

High-Performance Thin-layer Chromatography (HPTLC) Analysis of Multi-Ingredient Traditional Chinese Medicine Supplement

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Abstract : Analysis of traditional Chinese medicinal (TCM) supplements has always been a laborious task, particularly in the case of multi-ingredient formulations. Traditionally, herbal extracts are analysed using one or few marker compounds. In the recent years, however, pharmaceutical companies are introducing health supplements of TCM active ingredients to cater to the needs of consumers in the fast-paced society in this age. As such, new problems arise in the aspects of composition identification as well as quality analysis. In most cases of products or supplements formulated with multiple TCM herbs, the chemical composition, and nature of each raw material differs greatly from the others in the formulation. This results in a requirement for individual analytical processes in order to identify the marker compounds in the various botanicals. Thin-layer Chromatography (TLC) is a simple, cost effective, yet well-regarded method for the analysis of natural products, both as a Pharmacopeia-approved method for identification and authentication of herbs, and a great analytical tool for the discovery of chemical compositions in herbal extracts. Recent technical advances introduced High-Performance TLC (HPTLC) where, with the help of automated equipment and improvements on the chromatographic materials, both the quality and reproducibility are greatly improved, allowing for highly standardised analysis with greater details. Here we report an industrial consultancy project with ONI Global Pte Ltd for the analysis of LAC Liver Protector, a TCM formulation aimed at improving liver health. The aim of this study was to identify 4 key components of the supplement using HPTLC, following protocols derived from Chinese Pharmacopeia standards. By comparing the TLC profiles of the supplement to the extracts of the herbs reported in the label, this project proposes a simple and cost-effective analysis of the presence of the 4 marker compounds in the multi-ingredient formulation by using 4 different HPTLC methods. With the increasing trend of small and medium-sized enterprises (SMEs) bringing natural products and health supplements into the market, it is crucial that the qualities of both raw materials and end products be well-assured for the protection of consumers. With the technology of HPTLC, science can be incorporated to help SMEs with their quality control, thereby ensuring product quality.

Keywords : traditional Chinese medicine supplement, high performance thin layer chromatography, active ingredients, product quality

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