PURPLE PITANGA EXTRACT REVERSES DEPRESSIVE-LIKE BEHAVIOR AND PROVIDES NEUROPROTECTION INDUCED BY INTRANASAL MPTP IN OVARIECTOMIZED RATS

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INTRODUCTION: The neurotoxin 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) selectively targets catecholaminergic neurons, inducing symptoms similar to Parkinson's disease (PD) in rodents. The intranasal (i.n.) toxicity of MPTP is established and aggravated in estrogen-deficient models, such as ovariectomized (OVX) females, simulating postmenopausal conditions. Estrogen decline is associated with emotional and cognitive changes. Purple pitanga (Eugenia uniflora) is a fruit rich in polyphenols with antioxidant and antidepressant properties. MATERIALS AND METHODS: Female Wistar rats (250–300g, CEUA 010/2021) were ovariectomized or sham-operated. After 30 days, rats received intranasal MPTP (1 mg/nostril, 10 μL) or saline. PPE (1000 mg/kg) or saline was administered orally for 28 days according to groups: 1) Control; 2) PPE; 3) MPTP; 4) MPTP+PPE; 5) OVX; 6) OVX+PPE; 7) OVX+MPTP; 8) OVX+MPTP+PPE. Behavioral tests included splashing (anhedonia) and forced swimming (depression), performed on day 29 followed by euthanasia. The substantia nigra was analyzed for Tyrosine hydroxylase (TH) and tumor necrosis factor-α (TNF-α) by western blot. RESULTS: I.n. administration of MPTP ($p<0.0128$) reduced self-grooming time in the splash test compared to the control group. Treatment with MPTP+PPE ($p<0.0058$), OVX+PPE ($p<0.0440$), OVX+MPTP+PPE ($p<0.0074$) reversed this effect. In the forced swim test, MPTP ($p<0.0140$) and OVX+MPTP ($p<0.0077$) increased immobility time; this was reversed by PPE in

MPTP+PPE ($p<0.0258$) and OVX+MPTP+PPE ($p<0.0356$). MPTP ($p<0.3793$) reduced TH expression ($p<0.0004$). This reduction was not observed in groups MPTP+PPE and OVX+PPE. TNF-α levels were significantly decreased in PPE ($p<0.0002$) and OVX+PPE ($p<0.0015$), indicating anti-inflammatory effects. CONCLUSION: MPTP administration and absence of ovarian hormones (OVX) induce depressive-like symptoms and anhedonia in rats. PPE extract was effective in reversing these effects, protecting dopaminergic neurons by maintaining TH expression and preventing elevation of TNF-α. These results indicate PPE may be a promising adjuvant therapy for postmenopausal women with PD.