

ISOFLAVONES FROM *CALPURNIA AUREA* SUBSP. *AUREA* AND THEIR ANTICANCER ACTIVITY

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Abstract

Background: *Calpurnia aurea* is an African medicinal plant used in many countries in Africa to treat a range of medical conditions or disorders. Extracts of the plant were shown to be active in antibacterial and antioxidant assays as well as against lice, ticks and maggots. The aim of the study was to isolate the phytochemical constituents from the plant and to test them in appropriate bioassays dependent on the compounds isolated in order to provide a rationale for the use of the plant in ethno-medicine or to provide some information on its constituents. **Materials and methods:** The stem and bark of the plant was extracted with organic solvents of varying polarity and the extracts separated and purified using column chromatography. The isolated compounds were identified by NMR spectroscopy and the compounds were tested for their *in vitro* anticancer activity against breast (MCF7), renal (TK10) and melanoma (UACC62) human cell lines using an in house method developed at the CSIR, South Africa. **Results:** The isoflavones, 4',5,7-trihydroxyisoflavone (**1**), 7,3'-dihydroxy-5'-methoxyisoflavone (**2**), 7-hydroxy-4',8-dimethoxyisoflavone (**3**), 7-acetoxy-4',8-dimethoxyisoflavone (**4**) and 3',7-dihydroxy-4',8-dimethoxyisoflavone (**5**), a pterocarpan (3-acetoxy-9-methoxypterocarpan) and a quinolizidine alkaloid (calpurnine) were isolated from the stem and bark of *Calpurnia aurea*. The tetrasubstituted isoflavone **5** was found to be the most active in the three cell lines amongst all the compounds tested. This was followed by trisubstituted isoflavone **2**. **Conclusion:** The isoflavones showed moderate activity against the renal, melanoma and breast cancer cell lines tested against, with the isoflavones **2** and **5** showing the best activity of the compounds tested. These isoflavones may have a synergistic effect with other anticancer drugs.