



# ABSTRACT BOOK

25th Scientific Meeting  
of the  
**Malaysian Society of Pharmacology  
and Physiology**  
25th -26th May 2011

*“Advances in drug development  
for a better well-being”*

*organised by*



**UPM**  
UNIVERSITI PUTRA MALAYSIA  
BERSILU BERSUKSES

FACULTY OF MEDICINE AND HEALTH SCIENCES  
UNIVERSITI PUTRA MALAYSIA



THE MALAYSIAN SOCIETY OF  
PHARMACOLOGY AND PHYSIOLOGY

## Heavy Metal Content Determination In Locally Available Traditional Medicines Using Atomic Absorption Spectroscopy (AAS)

Reem S. Khalid<sup>1</sup>, \*A.B. M. Helal Uddin<sup>1</sup>, S. A Abbas<sup>2</sup>

<sup>1</sup>Department of Pharmaceutical Chemistry, Kulliyah of Pharmacy, IIUM, 25200, Kuantan, Pahang, Malaysia. <sup>2</sup>Taylor's University, 1, Jalan Taylor's, 47500 Subang Jaya, Selangor Darul Ehsan, Malaysia.

\*Corresponding Author

email: mohdhelal@hotmail.com; abmhelal@iium.edu.my

Traditional medicine (TM) is a system of health care that has ancient roots. It has been defined as practices designed to promote mental, physical and spiritual well-being of mankind. Usually (TM) are made from various types of medicinal plants. Sometimes they contain other ingredients such as animal parts and minerals however, the primary source of remedies is botanical. The use of traditional medicine has started beyond recorded history, but has increased tremendously in recent years. It is considered as alternative treatments which are widely used in developing countries. Recently became more popular in most developed countries as well. According to the world health Organization (WHO) reports that more than 70% of the population all over the world relies on non-conventional medicine. This high percentage indicates the positive attitudes towards herbal medicine in various places in the world, probably due to the people's believe that such products are more likely to be safe 'natural' rather than 'synthetic' origin. In Malaysia, folk medicines are widely used. The huge demand of TM has been driven the total Malaysian market for TM to US \$ 1.29 billion in 2005. The global popularity of(TM) has created great concern about the safety and efficacy of traditional medicines. Although WHO has developed guidelines for the quality control of herbal drugs, there is still a gap between available knowledge and implementation. Processors of herbal drugs are still not much aware of WHO's guidelines yet they continue their work without proper quality control which results in products with lots of contaminants such as heavy metals, pesticides residues and microbes, therefore inappropriate consumption of herbal preparation can cause serious health complication even toxicity. In our study we are focusing on identifying the presence of toxic heavy metals in locally available traditional medicines in the east coast region of Malaysia. Traditional medicine samples were collected from different sources such as shops, open market, night market and weekend market. Most of them are not registered with the Malaysian drug authority. All samples were digested using freshly prepared aqua regia (mixture of concentrated nitric acid and hydrochloric acid 1:3 ratio). 0.5 g of each sample was weighed and placed in 100 ml PTFE beaker, after which 9 ml of freshly prepared aqua regia was added. The mixture was then heated over water bath for 4-5 hours or until the sample had completely dissolved. The mixture was then allowed to cool and filtered; the residue was then washed with deionised water, and the extract was then made up to 50 ml with deionised water. The samples were then analysed by using atomic absorption spectroscopy (AAS). Out of twenty over traditional medicine samples most of them has shown the presence of lead (Pb), chromium (Cr), ferrum (Fe) and zinc (Zn). The results for nickel (Ni) and cadmium (Cd) were found below the detection limit using flame ionization technique and expected to be detected using graphite furnace AAS (GFAAS) method which will be the second part of this study. From the results we conclude that the traditional medicines available in local markets contain heavy metals which are considered toxic for human if consumed more than the permissible amount.

Key word: Traditional medicine, heavy metal, Toxicity, Aqua regia, AAS.