SD), Pearson coefficient.

All antioxidant activity values obtained were highly correlated with the total polyphenol and isoflavon content. *Genista tinctoria* had a higher total polyphenol and isoflavon content and also a higher antioxidant activity then *Genistella sagittalis*. Due to their isoflavon content both species can be used as an alternative to phytoestrogens.

- 2. M. Ozyurek , N.Gungor, S. Baki, K. Guclu and R. Apak, Anal Chem (2012), 84 pp. 8052-8059.
- 3. M.B. Arnao, et al. Phytochem Anal (2001),12(2):138-143.
- 4. W. Brand-Williams et al, Lebensmittel Wissenschaft und Technologie (1995), 28:25-30.
- 5. C.S.Fodorea et al, *Chemistry of Natural Compounds* (2005), 41(4):400-403.

<sup>1.</sup> D. Huang, et al, J Agric Food Chem (2005), 53(6):1841-1856.

Sample µg/ml	daidzin	genistin	ononin	daidzein	genistein	formononetin
Genistella sagittalis	2,89	51,60	0,89	0,55	9,02	0,84
Genista tinctoria	22,32	130,17	0,24	8,81	73,77	0,68

Table 1. Content of isoflavon compounds from the native extracts