INORGANIC AND PHYTOCHEMICAL CHARACTERISATION OF *Populus Nigra L.* BUDS EXTRACT

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Abstract

Poplar it is known to be an efficient bio accumulator of soil chemicals, allowing its use to remedy the soil of toxic elements being the subject of many studies [1]. Many parts of this tree can be used as active ingredients, but the most valuable are the buds. The aim of the study was to conduct a phytochemical characterization of *Populus nigra L*. buds extract obtained from the western areas of Romania and to determine the inorganic elements as well as the in vitro antiproliferative evaluation on the A549 human lung cancer cell line in terms of viability and cytotoxicity. Regarding the elements contained, the formulation of a phytopharmaceutical product includes several important aspects such as: the medicinal plant from which the active principles come (evaluation of the content of toxic elements, especially in the case of plants that are used for phytoremediation) and evaluation of the finished product to define active principles; ensuring that it is not contaminated with toxic metals either from the handling process or from the extractive process.

The inorganic elements concentrations were below the limit of detection for As, Co and As, whereas Cd = 0.019 µg/g, Mn = 0.59 µg/g, Cr = 0.79 µg/g, Ni = 3.28 µg/g, Cu = 6.66 µg/g, Zn = 14.84 µg/g, Fe = 39.00 µg/g and Al = 2109.87 µg/g. Pg ethanolic extract has a low contribution to trace elements in dietary intake, but the most valuable remark is regarding its safety, namely, the tested Pg extract does not produce any harmful effect of metal toxicity during therapeutic application [2].

The Pg extract was found to contain twelve different phenolic compounds consisting of dihydroxybenzoic acid, caffeic acid, chicoric acid, protocatechuic acid, apigenin-glucuronide, chrysoeriolglucuronide, 3-caffeoylquinic acid, 5-caffeoylquinic acid, tremuloidin, salicin, pinostrobin, and tremulacin. Apigenin–glucuronide was the major compound, found in an amount of 55.828 mg/g chlorogenic acid equivalent (CCE). Among all the phenolics identified, chryglucuronide and tremuloidin were also the most abundant compounds. Other results obtained for the phenols, are in line with those reported by other authors [3].

Different concentrations (10, 25, 50, 75, 100, and 150 µg/mL) of the extract were tested for the in vitro antiproliferative potential on A549 human lung cancer cell line. Poplar bud extract induced a significant decrease of tumor cell viability in a dose dependent manner with an IC50 = 72.49 µg/mL. Poplar bud extract can be regarded as a promising candidate for future studies involving lung cancer [4,5].

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