Abstract

Color is the most prominent factor in any marketable product. Many microorganisms have the potential to produce pigments as secondary metabolites. A number of synthetic pigments are used as food coloring agents. The chemicals used for their production can sometimes have detrimental effects on human health. Chemical components of the synthesized dye can be the root cause of cancer. This research aims to replace synthetic dye with more natural and cheaper dyes. To fulfill this aim, microbial pigment- pyoverdine was chosen which is cheaper and eco-friendly. Among the objectives of this study is extraction of pyoverdine from *Pseudomonas sp.,* and examination of its functional properties like antimicrobial activity, antioxidant activity and its potential to dye fabric. *Pseudomonas sp.* was isolated from water samples collected from different areas of Lahore. Identification of bacterial strain was done by streaking it on asparagine proline broth and cetrimide agar. Its pigment production capability was assessed on king's B medium. A colony producing green pigment was selected and labeled as D which was inoculated in nutrient broth. Optimization of growth parameters was analyzed using design expert® stat ease. Pigment produced after 120 hours of incubation was extracted using chloroform and purified using methanol. Detection analysis (Spectroscopy, TLC) confirmed the product as pyoverdine, and structure-based analysis (FT-IR and NMR) suggested its structure. Extracted pigment showed antimicrobial activity against *Salmonella sp., Staphylococci sp.* and *E.coli sp.* its antioxidant activity using DPPH and methanol as reagent was calculated as 111.03% (200µg/ml DPPH). The extracted pigment after treatment in dye bath (pigment dissolved in methanol and diluted by distilled water) coloured the cotton cloth sage (greenish brown). On the basis of above-mentioned results, the extracted pigment was entitled to be used in different industries specifically food and textile.