

Title: Effect of hydrophobic deep eutectic oil-in-water nano coating on the quality preservation of postharvest 'Harumanis' mango

Author Names: M.J. Gidado , Ahmad Anas Nagoor Gunny , Subash C.B. Gopinath , Chalermchai Wongs-Aree e , Nor Hanis Aifaa Yusoff g , Roshita Ibrahim a b , Rozeita Laboh h , Asgar Ali

Abstract: A hydrophobic deep eutectic oil-in-water nanoemulsion (HyDEN) was developed as a potential [edible coating](#) for preserving 'Harumanis' mango. Preventing water loss in mango during [postharvest](#) handling and storage is crucial to maintain their quality and market value. Mango with high respiration rates during storage tend to have shorter shelf life due to issues like softening and over-ripening. Edible coating materials such as lipids, [polysaccharides](#), and proteins have setbacks such as poor water vapor barrier and potential contamination which affect their performance in preserving fruit quality. In this study, a HyDEN coating was prepared to preserve 'Harumanis' mango. The HyDEN coating exhibited good stability, with a high zeta potential value of -42.02 ± 0.12 mV, a robust antioxidant property of $97.89 \pm 0.14\%$, and relatively low mean [droplet sizes](#) averaging 210.04 ± 0.89 nm. The application of HyDEN coating effectively extended the shelf life of 'Harumanis' mango. Additionally, it slowed down the ripening process, preserving the fruit's quality in terms of weight loss, firmness, total soluble solids, colour, titratable acidity, pH, radical scavenging rate, browning index, total phenolic content, total [flavonoid](#) content and sensory attributes after 20 days of storage, whereas the control fruit began to overripe and deteriorate after 10 days. This study introduces a novel delivery system for applying HyDEN as an [edible coating](#) for [postharvest](#) fruit preservation.

Keywords: Hydrophobic deep eutectic nanoemulsion (HyDEN); Edible coating; Harumanis mango; Postharvest preservation

<https://www.sciencedirect.com/science/article/abs/pii/S0927775724006794#:~:text=These%20significantl y%20affect%20their%20performances,change%20in%20fruit's%20physicochemical%20characteristics.>