Emulsion stability is one of the vital factors that determine its food applications. In this study, carvacrol loaded emulsions were prepared through ultrasonication technique.

- The Influence of concentration of the emulsifier (1%, 1.25% and 1.5%) on the emulsion formation was determined.
- The effect of sonication amplitude (45%, 60% and 75%) on the emulsion formulations was investigated.
- Similarly, the influence of sonication time (3 min, 6 min and 12 min) on the emulsion droplet size and ζ-potential was found out.

INTRODUCTION

- Human Health
- Outbreaks
- Use of synthetic preservatives
- Chemical treatments.
- Ultrasonication
- Cavitation phenomenon
- Size reduction

MATERIALS AND METHODS

- The key aspect of this research is to formulate and characterize essential oil loaded emulsions stabilized with biopolymer (1% w/v).
- The oil-in-water emulsions containing different amounts of carvacrol in the oil phase were produced.
- 50 mM sodium acetate buffer, pH 5.5 was used as aqueous phase.
- Mean droplet size, polydispersity index and ζ-Potential of Emulsion: Malvern Zetasizer Nano ZS dynamic light scattering particle size analyser.
- Storage stability and creaming stability: The stability of the emulsions to droplet aggregation and creaming was studied.
- Microstructural properties: Confocal laser scanning microscopy (CLSM) and transmission electron microscopy (TEM) were used for studying the morphology of emulsion droplets.
- The antimicrobial efficacy of model antimicrobials geraniol and carvacrol was tested alone and in combination against pathogens *Bacillus cereus* MTCC 430 and *Escherichia coli* MTCC 443 on BHI broth as a model testing system.
- Time-kill assay was performed.

CONCLUSION

- Upwelling stability studies demonstrated no visible separation of cream and serum layers. The microstructural analysis of the emulsion with CLSM and TEM indicated formation of stable emulsion.
- Antimicrobial studies demonstrated lower MIC values for antimicrobial compounds protected through emulsion based delivery system compared with their essential oil-only based counterparts.
- These results demonstrate that an oil-in-water emulsion system can be used to incorporate plant-based antimicrobial compounds for the prolonged protection of food systems.

REFERENCES
