Serotonin and Cortisol Response in Relation to Ashwagandha Root Treatment in C. elegans: A Model Organism for Antidepressant Studies

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This study will evaluate the efficacy of the herbal supplement Withania somnifera (Ashwagandha root) for treatment of depression, anxiety and stress. The American Psychological Association states, in any given year, 6.7% of adults suffer from depression, 18.1% suffer from anxiety and 3 of 4 adults experience at least one stress symptom per month. Selective Serotonin Reuptake Inhibitors (SSRIs) prescriptions for these disorders have increased 64% in the past 20 years; however, 15 million Americans every year turn to herbal supplement remedies to minimize the side effects and reliance on SSRI pharmaceuticals. This study aims to: 1) Verify Withania somnifera in a commercially available Ashwagandha root tea. 2) Study the effect of Ashwagandha root tea on Caenorhabditis elegans, a model organism supported in SSRI research. In this research, qPCR, gel electrophoresis and genetic sequencing show Withania somnifera as a major component of Ashwagandha root tea. Following exposure of C.elegans to Ashwagandha root tea, nose contraction, locomotion and egg-laying patterns show similarity to previous studies on C.elegans given Prozac (fluoxetine). Live fluorescence imaging of C.elegans genotype bqSi294 II; bqSi488 IV show a significant increase in serotonin expression in the body and head of C.elegans after Ashwagandha root tea exposure while ELISA tests evaluate cortisol expression. Altogether, this research indicates possible antidepressant activity of Ashwagandha root tea in C.elegans. Withania somnifera shows potential for adaptogenic activity for individuals struggling with depression, stress and anxiety.

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