

An investigation into the stress relieving properties of *Sutherlandia frutescens* by studying effect of the shrub on adrenal steroidogenesis.

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Sutherlandia frutescens is indigenous to South Africa and has traditionally been used as a remedy to treat many ailments, including stress related maladies linked to the endocrine system. Elevated glucocorticoid levels are associated with dysregulation of the stress response. The biosynthesis of these glucocorticoids takes place in the adrenal and is catalysed by the cytochrome P450 enzymes (P450s). P45017 α -hydroxylase (CYP17), c21-hydroxylase (CYP21) and 11 β -hydroxylase (CYP11B1) catalyse the biosynthesis of cortisol and its precursors. Therefore, the effect of *Sutherlandia* extracts and capsules on adrenal steroidogenesis was determined in ovine and rat adrenals. Spectral binding- and enzyme conversion assays were performed in adrenocortical microsomes and mitochondria. Hydrophobic compounds inhibited substrate binding more potently than the hydrophilic compounds in *Sutherlandia* extracts. Both progesterone and pregnenolone conversion in adrenal microsomal preparations was inhibited. CYP17 and CYP21 were subsequently expressed in COS1 cells to determine the effect of *Sutherlandia* on the individual enzymes, without interference from other enzymes and cellular components. The effect of *Sutherlandia* was also investigated *in vivo*. Immobilization stress in 40 adult male Wistar rats resulted in increased corticosterone levels in the control group while rats receiving *Sutherlandia* extract showed significantly decreased corticosterone levels ($P < 0.005$). Results will be presented showing that compounds in *Sutherlandia frutescens* could exhibit their anti-stress properties partially via adrenal steroidogenesis.