ABSTRACT

The most important compounds present in *Cannabis sativa* are cannabinoids, which are synthesized and stored in its trichomes. Three cannabinoids which includes, CBCA, THCA and Δ9-THC were successfully identified in the *Cannabis* trichomes. Using multivariate analysis methods and ^{1}H NMR spectroscopy, *C. sativa* cultivars from 3 different regions, i-e Feroz khel, Anjani and Bizot, were subjected to metabolomic profiling. NMR spectroscopy provided information on qualitative chemical profiles of *Cannabis* extracts. PCA model was unable to distinguish all the samples collected from three regions of orak zai. While PLSDA model was able to differentiate metabolites of *Cannabis* samples present in three groups namely Bizot (which includes CBG, CBN, Proline and Trigonelline), Anjani (Choline, inositol and leucine) and Feroz Khel (includes CBD and THC. The spectra of ^{1}H NMR from the extracts of *Cannabis* variety along with the metabolomics analysis obtained from the ^{1}H NMR spectra indicates that NMR is a good substitute as compared to classical chromatography, providing informative and accurate data without any requirement of sample pre-treatment. Different classes of primary and secondary metabolites were analyzed by comparing peaks of NMR with standard compounds.