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RESEARCH INTO PHYSIOLOGICAL AND PHARMACOLOGICAL EFFECTS OF NATURAL PRODUCTS: EXPERIENCES AT THE UNIVERSITY OF MALAYA

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The Malaysian ecosystem is one of the oldest in the world. Within it contains many natural products of medicinal value. Many of the curative properties of natural products have been known to the natives and traditional practitioners; however scientific research into the claims has generally been lacking. In recent years much interest has been directed towards systematically researching their physiological and medicinal properties. Here at the University of Malaya we have been actively studying the biological action of the natural products at a variety of levels, from molecular and cellular to organ systems and whole animals. We report on the results of some research on natural products that we have conducted in the Department of Physiology at the University of Malaya.

Extracts of *Andrographis paniculata* (Acanthecea), were found to be selectively cytotoxic *in vitro* to certain cancer cell lines, especially PC-3 prostate cancer cells, but not to non-cancer Chang liver cells. The active compound responsible, andrographolide, has been identified and is shown to induce apoptosis in PC-3 cells via the extrinsic caspase cascade mechanism.

Preparations of leaves and roots of Piper caninum have been found to have greater hypotensive effects in spontaneously hypertensive rats (SHR) than in normotensive WKY rats, when blood pressure was measured directly in anaesthetized rats or indirectly via the tail in unanaesthesized rats. Extracts from the plant showed that it reduced contractility in isolated rat hearts and caused vasodilatation in isolated rabbit ear arteries. Both these effects were blocked by Ca^{++} channel blockers.

Preparations of the plant *Melastoma malabathricum* are shown to have a wide variety of activities. It has analgesic effects in the rat as shown by delayed the plantar withdrawal to increased temperature (Hargreave's test). It also has anti-ulcer effects in rat: stomach lesions induced by several ulcerogenic agents including indomethacin, ethanol, HCl were smaller in rats pretreated with extracts from the plant. Aside from that it has been shown to have anti-inflammatory effects and improve wound healing. Compounds responsible for anti-inflammatory and anti-noniceptive effects have been identified.

In summary a wide variety of terrestrial and aquatic plants are being studied for their physiological and medicinal properties using a variety of approaches available at the University of Malaya, not only in the Department of Physiology, but in a cooperative way with other departments such as pharmacology, pharmacy, molecular medicine and other faculties (science and dentistry).