# Rotenoid compounds, isolated from dried root of plant and their inhibitory activities on cancer cells

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**Key words:** 6-deoxyclitoriacetal (6-DA), rotenoids, cytotoxic activity.

**Background:** 6-Deoxyclitoriacetal (6-DA), isolated from dried roots of *Stemona collinsae* Craib, and derivatives of 6-DA modified at C-11 position with morpholine showed relative cytotoxic activities to doxorubin, a commercial drug, against various types of human carcinoma cell lines such as breast carcinoma cell (BT474), colon carcinoma (SW260), gastric carcinoma (KATO3) , hepato carcinoma (HEP-G2), and lung carcinoma cell (CHAGO) [*Sangthong, S.,et al,2011*], therefore, in this work, we present the cytotoxicity of derivatives of stemone, stemonal compounds.

**Objective:** To enhance the cytotoxicity of rotenoid compounds

**Methods:** 6-Deoxyclitoriacetal (6-DA), stemone and stemonal are rotenoid and it derivative were extracted from the dried roots of *Stemona collinsae* Craib using $CH_2Cl_2$, isolated by silica gel column chromatography and analyzed by TLC visualize using UV light. Tosylated stemonone (1), 6-Deoxyclitoriacetal di(4-dimethylamino) benzoate (3) and Stemonone diamine (4) were synthesized. The structure of rotenoid compounds and its derivative as showed in figure 1. were confirmed by $^{1}H$ ,$^{13}C$ NMR spectroscopy and Mass spectroscopy.The cytotoxic activity was evaluated by the MTT assay against human cancer cell lines of; lung carcinoma (CHAGO), hepato carcinoma (Hep-G2), gastric carcinoma (KATO), colon carcinoma (SW260), and human breast carcinoma (BT474)

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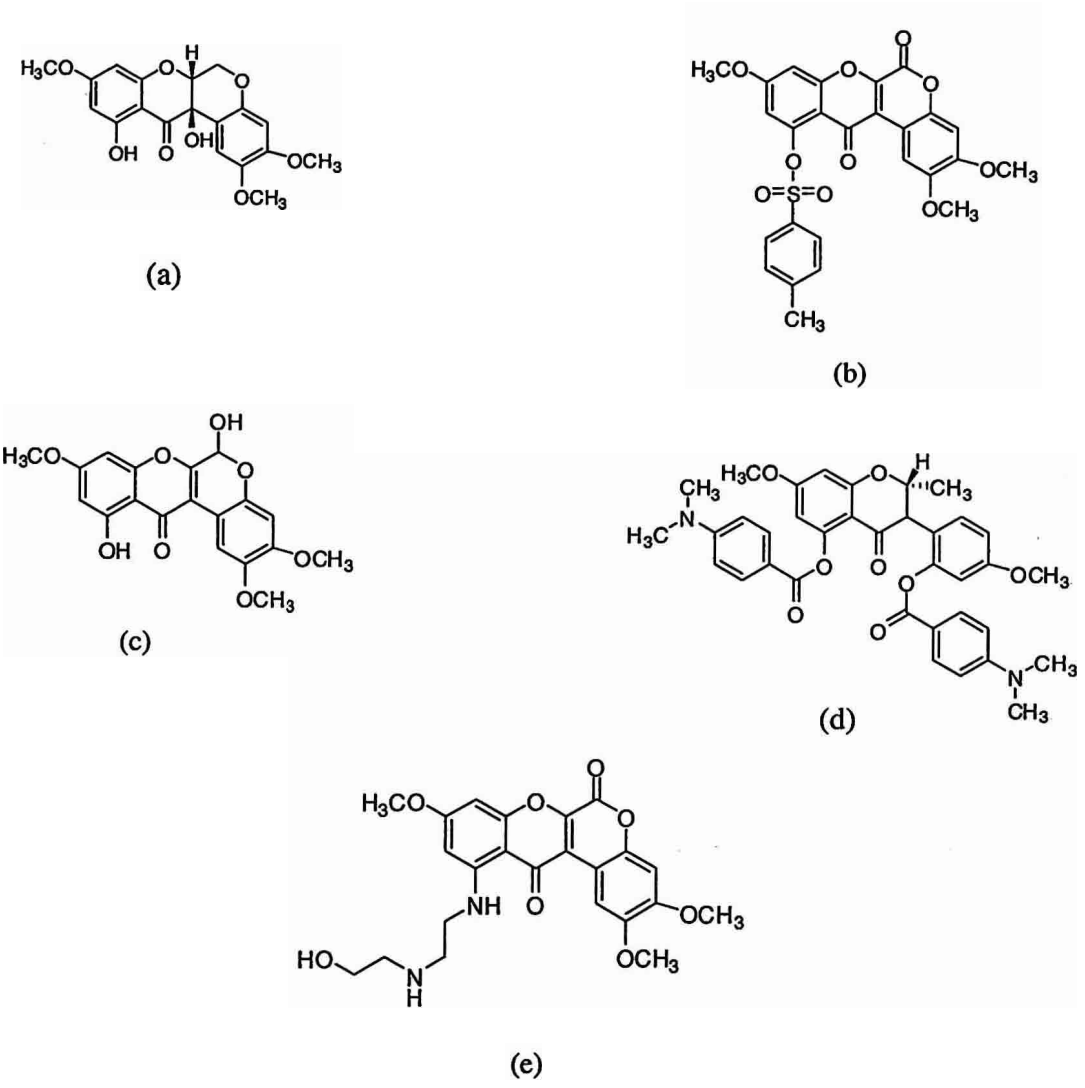


**Figure 1.** Representation the structure of (a) 6-DA, (b) tosylated stemonone, (c) stemonal , (d) 6-deoxyclitoriacetal-di-(4-dimethylamino) benzoate and (e) stemonone diamine.

**Results:** 6-DA showed $IC_{50}$ value against cancer cell lines; CHAGO and HEP-G2 at 5.098 and 4.980 μM, respectively, but are inactive in BT474, KATO and SW260 cell lines. Compound 1 and 3 are inactive against all tested cancer cell lines, while Compound 2 showed $IC_{50}$ values of ??? against cancer cell lines; BT474, CHAGO and HEP-G2 but inactive cytotoxicity against KATO and SW260. For compound 4 showed active cytotoxictiy against only CHAGO cancer cell line at $IC_{50}$ value 3.687 μM.

**Table 1.** The inhibitory of activity ($IC_{50}$) of test compounds

| Compound | $IC_{50}$ (μM) | | | | |
|---|---|---|---|---|---|
| | BT474 | CHAGO | HEP-G2 | KATO | SW260 |
| Doxorubicin | 1.53±0.45 | 2±0.32 | 1.23±0.39 | Inactive | 1.22±0.01 |
| 6-Deoxyclitoriacetal | Inactive | 5.1± 1.23 | 4.98±0.87 | Inactive | Inactive |
| Compound 1 | Inactive | Inactive | Inactive | Inactive | Inactive |
| Compound 2 | 4.84±0.22 | 4.96±0.19 | 4.37±0.73 | Inactive | 4.61±0.50 |
| Compound 3 | Inactive | Inactive | Inactive | Inactive | Inactive |
| Compound 4 | Inactive | 3.69±1.46 | Inactive | Inactive | Inactive |

**Conclusion:** Pre- study of this work demonstrated that stemonal (2) has a strong cytotoxic activity and against various type of cancer cell lines such as BT474, CHAGO, SW260 and HEP-G2. While 6-DA showed cytotoxicity to CHAGO and HEP-G2 cancer cell line less than stemonal. For tosylated stemonone (1), which is stemonone derivative, and 6-deoxyclitoriacetal-di-(4-dimethylamino) benzoate (3) which is 6-deoxyclitoriacetal derivative has no cytotoxic acitivity to cancer cell lines. For stemonone diamine (4) is the one of stemone derivative showed strong cytotoxicity to CHAGO cancer cell line than its parent compound.

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