

Euryops pectinatus L. Flower Extract Inhibits P-glycoprotein and Reverses Multi-Drug Resistance in Cancer Cells: A Mechanistic Study

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Abstract

Euryops pectinatus is a South African ornamental plant belonging to family Asteraceae. The present work evaluates the cytotoxic activity and phytochemical profile of the flower extract. Metabolite profiling was performed using HPLC-PDA-ESI-MS/MS. Total phenolics and flavonoids content were assessed. Cytotoxicity was evaluated against 6 different cancer cell lines using MTT assay. The possible underlying mechanism was proposed. We analyzed whether the extract could overcome the resistance of multidrug-resistant cancer cells for doxorubicin. The effect of combination of E. pectinatus with doxorubicin was also studied. Additionally, the potential inhibitory activity of the identified phytochemicals to P-glycoprotein was analyzed using in silico molecular docking. Twenty-five compounds were tentatively identified. Total phenolic and flavonoid contents represented 49.41 ± 0.66 and 23.37 ± 0.23 mg/g, respectively. The extract showed selective cytotoxicity against Caco2 cells but its main effect goes beyond mere cytotoxicity. It showed strong inhibition of P-glycoprotein, which helps to overcome multidrug resistance to classical chemotherapeutic agents. In silico molecular docking showed that dicaffeoyl quinic acid, kaempferol-O-rutinoside, rutin, and isorhamnetin-O-rutinoside exhibited the most potent inhibitory activity to P-glycoprotein involved in tumor progression. Euryops pectinatus flower heads could have promising selective cytotoxicity alone or in combination with other chemotherapeutic agents to counteract multidrug resistance.

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