PATNA WOMEN'S COLLEGE 1940

Industrial Microbiology

Explore–Journal of Research for UG and PG Students
ISSN 2278 – 0297 **(Print)**
ISSN 2278 – 6414 **(Online)**

http://www.patnawomenscollege.in/journal

Efficiency of bacterial isolates to degrade textile dyes

• **Ankita Singh** • **Rakhshan Ahmad** • **Shweta Mishra**
• **Jaya Philip**

Received : November 2014
Accepted : March 2015
Corresponding Author : Jaya Philip

Abstract : *The increasing demand for colourfast and non fading dyes has led to the rapid growth in the use of reactive dyes, the majority of which are azo dyes which are not recyclable and scarcely biodegradable due to their complex structures. Increasing concern about their discharge into water bodies from industries has accelerated the need for new treatment schemes and to find our study three bacterial strains of genus Bacillus, Paenibacillus and Pseudomonas were isolated from dye contaminated soil. Paenibacillus and Bacillus rapidly decolorized and degraded a methyl orange azo dye Solution i.e. 47.3% and 43.6% respectively. Bacillus also degraded 26.5% Methyl red dye while Pseudomonas degraded it the least. These strains exhibited a remarkable decolourization capability at pH 7 and at temperatures 37^{0}C to 42^{0}C. Methyl orange and methyl red were found non-toxic after degradation and supported the growth of natural flora. Methyl orange and Methyl red inhibited the three selected stains at the concentration of 5 mg/ml while Congo red at the concentration of 4 mg/ml was inhibitory.*

Key words: *Bacterial strains, Degradation, Decolourization, Toxicity assay, Minimal inhibitory concentrations.*

Ankita Singh
B.Sc. III year, Industrial Microbiology (Hons.),
Session: 2012-2015, Patna Women's College,
Patna University, Patna, Bihar, India

Rakhshan Ahmad
B.Sc. III year, Industrial Microbiology (Hons.),
Session: 2012-2015, Patna Women's College,
Patna University, Patna, Bihar, India

Shweta Mishra
B.Sc. III year, Industrial Microbiology (Hons.),
Session: 2012-2015, Patna Women's College,
Patna University, Patna, Bihar, India

Jaya Philip
Assistant Professor, Deptt. of Industrial Microbiology,
Patna Women's College, Bailey Road,
Patna–800 001, Bihar, India
E-mail : jayaphilipmicrobio@gmail.com

Introduction :

Dyes are used in wide range of industries like food, pharmaceuticals, cosmetics, leather but are of primary importance to textile manufacturing. Dyes used in textile industries have a synthetic origin and complex aromatic molecular structures which make them stable and difficult to be biodegraded. 80% of the commercial dyes used all over the world in textile industries are Azo dyes. Azo dyes, contain one or more azo bond (-N=N-) as its chemical structure and account for its major contribution in all textile dyes used. Estimations state that 10-15% of the total dye is lost during synthesis and the dyeing processes. Due to its high reactivity it is difficult to process the dye and the