HEPATOPROTECTIVE MECHANISMS OF SELECTED HERBAL PLANTS NATIVE TO SABAH, MALAYSIA
FRG0166-SP-2008

ASSOCIATE PROFESSOR DR. MOHAMMAD IQBAL
(PROJECT LEADER)

BIOTECHNOLOGY RESEARCH INSTITUTE
UNIVERSITI MALAYSIA SABAH
2011

UMS
UNIVERSITI MALAYSIA SABAH

FINAL REPORT

FUNDAMENTAL RESEARCH GRANT SCHEME

Project Entitled

HEPATOPROTECTIVE MECHANISMS OF SELECTED HERBAL PLANTS NATIVE TO SABAH, MALAYSIA (PROJECT CODE: FRG0166-SP-2008)

Submitted to

MINISTRY OF HIGHER EDUCATION GOVERNMENT OF MALAYSIA

By

Associate Professor Dr. Mohammad Iqbal
(Project Leader)
Email: miqbal@ums.edu.my

BIOTECHNOLOGY RESEARCH INSTITUTE
UNIVERSITI MALAYSIA SABAH
2011

UMS
UNIVERSITI MALAYSIA SABAH

ABSTRACT

HEPATOPROTECTIVE MECHANISMS OF SELECTED HERBAL PLANTS NATIVE TO SABAH, MALAYSIA

Oxidative damage of biomolecules is implicated in the pathogenesis of various chronic diseases including cancer. This has led to intensive investigation aimed at reducing the extent of such oxidative injury. The present study was aimed to evaluate the total phenolics, hepatoprotective and antioxidative effects of eighteen (18) selected herbal plants viz. Andrographis paniculata; Plantago major; Orthosiphon stamineus; Peperomia pellucida; Centella asiatica; Strobilanthes crispus; Eleusine indica; Thysanolaena latifolia; Merremia bornensis; Hoya coronaria; Homalanthus species; Momordica charantia; Parkia speciosa; Catharantus roseus; Pereskia sacharosa; Lantana camara; Oxalis corniculata; Cymbopongon citratus, known to be used as medicinal plants by local ethnic communities in Sabah, against carbon tetrachloride (CCl_4) mediated oxidative tissue damage and toxicity in rats. Animals were pre-treated with selected herbal plants accordingly to the selected doses (100 to 300 mg/kg b.w.) for 14 days prior to the administration of CCl_4 (1.2 ml/kg b.w. p.o) on 13^{th} and 14^{th} days. All of these animals were sacrificed 24 hours after the last dose of CCl_4 or saline. Blood and liver tissues were taken quickly for biochemical and histopathological studies to assess the derangement in the functioning of liver. Hepatic damage was evaluated by employing serum biochemical parameters (alanine aminotransferase-ALT, aspartate aminotransferase-AST and lactate dehydrogenase-LDH), malondialdehye (MDA) level, reduced GSH and antioxidant enzymes (catalase-CAT, glutathione peroxidase-GPX, quinone reductase-QR, glutathione S-transferase-GST, glutathione reductase-GR and glucose-6-phosphate dehyrogenase-G6PD). In addition, CCl_4 mediated hepatic damage was further evaluated by histopathological examination. However, most of these changes were alleviated by prophylactic treatment of animals with selected herbal plants dose dependently ($p<0.05$).The protection was further evident through decreased histopathological alterations in liver. Selected herbal plants were also evaluated for total phenolic content and 2,2-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity. The results of present study indicated that the hepatoprotective effects of selected herbal plant extract might be ascribable to its antioxidant and free radical scavenging properties. We concluded that only twelve (12) selected herbal plants viz. Andrographis paniculata; Orthosiphon stamineus; Centella asiatica; Strobilanthes crispus; Eleusine indica; Thysanolaena latifolia; Merremia bornensis; Hoya coronaria; Homalanthus species; Momordica charantia; Parkia speciosa; Cymbopongon citratus, could be used as hepatoprotective agents and possess the potential to be used to treat or prevent degenerative diseases where oxidative stress is implicated. However, other six (6) selected herbal plants viz. Plantago major; Peperomia pellucida; Catharantus roseus; Pereskia sacharosa; Lantana camara; Oxalis corniculata, has no effect on CCl_4-mediated oxidative tissue damage and toxicity in rats. Prior to considering the therapeutic aspects of selected herbal plants, the mechanism of action, comprehension investigation of pharmacokinetic and bioavailability of its bioactive constituents are much essential and needed.

UMS
UNIVERSITI MALAYSIA SABAH