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Bacteriophage as a therapeutic agent and a novel route for the synthesis of gold nanoparticles

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A strain of Klebsiella sp. was isolated from the Pavana River, Pune city, Maharashtra, India. Based on biochemical characterization and molecular analysis, the bacterial strain was identified as Klebsiella sp. Similarly, a bacteriophage was isolated from the river that was capable of forming plaques on the plates containing Klebsiella sp. Morphology of Salmonella-phage was observed by using transmission electron microscopy (TEM). Potential of this phage was checked for disruption and inhibition of Klebsiella biofilms in 96 well plates. Biofilm disruption and inhibition was also observed on glass surfaces by using scanning electron microscopy (SEM). Further, the phage lysates were used for synthesis of gold nanoparticles. Gold nanoparticles were characterized by UV-visible spectrophotometer, SEM-EDS and XRD. Gold nanoparticles were also showed antimicrobial activity against some pathogenic microorganisms. Thus, phages were found effective against pathogens and green source for nanoparticle synthesis was investigated.

Biography

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RAPD markers for identification of cytoplasmic genic male sterile and restorer lines of pigeonpea

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GMS system was exploited for potential heterosis breeding but proved failure because of labour intensiveness in seed production and seed purity concerns. This resulted in the development of cytoplasmic genetic male sterility system using cytoplasm of wild species like C.sericeus and C. scarabaeoides. In development of CMS based hybrids, male sterile (A), maintainer (B) and restorer (R) lines are required. Unambiguous characterization of the parental lines not only reduces the cost, labour, and time but also leads the hybrid development in the proper perspective.

DNA based markers are the best option to characterize the parental lines involved in the development of hybrids as they are numerous, independent of environmental effects and can detect the plants of interest at an early growth stage. In present study, RAPD analysis was used to study the genomic DNA variation among the Sterile (A) lines and Restorer (R) lines of pigeonpea. The cytoplasmic-genetic male sterility (CMS) system is considered to be feasible approach to develop hybrids in pigeonpea. Identification of CMS lines and their putative restorers using molecular markers in the early stage of growth is important and economical in long duration pigeonpea. Random amplified polymorphic DNA (RAPD) markers were used to identify the sterile (A) lines and fertility restoration (R) lines of pigeonpea. Of the 80 RAPD primers screened, 72 were found to be polymorphic. Two RAPD primers were identified that could distinguish the sterile (A) lines and restorer (R) lines. The use of these primers in heterosis breeding is discussed.

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