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CARDIOPROTECTIVE EFFECT OF TWO CAMEROONIAN SPICES AGAINST DOXORUBICIN INDUCED CARDIOTOXICITY ON H9C2 CELLS

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Background: Doxorubicin (Dox) is a highly active chemotherapeutic drug used to treat several solid and hematologic tumors. However, its clinical use is limited by its severe cardiotoxic side effects including, reactive oxygen species (ROS) production. The aim of this study is to investigate the protective effects of plants extracts used as spices against the Dox-induced toxicity on H9c2 cells and elucidates their mechanism of action.

Methodology: The cytoprotective effects of the extracts of Afrostyrax lepidophyllus (GEH) and Monodora myristica (AEH) were tested by assessing the growth and viability of H9c2 cells treated with doxorubicin in presence of the extracts using sulforodamine B (SRB) and resazurine assays. The effects of extracts on morphological and biochemical changes of the cells were explored through the mitochondrial membrane potential (ΔΨm), the production of ROS, and the activity of caspases 3 and 9.

Results: The SRB assay showed that the samples AEH (60.56±9.83%) and GEH (65.26±9.29%) at the concentration of 25 µg/mL have revealed a significant ($P<0.05$) protective effect of cell growth and the resazurine assay confirmed their effect on cell viability with the respective values of 68.94 ± 6.00% and 74.68 ± 5.84% that were significantly higher compared to the control treated with Dox. We found an increase of the ΔΨm in presence of the samples: GEH (68.75±7.99%) and AEH (68.41±3.21%) compared to the group receiving the Dox (56.91±4.18%). Also we noted a decrease production of ROS in living H9C2 cells and reduction of the activity of the caspases 3 and 9. The morphological assessment showed a reduction of apoptotic cells, nucleus fragmentation and the TMRE showed an increase of the ΔΨm in the presence of AEH and GEH.

Conclusion & Significance: AEH and GEH extracts demonstrated protective effect against the deleterious effects of Dox on cardiomyocytes. Their mechanism implied the reduction of apoptosis in cardiac cells and oxidative stress. Therefore, they could be used as inhibitor of Dox cardiotoxicity to improve cancer treatment.

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