4th African Pharma Congress

June 20-21, 2016 Cape Town, South Africa

South African plants and skin cancer

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Nancer is considered to be one of the major causes of death worldwide. Cancer occurrence and cancer related death numbers seem to be increasing in Africa, Asia and Central and South America. Currently, more than 100000 cases are reported each year in South Africa. Skin cancer is considered the most prevalent cancer in South Africa. The ethanolic extracts of South African plants were investigated for their potential for anti-cancer activity against squamous cell (A431) carcinoma. The plants were investigated for their cytotoxicity on a human skin cancer cell line and a non-cancerous cell line using the sodium 3'-[1(phenyl amino carbonyl)-3,4-tetrazolium]-bis-[4-methoxy-6-nitrobenzene sulfonic acid hydrate (XTT) Cell Proliferation Kit II. The extract's antioxidant activity was determined by measuring the extract's ability to scavenge 2, 2-diphenyl-1-picrylhydrazyl radical (DPPH); nitric oxide (NO) radical and the superoxide (O₂) radical. The mechanism of action of the extracts was determined using confocal microscopy. The extracts of samples, "HO" and "CM" showed the highest cytotoxic activity on the A431 cells with an IC50 of of 15.5 and 26.9µg/ml respectively, whereas the IC₅₀ values of the other extracts (Euclea crispa, Sideroxylon inerme and Terminalia prunioides) ranged from 41.8 µg per ml to 158.6 µg per ml. The CM fruit extract also showed high inhibition of the DPPH free radical (5.1 µg per ml) but not for the nitric oxide free radical (180.3 µg per ml) or the superoxide radical (166.7 µg per ml). Furthermore, the A431 cells showed signs of apoptotic cell death after exposure with various concentrations (12.5-50 µg/ml) of the CM fruit extract. CM showed significant activity against A431 cells and high radical scavenging activity against the DPPH free radical. From the confocal microscopy images morphological characteristics of apoptosis were observed.

Biography

Namrita Lall has completed her PhD from the University of Pretoria and was a Visiting Scientist at the University of Illinois, Chicago and Kings College London. She has published more than 100 papers in peer reviewed journals. She is also the Co-Inventor of 14 national and international patents. In 2014, she received the Order of Mapungubwe: South Africa's highest honour from Honourable South African President, Jacob Zuma, in recognition of her research. The highlight of her academic career has been her nomination for a National Research Chair in Plant Health products from IKS, which was awarded by the NRF/DST in 2016, which is her current position at the University of Pretoria, South Africa.

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