



## **<sup>1</sup>H NMR-BASED METABOLOMICS AND CANNABINOID ANALYSIS OF MEDICINAL *CANNABIS* TRICHOMES DURING FLOWERING PERIOD**

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*Cannabis sativa* L. trichomes are known as the main site of cannabinoids production, which are the responsible compounds for most biological activities of the plant. This study reports <sup>1</sup>H NMR based-metabolomics and cannabinoids analysis of trichomes of four medicinal *Cannabis* varieties, Bediol, Bedica, Bedrobinol, and Bedrocan, in order to investigate cannabinoids production and metabolites profiles of the trichomes during the last four weeks of flowering period. Analysis of <sup>1</sup>H NMR spectra revealed totally six identified cannabinoids in the chloroform extracts, Δ<sup>9</sup>-tetrahydrocannabinolic acid [THCA], cannabidiolic acid [CBDA], cannabichromenic acid [CBCA], cannabigerolic acid [CBGA], Δ<sup>9</sup>-tetrahydrocannabinol [THC] and cannabidiol [CBD], and 20 compounds in the water extracts including sugars, amino acids, and other acidic compounds. Different metabolite profiles within trichomes varieties were revealed by Partial least-squares-discriminant analysis (PLSDA) models of metabolomics. Important differential metabolites in this discrimination were THCA and CBDA in the chloroform extracts, and asparagine, choline, fructose and glucose in the water extracts. Furthermore PLSDA classified trichomes of every variety based on their harvested weeks. THCA was found as an important discriminant compound in the chloroform extracts of every variety. Meanwhile, threonine, asparagine and fructose were detected as differential metabolites in the water extracts of each variety. This study indicated that *Cannabis* trichomes during flowering period produced metabolites, particularly cannabinoids in different amounts depending on time and the plant variety. Furthermore it is the first report for monitoring metabolites production in plant trichomes using <sup>1</sup>H NMR-based metabolomics.