DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRIC METHOD FOR SIMULTANEOUS ESTIMATION OF EUGENOL AND CARVACROL

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(Received 21 April 2025) (Accepted 20 September 2025)

ABSTRACT

Eugenol and carvacrol, aromatic compounds found in essential oils, have become central components of herbal formulations and natural products intended for a variety of medicinal and commercial uses. They are available in sprays, cosmetic products and antimicrobial formulations. These formulations often involve incorporating them into different matrices, like nanoparticles or films, for enhanced stability and controlled release. While eugenol and carvacrol offer considerable biological benefits, quantification of these compounds presents several challenges. A major difficulty arises from their high susceptibility to photolysis, particularly under exposure to sunlight. The main objectives of this study were to establish a UV-spectrophotometric method that can simultaneously measure eugenol and carvacrol in bulk. Linearity was achieved in 5-25 µg mL^{-1} for eugenol and 5-50 µg mL^{-1} for carvacrol, with λ_{max}: 229 nm and 277 nm, with correlation coefficients were 0.995 and 0.999, respectively. The isoelectric point of both molecules was detected at 264 nm. The percentage recoveries for eugenol and carvacrol were 100% and 98.6%, respectively. The precision of the method was ensured as the % RSD value was below 2.