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In vitro evaluation of the comprehensive antimicrobial and antioxidant properties of *Curtisia dentata* (Burm. F) C. A. Sm: Toxicological effect on the human embryonic kidney (HEK293) and human hepatocellular carcinoma (HepG2) cell lines

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Curtisia dentata is traditionally used in African traditional medicine to treat and manage sexually transmitted infections, diarrhoea, stomach complaints and as a purgative. *C. dentata* leaves were collected from Buffelskloof Private Nature Reserve in Mpumalanga province, South Africa. The ethanol, chloroform, ethyl acetate and acetone extracts were evaluated for antimicrobial activity using micro dilution assay against ATCC strains of *Escherichia coli*, *Pseudomonas aeruginosa, Mycobacterium smegmatis, Mycoplasma hominis, Candida albicans* and some clinical isolates of *Moraxella catarrhalis, Proteus mirabilis* and *Staphylococcus aureus* isolated from HIV patient. Acetone extract exhibited lowest MIC of 0.01 mg/ml against *Candida albicans* compared to other extracts. Besides lupeol, betulinic acid and ursolic acid, β-sitosterol was isolated for the first time from *C. dentata* leaves and exhibited moderate antimicrobial activity with MIC values ranging from 0.20 to 6.25 mg/ml. Furthermore, the ethanol extract and the four isolated compounds revealed MIC index of less than 4 suggesting that their effect is bactericidal. The ethanol extract revealed the best total activity of 2400 ml/g against *Mycoplasma hominis* compared to other extracts. Lupeol exhibited low selectivity index indicating that the compound had the similar cytotoxicity and antimicrobial activity. The cytotoxicity of the isolated compounds was further investigated against the Human Embryonic Kidney (HEK293) and Human Hepatocellular Carcinoma (HepG2) cell lines using the MTT assay. Ursolic acid exhibited the lowest LD50 of 122.4 µg/ml against HEK293 cell line, while lupeol exhibited LD50 of 278.8 and 289.4 µg/ml against HEK293 and HepG2, respectively. The ethyl acetate and acetone extracts were further investigated for antioxidant activity against 2,2-diphenyl-1-picrylhydrazyl (DPPH). The acetone extract exhibited 53.6% inhibition against DPPH at a concentration of 1 mg/100 ml. The findings of the current work validate the use of the plant species in the treatment of various human infections. The biological activity of the extracts, particularly the ethanol extract, may possibly be attributed to the isolated compounds. There is a need to explore the biological activity of the derivatives of the compounds isolated against other human pathogenic strains.

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Isoindolines as potential modulators of human histone deacetylase: New discovery

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Cancer is a disease that is taking great importance in societies worldwide, so that has been earmarked much of the world's resources in finding an effective treatment. Currently, it is intended that new anticancer drugs to be more selective and do not generate side effects. This has been possible with new technologies that allow us to develop drugs with high selectivity to act at a specific level by inhibiting important processes in the cancer cells. The aim of this work was to develop a series of isoindolines as inhibitors of HDAC (Histone Deacetylase), a key enzyme in the transcription of genetic information; the purpose of these ligands is inhibition of histone deacetylase leading to a hyper-acetylation state to allow transcription of anti-oncogenes like NFκB, p53, Ku70, tubulin, among others. The results demonstrate that our compound decreases cell viability at the concentration of 1x10-3 M at 24 and 48 hours, the results were obtained by two methods: through spectroscopy at 540 nm and cell counting performed by a cell counter. The compound decreased the cell viability 50% at 24 hours and 20% at 48 h ($p<0.05$). In spite of these excellent results we found a second effect that is related with cell proliferation at concentrations lower than 1x10-7 M, setting a new question on the table: what is the mechanism of this biphasic effect? Therefore, it is necessary research in different cell lines to test their proliferative effect and its possible applications.