Pentacyclic triterpenoids and ceramide mediate the vasorelaxant activity of Vitex cienkowskii via involvement of NO/cGMP pathway in isolated rat aortic rings.

Abstract:

Vitex cienkowskii Kotschy & Peyritsch is a deciduous tree, prescribed by Cameroonian traditional healers as one of the most popular plant widely used in many disorders including cardiovascular diseases. The preliminary pharmacological studies carried out on Vitex cienkowskii showed its vasorelaxant activities on guinea-pig aortic rings. The present work evaluated the vasorelaxant activity of extract and isolated compounds from Vitex cienkowskii. Rat aortic rings were used to evaluate the in vitro vascular effect of the extract. The antioxidant activity was determined by measuring the reduction of the free radical 1,1-diphenyl-1-picryl-hydrazyl (DPPH). Vitex cienkowskii induced significant relaxation in a concentration- and endothelium-dependent manner (EC(50)=12.12 µg/ml, CH(2)Cl(2)-MeOH, 1:1) and did not produce a vasorelaxant effect on contraction evoked by KCl (60 mM). In order to determine its mode of action, Vitex cienkowskii-induced relaxant effect was evaluated in the presence of indomethacin (10 ?M), L-NAME (100 ?M), ODQ (1 ?M) and SQ22356 (100 ?M). Relaxation was significantly blocked by L-NAME and ODQ. These results indicate that Vitex cienkowskii-mediated relaxation is endothelium dependent, probably due...
to NO release, and the consequent activation of vascular smooth muscle soluble guanylate cyclase (sGC), a signal transduction enzyme that forms the second messenger cGMP. Bio-guided study of Vitex cienkowskii allowed the isolation of the known pentacyclic triterpenoids and a ceramide. It is the first report of salvin A, maslinic acid and a ceramide from Vitex cienkowskii. The activity induced by these compounds indicated that they may be partly responsible for the vasorelaxant effect of the plant extract. A dose of 40 mg/kg of CH(2)Cl(2)-MeOH (1:1) extract administered intravenously induced a decrease of mean arterial pressure but did not affect the heart rate. Moreover the plant extracts were found to be highly active in the DPPH radical scavenging assay. Vitex cienkowskii extract possesses antioxidant property, vasorelaxing, and hypotensive effect linked to the endothelium related factors, where nitric oxide is involved.