

# TITLE OF RESEARCH: MASS SPECTROMETRY-BASED METABOLOMICS APPROACH FOR METABOLITE PROFILING AND BIOMARKER DISCOVERY OF ACANTHACEAE MEDICINAL PLANTS AND TISSUE CULTURES

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## ABSTRACT (120 words)

*Clinacanthus nutans* (Sabah Snake Grass) and *Strobilanthes crispus* (daun pecah beling) from the family of Acanthaceae, are gaining research interest as the plants have been reported to possess various bioactivities. The present study was aimed to profile and identify the biomarker compounds of *C. nutans* and *S. crispus* plants and its tissue cultures using GCMS-based metabolomics approach. Using this high-throughput instrument coupled with advanced chemoinformatics softwares, the plants were found to rich with squalene, pentacyclic triterpenoids such as lupeol, betulin, phytosterols such as stigmasterol, campesterol and others such as alpha-tocopherol, didecan-2-yl phthalate, beta-tocopherol. As the metabolomes of *C. nutans* and *S. crispus* unfold, it is believed that such information will play critical role in the standardization and development of herbal drugs derived from the plants in the future.

## 1. INTRODUCTION

*Strobilanthes crispus* (L.) Bremek (Acanthaceae), or known as "pecah beling" is a plant native to countries from Madagascar to the Malay Archipelago. The plant is commonly consumed in the form of herbal tea and has been used traditionally as antidiabetic, diuretic, laxative. Studies of the plants scientifically have proven the plants to have high potential of antioxidant activity, anti-AIDs, anti-hyperglycemic and anti-cancerous properties. Meanwhile, *Clinacanthus nutans* Lindau (known as Sabah Snake Plant in English), which belonged to the same family with *S. crispus*, is a small shrub occurring throughout South East Asia. *C. nutans* has long been used as a traditional medicine for the treatment of insect- and snake-bite and skin rashes, including herpes simplex virus and varicella-zoster virus lesions, and has been reported to possess antiviral, anti-inflammatory, anticancer, antimicrobial activities.

While most of the literatures focused on the chemical compounds present in the leaves of *C. nutans* and *S. crispus*, none have been reported for the phytochemical constituents of the whole *C. nutans* and *S. crispus* plant (leaf, stem, root, and/or flower). The lacking of such information has created a gap for researchers to understand the plant in more detail and also may cause the researchers to lose a lots of important information when identifying and isolating bioactive compounds as well as during the standardization of herbal products derived from the plants.

Metabolomic studies of the medicinal plants provide a powerful, rapid and promising approach for enhancing drug discovery process of the traditional

