

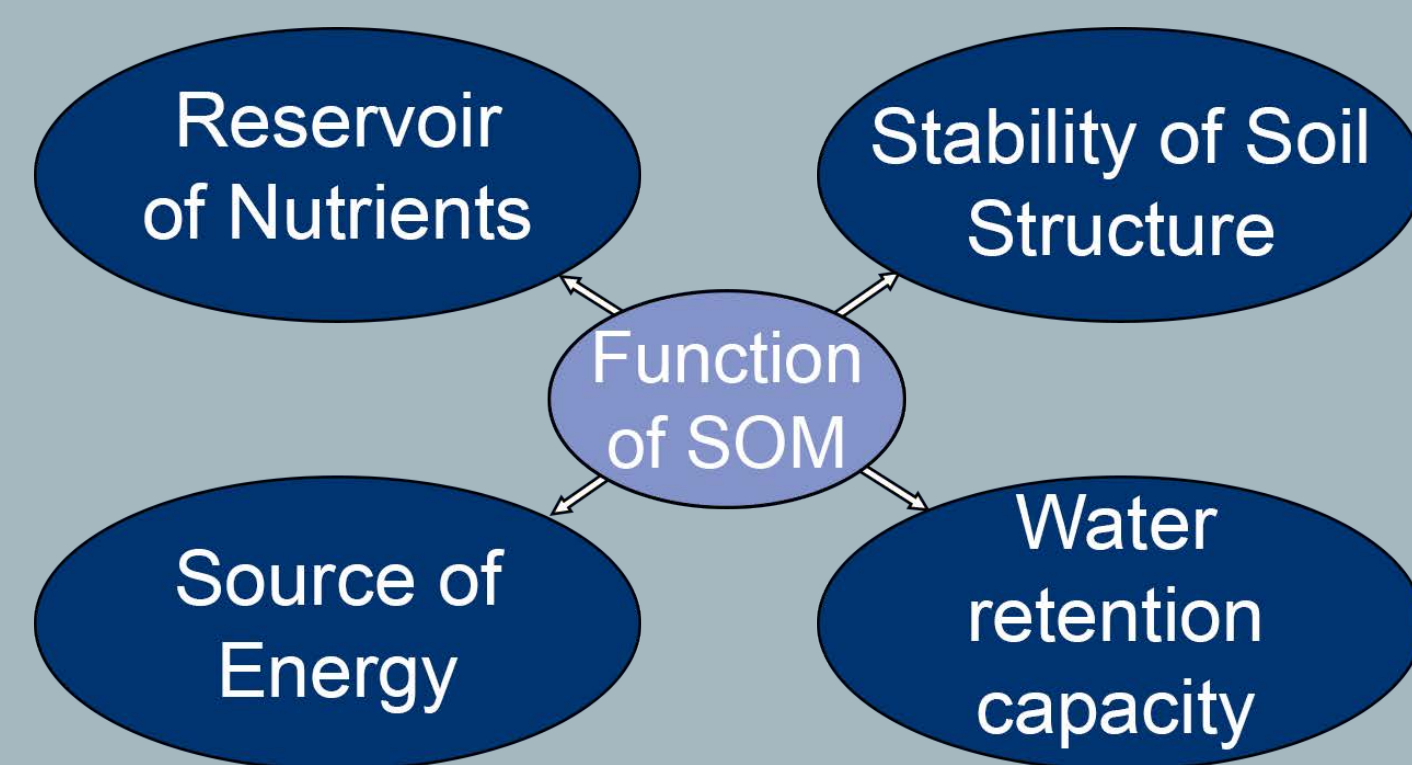
# Simultaneous Analysis of Organic Compounds in Sandy Soil

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## Background

- Soils contain a wide range of compounds that originate from plant litter and microbial biomass

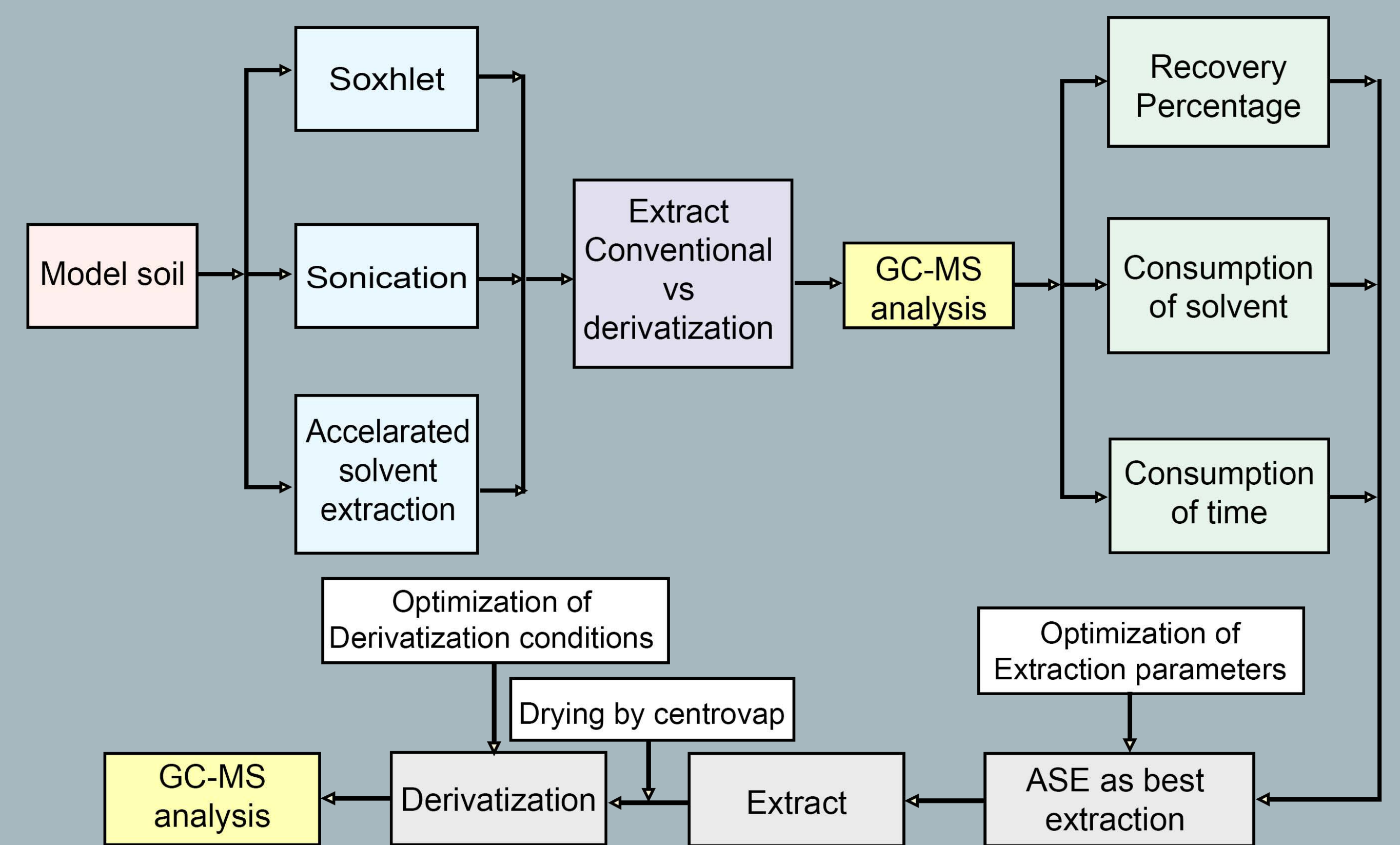


- Analyzing Soil Organic Matter is important for monitoring soil quality
- Requires a multi-biomarker strategy and robust analytical method

### This Study:

- Provides a comparative, comprehensive, and systematic methodological procedure to investigate the composition of soil organic matters and implement an alternative monitor of soil health

## Methodology



- Model soils were prepared by loading chemical compounds onto Acid Washed Sand
- Sandy soils from Western Australia were analyzed using the optimized method

## Findings: an optimized method for sandy soil analysis

### Derivatization:

- Important step for soil organic compound analysis, improves volatility, thermal stability, sensitivity, peak shapes
- Reduces polarity of the compounds in chromatographic analysis

### Optimized Methods/Conditions:

- Accelerated solvent extraction (ASE) identified as best method for extracting organic compounds from soil based on recovery percentage of compounds, time, and solvent consumption
- Organic compounds such as alkanes, fatty acids, alcohols, sterols, sugars, and amino acids from soil can be extracted by ASE at 75 °C within a short duration with the use of isopropanol and ammonia
- Pyridine and N,O-bis(trimethylsilyl)trifluoroacetamide (BSTFA), 70 °C at 60 minutes provided best conditions for derivatization of soil organic compounds

### Soil Analysis:

- The optimized simple and rapid method was employed to analyze sandy soil, leading to the identification and quantification of multiple classes of organic compounds derived from plant materials and microbial activities
- This optimized method will now provide the foundation to assess how various amendments influence the organic composition of soil and its overall health

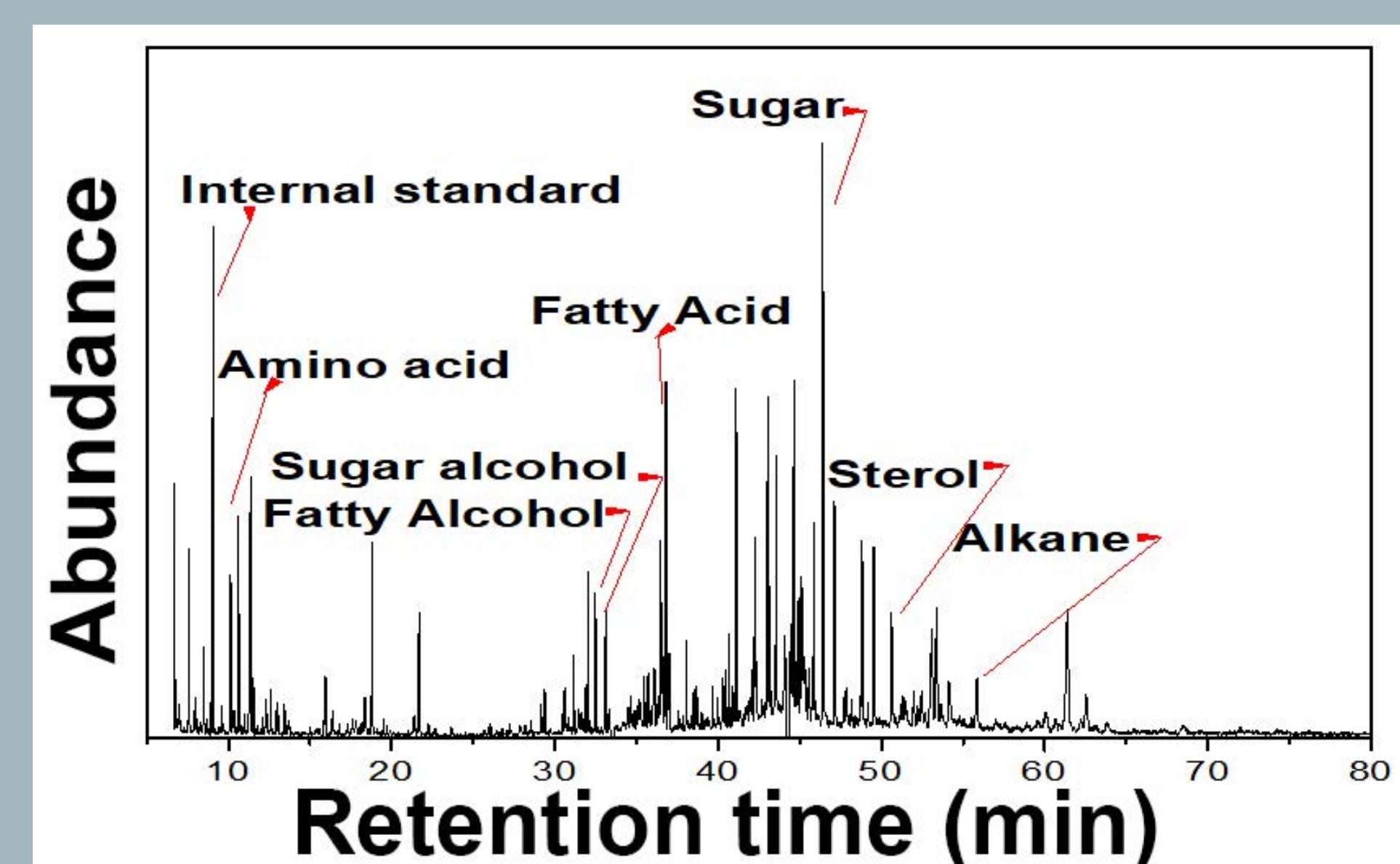


Fig: Chromatogram of sandy soil from Gingin, Western Australia showing major compound classes identified using the optimized method