ANTIOXIDANT COMPOUNDS FOUND IN PLANTS FROM NORTHEAST OF BRAZIL, PROTECTS PC-12 CELLS AGAINST 6-OHDA NEUROTOXICITY


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Introduction: Parkinson’s disease (PD) is a chronic progressive neurodegenerative movement disorder characterized by a profound and selective loss of nigrostriatal dopaminergic neurons. Oxidative stress actively participates in the dopaminergic (DA) neuron degeneration of PD. Objective: The aim of this study was to evaluate the activity cytoprotective of 18 substances of various chemical classes isolated from plants from Northeast of Brazil on 6-OHDA-induced cytotoxicity in PC12 cells. Materials and methods: The compounds (substances of various chemical classes) were obtained from plants from Northeast of Brazil: Acid anacardic, Sodium anacardate, Acetyl-anacardic acid, Sodium acetyl-anacardate, Copernicia prunifera poder, Ocimum gratissimum oil, Lupeol, Epiisopilosine, Cicloeucalenone, Galic acid, Troxerutin, Rutin+isoquercitrin, Lapachol, Sorbitol, β-Sitosterol, Hesperidin, β-hydroxibarbatusin. PC12 cells (2×10^5 cells/mL) were treated with troxerutin and gallic acid at a concentration of 100 μg/mL and 50 μg/mL respectively, 15 minutes before 6-OHDA (100μM) exposure. After 24 hours the tests were done to assess cell viability (MTT) and oxidative stress (nitrite, malondialdehyde and GSH levels). The data was analyzed by ANOVA (one-way) followed by Dunnet test. Results have been expressed as means ± S.E.M. from at least three experiments. Results: From the tested substances only gallic acid and troxerutin showed cytoprotective effect. The 6-OHDA significantly reduced cell viability and increased nitrates levels. The gallic acid and troxerutin significantly protected cells from damage induced by 6-OHDA (p < 0.05), increasing cell viability (MTT: gallic acid 50 + 6-OHDA= 85.3%; troxerutin 100 + 6-OHDA= 72.3%). Treatment with gallic acid and troxerutin decreased the nitrite and malondialdehyde levels, in addition to increased the levels of GSH. Conclusions: These results showed a cytoprotective effect from gallic acid and troxerutin probably by antioxidant activity of these compounds. Furthermore, our data leads us to conclude these compounds could be used as a therapeutic agent potential for neurodegenerative diseases.

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Keywords: Gallic acid, Troxerutin, Antioxidant.