

Antihypertrophic effects of the seed ethanolic extract of *Aframomum prunosum* Gagnep. (Zingiberaceae) against isoproterenol-induced cardiac hypertrophy in male Wistar rat

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Abstract

The seeds of ethanolic extract *Aframomum prunosum* (EE) are popularly used in the management of cardiovascular conditions. This study was undertaken to evaluate the capacity of EE to prevent the development of cardiac hypertrophy in rats. Isoproterenol (0.3 mg/kg/day, *sc*) was injected to male rats alone or concomitantly with EE (37.5, 75, or 150 mg/kg, *per os*) or propranolol (20 mg/kg/day, *per os*) for 7 consecutive days and Systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate measurements were performed. Cardiac homogenates were used to assay myeloperoxidase (MPO), superoxide dismutase (SOD), catalase, nitric oxide (NO) and reduced glutathione (GSH). Also, sections of heart tissue were stained with Hematoxylin-Eosin, Masson trichrome, or for immunohistological labelling of atrial natriuretic peptide (ANP). Chemical profiling of EE was done by gas chromatography-mass spectrometry (GC-MS). Isoproterenol administration caused a decline in SBP and DBP ($p < 0.001$). Heart rate, cardiac mass, cardiomyocyte surface, and MPO levels were significantly ($p < 0.001$) increased. All these alterations were significantly prevented ($p < 0.01$ and $p < 0.001$) by EE. EE inhibited immune cell infiltration and cardiac fibrosis elicited by isoproterenol injection. The overexpression of ANP in the atrium and ventricle induced by the isoproterenol was significantly ($p < 0.001$) prevented by EE. GC-MS analysis showed that EE possesses many compounds mainly nerolidol 2. EE possesses antihypertrophic effect against isoproterenol-induced cardiac hypertrophy that may result from its antifibrotic, anti-inflammatory properties, as well as its capacity to down regulate the expression of ANP.

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