

Black Garlic Nanoparticles (*Allium sativum* 'Solo garlic'): Preparation, Characterization and Antioxidant Test

by Retno Arianingrum, Cahyorini Kusumawardani, dan Sri handayani

ABSTRACT

Black garlic is the product from the aging process of garlic (*Allium sativum* L). Although black garlic has a high level of antioxidant activity, its biological activity may be reduced in vivo due to the evaporation or degradation of these bioactive components. By creating black garlic nanoparticle components, nanotechnology can be used to boost the bioavailability of black garlic. This research aims to synthesize black garlic ethanol extract nanoparticles, characterize them and test their antioxidant activity. The research stages carried out include extraction of black onions using the maceration method, synthesis of nanoparticles using the ionic gelation method using chitosan and sodium tripolyphosphate (Na-TPP) at various concentrations and temperatures, characterization of nanoparticles using Particles. Size Analyzer (PSA) to determine the particle size distribution, Scanning Electron Microscope (SEM) to determine the morphological structure and X-Ray Diffraction (XRD) to determine the crystal structure. The antioxidant activity test was carried out using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method. The research showed that the best concentration ratio of Na-TPP and chitosan to produce nanoparticles of black garklic ethanol extract was 0.05% Na-TPP and 0.1% chitosan at room temperature. The size of the nanoparticles obtained was 52.47 nm. The nanoparticles had strong antioxidant activity with an IC_{50} of 74.91 ppm.

Kata Kunci: *Black garlic ethanol extract, nanoparticles, synthesis, characterization and antioxidant assay.*