ANTI-OSTEOPOROSIS COMPOUNDS ISOLATED FROM CHROZOPHORA TINCTORIA: BIOCHEMICAL STUDY

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Osteoporosis is a chronic disease in which the skeleton loses a weighty proportion of its mineralized mass and mechanical pliability. Currently available antiosteoporotic agents suffer adverse effects that include elevated risk of thrombosis and cancer. In this regard, phytochemicals are effective and safer alternatives. In the current work, six flavonoids were isolated from *Chrozopha tinctoria* and identified as amentoflavone (**1**), apigenin-7-*O*-β-D-glucopyranoside (**2**), apigenin-7-*O*-6 ``-*E*-*p*-coumaroyl-β-D-glucopyranoside (**3**), acacetin-7-*O*- β-D-[α-L-rhamnosyl(1→6)]3``-*E*-*p*-coumaroyl glucopyranoside (**4**), apigenin-7-*O*-(6``-*Z*-*p*-coumaroyl)-β-D-glucopyranoside (**5**) and rutin (**6**). Structures of isolated compounds were established by NMR and mass spectral data, in addition to referring to literature data. Exposure of MCF7, MG-63 and SAOS-2 cells to subcytotoxic concentrations of the compounds under investigation leads to enhanced proliferation. Among them rutin was selected for subsequent studies in SAOS-2 cells. DNA flowcytometric analysis of cell cycle distribution revealed that rutin did not induce any significant change in the proliferation index of SAOS-2 cells. Assessment of osteogenic gene expression revealed that rutin enhanced the expression of osteocyte and osteoblast-related genes and inhibited osteoclast and RUNX suppressor genes. Biochemically, rutin enhanced alkaline phosphatase activity and vitamin D content and decreased the osteoporotic marker acid phosphatase. In conclusion, rutin exhibited potent proliferative and ossification characteristics in bone cells.