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Тези доповідей

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# PHENOLIC CHARACTERIZATION OF CYNIPID GALL (CYNIPIDAE) EXTRACTS BY HPLC

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**Summary.** Gall is the abnormal growth that the host plant creates to trap a foreign organism (cynipid wasp) to protect itself. The importance of the galls has increased recently with the aim to find cure against diseases as well as finding new molecules that possess antioxidant and antimicrobial activities for using them in food and pharmaceutical industries.

**Introduction and purpose.** The cynipid wasps (Cynipidae) induce gall on their host plant species which mostly Fagaceae, Rosaceae, Lamiaceae, Asteraceae and Papaveraceae. The gall provides nourishment, shelter and protect for the cynipids. The galls have been used in folk medicine for various treatments due to their bioactive compounds (phenolic, flavonoid, tannin, etc.). It is wide known as antioxidant possess resistence aganist radiation damage living cells.
Most common bioactive compounds include secondary metabolites such as antibiotics, mycotoxins, alkaloids and phenolic compounds. Phenolic compounds comprise flavonoids, phenolic acids, and tannins, among others. The bioactive compounds due to their ability to provide cure against some diseases like cancer and diabetes. The purpose of the study was to investigate characterization of phenolic compounds of cynipid galls for future investigations.
**Materials and methods.** Phenolic compounds of the gall samples (*Andricus kollari, A. mitratus, A. polycerus, Cynips quercusfolii, Diplolepis fructuum*) were analyzed by high performance liquid chromatography (HPLC). Detection and quantification were performed with a diode array detector (SPD–M20A), a LC–20AT pump, a CTO–10ASVp column heater, SIL–20ACHT auto sampler, SCL–10Avp system controller and DGU–14A degasser. The mobile phases were A: 3.0% formic acid in distilled water and B: methanol. Methanol was used to dissolve samples, and then 20 µL of this solution was injected into the column. Gallic acid, 3,4-dihydroxybenzoic acid, 4-hidroxybenzoic acid, 2,5-dihydroxybenzoic acid, chlorogenic acid, vanilic acid, epicatechin, caffeic acid, p-coumaric acid, ferulic acid, rutin, ellagic acid, naringin, quercetin, and cinnamic acid were used as standards. The differentiation and quantitative analysis were made by comparing the standards. The quantity of each phenolic compound was expressed as µg per gram of the extract.
**Results and conclusion.** According to result of HPLC analysis, the highest phenolic compound values of cynipid gall extracts are given for each species. The major phenolic constituents in the ethanolic gall extracts: *Andricus kollari*-caffeic acid (8026,541 µg/g), *A. mitratus*-epicatechin (62,826 µg/g), *A. polycerus*-caffeic acid (74183,088 µg/g), *Cynips quercusfolii*-caffeic acid (83604,683 µg/g) and *Diplolepis fructuum*-caffeic acid (10828,161 µg/g). Consequently, these phenolic compounds can be isolated and may be used as a natural agent in pharmacological and food applications as well as in medical radiology.

**Keywords:** HPLC, gall, Cynipidae, phenolic compound, extract.