Abstract

Azo dyes constitutes about constitutes about 70% of worlds dyestuff production. Accumulation of dyestuff in wastewater is not only an environmental, but also medical and aesthetic problem. These pollutants possess serious toxicants, which reportedly are carcinogenic, teratogenic, genotoxic and mutagenic. They are very slow in degradation and their removal from the hot textile industrial discharge is fundamental problem. Bioremediation is an economical and environment friendly solution for the problem of dyestuff pollution. Present study was aimed to assess the degradation potential of environmental isolate IJA-2A for multi-azo textile dye Direct Black-22 (DB-22). IJA-2A shows significant degradation potential at 37°C for 96 hours. Spectrophotometric analysis indicated 95% degradation of the dye DB-22, changing its color from matte black to yellowish (color of media). Fourier transform infrared spectroscopy further confirmed the degradation of DB-22, as new peaks are formed in the treated sample. Gas Chromatography Mass Spectrometry analysis indicates the formation of new metabolites at retention time 7.258, 18.222, 15.380, 24.455, 17.255, 20.729 and 8.692, identified 2-Piperidinone, 1,3-Cyclohexanedione, 2,5,5-trimethyl, benzene, 1,2,4-trimethoxy-5-(1E)-1-propen-1-yl-, DL-Leucine, N-DL-leucyl, 1,4-diazabicyclo[4.3.0]nonan-2,5-dione, 3-methyl, Hexamethylcyclohexane-1,3,5-trione and Benzeneacetic acid, respectively. Among them the most abundant metabolite was 2-Piperidinone. Molecular characterization of environmental strain IJA-2A revealed that it was identified as *Brevundimonas vancanneytii*. It was concluded from the study *B. vancanneytii* efficiently degraded DB-22, indicating its potential utilization in bioremediation process.