

ABSTRACT

*The misuse of conventional antibiotics has led to an upsurge in antibiotic resistance among bacteria. Therefore, it is necessary to develop a new and effective strategy to eradicate bacterial infections. Recent reports have shown the potential of nanoparticles to wield potent antibacterial properties. However, there remains a lack of research done in producing stable nanoparticles for antibacterial applications. Moreover, studies on the effect of various liquid environments in the synthesis of such particles is still limited. Therefore, this study explores carbon nanoparticles synthesized in various liquid media via the pulsed laser ablation method utilizing an Nd:YAG laser. The laser was focused onto the surface of the graphite plate that is submerged at the bottom of a glass beaker containing different liquid media. Interestingly, the choice of liquid media significantly affected both the physical and antibacterial properties of the produced carbon nanoparticles; nanoparticles synthesized in chitosan solution exhibited greater colloidal stability compared to their counterparts and had a diameter around 38.5 nm, while the ones produced in ethylenediamine were the smallest in size, with a diameter around 29.4 nm. Further examinations revealed that this method yielded high-purity carbon nanoparticles. Antibacterial assessments conducted via the disk diffusion method against *E. coli* bacteria have also shown that the usage of ethylenediamine during the synthesis procedure greatly improved its antibacterial property. This further confirms the fact that the smaller the nanoparticle is in size, the greater its ability in inhibiting bacterial growth.*

Kata Kunci : *Carbon nanoparticles, Pulsed laser ablation, Nd:YAG laser, Chitosan, Ethylenediamine*