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ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

5.3 = Bioactivities of cannabidiol: focus on plant growth stimulation

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Cannabis sativa L., belonging to the Cannabaceae family, was one of the earliest species cultivated by humans for fibers as far back as 4,000 BC. The medicinal use of this plant was reported in the world's oldest Pharmacopoeia (1). Cannabis contains varying concentrations of more than 100 naturally occurring phytochemicals, with tetrahydrocannabinol (THC) and cannabidiol (CBD) being the two predominant cannabinoids. Furthermore, CBD has also been identified in hemp essential oil (EO) extracted from various parts of the plant such as leaves, flowers, seeds, and inflorescences as well as in seed oil. The identification of specific cannabinoid receptors in the nervous system, the discovery of the endogenous cannabinoid anandamide (2), together with the numerous biological activities exhibited by CBD (3), have renewed interest in cannabis studies. Additionally, edible oils enriched with 5% to 30% CBD have gained significant popularity among the general population in recent years. The objectives of this comprehensive research were: 1) to compare edible oils (hemp, coconut, argan, and pumpkin) enriched with 10% CBD from various producers and assess them through diverse bioassays, and 2) to uncover potential biological activities of the product that could be harnessed for various applications. In addition, the pure oils were also examined. The study evaluated the fatty acid content, as well as antibacterial, antifungal, antioxidant, cytotoxic, and phytotoxic activities (Fig. 1). The CBD samples presented antimicrobial activity against *Pseudomonas fluorescens*, *Bacillus cereus*, *Bacillus megaterium*, *Bacillus mojavensis*, *Xanthomonas campestris*, and *Xanthomonas vesicatoria*, at concentrations of 10 and 5 g/L, and also antifungal activity against *Alternaria alternata*, *Penicillium italicum* and *Aspergillus flavus*. DPPH and FRAP assays showed greater activity in CBD-supplemented samples compared to pure oils and vitamin E. In cell lines (IPEC-J2 and Caco-2), reduced cell proliferation and viability were observed after 24 hours of incubation with CBD samples. The oils showed progerminative effects. The tested activities were linked to the presence of CBD in the oils. Current research has brought new insights into the application of CBD. While much of the existing literature has focused on the effects of CBD on the nervous system, the current study shows that CBD could also be used for different purposes. Its antimicrobial and antifungal activities were confirmed. Additionally, the results obtained in the two antioxidant assays and on two cell lines in cytotoxic tests, suggest the possible use of these CBD samples as natural products with antioxidant and cytotoxic effects. The observed results after applying CBD samples to plant seeds demonstrated that, in some cases, a significant change in root growth occurred. The presented results belong to a pilot study that can be considered a starting point for further investigations.

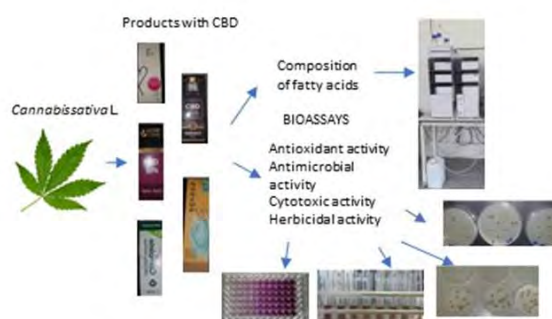


Fig. 1. Bioactivities of CBD samples

- 1) H. L. Li, H. Lin (1974) Econ. Bot., 28, 437–447
- 2) B.R Martin, R. J. Mechoulam, R. K. Razdan (1999) Life Sci., 65, 573–595
- 3) S. Hayase (2018) J. Asia-Pac. Stud., 3, 171–181