UNIVERSITI TEKNOLOGI MARA

HEPATOPROTECTIVE EFFECT OF DRIED AND FERMENTED VIRGIN COCONUT OILS AGAINST CARBON TETRACHLORIDE AND PARACETAMOL-INDUCED LIVER DAMAGE *IN VIVO*

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ABSTRACT

Virgin coconut oil (VCO), famously known in Malaysia as 'minyak kelapa dara', is a type of coconut oil that has gained a lot of attention recently due to various claimed of medicinal values. The present study was carried out on two types of VCOs, labelled as VCOA and VCOB, to determine its toxicity, hepatoprotective property and mechanism of action. The acute toxicity study was carried out by oral administration of 10 ml/kg VCOA or VCOB to normal rats for 7 days. The hepatoprotective property was determine using carbon tetrachloride (CCl_4)- and paracetamol-induced liver damage. The mechanism of hepatoprotection of VCOs was determine using an inducer, Phenobarbital (PB), and an inhibitor, SKF 525A, of cytochrome P450 (CYP), against paracetamol-induced liver damage.

From the data obtained both types of VCOs did not show any sign of toxicity to the animal. The result on hepatoprotective of VCO A and VCO B against CCl_4 induce liver damage did not show any significant different because CCl_4 at 1.5ml/kg orally did not induce extremely liver damage compare to PCM. Both types of VCOs were found to produce hepatoprotective effect against paracetamol-induced liver damage at the volume of 10 ml/kg. This finding is confirmed by significant ($P<0.05$) reduction in body weight, liver weight, concentrations of liver enzymes, namely alanine aminotransferase (ALT), aspartate aminotansferase (AST) and alkaline phosphatase (ALP), and cell viability were increase compared to group treated with paracetamol alone. Histopathology study of rat's liver treated with PCM only show necrosis but pre-treated with 10ml/kg both VCOs showed normal architecture of the liver. The inhibition of CYP may be a key role in the mechanism of hepatotoprotective effect of both VCOs against the paracetamol-induced liver damage. This is justified by significant ($P<0.05$) reduction of body weight, liver weight, concentration of liver enzymes and cell viability in groups receiving VCOs followed by SKF 525A.

As a conclusion, VCO possesses hepatoprotective property against paracetamol-induced liver damage, which is mediated via inhibition of the CYP action and is less toxic.

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CHAPTER 1

INTRODUCTION

1.1 Background

Liver is the second largest organ in the body after the skin, and is essential in keeping the body functioning properly. It performs various functions in the body, including breaking down potentially toxic substances into harmless ones that the body can use it.

As liver plays a central role in metabolizing chemical and drug, this may increase susceptibility to various injuries. Damage is often initiated by biotransformation of chemicals to an unstable toxic reactive metabolite. The reactive metabolite exert it is toxic effect by various mechanism which include interaction with cellular macro molecules such as protein, lipid and nucleic acid resulting in protein dysfunction, lipid peroxidation, DNA damage and oxidative stress. Besides these electrophilic noxious substances cause disturbance of ionic gradient that is essential in the generation of ATP signaling, regulating of biosynthesis and catabolic reaction of organelles and cell (Meeks, 1991).