Abstract:

The consumer sensitivity toward application of synthetic colors led to the exploitation of food grade bio-colors from bacteria. *Pseudomonas aeruginosa* and *Serratia marcessence* is an opportunistic, gram-negative bacterium that secrete a variety of redox-active phenazine pigmented compounds and Tripyrrole structures, which are significant for a variety of biological activities. Pyocyanin, a water soluble blue green phenazine pigment producing *P. aeruginosa* was screened from aquatic habitats of isolation of Pakistan, identified and compared by 16S rRNA gene sequence for genetic variability. The similarity of selected strain was found 99% with *P. aeruginosa* DSM 50071 with accession no CP012001.1 in gene bank. Pyocyanin from the identified strain was extracted after 72 h of incubation by chloroform and purified with 0.1 N HCl and 1 N NaOH. Prodigiosin as red-pigment was extracted from meat source. Protective effects of the extracted pyocyanin and prodigiosin as food colorant were evaluated. Pyocyanin and Prodigiosin showed anti-oxidant potential with inhibition of 2,2- diphenyl-1-picrylhydrazyl radical compare to Trolox and BHT and free radical scavenging of 2,20-azinobis-(3-ethylbenzothiazoline-6- sulfonic acid) in comparison to Trolox and BHA at 50 lg/ml concentration. The anti-microbial efficacy of pyocyanin was assessed against food borne pathogenic bacteria and fungi by agar well diffusion method. Pyocyanin and Prodigiosin exhibited anti-bacterial activity with distinct zone of inhibition against *B. spizizenii, S. aureus, E. aerogenes*,

S. enterica, P. aeruginosa and E. coli at 50 lg/ml concentration. Pyocyanin and Prodigiosin was more susceptible at the same concentration against fungal strains for *F. oxysporum, A. niger and A. fumigatus* respectively. Anti-biofilm profile of pyocyanin exhibited significant inhibition of the biofilm formation against biofilm forming bacteria *B. cereus, S. aureus, P. aeruginosa and K. pneumonia* when assessed by crystal violet assay at 50 lg/ml concentration. Similar effects at the same

concentration was observed in disruption of pre-formed biofilm against *B. cereus, S. aureus, P. aeruginosa and K. pneumonia*. The presented remarkable biological activities of pyocyanin and Prodigiosin against food borne pathogens augment the utilization of chromogenic microbes existing in Pakistani aquatic resource as an alternative potent source for efficient production of natural pigment and their application as natural color and bio-preservative in food industries and many other biological applications such as pharmaceuticals.