ORIGINAL RESEARCH

Virgin Coconut (*Cocos nucifera*) Oil Attenuates Rotenone-Induced Toxicity in Fruit Flies (*Drosophila melanogaster*)

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ABSTRACT

Background: Parkinson's disease (PD) is a multifactorial neurodegenerative disease with pathogenic mechanisms traceable to oxidative damage and mitochondrial dysfunction. Rotenone, a chemical compound commonly found in pesticides, has been found to inhibit mitochondrial complex-I and initiate PD-like symptoms in mammals and several invertebrates. Virgin Coconut Oil (VCNO) obtained from the coconut fruit has been found to possess anti-oxidative and anti-inflammatory properties.
Objectives: The present study evaluated the effect of VCNO on rotenone-induced Parkinsonism in fruit flies- *Drosophila melanogaster* (*D. melanogaster*).
Methods: Canton special (CS) strains of *D. melanogaster,* aged between 1 to 3 days were orally exposed for 7 days to 0, 250, 500 and 750 µM rotenone diet for toxicity assay, and 0, 2.5, 5 and 10 % *w/w* VCNO diet for longevity assay. Thereafter, 5 % VCNO diet was selected for evaluation against 500 µM rotenone. Subsequently, behavioural test (negative geotaxis), markers for redox status and enzyme activities were evaluated.
Results: The results showed that rotenone induced toxicity in the flies, while VCNO increased the lifespan of *D. melanogaster* in a dose-dependent manner. In addition, VCNO ameliorated rotenone-induced locomotor deficits, elevated MDA, as well as the depleted GSH levels. It also mitigated the inhibited activities of SOD, CAT and ATPase in the flies.
Conclusions: VCNO protected *D. melanogaster* against rotenone-induced toxicity by extending longevity, preventing locomotor deficits and reducing oxidative stress.

Keywords: *Drosophila melanogaster,* Fruit flies, motor skills, Parkinson's disease, Rotenone, Virgin Coconut Oil.