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Green solutions for skin-ageing

South African plants were selected for investigation on the basis of their traditional uses for skin-disorders. South Africa has a wealthy supply of plants (about 23,500 species of higher plants) together with a high degree of endemicity (36.6%), of which 4000 plant taxa are ethno medicinally used and approximately 500 species are used in traditional medicine by an estimated 70% South Africans on a regular basis. The country has huge potential in identifying novel compounds to treat many diseases. Ethanolic and fermented extracts were prepared and their anti-ageing potential was evaluated by means of elastase inhibition. The results showed significant elastase-inhibition for three samples compared to the positive control, ursolic acid, a known inhibitor, with the ability of the extracts to inhibit 50% of the enzyme (IC50) at concentrations of 79.09 µg/ml, 83.92 µg/ml and 50.59 µg/ml for the ethanolic samples of *Annona senegalensis* (leaves) (ASL), *Annona senegalensis* (bark and twigs) (ASB) and *Persicaria senegalensis* (PS) respectively. All three samples were then evaluated for their *in vitro* cytotoxic potential against the human keratinocyte cell line and were found to exhibit no cytotoxicity at the highest concentration tested (400 µg/ml). Further studies then investigated the anti-inflammatory propensity of the extracts by measuring their ability to inhibit a crucial enzyme involved in the inflammatory process, cyclooxygenase-ii. The results indicated the best inhibition of this enzyme to be for PS, with an IC50 of 2.27 µg/ml, followed closely by ASL (3.51 µg/ml) and ASB (5.02 µg/ml). Superoxide has been identified as one of three main free radicals implicated in the activation of the ageing pathway and as such the scavenging capacity of these extracts was also evaluated. The results again revealed the best activity by PS (27.22 µg/ml), followed then by ASB (43.29 µg/ml) and ASL 70.38 µg/ml). PS thus showed the greatest potential of the samples tested, exhibiting noteworthy inhibition of crucial enzymes implicated in the ageing pathway as well as the ability to diminish the activation of the pathway. Another shining example of anti-ageing skin care by South African plants is *Myrsine africana* (INCI: Alcohol (and) Water (and) *Myrsine africana* Leaf Extract (MA). The semi-pure fraction of the plant inhibited elastase with an IC50 value of 28.04 µg/ml. Semi-pure fractions was evaluated for their anti-ageing efficacy in clinical studies, confirming their activity and a potential licensee is being explored. The results obtained from this study illustrate the value of terrestrial as well as wetland plants of South Africa used by indigenous knowledge systems and will hopefully encourage the recognition and conservation of indigenous knowledge as guarded by their knowledge holders across South Africa. A number of other medicinal samples with significant activity for skin-hyperpigmentation, acne, oral care, an adjuvant for tuberculosis- patients have been identified. The samples were subjected to clinical studies and have been recommended for their use for melasma, skin-toning purposes and for acne. The research results have attracted a number of national and international Cosmeceutical companies who are willing to commercialize extracts and purified compounds which might eventually lead to entrepreneurship.

Speaker 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 120 papers in reputed journals. She is also the Co-inventor of 16 national and international patents. This medicinal plant scientist at the University of Pretoria is ranked in the top 1% of the global Essential Science Indicators list of influential academics who write about pharmacology and toxicology. In 2014, she received the Order of Mapungubwe - South Africa's highest honor - from President Jacob Zuma, in recognition of her research.

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