Feasting Fruit Flies: Evaluating the Effect of Selected Ayurvedic Plant Extracts on the Mood, Memory, and Fertility of Drosophila melanogaster

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Despite 80% of India’s population incorporating Ayurveda to maintain their health, Ayurvedic herbs consumed to treat depressive moods, impaired memory, and infertility lack evidence to support their effectiveness. This study investigates the effects of Ashwagandha, Shatavari, and Brahmi on Drosophila Melanogaster’s: 1) Mood 2) Memory and 3) Fertility (n=20). Select percentages of each herb (2.5%, 5%, and 10%) were incorporated in fly medium to model human dosages. An impaired geotaxis assay was assessed to measure depression-like state. An aversive phototaxic suppression assay was conducted to evaluate short-term memory. Adult and death counts were conducted after a 2-week period to analyze fertility. Geotaxis was not significantly impaired by Shatavari. However, it was significantly impaired by Ashwagandha with the least optimal concentration of 10% (OR 0.03, $p<0.001$). Geotaxis was positively affected by Brahmi with an optimal concentration of 10% (OR 7.43, $p<0.02$). Memory was not significantly impacted by Shatavari (OR 1.11, $p>0.05$), however, it significantly increased with consumption of larger concentrations of Brahmi (OR 3.99, $p<0.05$). Ashwagandha positively increased memory with an optimal concentration of 10% (OR 3.67, $p<0.02$). Fertility significantly increased at 2.5% Ashwagandha and Shatavari ($p<0.009$, $p<0.01$) whereas Brahmi decreased exponentially. Concentrations above 2.5% lowered fertility below control - Brahmi being most significant ($p<0.004$), then Shatavari ($p<0.006$). Ashwagandha did not decrease significantly. Overall, Ayurvedic herbs must be scientifically reviewed as some negative effects on aspects 1, 2 and 3 are significant enough that they may endanger consumers. Despite exhibited benefits, they must be further substantiated to ensure safe usage.

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