

9<sup>th</sup> World Congress on

# Chemistry and Medicinal Chemistry

May 13-14, 2019 | Prague, Czech Republic

## Chemical characterization and evaluation of the antibacterial activity of essential oils from fibre-type *Cannabis sativa* L. (hemp)

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The main phytochemicals that are found in *Cannabis sativa* L. are cannabinoids and terpenes, reaching up to 42% of the identified molecules. Terpenes represent the largest group of *Cannabis* components and they are responsible for its aromatic properties. Even if many studies have been focused on cannabinoid components in *Cannabis*, little research has been carried out on its terpenic compounds

In the light of all the above, in the present work the phytochemical composition of seventeen essential oils from different fibre-type varieties of *Cannabis sativa* L. (hemp) was deeply investigated by means of GC-FID and GC-MS techniques. In total 89 compounds were identified and the semi-quantitative analysis revealed that  $\alpha$ - and  $\beta$ -pinene, myrcene and  $\beta$ -caryophyllene are the major terpenes in all the essential oils analysed.

The antibacterial activity of hemp essential oils against some pathogenic and spoilage microorganisms isolated from food and food processing environment was also determined. The inhibitory effects of the essential oils were evaluated by both Agar Well Diffusion assay and Minimum Inhibitory Concentration (MIC) determination. By using the agar diffusion method and considering the zone of inhibition, it was possible to preliminarily verify the inhibitory activity

on most of the examined strains. The results showed that the lowest MIC values were obtained, in particular, with six hemp essential oil against the Gram-positives bacteria, such as *Listeria monocytogenes*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Enterococcus faecalis* and against *Bacillus* spp. spoilage bacteria.

The results obtained in this study demonstrate that hemp essential oils can reduce or inhibit bacteria proliferation, thus proving a valid support to reduce microorganism contamination especially in the food processing field.

### Speaker Biography

Virginia Brighenti graduated in 2013 in Pharmaceutical Chemistry and Technology at the Department of Life Sciences of the University of Modena and Reggio Emilia. In 2018 she got a PhD degree in Clinical and Experimental Medicine. Currently she covers a post-doctoral fellowship position in Medicinal Chemistry at the Department of Life Sciences of the University of Modena and Reggio Emilia. Her research activity is mainly focused on the development of innovative techniques for the extraction and analysis of bioactive natural products, and on the isolation of new bioactive compounds of natural origin with antioxidant and antiproliferative activity. She is the author of 15 papers in ISI indexed international journals, and more than 20 congress communications (oral and poster).

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