

UNIVERSITI TEKNOLOGI MARA

**ANTIHYPERCHOLESTEROLEMIC
PROPERTIES OF PALM OIL AND
CURCUMA LONGA EXTRACT AS
SINGLE AND COMBINATION
DOSES IN RABBITS**

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of the requirements for the degree of
Master of Science

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknolgi MARA, regulating the conduct of my study and research.


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ABSTRACT

Curcuma longa (CL) is known as Turmeric. Palm oil (PO) is the most produced edible vegetable oil in the world. Both CL and PO have medicinal values. This study was carried out to evaluate the antihypercholesterolemic effect of PO and CL extract given in combination to rabbits fed a high cholesterol diet. New Zealand white rabbits were randomly divided into six groups of six rabbits per group. All groups except one (control normocholesterolemic group) were fed on 1% (w/w) cholesterol-enriched pellet for 8 weeks. Control normocholesterolemic group was fed normal pellet. The rabbits fed with high cholesterol diet were treated daily, orally, for 8 weeks with 5 mg/kg atorvastatin, 1 mL/kg PO, 500 mg/kg CL extract or with PO and CL extract in combination. Blood samples were taken before initiation of treatment and every 4 weeks during the 8 weeks experimental period for measurement of plasma total cholesterol (TC), low density lipoprotein (LDL), high density lipoprotein (HDL), triglyceride (TG) as well as fibrinogen, cytokines (interleukin-6 (IL-6) and tumor necrosis factor Alpha (TNF- α)) and liver enzymes (aspartate aminotransferase, AST; alkaline phosphatase, ALP; and alanine aminotransferase, ALT). At the end of treatment, the animals were sacrificed and the aortas were excised for histology and immunohistochemistry analysis. Data were analysed by using one-way ANOVA and post-hoc Bonferroni analysis tests. In summary, treatment with PO and CL extract in combination elicited better effects in rabbits fed a high cholesterol diet than treatment with atorvastatin or singly with 1 mL/kg PO or 500 mg/kg CL extract. PO and CL extract in combination significantly decreased the level of serum TC, LDL, TG ($p < 0.05$) and increased the HDL level at week 8 ($p < 0.05$). AST, ALP and ALT levels returned to the normal, similar to that of normocholesterolemic control group. TNF- α or IL-6 levels of treated groups were not different from those of normocholesterolemic control group. The level of fibrinogen dropped significantly from 405.2 mg/dl to 344.8 mg/dl at 8 weeks of treatment with moderate thickening of the arterial wall in aortic sections of the group that received PO and CL in combination. The combination of PO and CL extract also significantly down-regulated expression of VCAM-1, ICAM-1 and E-selectin. In conclusion, the results provided the effectiveness of treatment with combination of PO and CL extract at reducing hypercholesterolemia in rabbits, comparable to effects of atorvastatin and potentially beneficial at prevention of hyperlipidemia and protection against cardiovascular disease.

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