PP21. Quality evaluation of *Hedychium coronarium* essential oils by GC-MS fingerprinting associated with chemometrics

Asit Ray[1]*, Namita Mahapatra[2], Sanghamitra Nayak[1]

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Hedychium coronarium J. Koenig (Zingiberaceae) is a valued plant species due to its exquisitely fragrant essential oil. However, there is a significant diversity in essential oil yield and quality associated with the geographical origin of the plant. The aim of the present study is to establish a quality control chemical fingerprint and differentiate *Hedychium coronarium* essential oils of different geographical origin using chemometrics. A total of 50 samples collected from five different geographical regions (Odisha, West Bengal, Andhra Pradesh, Jharkhand and Assam) of India were analyzed by GC-MS. Forty four volatile constituents belonging to different classes were identified, among which *β*-pinene, eucalyptol, linalool and coronarin E were the predominant constituents. Thirteen shared chromatographic peaks were selected and the relative standard deviations of retention time and peak areas of these compounds were less than 0.2 and 3%, respectively. The correlation coefficients and overlapping peak ratio of each chromatogram to the simulative mean chromatogram was greater than 0.81 and 81.2%, respectively, thus indicating that the developed chemical fingerprint was very consistent. Chemometric techniques like hierarchical cluster analysis (HCA), principal component analysis (PCA) and stepwise linear discriminant analysis (SLDA) were applied to provide accurate classification and discrimination of *H. coronarium* essential oils of different origin. The HCA and PCA score plot clustered *H. coronarium* essential oils into 5 groups in accordance with their origin. By SLDA, 11 constituents with the best discriminating capacity were selected, and 4 discriminant functions (DFs) achieved a success rate of 100% in both classification and prediction, thereby revealing accurate discrimination of *H. coronarium* oils from different regions. These results suggest that GC-MS fingerprinting coupled with chemometrics could be an effective and reliable tool for identification and discrimination of *H. coronarium* of different geographical origin and for quality control.

References:
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[1]Centre for Biotechnology, Siksha O Anusandhan University, Kalinganagar, Ghatikia, Bhubaneswar-751003, Odisha, India; [2]Regional Medical Research Centre (Indian Council of Medical Research), Chandrasekharpur, Bhubaneswar-751017, Odisha, India.
Corresponding author: asitray2007@gmail.com