

## **Effects of coated capillary column, derivatization, and temperature programming on the identification of *Carica papaya* seed extract composition using GC/MS analysis**

### **ABSTRACT**

Some of the common practices to assess the composition of plant extract, including *Carica papaya* seed extract (CPSE) are direct injection of the extract, compound separation using polyethylene glycol capillary column (DB-WAX), and non-linear-temperature programming (NLTP) of GC/MS analysis. This study specifically compared the coating of capillary column, sample derivatization, and temperature programming of GC/MS to determine the composition of CPSE. The retention indices (RI) of the detected compounds were determined and compared to the reference RI. In particular, 5% phenyl–95% methylpolysiloxane (HP-5MS)-, DB-WAX-, and biscyanopropyl polysiloxane (HP-88)-coated capillary columns were used to identify the composition of CPSE. For this study, HP-5MS column, which separated the highest number of compounds (26 compounds) from CPSE, was deemed as the most suitable column. The GC/MS analysis of derivatized CPSE identified 21 compound groups, where fatty acids and fatty acid methyl esters served as the major compounds (80.23%), followed by these compounds in decreasing order: amides > nitriles > sterols > fatty aldehydes > organic acids. A stronger correlation determination between the carbon number and alkane retention time of linear-temperature programming (LTP) ( $R^2 = 0.9859$ ) was found, as compared to its correlation determination with NLTP ( $R^2 = 0.9175$ ), which exhibited an almost equal RI of LTP to the reference RI. Conclusively, GC/MS analysis for the derivatized CPSE using HP-5MS column separation and LTP is highly recommended.

**Keyword:** Capillary column; *Carica papaya* seed; GC/MS; Sample derivatization; Temperature programming