The Effect of Ayurvedic Plant Extracts -- Mucuna pruriens and Brassica oleracea -- on the Alleviation of Motor Symptoms in PINK1 Drosophila melanogaster: A Model of Parkinson's Disease

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Parkinson’s Disease (PD) is a neurodegenerative disease that is characterized by loss of dopaminergic neurons of the substantia nigra, negatively affecting motor control and causing symptoms such as dyskinesia, or uncontrollable, involuntary muscle movement. Long term use of the current treatment of L-DOPA and Dopamine agonists have been linked to dyskinesia, hallucinations, confusion, psychosis, etc. Further, because of the number of developing countries that may not even have access to these modern treatment for PD, the purpose of this study was to explore a safe, affordable, and accessible alternative method of treatment for such symptoms. It was hypothesized that when Mucuna pruriens (Mpe) and Brassica oleracea (B. oleracea) extracts are administered to PINK1 Drosophila, Brassica oleracea would delay the loss of motor ability in the PINK1 flies the longest because it contains sulforaphane which activates the Nrf2 pathway, promoting antioxidant activity and countering oxidative stress. To quantify the climbing ability of the PINK1 Drosophila, which display PD-like symptoms, a climbing assay was conducted on the treatment groups, where the flies were orally administered either 32mg/100g Mpe or B. oleracea, and the control group, which was administered nothing. Starting on the day of administration, climbing assays were conducted every other day for a period of 16 days, for each experimental group. After running a Two-way ANOVA and t-test on the results of this experiment, it was determined that only Mpe treatment showed a significant delay in the loss of the climbing ability in PINK1 Drosophila. Therefore, Mpe treatment in humans could potentially be used to help slow down the progression of PD motor symptoms, without the burden of serious side effects.