

PROTECTIVE EFFECT OF SESQUITERPENOID ZERUMBONE ON SELECTED MAMMALIAN CELL LINES AGAINST FUNGICIDE MANCOZEB INDUCED CYTOTOXICITY

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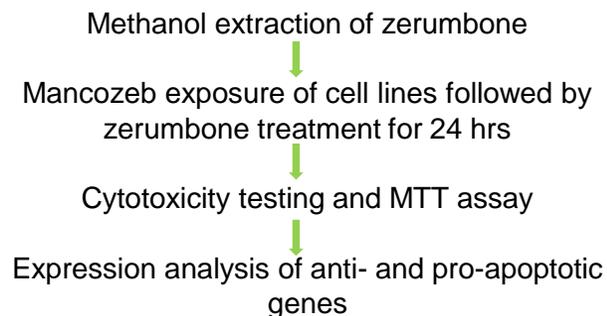
Abstract

Zerumbone, the sesquiterpenoid principal metabolite in rhizome of medicinal plant, *Zingiber zerumbet* displays diverse bioactivities, including protection of cells from oxidative stress. Present study was undertaken to investigate the ameliorative effect of zerumbone on cytotoxicity induced in HEK-293 and Vero cell lines by the widely used fungicide, mancozeb-75% WP. The results indicates the protective role of zerumbone on kidney cell lines as evidenced by histological analysis and reduction in apoptosis caused by mancozeb exposure.

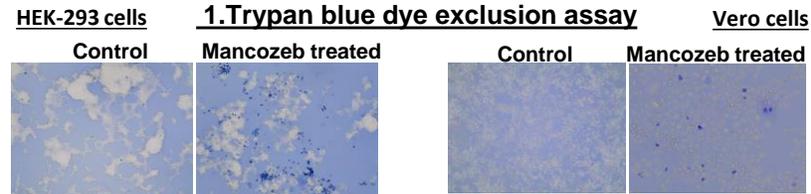
Introduction

- Mancozeb [ethylene-bis-dithiocarbamate; (EBDC)], is a contact fungicide, widely used in agriculture.
- Targets sulfhydryl groups of enzymes and disrupt fungal biochemical processes.
- Excessive use reported to adversely impact human health and environment by inducing oxidative stress and endocrine disruption.
- Secondary metabolites with natural antioxidant activity like zerumbone, constitutes a potent candidate molecule that can be explored for its ameliorative effect.

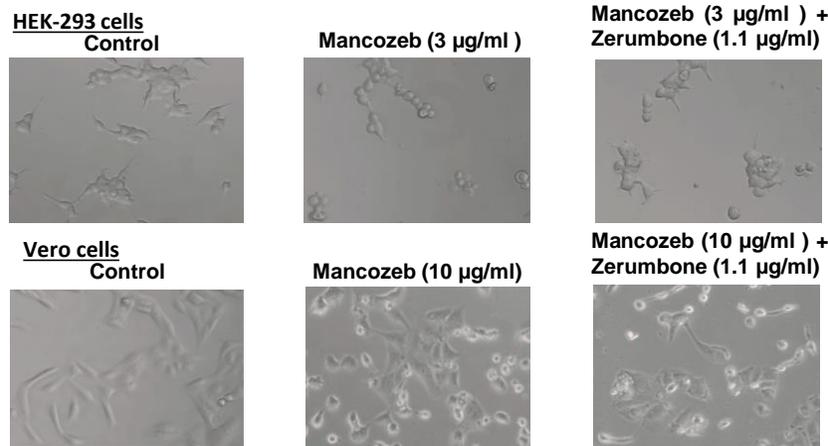
Methodology



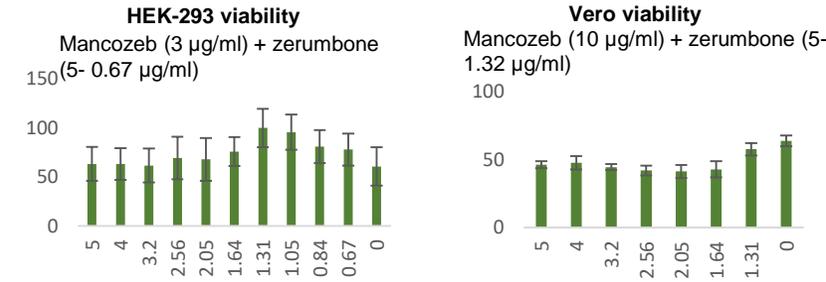
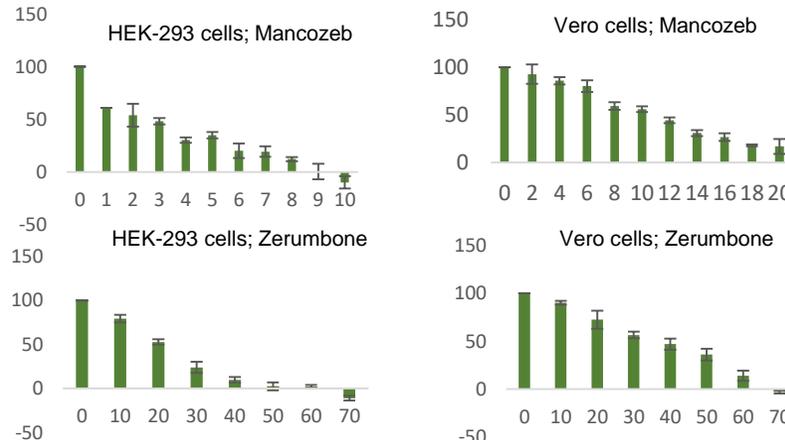
Results



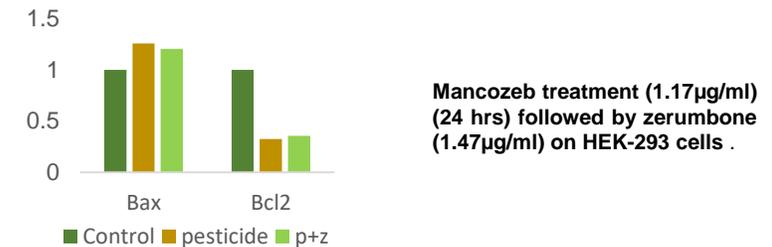
2. Microscopic analysis of cell morphology



3. MTT assay ;Dose dependent cytotoxicity



4. Gene expression analysis



Conclusions

- Reduction in viability in both HEK293 and Vero cells on mancozeb treatment with respective IC₅₀ of 2.46 µg/ml and 10.97 µg/ml
- Zerumbone (0.8-2 µg/ml) treatment reduced mancozeb induced cell death in HEK-293 cells
- Zerumbone treatment decreases mancozeb induced expression of *bax* and increased expression of *bc2* gene in HEK 293 cells
- Study reveals protective effect of zerumbone in reducing the cytotoxicity induced by mancozeb

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