Mass spectrometric analysis of cannabinoids in hemp in relation to health risk assessment

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Structure of some cannabinoids:



tetrahydrocannabinol (THC),



acidic form THCA



cannabidiol (CBD)



acidic form CBDA



canabichromene (CBC)



cannabinol (CBN),

HC

canabigerol (CBG)

Ultra performance liquid chromatography (UPLC) - quadrupole orthogonal acceleration time-of-flight (Q-Tof) mass spectrometer.



Figure 1. Total ion chromatogram of hemp oil.



Figure 2. Selected ion chromatogram of m/z 313 in hemp oil sample for calculation of THC/CBD quantitative ratio.



Figure 3. High resolution mass spectrometry report of elemental composition of THC deprotonated molecule at m/z = 313.

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Figure 4. MS-MS spectrum of deprotonated molecular ion of THC at m/z = 313.



Conclusions

- LC-MS method was used in our application for rapid determination of THC to CBD ratio in hemp.
- Identification of other cannabinoids and ingredients in cannabis oil to characterize and grade oil material for medical treatment.
- The information of THC/CBD ratio in hemp food supplement is of primary importance to the medical personnel prescribing cannabis for medicinal and therapeutic purposes (1).
- Ultra performance liquid chromatography (UPLC) hybrid quadrupole orthogonal acceleration time-of-flight (Q-Tof) mass spectrometer is successfully applied for identification and characterization of products of hemp.

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