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## Discrimination of *Clinacanthus nutans* extracts and correlation with antiplasmodial activity using ATR-FTIR fingerprinting

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### Abstract

*Clinacanthus nutans* or Sabah Snake Grass is a small shrub indigenous to tropical Asia. It has been used in the treatment of skin rashes, insect and snake bites, cancer and diabetes. In this study, Fourier transform infrared spectroscopy was used to discriminate the effects of different extraction methods on the chemical composition of *C. nutans* freeze dried leaves and stems. The samples were extracted using different methods (soaking and sonication) followed by the measurement of its antiplasmodial activity. Based on the absorption peaks, *C. nutans* extracts comprise of compounds with hydroxyl, methyl, sulfoxide, sulfone, aromatic and carbonyl functionalities which indicate the presence of carbohydrates, terpenes, sulfurous glycosides and aromatic compounds in the extracts. Multivariate data analysis such as orthogonal partial least square (OPLS) was used to correlate the FTIR spectra of the extracts with antiplasmodial activity. The OPLS model exhibited (RY)-Y-2 and Q(2)Y values of 0.896 and 0.736, respectively. The RMSEE and RMSECV value were 22.41 and 32.36. The loading line plot of the OPLS model revealed that OH, C=O, C-H and C-C functional group induced the activity, whereas, C-N and S=O reduced the bioactivity. These preliminary results demonstrated that FTIR spectroscopy can be used as a simple and rapid technique to discriminate *C. nutans* extracts obtained from different extraction methods which is useful in the quality control during processing of this plant.

### Keywords

Author Keywords: *Clinacanthus nutans*; Fourier transform infrared spectroscopy (FTIR); Antiplasmodial; Metabolomics; Multivariate data analysis

KeyWords Plus: TRANSFORM INFRARED-SPECTROSCOPY; ULTRASONICALLY ASSISTED EXTRACTION; BIOACTIVE PRINCIPLES; BARLERIA-LUPULINA; CULTIVARS; CONSTITUENTS; LEAVES

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