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Phyllantus nuriri Protect against Fe2+ and SNP Induced Oxidative Damage in Mitochondrial Rich Fractions of Rats Brain

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Abstract : We evaluated the potential neuroprotective effect of Phyllantus nuriri against Fe2+ and SNP induced oxidative stress in mitochondria of rats brain. Cellular viability was assessed by MTT reduction, reactive oxygen species (ROS) generation was measured using the probe 2,7-dichlorofluorescein diacetate (DCFH-DA). Glutathione content was measured using dithionitrobenzoic acid (DTNB). Fe2+ (10µM) and SNP (5µM) significantly decreased mitochondrial activity, assessed by MTT reduction assay, in a dose-dependent manner, this occurred in parallel with increased glutathione oxidation, ROS production and lipid peroxidation end-products (thiobarbituric acid reactive substances, TBARS). The co-incubation with methanolic extract of Phyllantus nuriri (10-100 µg/ml) reduced the disruption of mitochondrial activity, gluthathione oxidation, ROS production as well as the increase in TBARS levels caused by both Fe2+ and SNP in a dose dependent manner. HPLC analysis of the extract revealed the presence of gallic acid (20.54±0.01), caffeic acid (7.93±0.02), rutin (25.31±0.05), quercetin (31.28±0.03) and kaemferol (14.36±0.01). This result suggests that these phytochemicals account for the protective actions of Phyllantus nuriri against Fe2+ and SNP -induced oxidative stress. Our results show that Phyllantus nuriri consist important bioactive molecules in the search for an improved therapy against the deleterious effects of Fe2+, an intrinsic producer of reactive oxygen species (ROS), that leads to neuronal oxidative stress and neurodegeneration.

Keywords : Phyllantus niruri, neuroprotection, oxidative stress, mitochondria, synaptosome
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