

Fatty Acid Composition Analysis of Glycerides in Edible Oils

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BACKGROUND In cardiovascular medicine, increasing attention is being given to the varying health effects of different edible oils. Edible oils are predominantly acylglycerols (fatty acids esterified with glycerol, also known as glycerides), with different fatty acid constituents associated with positive and negative health effects. Analytical methods that can quickly and easily determine the fatty acid composition of edible oils are thus of increasing importance. In this report, we introduce the fatty acid composition analysis results of glycerides in edible oil using ionRocket coupled with Direct Analysis in Real Time Quadrupole Time of Flight Mass Spectrometry (DART®-QTOFMS).

SAMPLE 1. Rapeseed Oil 2. Edible oil containing medium-chain fatty acids

METHOD ionRocket combined with a DART® equipped QTOF-MS was used as the analytical system for this application (Fig. 1). 3 μL samples were placed into the ionRocket sample POT. A temperature gradient of $100^\circ\text{C}/\text{min}$. from room temperature to 600°C was applied (total run time: 7 min.).



Fig. 1 ionRocket DART®-QTOFMS system

RESULTS As shown in Fig. 2, peak groups presumed to be glycerides were detected between $200\text{--}300^\circ\text{C}$ in rapeseed oil. Further analysis of the resulting mass spectra between $200\text{--}300^\circ\text{C}$ of both samples detected many different glycerides (Fig. 3). Moreover, analysis of the accurate mass and the MS/MS spectra easily confirmed the fatty acid constituents of the glycerides (Fig. 4).

In summary, the ionRocket combined with DART®-MS enables rapid analysis of fatty acid constituents of acylglycerols without any sample pre-treatment. Therefore, this analytical method is useful for R&D and QC for fats and oils.

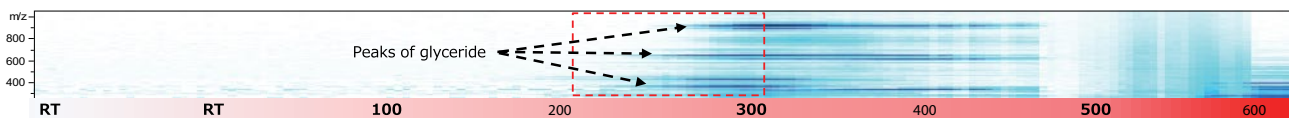


Fig. 2 Heat map of rapeseed oil

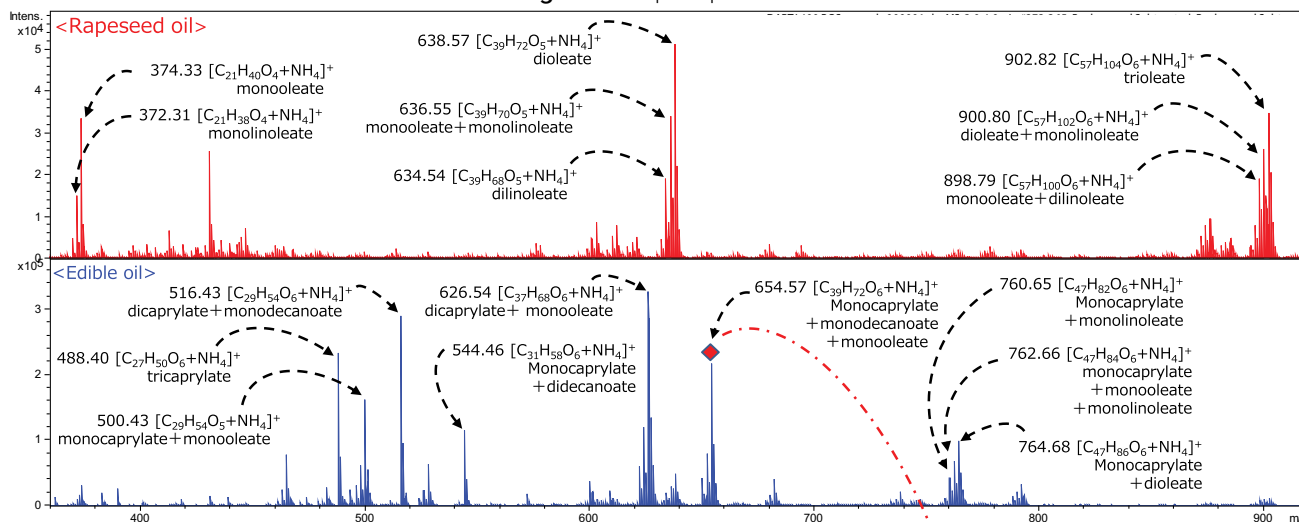


Fig. 3 Mass Spectra at $200\text{--}300^\circ\text{C}$

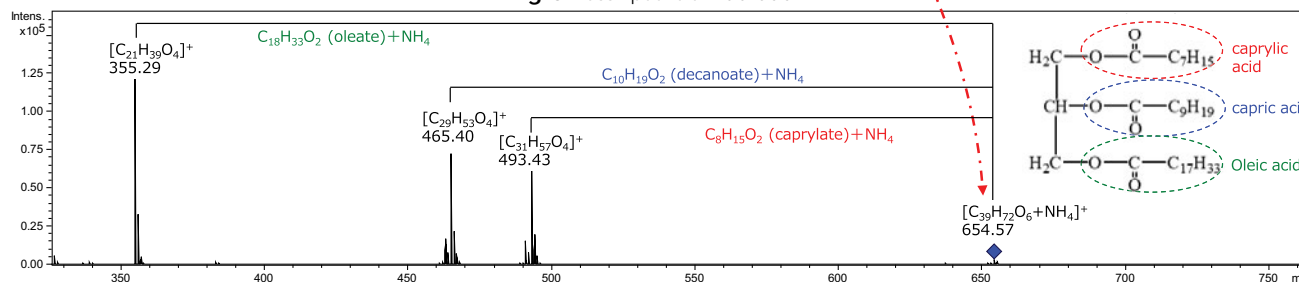


Fig. 4 MS/MS spectrum of m/z 654.57