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## CHARACTERISATION OF *CARUM CARVI* L. ESSENTIAL OIL AND ITS ACTIVITY AGAINST FOOD POISONING PATHOGENS

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**Abstract:** Essential oils are chemical mixtures of lipophilic molecules with relatively low molecular mass that have the ability to penetrate the membrane barrier of antibiotic-resistant pathogens. By training the caraway seeds with water vapour, a slightly yellowish-coloured oil was obtained, with a training yield of 3.46%. The GC-MS analysis identified 25 compounds representing 90.50% of the oil mass. linalool (LA) was the main constituent of essential caraway oil (CEO) (33%). Both CEO and LA had a significant inhibitory effect compared to *S.aureus*/ *E. coli*, with MIC values obtained being 25.50/75.50 µg/mL and 30.25/85.50 µg/mL respectively.

### INTRODUCTION AND OBJECTIVES

The main purpose of this study was to investigate the chemical composition, the antimicrobial activity of the essential oil obtained from caraway seeds, as well as the mechanism of action of the main constituent, linalool, on the survival of pathogenic strains of *Escherichia coli* and *Staphylococcus aureus*. In view of the aim pursued, the objectives concerned:

- assessment of the volatile oil content extracted by hydrodistillation;
- establishing the chemical profile of volatile oils by GC/GC-MS analysis ;
- in vitro evaluation of the antimicrobial effect of some volatile oils.

### MATERIAL AND METHOD

The (CEO) was obtained by training with water vapour for 3 hours using a Clernger machine. The volatile oil obtained was captured in a brown, hermetically sealed vial and kept refrigerated at 40C until analysis

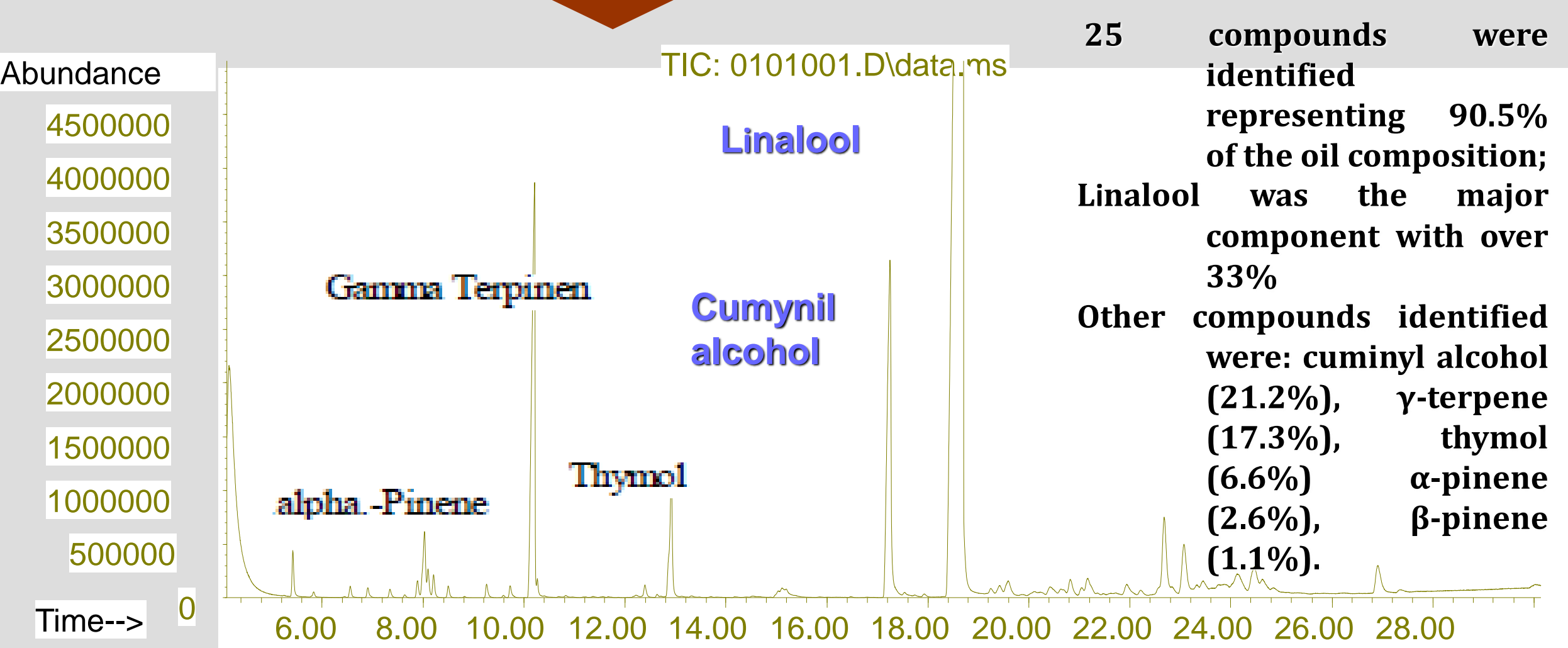
The chemical composition of the essential oil was analyzed by the GC-MS technique using a chromatograph gas coupled with the QP 2010Plus Shimadzu mass spectrometer.

The MIC values of the CEO and LA compared to *Staphylococcus aureus* ATCC 6538, *Escherichia coli* ATCC 8739 were estimated using the serial dilution method as recommended by EUCAST DEF.3.1.

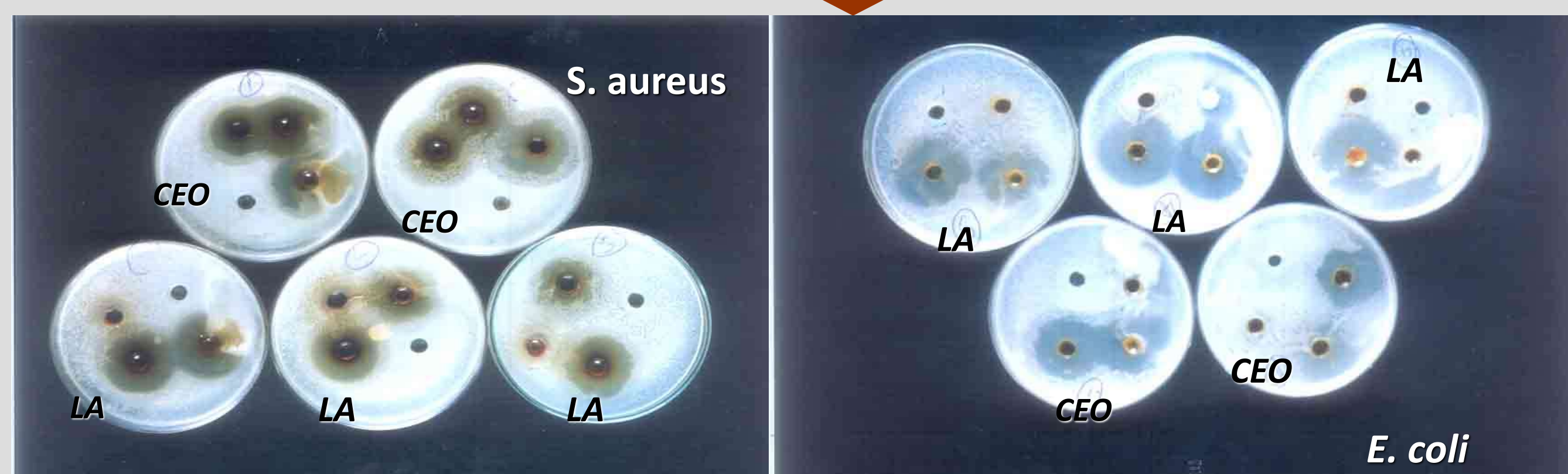
MBC was determined by calculating the relative proportion of viable bacteria versus dead bacteria using a fluorescence technique.

### RESULTS AND DISCUSSIONS

#### GC/MS analysis of essential oil *Carum carvi* L.



#### The antimicrobial action of CEO / LA against *S. aureus* respectively. *E. coli*



#### Concentrația minimă inhibitoare a CUE/CA față de *S. aureus* respectiv *E. coli*

Bacteria	Essential oil (µL/mL)	Linalool (µL/mL)
<i>S. aureus</i>	25.50	30.25
<i>E. coli</i>	75.50	85.50

### CONCLUSIONS

- ✓ According to the GC / GC-MS analysis, the volatile oil of caraway seeds was found to have linalool (33%) as the major component seconded by cuminyl alcohol (21.21%).
- ✓ Most of the compounds identified by chromatographic analysis (70.3-81.5%) belong to the class of oxygenated terpenes.
- ✓ Antimicrobial action: both volatile oil and linalool have been shown to be active against Gram-positive and Gram-negative pathogenic bacteria.
- ✓ Future studies are needed to investigate the synergistic effect of cuminaldehyde on tested pathogenic bacteria.

#### References

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