

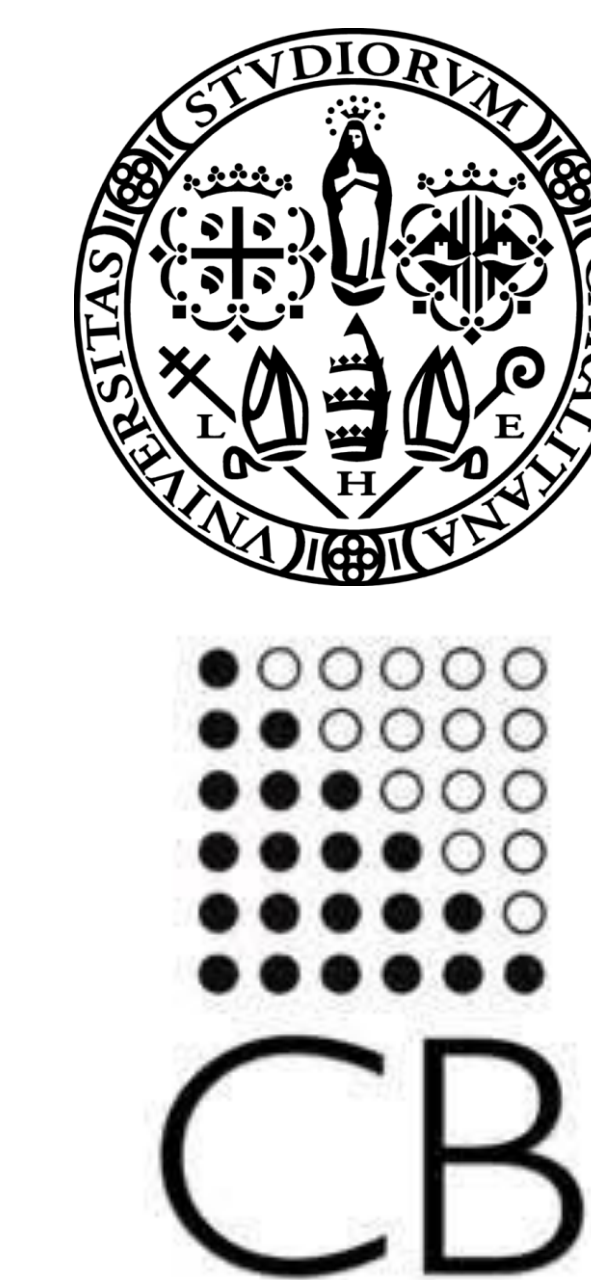


INNOVATIVE BIOSTIMULANTS FOR PLANTS OBTAINED BY SLAUGHTER WASTE

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INTRODUCTION

Animal by-products (SOA) are animal-derived materials that cannot be used for human consumption. Slaughter wastes like skin, bones, horns and hooves, blood, fat and inedible offal are SOA; it is necessary to dispose properly this waste. Currently, chemical or thermal methods and composting are used to treat SOA. These processes require time, high temperature and pressure, and produce biproducts.

The Concimi Biologici Srl team proposes an innovative method using microwaves (MW). MW treatment does not require water, operates in a few hours, without producing other wastes. The treated product is a possible candidate as bio-stimulant for plants. Biostimulants are substances and/or microorganisms that, when applied to the plants, stimulate natural processes improving the absorption and assimilation of nutrients, together with the tolerance to abiotic stress.

ABSTRACT

The obtained product was chemically characterized by our team at the University of Cagliari. We quantitated fatty acids in slaughter wastes before and after MW treatment.

MATERIALS & METHODS

We set-up an analytical method to study the content of fatty acids like myristic, palmitic and stearic acids by using a direct immersion ultrasonic extractor. Thanks to this equipment, the solvent volume, sonication time and energy consumption are reduced, as well as the acoustic pollution.

A little amount (2 g) of each sample was extracted by a 2:1 acetone-hexane mixture, and the extracted sample was purified by Solid Phase Extraction column.

Gas chromatography coupled with mass spectrometry was used for the identification and quantitation of the analytes.

RESULTS & DISCUSSION

We compared the chromatograms of the sample before and after its MW treatment (Figure 2). As can be seen, in the untreated sample chromatogram, many intense peaks corresponding to fatty acids are present. After the treatment, the intensity of the peaks were reduced. After only one hour of MW treatment the concentration of long-chain fatty acids was reduced by 90%.

When the obtained product is spread in the soil as a biostimulant, the degradation of long-chain fatty acids reduces the selection of bacterial colonies.

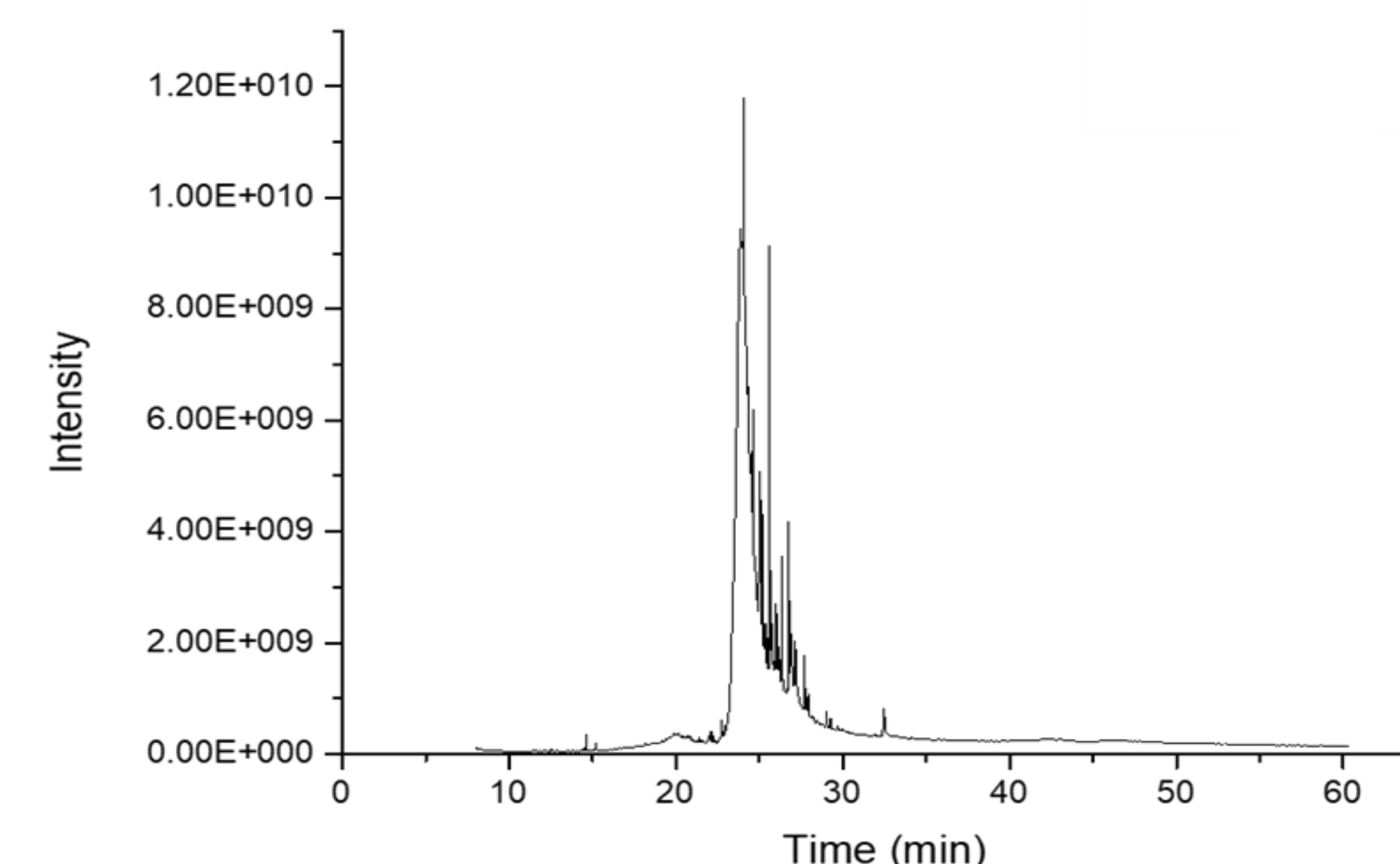


Figure 1: Chromatogram of untreated sample.

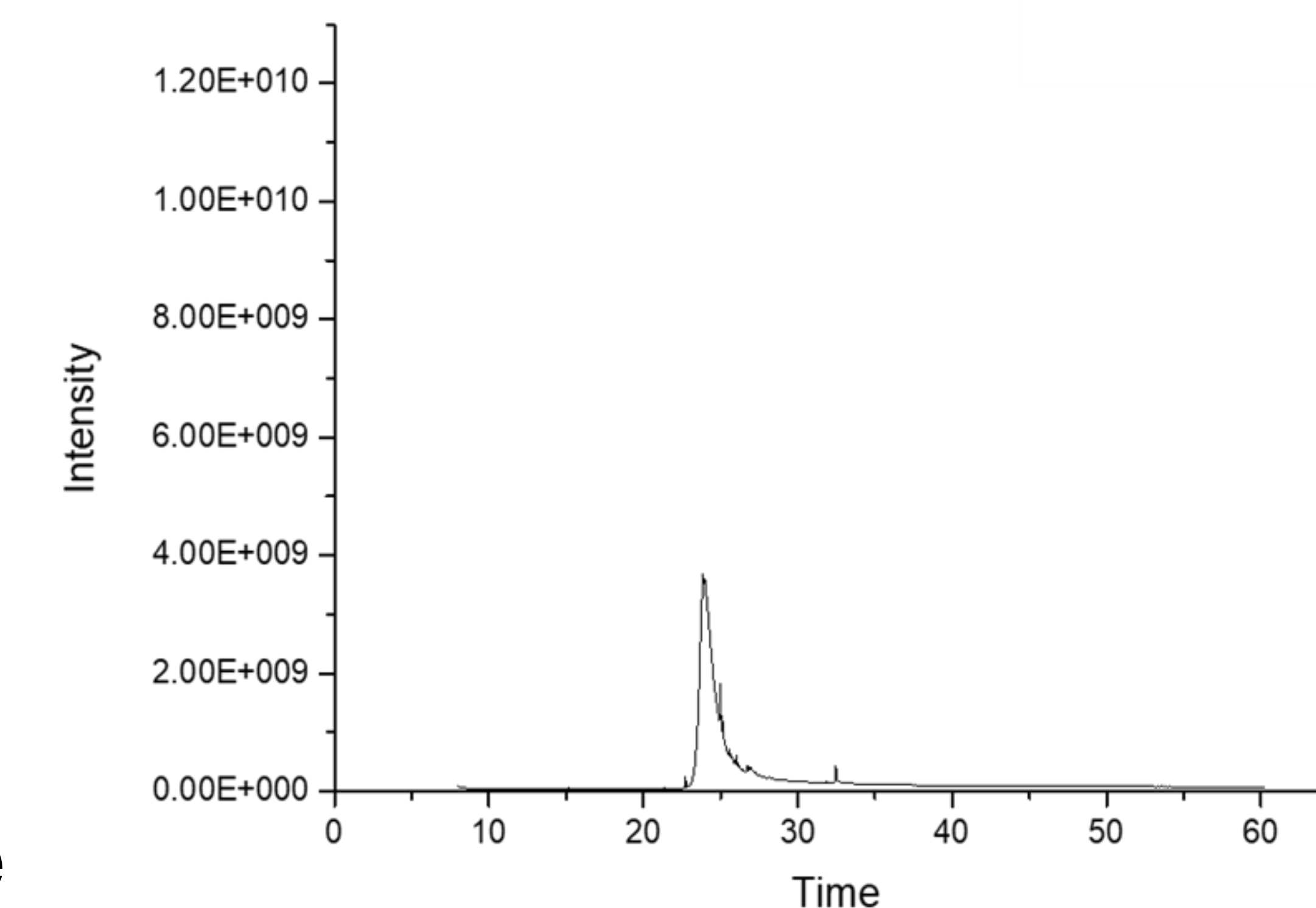


Figure 2: Chromatogram of treated sample.

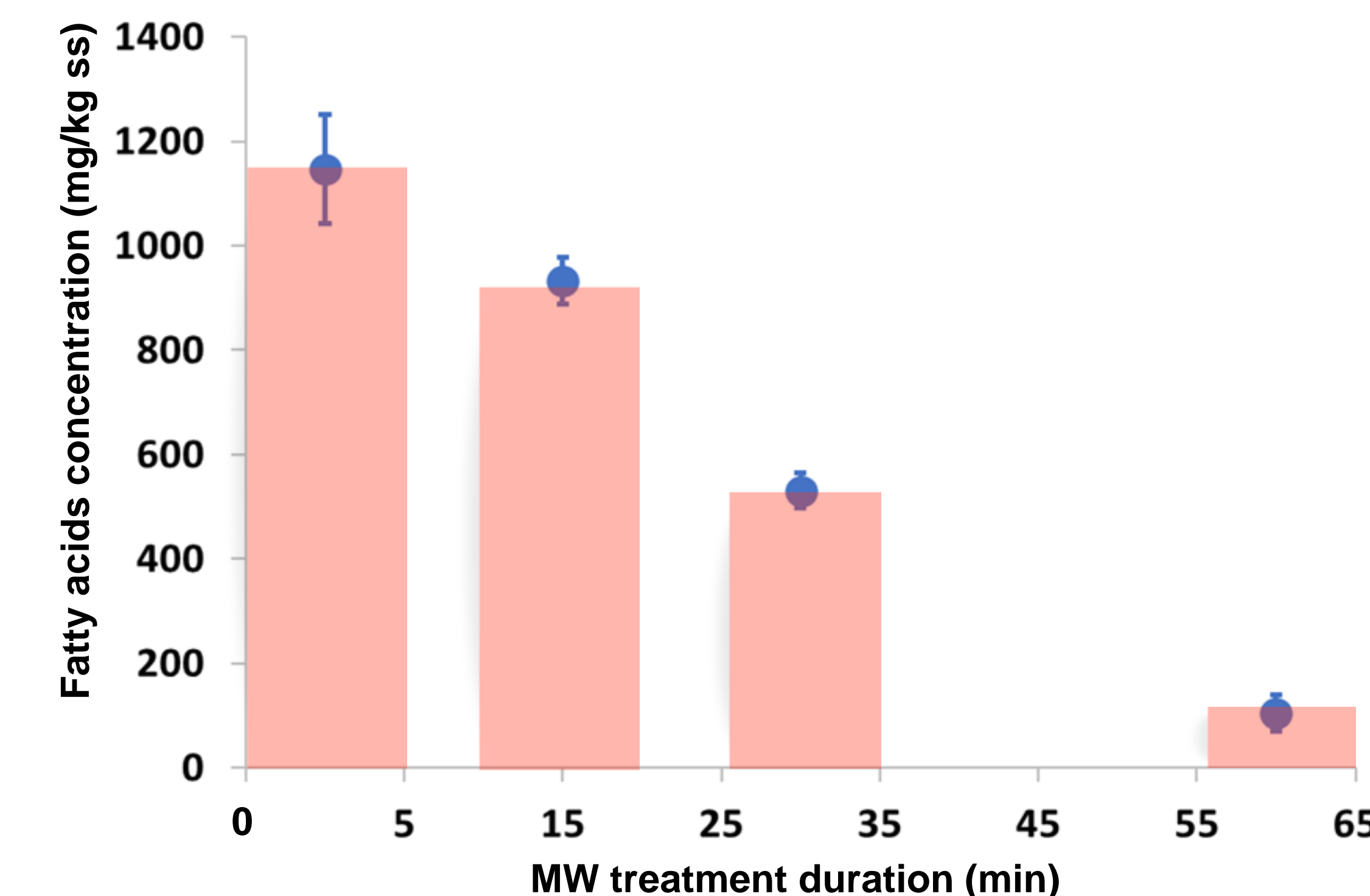


Figure 3: Fatty acids concentration at different time of MW treatment.