

## Green-synthesized of Selenium Nanoparticles Using Garlic Extract and Their Application for Rapid Detection of Salicylic Acid in Milk

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**Abstract :** Milk adulteration is a global concern, and the current study was plan to synthesize Selenium nanoparticles by green method using plant extract of garlic, *Allium Sativum*, and to characterize Selenium nanoparticles through different analytical techniques and to apply Selenium nanoparticles as fast and easy technique for the detection of salicylic acid in milk. The highly selective, sensitive, and quick interference green synthesis-based sensing of possible milk adulterants i.e., salicylic acid, has been reported here. Salicylic acid interacts with nanoparticles through strong bonding interactions, hence resulting in an interruption within the formation of selenium nanoparticles which is confirmed by UV-VIS spectroscopy, scanning electron microscopy, and x-ray diffraction. This interaction in the synthesis of nanoparticles resulted in transmittance wavelength that decrease with the increasing amount of salicylic acid, showing strong binding of selenium nanoparticles with adulterant, thereby permitting in-situ fast detection of salicylic acid from milk having a limit of detection at  $10^{-3}$  mol and linear coefficient correlation of 0.9907. Conclusively, it can be draw that colloidal selenium could be synthesize successfully by garlic extract in order to serve as a probe for fast and cheap testing of milk adulteration.

**Keywords :** adulteration, green synthesis, selenium nanoparticles, salicylic acid, aggregation

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