

OP10. Cyclodextrin nanosponges as a new encapsulating agent for essential oils and their effectiveness against foodborne pathogens

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In this work, we exploit the antimicrobial properties of cinnamon and coriander [1] essential oils that are incorporated in cyclodextrin nanosponges to create a stable controlled release system for these oils. For this purpose, cyclodextrin (CD) nanosponges (NS) were loaded with coriander (COO) and cinnamon essential oils (CIO) and evaluated for their antimicrobial activity against common foodborne pathogens both in direct contact as well as in vapour phase. To evaluate the loading capacity of the nanosponges, two SPME-GC-MS methods were successfully validated for the major compounds present in COO and CIO. The results demonstrated that loading was dependent on the type of solvent used and that nanosponges have different affinities for the oils tested as well as for each of their components. The results showed that, for COO, the NS with higher loading capacity were the ones based on β - and HP- β -CD; while for CIO, α - and β -NS were the ones yielding the best encapsulation efficiencies. The results showed that COO and CIO loaded nanosponges can effectively release essential oils and are able to exert their antimicrobial activity both in liquid medium as well as in the vapour phase. Overall, these results suggest that these nanosponges can effectively load and release COO and CIO to exert their antimicrobial activity, which opens the doors for their potential use in antimicrobial food packaging applications.

References:

[1] Silva, F., Domingues, F.C., 2017. *Crit. Rev. Food Sci.* 57, 35–47.

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