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RED PIGMENT ISOLATED FROM SOIL BACTERIUM KEGS1_1 AS A POTENTIAL BIOACTIVE AGENT: A PRELIMINARY STUDY

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Prodigiosin, a bright red-coloured pigment of the alkaloid family, mainly produced by *Serratia* spp., is known to harbour antibacterial, antimalarial, and antitumor properties. The main goal of the present study was to characterize and identify bioactive potentials of the intracellular, red-coloured pigment extracted from the soil bacterium KEGS1_1. The pigment was extracted from the KEGS1_1 culture grown in nutrient broth, using solvent extraction with ethyl acetate, and purified by silica gel column chromatography. The colour of the extracted pigment changed into pink and yellow upon the concentrated HCl and concentrated NH_4OH treatments, respectively, indicating the positive presumptive test for prodigiosin. Preliminary characterization of the red pigment by UV-Visible spectrophotometry (λ_{max} = 536 nm) and thin layer chromatography (R_f, = 0.84, chloroform: methanol: acetone 4:2:4) further revealed prodigiosin as a main chemical constituent of the extracted pigment. Antimicrobial activity was determined using a standard disk-diffusion assay against six bacterial and three fungal strains at the concentration of 400 µg of pigment per disk. The pigment exhibited inhibitory effects against the tested bacterial strains *Staphylococcus aureus* (ATCC 25923, 20.11±0.42 mm), *Bacillus subtilis* (ATCC 6633, 32.89±0.87 mm), *Listeria monocytogenes* (NCTC 11994, 21.67±0.27 mm) and *Escherichia coli* (ATCC 25922, 18.44±0.16 mm). However, at the same concentration, no inhibition zones were observed for the tested fungal strains *Candida albicans* (ATCC 10231), *Aspergillus welwitschiae* and *Scelorotinia sclerotiorum.* The DPPH free radical scavenging activity of the pigment increased gradually with the concentration, and the IC_{50} value was 77.03±0.83 µg ml^{-1}. The *in vitro* Sun Protection Factor (SPF) of the pigment was determined using a UV-visible spectrophotometric method, and the pigment showed a moderate SPF value of 24.86±0.05 at the concentration of 2 mg ml^{-1}. The findings of the current study suggested the potential use of the red pigment as an antibacterial and a photoprotective agent.

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Keywords: Antibacterial activity, Antioxidant activity, Pigment, Prodigiosin, Sun Protection Factor