"*The Mechanism of Cytotoxic activity of the active fraction isolated from Costus woodsonii*"

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Costus woodsonii belongs to the Costaceae family. Although this family is well-reported to have diverse pharmacological activities at different plant parts, there has been no report of bioactivities study on *C. woodsonii*. In our laboratory, screening of different plant parts of *C. woodsonii* Maas revealed that rhizome extract showed strong cytotoxic activity against numerous cancer cells. The aim of this study was to (1) isolate the active phytochemicals from the *C. woodsonii* rhizome extract and (2) to elucidate the possible mechanisms of this bioactive compound.

C18 column chromatography was employed to isolate the bioactive compound(s) present in the extract. Purification of the bioactive *C. woodsonii* rhizome sequential extract had isolated and identified the bioactive compound, dioscin, with the aid of HPLC, LC-MS/MS and NMR. Dioscin, diosgenin-3-yl-α-L-rhamnopyranosyl-(1→2)-[α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranoside, is a steroidal saponin and has a molecular formula of $C_{45}H_{72}O_{16}$ with a molecular weight of 868.4845. The effect and mechanistic study of dioscin was tested on oral squamous cell carcinoma. As previously proven in our lab, H314 OSCC cells which is resistant to cisplatin treatment while H103 is the sensitive line. These two cell lines were chosen in this study and were treated with or without dioscin. Our preliminary cytotoxic studies showed that dioscin significantly inhibits cell viability of both H314 and H103 OSCC. Flow cytometry analysis indicates the compound induced cell cycle arrest of H314 cells at G0/G1 phase. In addition, dioscin was demonstrated to induce apoptosis in H314 cells. A significant suppressive effect on H314 cells motility in the scratch and transwell migration assay were also observed. Taken together, the present work showed that dioscin affects the cell cycle, induces apoptosis and affects the migration of OSCC cells. Findings of this study suggest that dioscin could be a potential candidate drug in the treatment of oral cancer.

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