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Introduction

In present day the cry due to environmental pollution can be heard from all around the world. e rapid increase in the pollution level has now become a major threat to the survival of mankind on Earth. e ecological balance of nature is being disturbed by the mankind for their wealth, comfort and ego but now nature itself has started disturbing the nature's balance. e tremendous increase in industrial activity and discharge of toxic industrial waste into the environment is an issue of serious concern. e foremost responsibility of every citizen is to maintain ecological balance and environmental purity.Based on global scenario, according to a report of WHO on national baseline data reported through 86 developing countries by the end of 1980 three residents out of four from urban had access to pure water. Almost 80% of all diseases and epidemics can be associated to inadequate water and improper sanitation. Approximately 6 million infants in developing countries die because of diarrheal diseases each year and more than 400 million citizens su er from gastroenteritis According to the survey of Indian National Scenario, eight hundred cases out of one lakh annually revealed incidence of water borne diseases based on the data collected by Indian Planning Commission, water related or borne diseases incorporated around 80% of country's health related problem. By the end of 1980, approximately 59% of the population of India (around 69% rural and 23% urban) did not have approach to safe and pure drinking water. To assess the quality of water it is necessary to examine its physico-chemical and biological parameters and to check out the source of pollution, which nally helps in water quality management, such qualities guide to nd out in case water is convenient for agricultural, domestic, industrial purpose

which will also disturb the aquatic life.

e physical chemical and biological parameters of water bodies can be extremely changed by various man-made activities like agricultural practices, industrial discharges and natural dynamics which consequently disturbing the water quantity and quality. Chemical alteration of river water quality can be check out by the analysis of chemical parameters and biochemical studies. For a healthy river it is essential that DO should be minimum 5 mg/L and BOD 3 mg/L which is necessary for the survival of aquatic life. ough, disease causing microorganisms can be characterized by evaluating the faecal coliform counts which should be less than 500 per 100 ml of water. According to water quality the river water is divided into ve classes pollution of riverine ecosystem is a burning problem. Various social, Non-Government Organizations (NGO's) and prominent persons have shown concern for pollution in Yamuna river water of Agra, which is clear by perusing following news articles- (Table-1, Figure-1 & 2).

S. No.	Title	Publisher	Published Date and Year
1.	Yamuna Pollution problem beyond redemption: Central Da		
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enhanced by organisms and can be reformed to organic complexes, which might be more toxic in nature.

In aquatic system metals are introduced as a consequence of weathering of rocks and soil, from volcanic eruption and from an assortment of

Heavy Metals

e release of waste water consisting huge amount of heavy metals to recipient water bodies have detrimental environmental e ects. Accumulation and occurrence of heavy metals in the environment is a consequence of direct or indirect human activities like rapid urbanization,

HCH	Bacillus circulans and Bacillus brevis isolates degraded α and γ isomers at signi cantly high rates but also degraded thermodynamically stable β and δ isomers at di erent concentrations.	Gupta et al., (2000)
Dimethoate	Bacterial strains such as Brevundimonas sp. showed 96% degradation, Bacillus sp. 94% while Klebsiella oxytoca showed 71% degradation of dimethoate pesticides.	Deshpande, (2002)
Endosulfan	Pseudomonas spinosa, P. aeruginosa, and Burkholderia cepacia, were the most e ective degraders of endosulfan as they consumed more than 90% of amount in the broth a er 14 days of incubation.	Hussain et al., (2007)
HCH	Results revealed that biological growth kinetics of Pseudomonas aeruginosa degraded HCH in batch process under aerobic condition	Lodha et al.,(2007)
Dimethoate	Acetonitrile extracts of the bacterial isolates Bacillus licheniformis and Pseudomonas aeruginosa were run through in layer chromatography using two solvent systems: methanol-cyclohexane and hexane-chloroform. Chromatogram showed the presence of four di erent metabolites of dimethoate having di erent Rf values. Complete disappearance of dimethoate spot shown in Bacillus licheniformis strain a er three days.	Debmandal et al., (2008)
Chlorpyrifos	Pseudomonas aeruginosa (NCIM 2074) degraded chlorpyrifos at concentrations up to 50 mg/l since the organism is inhibited by higher concentrations	Fulekar and Geetha (2008)
Chlorpyrifos	As assessed by GC-MS, revealed that chlorpyrifos at 10, 25, 50 mg/l degraded completely within 1, 5 and 7 days, respectively. Pseudomonas aeruginosa (NCIM 2074) has been bene cialin degradation of chlorpyrifos at concentrations upto 50 mg/l,	Fulekar and Geetha (2008)
Dimethoate	An exclusive approach for degradation of dimethoate (organophosphorus pesticides) in liquid media by E ective microorganisms (EM) was studied. Study recommended that microorganisms enriched with the ability to degrade toxic pollutants from ecosystem are blessings to human beings.	Megeed and Nakieb (2008)
Dimethoate	e e ectiveness of dimethoate degradation were 100%, 96%, 83%, 72% and 71%, for Bacillus licheniformis, Pseudomonas aeruginosa, Aeromonas hydrophila, Proteus mirabilis and Bacillus pumilus respectively.	Debmandal et al., (2011)
Iprobenphos, Malathion Propenophos, Quinolphos Triazophos, Acetamiprid Carbaryl, Hexaconazole Carbendazim	Bacillus thuringiensis (NCIM 2159) and Proteus spp. (SUK 7) are found e cient in degradation and assimilation of many of pesticide residues.	Sabale et al., (2012)
Organophosphate, Quinalphos	Study showed that > 80% of quinalphos was degraded in 17 days by Bacillus and Pseudomonas spp. No metabolites were observed during biodegradation process.	Dhanjal et al. (2014)
Endosulfan and Endosulfan sulfate	Bacillus subtilis (AKPJ04) strainwas suitable to degrade endosulfan as well as its equally lethal metabolite endosulfan sulfate to endodiol and endosulfan lactone (non-toxic metabolites) very e ectively i.e. up to 94.2 % within 7 days, estimatedquantitatively by gas chromatography-electron capture and qualitatively by thin layer chromatography detection methods.	Kumar et al., (2014)

Table 2: Biodegradation of Pesticides

Water is a prime resource for numerous human activities and its quality and quantity are gaining extensive attention throughout the world due to massive population growth and increasing trends of social, economic development. Rivers are the primary source of water in distinct parts of India. Unfortunately, rivers also becoming a major sink of wastes that ow into them. River water management is signi cant eld of natural resource management and in order to be more e cient it requires public interference through proper institution and an action plan approach. At present, the direct use of river water for the purpose of drinking causes severe hazards due to anthropogenic activities causing environmental pollution in rivers.

e noxious discharge of toxic industrial waste consisting heavy metals into the water bodies specially river, prevail in water bodies and through the food chain get accumulated. Biomagni cation of toxic heavy metals through the food chain causes severe health hazards to humans and other living creatures. Heavy metal alters the structural and biological function of biomolecules. In India distressing level of pesticides has

been reported in water, air, soil along within biological materials and food. However extensive and extreme utilization of farming pesticides accelerate contamination of water and land. Long duration contact to pesticides can harm the living organisms and can disrupt the function of di erent body organs including endocrine, reproductive, nervous, renal, immune, respiratory and cardiovascular systems. Various chemical and biological methods are available for reducing the water pollution level but the emergence of an astonishing technology of multicultures of aerobic and anaerobic e ective and bene cial microorganism is gaining a lot of popularity because of its eco-friendly nature.

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Con icts of Interest

e authors have no con icts of interest.

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