

ABSTRACT

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Viscum album Homeopathic Preparations and Biological Effects: Phytochemical Markers and Seasonal Aspects in *In Vitro* Models

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Background: The cytotoxic effects of *Viscum album* mother tinctures (VAMT) and their corresponding ultra-diluted solutions have been observed *in vitro* models. A metabolomic approach has revealed influences of host trees, seasonal variations, methodologies, and solvents used on the phytochemical characteristics of mistletoe.

Methods: Whole fresh specimens of *V. album* were harvested from different host trees, including *Malus domestica*, *Quercus robur*, *Quercus petrae*, *Ulmus carpinifolia*, *Abies alba*, and *Pinus sylvestris*. To assess potential variations in the chemical composition of VAMT attributable to geographical and soil factors, samples were collected from various locations in Switzerland during both summer and winter. All harvests adhered to a standardized protocol, and VAMT and homeopathic potencies (dH, cH, LM) were prepared according to standard methodologies [1-3]. The biological effects of VAMT, as well as the corresponding ultra-diluted solutions, were evaluated in tumor (Yoshida, Molt-4, MDA-MB-231, B16F10, SCC-25) and non-tumor cells (HaCat, L929, LLC-PK1).

Results: MTT and WST assays indicated no mitochondrial damage in Molt-4 and Yoshida cells incubated with 2dH potency [4]. In contrast, in melanoma cells (B16F10), a decrease of reactive oxygen species and inflammatory cytokines levels were detected after incubation with 12dH and 5LM, derived from mistletoe harvested from *Quercus robur* (VAMTQ), thus ruling out the denaturation phytochemical components during dynamization process. Seasonal factors significantly influenced the biological effects of VAMTQ, with summer preparation demonstrating more significant cytotoxic potential than winter, particularly in the kidney (LLC-PK1) and human breast cancer cells (MDA-MB-231). **Conclusion:** This research underscores the biological effects of mistletoe preparations, even in the absence of specific molecules. Furthermore, the cytotoxic effects depend on the specific physiological characteristics of the cells, emphasizing the importance of basic research models in understanding the mechanisms of action associated with *Viscum album* preparations.

Keywords: *Viscum album*, Homeopathic potencies, ROS, Inflammation.

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References

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