

Toward the Detection of Sterols in Plants

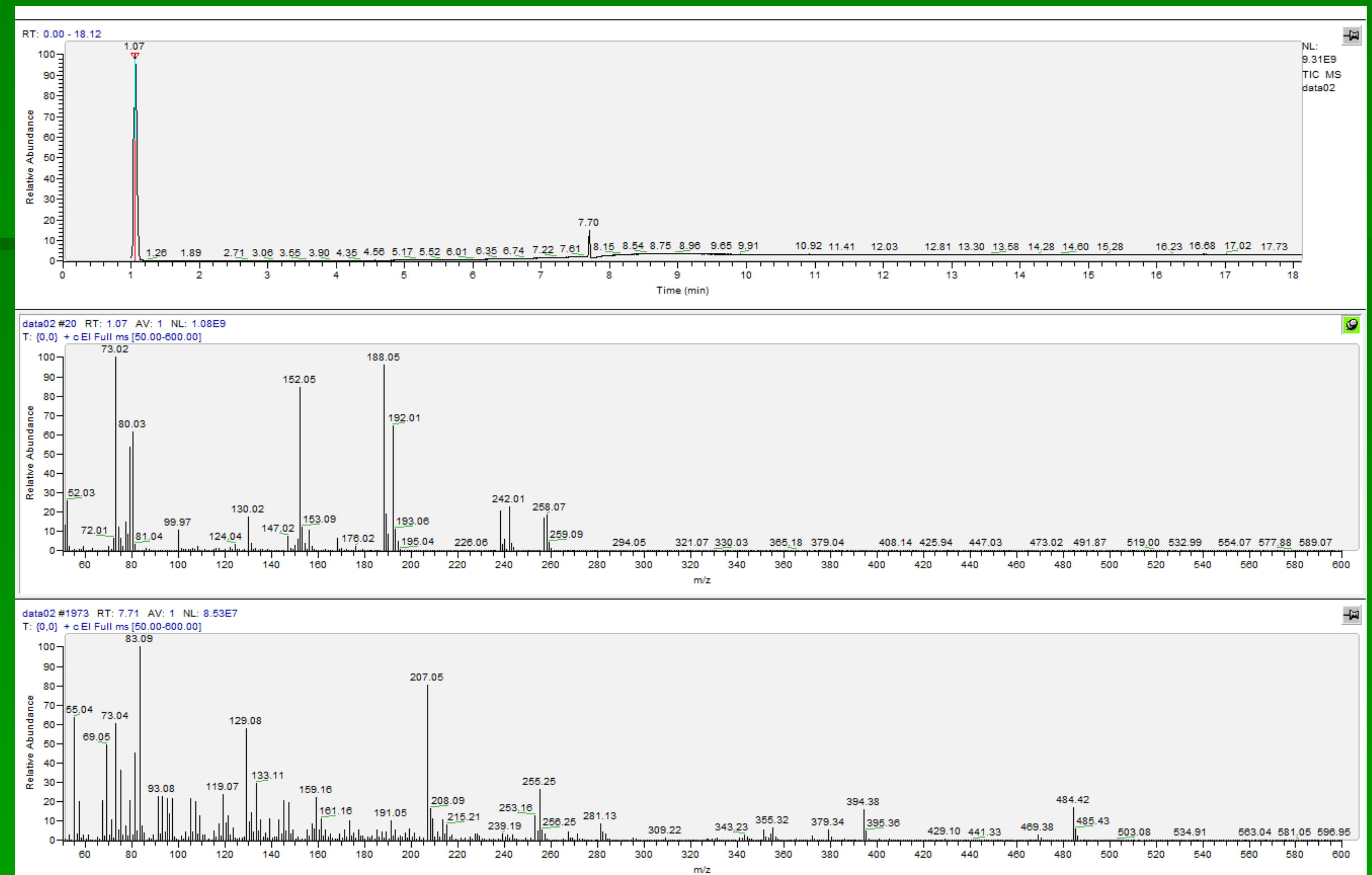
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Introduction

Gas Chromatography-Mass Spectrometry was used to develop a method to analyze for the presence of phytosterols in plants. Phytosterols are compounds similar in structure to cholesterol that compete for absorption in the digestive system, effectively lowering total blood cholesterol. Viable methods of chemical analysis of phytosterols in food would assist health professionals in advising dietary changes that could lower cholesterol without pharmacological intervention.

Analysis Method

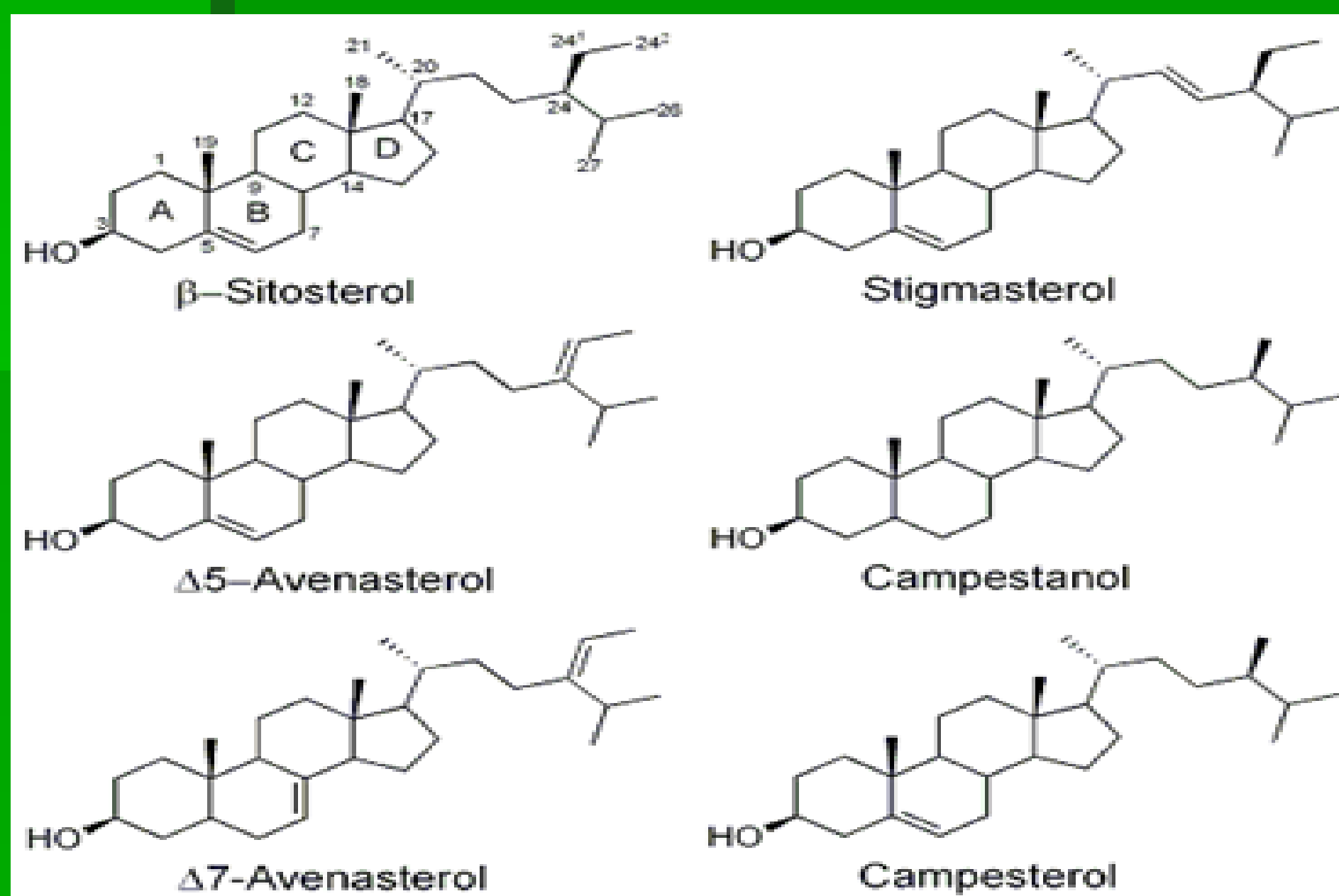
Standards and samples were analyzed using a Thermo Scientific Trace 1310 Gas Chromatograph in combination with a ISQ Single Quadrupole Mass Spectrometer. Vials for analysis contained three 100 μ L aliquots of the standard or sample, a derivatizer called BSTFA and pyridine. Solutions analyzed were injected at a temperature of 200 $^{\circ}$ C, and temperature was increased 20 $^{\circ}$ C per minute and held at temperature for 5 minutes. Temperature was increased to a final temperature of 350 $^{\circ}$ C.



Representative Chromatogram

Results and Future Direction

Final analysis method yielded molecular fragmentation patterns consistent with the phytosterol molecule dissolved in solution. According to the National Institutes of Technology's database of reference spectra, the method produced molecular fragmentation patterns that matched with greater than 70% probability for stigmasterol and β -sitosterol. A sample of a Nature Made phytosterol vitamin was analyzed; however, it did not display any peaks consistent with common phytosterols. It is possible that the sample matrix was too complex for the analysis method to detect phytosterols or that the vitamin did not contain the phytosterols that were analyzed in standard development. Further method development could focus on refining the method to detect a wider variety of phytosterols for more effective analysis.



Some Common Phytosterols

Works Cited

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