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Medicinal plants used for the management of diabetic complications

The inhibitory activities of extracts containing various classes of phytoconstituents such as terpenoid, phenolic and other miscellaneous were studied. *In vitro* rat lens aldose reductase (RLAR) and rat kidney aldose reductase (RKAR) inhibitory activity of standardized extracts of *Boswellia serrata* (leaves), *Lagerstroemia speciosa* (leaves), *Ocimum gratissimum* (leaves), *Syzygium cumin* (fruits), *Morus alba* (leaves), *Phyllanthus amarus* (whole plant), *Punica granatum* (fruits) and *Stevia rebaudiana* (leaves), *Cassia auriculata* (flower), *Saraca asoca* (flower) *Andrographis paniculata* (aerial parts), *Butea monosperma*, *Picrorhiza kurroa* and *Hibiscus rosa-sinensis* at concentrations of 10, 50 and 100 µg/ml and their active constituents boswellic acid, corosolic acid, ursolic acid, ellagic acid, morusin, phyllanthin, punicalagin and stevioside, procyanidin B1, leucocyanidin, andrographolide, butein, resveratrol and quercetin, each at concentrations of 1, 5 and 10 µg/ml were assayed spectrophotometrically. Among the tested extracts and compounds, standardized extract of *O. gratissimum* showed the highest activity, while the extract of *P. kurroa* and *Hibiscus rosa-sinensis* were the least active. Among the tested pure compounds the RLAR inhibitory activity of corosolic acid, boswellic acid, ursolic acid and resveratrol were better than the rest. The above compounds with the potent inhibitory activity against RLAR were tested against human recombinant aldose reductase followed by the *in vivo* AR inhibitory activity in rats using galactosemic model by estimating the lens galactitol levels by using gas liquid chromatography. Based on the above studies on the AR inhibitory activity, some of the potent compounds such as ursolic acid and resveratrol were studied for their effect on diabetic complications such as cataract and nephropathy. The compounds were tested for the *in vitro* anti-cataract activity in isolated cattle lens using organ culture technique in Krebs' ringer buffer medium. The ability of the compounds to inhibit the glucose mediated induction of cataract was measured with respect to extent of opacity and formation of polyols in the lens. Further to the above studies, resveratrol and ursolic acid were tested for their activity in diabetic nephropathy along with various biochemical parameters to elucidate the mechanism of action of the compounds. Thus an extensive research on various phytoconstituents for their potential in alleviating diabetic complications was carried out which might fulfill the unmet clinical need in the treatment of these complications.

Biography

Ciddi Veeresham has completed his PhD from Kakatiya University and Postdoctoral studies from Cornell University, School of Biochemical Engineering, USA. He is the Professor of Pharmacy at University College of Pharmaceutical Sciences, Kakatiya University, India. He has published more than 130 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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