

ABSTRACT

Pyocyanin (1-hydroxy-5-methyl phenazine), the characteristic blue pigment of *Pseudomonas aeruginosa*, belongs to the class of pigments called phenazine. Biologically produced pyocyanin was extracted from *P. aeruginosa* P4 (soil isolate) and was quantified spectrophotometrically to be $17.99 \mu\text{g mL}^{-1}$. Also, the incubation conditions of the production strain were optimized for enhanced production of pyocyanin. Maximum pigment was obtained using glycerol-alanine broth at 40°C in agitation condition (150 rpm). Maximum pyocyanin was obtained after 66- 69 hours of incubation. Antibacterial activity of pyocyanin was studied by performing Disk Diffusion Assay and Minimum Inhibitory Concentration determination against 3 pathogenic bacterial strains namely *S. aureus*, *S. epidermidis* and *S. pyogenes*. Pyocyanin was found to be most potent against *S. pyogenes* having the minimum inhibitory concentration as $13 \mu\text{g mL}^{-1}$ against this bacterium. Antifungal activity of pyocyanin was studied by performing Minimum Inhibitory Concentration determination against 3 plant pathogenic fungal strains namely *Rhizoctonia solani*, *Bipolaris bicolor* and *Botrytis cinerea*. *B. bicolor* and *B. cinerea* were found to be most susceptible to Pyocyanin at $20\text{-}40 \mu\text{g mL}^{-1}$. The pigment was comparatively less effective against *R. solani* whose MIC range was determined to be $200\text{-}250 \mu\text{g mL}^{-1}$. Further, using a UV-sensitive bacterial culture (*S. aureus*), it was inferred that pyocyanin exhibited protection from UV in a concentration dependent manner. Most effective protection (32.8 %) was observed when bacterial culture (containing $20 \mu\text{g mL}^{-1}$ of pyocyanin) was exposed to UV for 10 min. These studies helped in drawing meaningful conclusions regarding applicability of this pigment as antimicrobial agent and as UV protectant.