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Metabolomics Studies on Asteraceae Family Plants to Find Cytotoxic Drug Candidates †

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Abstract: Cancer is one of the major causes of death globally, which involves uncontrollable growth and spread of abnormal cells. Cytotoxic plant extracts may act on various cancer cells. In this study cytotoxicity of five cultivated Asteraceae plant extracts (*Echinacea purpurea* L., *Achillea filipendulina* L., *Achillea millefolium* L., *Tanacetum parthenium* L., *Silybum marianum* L.) has been investigated on different cell lines. Metabolomic profiling of the plants was performed using the LC-qTOF-MS system. In vitro MTT assay applied for determine cytotoxic activity of samples on HT29 (Human colon cancer cells) and L929 (mouse fibroblast) cells. Correlation has been examined between cytotoxicity and metabolomic profile to find active seconder metabolites ($r \geq 0.60$, $r \leq -0.60$). Total 585 seconder metabolites have been detected for five Asteraceae plants. 118 metabolite showed positive correlation with the cell viability on L929 cell lines while 79 metabolites showed negative correlation. 112 metabolites showed positive correlation with cytotoxic activity on HT29 cell lines while 70 metabolites showed negative. 18 uncommon metabolites were detected in *S. marianum* extract which has selective cytotoxic activity on cell lines. 16 common metabolites were highly correlated positively as selective cytotoxic activity. These results showed us correlation analyzes between activity and metabolomic profile can be an easy and appropriate method to determine active seconder metabolites in plant extracts.

Keywords: metabolomics; cytotoxicity; Asteraceae; HT29; L929