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Biological effects of Viscum album homeopathic preparations in kidney proximal tubule cells: an in vitro study

Rodrigo dos Santos Pinto Duarte 1*, Michelle Nonato de Oliveira Melo 1, João Vitor da Costa Batista 2, Giovanna Gomes Martins 1, Adriana Passos Oliveira 1, Rosilane Taveira da Silva 3, Marcelo Einicker-Lamas 3, Stephan Baumgartner 2, Carla Holandino 1

1 - Laboratório Multidisciplinar em Ciências Farmacêuticas, Universidade Federal do Rio de Janeiro, Brazil; michellenonato.far@gmail.com; giovannagmartins10@gmail.com; passosoliv@hotmail.com; cholandino@gmail.com
2 - Society for Cancer Research (Hiscia Institute), Arlesheim, Switzerland; j.dacostabatista@vfk.ch; st.baumgartner@vfk.ch
3 - Instituto de Biofísica Carlos Chagas Filho, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; rtsilva@biof.ufrj.br; einicker@biof.ufrj.br
* rodrigo.spd@hotmail.com- https://orcid.org/0000-0001-9030-5403

Abstract

Introduction: Viscum album (VA) preparations of different host trees have been used for the treatment of different diseases with mainly on cancer1 and cardiovascular diseases2. However, the mechanisms related to the mistletoe hypotensive potential are poorly investigated. Therefore, the objective of this work was to evaluate the cytotoxicity, the Na+/K+ ATPase activity and the Reactive Oxygen Species (ROS) generation induced by winter and summer Viscum album mother tinctures (TMVA), as well as by their potentized samples (6cH, 12cH and 30cH), in porcine proximal tubule renal cells (LLC-PK1).

Methods: For the cytotoxicity evaluation, after 24h of treatment with TMVA (from Quercus robur, Malus domestica, Ulmus carpinifolia, Pinus sylvestris and Abies alba), at concentrations ranging from 0.5% to 2.5% (V/V), the 3-(4,5-dimethyl-2-thiazolyl)-2, 5-diphenyl-2H-tetrazolium bromide (MTT) was added. The same procedure was done with the potentized samples, after systematic control evaluation, in which the dynamized water was blindly tested. For the Na+/K+ ATPase and ROS assays, cells were treated only for 30 min, using 1.5% (V/V) of TMVA of Malus domestica, Pinus sylvestris and Abies alba and their respective homeopathic potencies.

Results: The MTT assay showed a dose-dependent cytotoxicity related only to the summer Quercus Robur TMVA (p<0.05). The Na+/K+ ATPase evaluation (n=9) indicated no enzymatic activity alterations at 30min of incubation time. Conclusion: Further experiments are under development with higher incubation cellular times (24 and 48 h) to confirm the Na+/K+ ATPase effects induced by potentized and non-potentized V. album samples. Additionally, the gene expression of Na+/K+ ATPase, by western blot, and the ultrastructural cellular aspects, using transmission electron microscopy, will be performed.

Keywords: Viscum album, potentized systems, cytotoxicity, Na+/K+ ATPase, ROS.

References


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