

Wayne State University 2015 Graduate Exhibition

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ABSTRACT TITLE: The in vivo effect of oil palm phenolics (OPP) in atherogenic diet induced rat model of Alzheimer's Disease (AD)

ABSTRACT

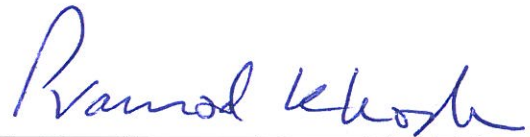
Abstract should not exceed 250 words, single spaced, 11-12 point font, on this page

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OPP, a water soluble fraction from oil palm, rich in phenolics has been found to possess significant antioxidant activities. Since AD and the associated amyloid plaque buildup has an underlying component of oxidative stress, we hypothesized that OPP may reduce amyloid beta burden in vivo. The aim of this study was to investigate the change in behavior and pathology upon dietary supplementation of OPP in an atherogenic high cholesterol diet induced rat model of Alzheimer's disease. For this, 24 male Brown Norway rats were randomly assigned to 3 groups: the cholesterol group (2% cholesterol), cholesterol + OPP (5% OPP) and cholesterol + curcumin (2% curcumin), and maintained on their respective diets for 6 months. Curcumin has shown to have therapeutic benefits in AD and was used as a positive control. Morris water maze test performed once a month (3 trials/day for 5 days) to assess hippocampal dependent spatial learning showed that OPP supplemented rats exhibited improved learning abilities as compared to the cholesterol group ($p < 0.05$). Hippocampal β Amyloid ($A\beta$) plaque burden, as observed by Congo red staining, was reduced in both OPP and curcumin supplemented animals. This was validated by ELISA assay. Further, mRNA expression levels of APP and BACE1, involved in $A\beta$ formation in AD were significantly decreased in the OPP and curcumin supplemented rats. 1H NMR combined with the Chenomix spectral database was used for identifying and quantifying changes in the urinary metabolome due to intervention with OPP. The data indicates that dietary OPP has potential in improving an age-dependent decline in spatial cognition and $A\beta$ deposition in hippocampus.



Student Signature



Graduate Director Signature