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Cellular effects of cannabinoids from Cannabis sativa in vitro

N. Kolar[1]*, E. E. Bankoglu[1] & H. Stopper[1]

[1] Institute for Pharmacology and Toxicology, Wuerzburg, Germany
** nicol.kolar@uni-wuerzburg.de*

Products containing Cannabis-derived cannabinoids such as cannabigerol, cannabidiol, and cannabinol can be bought worldwide without restrictions. Often these products are advertised as highly beneficial for human health; however, the research community is divided. Some studies have shown that Cannabis phytoproducts have antioxidant, anti-inflammatory, and anticarcinogenic properties. Still, others claim that the bioactivity of these phytoproducts is not adequately characterized, and their accurate benefits and disadvantages are unclear. Therefore, this study aimed to investigate the cellular effects of pure cannabigerol, cannabidiol, and cannabinol on the human lymphoblastoid cell line, TK6, and the human hepatoma cell line, HepG2, using the cytokinesis–block micronucleus assay. Cannabidiol significantly increased micronucleus formation in human lymphoblastoid but not in hepatoma cells. Furthermore, cannabidiol caused a significant reduction of cytokinesis–block proliferation index in both cell lines. However, the lack of increment in micronucleus formation in cannabidiol-treated hepatoma cells differs from published data and needs further investigation regarding the reasons for this difference. The preliminary data for cannabigerol and cannabinol showed that they could possibly induce micronuclei formation in both cell lines at concentrations ≥ 10 µM. At the same time, the effects on cytokinesis–block proliferation index are still unclear. Therefore, these cannabinoids require further experiments to elucidate their effects in vitro.

Keywords:
Cannabis sativa; cannabinoids; genotoxicity; proliferation.