Modulation of UVB-induced inflammation in keratinocytes (HaCaT) by unfermented rooibos and honeybush aqueous extracts: a comparativestudy

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Introduction: In skin, ultraviolet B (UVB) irradiation elicits a wide range of biological effects which may lead to cancer development. Chronic exposure to UVB light that is associated with the induction of pro-inflammatory cytokines in keratinocytes are key determinants in the underlying mechanism in skin carcinogenesis. Natural components, such as tea polyphenols, have been shown to prevent UVB-induced damage by modulating the inflammatory response and the proliferation in the skin *in vitro* and *in vivo*.

Aim: To investigate preventive effects of unfermented rooibos (*Aspalathus linearis*) and honeybush (*Cyclopia* spp.) aqueous extracts against inflammation in human keratinocytes using a pre-exposure UVB/HaCaT skin keratinocyte model.

Methodology: The modulation of cell growth indices (cell viability and apoptosis), pro-inflammatory cytokine production (IL-1α, IL-1ra, IL-6 and IL-8) and oxidative stress (DCFDA), prior to and following UVB exposure of skin keratinocytes (HaCaT), were monitored.

Results: Rooibos and Honeybush extracts exhibited anti-inflammatory activity by inhibiting icIL-1α production in UVB irradiated keratinocytes. Rooibos also affected the reduction of extracellular IL-8 and intracellular ROS activity. Honeybush, on the other hand, reduced both extracellular IL-6 and IL-8.

Discussion and Conclusion: Differential activity of the herbal teas against cytokine synthesis and intracellular ROS activity implicates the role of two different anti- inflammatory mechanisms. For rooibos, anti-inflammatory effects are possibly mediated through the Nrf2 pathway but for honeybush, the NFκB pathway may play a more prominent role. In conclusion, herbal tea extracts seem to inhibit pro- inflammatory cytokine production through different mechanistic pathways.