**INTRODUCTION**

The word "antibiotics" originates from the Greek word. *Anti* means "against" and *bios* means "life". Waksman et al. (1947) was a soil microbiologist suggested the word “antibiotic” in 1942. Antibiotics are molecules that kill or inhibit the growth of bacteria (Cundcliff et. al., 2000; Dunkle et. al., 2010). Antibiotics that kill bacteria are called “bactericidal” and antibiotics that stop the growth of bacteria are called “bacteriostatic” (Kaldalu et. al., 2004). These compounds have different modes of action. Generally they interfere with biological processes such as replication, translation and cell wall synthesis. Antibiotics are the natural, semisynthetic or synthetic chemical agents which are capable of killing or inhibiting the bacterial pathogens and cause harm as little as possible to the host. Antibiotic drugs are the group of pharmaceuticals that exhibit toxicity to microorganisms (Prescott et al., 2000).

In 1926, Alexander Fleming discovered penicillin, a substance produced by fungi—*Penicillium chrysogenum* (Deshpande et al., 2004) the Penicillin that appeared to inhibited bacterial growth. In 1939, Edward Chain and Howard Florey further studied penicillin and later carried out trials of penicillin on humans. Fleming, Florey, and Chain received the Nobel Prize in 1945 for the discovery and production of penicillin (Prescott, 2005).

 Antibiotics are obtained from three sources the natural or biotic sources is general fungal origin which includes mainly for ex.- Penicillin, Erythromycin etc. Then other category of antibiotic is semisynthetic
nature and it is prepared by using the natural antibiotic with synthetic organic compounds having active group for ex.- ampicillin, cephalexin, amoxicillin etc. The third category is totally synthetic antibiotic which are organic compounds with a definite structural formula for ex. - sulfad Drugs, nitrofurans etc.

The antibiotics are mostly used in hospitals, nursing homes, agriculture fields, animal husbandry etc. After metabolism of antibiotic compounds in the different systems of animal and plant body, enter in the soil and aquatic ecosystem. The unused such compounds also enter in the manner to different ecosystems. These, after accumulation in the soil as well as in aquatic environment, cause great threat to the environmental health. The ecosystem becomes very harmful to human, animal and plant health. The residue and metabolic products along with the unaltered antibiotic compounds enter in different ecosystems through different modes such as through animal wastes, pharmaceutical manufacturing plants effluents, wastes of nursing home, hospital waste water etc. The animal fertilizers, municipal waste water treatment plants and through house hold wastes are also the means of such pollution. (Garoma et al., 2010; Pauwels et al., 2006). In last few decades, the pesticides, endocrine disrupting chemicals (EDC) and drugs like antibiotics, have become more environment distorting agents and become new emerging ecological polluting agents (Benjamin et al., 2008; Imai et al., 2007).

The antibiotics, as human and veterinary medicine has led to widespread toxic pollution in the environment. The extremely biological resistant antibiotics have been recorded in pre-treated sewage, industrial
effluent, aquatic environment and also in drinking water (Klavarioti et al., 2009). Guo et al., (2010) noticed the presence of cephalexin residue in aquatic environment and the cephalexin antibiotic was highly stable compounds to the biological degradation processes and due to their continuous input in the environment they remained in the environment for a long time. They also concluded that presence of cephalexin in the environment was considered dangerous in low and high concentrations. The presence of several pharmaceutical compounds including antibiotics have been observed in wastewater treatment plants (WWTPs) effluents and sludge (Heberer et al., 2002; Garoma et al., 2010) in drinking water (Heberer et al., 2002; Kolpin et al., 2002; Garoma et al., 2010), surface water bodies (Stan et al., 1994; Meyer et al., 1999; Heberer et al., 2002; Kolpin et al., 2002; Anderson et al., 2004; Rabiet et al., 2006; Garoma et al., 2010) and in ground water, sewage treatment plant effluents (Richardson and Brown, 1985; Halling-Sørensen et al., 1998; Kummerer et al., 2000).

The existence of antibiotic drugs in the aquatic as well as in terrestrial environment has been reported to compare with indigenous usage. Antibiotics, because of its incomplete treatment or due to the unsuitable discard are discharged into the aquatic environment via wastewater effluent. Tetracycline, ciprofloxacin, sulfamethazine, Erythromycin, sulfamethoxazole, and trimethoprim have been noticed that incomplete or faulty wastewater treatment facilities release their antibiotic effluents to both ground and surface waters (Karthikeyan and Meyer, 2006). Erythromycins generally show low toxicity (Aiello et al., 1998; JECFA, 1991). These chemicals are released in the environment,
which are of high concern for public health and they cause serious human, animals and ecosystem hazards (Garoma et. al., 2010).

Levy et al., (1998) noticed that more than 20,000 tons the antibiotics were manufactured per year and half this quantity was utilized by the animals. Greiner and Ronnefahrt (2003) and Kummerer and Heminger (2003) surveyed that the 400 tons per year antibiotics were used in the human drugs in Germany. Kools et al., (2008) obtained the data of 2004 in which the antibiotic was consumed approximately. Hayder et al., (2012) reported that in 1999 approximately 186.2 tons ciprofloxacin entered in environment via European sewage treatment plants. Lin et al., (2008) have the approximately 100000-200000 tons of antibiotics were consumed globally per year.

Antibiotics of human and veterinary medicinal use are increasing in the soil environmental as contaminants. Antibiotics after metabolism, are excreted by organisms and then after reach agricultural soils with contaminated manure and sewage sludge (Hirsch et al., 1999; Jorgensen and Halling-Sorensen, 2000), where they cause adverse effects (Thiele-Bruhn 2003). The antibiotics have been determined in soils, groundwater, and drainage water after the metabolism in living organism (Boxall et al., 2002; Campagnolo et al., 2002; Hamscher et al., 2002; Kolpin et al., 2002). Some antibiotics were shown to persist in soil (Hamscher et al., 2002; Gavalchin and Katz, 1994; Winckler and Grafe, 2001).

Daughton et al., (1999); and Kasprzyk-Hordernetetal., (2008) observed that pharmaceutical drugs emerged mainly through WWTPs effluents in water and soil. Other sources were direct applications in aqua
farming, manure run-off (Halling-Sorensen et. al., 1998). Richardson et al.,(1985) and Kummerer et. al., (2001) noticed that the hospital effluent and land fill leaching were the main sources of antibiotic contamination in such system. Lots of pharmacologically dynamic compounds annually used in animal and human drugs for treatment and prevention of illness (Diaz-cruz et al., 2003; Sarmah et al., 2006).

Antibiotics were specially designed for protection of animal and human health by controlling bacterial growth. Maximum antibiotics were defecated in the environment after treatment of human and animal body, either unchanged or as intermediate compound or still bioactive (Sarmah et al., 2006). Obviously this makes them potentially hazardous to bacteria and other organisms in the environment (Baguer et al., 2000). Different types of drugs have different predictable disclosure paths to the surroundings (Jorgensen and Halling-Sorensen, 2000).

The use of animal manure and bio-solids containing excreted antibiotics to agricultural land as fertilizer are the main pathway for antibiotic release in the terrestrial environment (Jorgensen and Halling-Sorensen,2000; diaz-cruz et al., 2003, 2006; Golet et al., 2003; Gobel et al., 2005; Kemper, 2008). Pharmaceutical drugs including antibiotics also entered in the agricultural land through irrigation with domestic waste water (Renew and Huang, 2004; Yang et al., 2005; Gulkowska et al., 2008).

Halling- Sorensen et al., (1998) observed that the antibiotics entered in the normal water body via pharmacological manufacturing wastes and animal and human sewage waste. The antibiotics administered
by animal and human, up to 90% of quantity were excreted in the manure via urine and feces release, consequently the antibiotic concentration was higher in the surface and ground water.
Fig. 1: The pharmaceutical residues including antibiotics entered in the environment through different possible pathways.
These antibiotics found to be degraded by several means mainly by photo, UV radiation, thermal (physical degradation), microbial degradation mainly by bacteria and fungi. The present study has focused the antibiotic degradation by physical and biological means.

*Escherichia coli* broth was capable of degrading the cephalothin when it was in higher concentration but this was possible after prolonged duration (Nishiura et al., 1978). Ingerslev et al., (2001) investigated that the aerobic and anaerobic degradation of oxytetracycline, metronidazole, olaquindox and tylocin antibiotics in aquatic medium. Maki et al., (2006) noticed that the ampicillin, doxycillin, oxytetracycline, thiamphenicol, and josamycin antibiotics were microbial degraded in the marine sediments this degradation was affected by the microbial concentration. Gartiser et al., (2007) studied the intrinsic biodegradation of natural, semisynthetic and synthetic antibiotic (amoxicillin, benzylpenicillin sodium salt, ceftriaxone disodium salt, cefuroxime sodium salt, chlorotetracycline hydrochloride, clindamycin, erythromycin, gentamycin sulfate, imipenem, metronidazole, monensin sodium salt, nystatin, ofloxacin, sulfamethoxazole, tetracycline, trimethoprim and vancomycin hydrochloride) in waste water treatment plant.

Emolla et al., (2009) measured the biodegradation of ampicillin, amoxicillin and cloxacillin in the municipal waste water treatment plant. Zhang et al., (2010) studied the degradation of 11 antibiotics (ampicillin, cephalexin, sulfamethoxazole, sulfadiazine, norfloxacin, ciprofloxacin, ofloxacin, tetracycline, roxithromycin, anhydro-erythromycin and trimethoprim) in fresh water and saline sewage sludge. Nnenna et al.,
(2011) observed the degradation of ciprofloxacin and erythromycin antibiotics mixture by bacteria and fungi in the aquatic environment.

Al-Gheethi et al., (2014) isolated *Bacillus subtilis* 1556WTNC from treated sewage effluents for biodegradation of *B*-lactams antibiotics the penicillin (amoxicillin and ampicillin), cephalosporins (cephalexin and cefuroxime), and quinolones (ciprofloxacin) in treated sewage effluents. Al-Gheethi et al., (2015) further noticed the bacterial degradation of *B*-lactam antibiotics from sewage discharge. Wang et al., (2015) isolated six bacterial strains from waste penicillin bacterial residues degrading the penicillin G and they further observed that the *Klebsiella pneumonia* Z-1 showed maximum degradable capacity.

Sabic et al., (2015) reported the microbial degradation of antibiotic erythromycin in pharmaceutical wastes with the help of *Pseudomonas aeruginosa* 3011, which was prevailing in the environment. Al-Gheethi et al., (2015) isolated the bacteria *bacillus subtilis* from sewage effluent, which was capable of biodegrading the cephalexin antibiotics and heavy metals in the pharmaceutical discharges. Lin et al., (2015) recorded the isolation of two bacterial strains CE21 and CE22 identified as *pseudomonas sp.* from activated sludge for biodegradation of cephalosporins antibiotic cephalexin. They further noticed that the CE21 and CE22 were also degraded the caffeine, saliglic acid, chloramphenicol and the CE21also degraded sulfamethoxazole and naproxen. Otto et al., (2015) performed the experiments for the bio-degradation of *B*-lactam antibiotic with the help of *Staphylococcus aureus* in waste water effluents by advanced oxidation process.
Navarro et al., (2003) recorded that when the penicillins were treated with ions Cd (II) and Zn$^{2+}$ ions in the presence of in the methanol then its degradation was possible. Emolla et al., (2009) reported the photodegradation of ampicillin, amoxicillin, and cloxacillin antibiotics with the help of photo-fenton process in aquatic medium. Jasim et al., (2010) studied the photodegradation of aqueous tetracycline and cephalaxin. They further noticed that the photodegradation rate of tetracycline degradation was higher to the cephalaxin. Elmolla et al., (2010) focused on the aqueous degradation of amoxicillin, ampicillin and cloxacinil antibiotics in different operating condition such as UV, zinc oxide, concentration, pH and irradiation time. The rate of degradation of amoxicillin, ampicillin and cloxacinil antibiotics was highly affected by the pH.

The degradation of cephalaxin in aqueous solution under ultrasound (sonochemical) irradiation was investigated by Guo et, al., (2010), they also noticed that under the influences of ultrasound power and pH value affect the biodegradation of cephalaxin in the aqueous medium. Keen et al., (2013) studied the degradation of ciprofloxacin, erythromycin, penicillin G, trimethoprim and clindamycin antibiotics with the help of UV photolysis and UV/H$_2$O$_2$ advanced oxidation in waste water. Wirzal et al., (2013) recorded that the degradation of ampicillin penicillin G by oxidation method by using metal (mixed) oxide electrode as anode. Lysenkova et al., (2013) focused the degradation of the retroaldol, a product of oligomycin A and noticed that this product was degraded in the alkaline medium. Zuorro et al., (2014) studied that the degradation of chloramphenicol in liquid medium containing H$_2$O$_2$
under the UV radiation. Kondalkar et al., (2014) reported the photo-electron catalytic degradation of cefotaxime with the help of TiO\textsubscript{2} nanoparticles by changing pH under UV radiation in liquid medium.

Michael-Kordatou et al., (2015) noticed the complete degradation of erythromycin when exposed to the UV-C activated per-sulfate oxidation in liquid medium. They further noticed the oxidant dose; pH and aqueous matrix effected the erythromycin degradation. Fabbri et al., (2015) noticed that in surface water, the degradation of cephalosporin antibiotics the cefradine, cefapirin, cefazolin, cefotaxime and cephalaxin, was possible with the help of direct photolysis. Palmisano et al., (2015) investigated the photodegradation of erythromycin, amoxicillin, streptomycin and ciprofloxacin with the help of UV exposure and UV exposure presence of TiO\textsubscript{2} catalyst in liquid medium and they observed the low toxicity of antibiotics after degradation. Azimi et al., (2015) studied the photodegradation of tetracycline and cephalaxin under mercury lamp radiation. Alalm (2016) recorded the photodegradation of ampicillin antibiotic with the help of UV radiations in the presence of Ru, WO\textsubscript{3} and ZrO\textsubscript{2} catalyst in liquid medium.

Martens et al., (1996) focused their study on the biodegradation of antibiotic enrofloxacin in aquatic environment by wood rotting fungi. Rainer et al., (1996) also studied the degradation of veterinary enrofloxacin of fluoroquinolone group by four species of wood-rotting fungi, growing on moist wheat straw. Wetzstein et al., (1997) focused the biodegradation of the norfloxacin by brown rot fungus *Gloeophyllum striatum* in liquid medium. Wetzstein et al., (1999) also studied the
degradation aqueous solution of ciprofloxacin by Basidiomycetes fungal sps. Kumerer et al., (2000) studied the genotoxic antibiotics such as ciprofloxacin, ofloxacin and metronidazole in sewage for their degradation and observed that these antibiotics were very slowly degradable. Further they studied that these antibiotics along with their metabolic products.

Jiskra et al., (2008) reported the biological and photodegradation of pharmaceutically active compound diclofenac antibiotic in aquatic medium. Rodarte-Morales et al., (2011) recorded that the pharmaceutical products such as sulfamethoxazole and diclofenac antibiotics were degraded by white rot fungi. Prieto et al., (2011) noticed the ciprofloxacin and norfloxacin were degraded with the help of white rot fungus in malt extract mineral medium. Zhang et al., (2011) have isolated two bacterial strains *Escherichia sp.* HS21 and *Acinetobacter sp.* HS51 degrading the sulfadoxine.

Zhang et al., (2012) further isolated a bacterial strain *Pseudomonas sp.* DX7 for the degradation of sulfadoxine. Amorim et al., (2014) have recorded the degradation of three most popular ciprofloxacin antibiotics, the ciprofloxacin, ofloxacin and norfloxacin by bacterial strain *Labrysportucaensis* F11 and transformation of fluoroquinolones by *L. sportucaensis*. They further studied the biological and physical degradation of the synthetic antibiotic, ciprofloxacin and ofloxacin antibiotics.

Maia et al., (2014) observed the biological degradation of fluoroquinolones – ciprofloxacin, ofloxacin moxifloxacin and norfloxacin
with by mixed bacterial culture in laboratory conditions. Oliveira et al., (2016) concluded the biodegradation of veterinary antibiotic sulfamethazine in batch test in the anaerobic granular sludge and they further noticed that the biodegradation was depending on the presence of organic matter in batch.

The photodegradation of several antibiotic composites such as fluoroquinolones, sulfonamides and tetracyclines have been studied in liquids medium (Oka et al., 1989; Lunestad et al., 1995; Burhenne et al., 1997; Halling-Sørensen et al., 2003; Boreen et al., 2004; Boreen et al., 2005). Ferguson et al. (1988) observed the photodegradation of ciprofloxacin with the help of UV exposure. Philips et al., (1990) reported that after photodegradation, the antibacterial activity of ciprofloxacin (Fluoroquinolones antibiotic) was decreased. Tiefenbacher et al., (1994) investigated that the photodegradation of fluoroquinolones, such as ciprofloxacin, ofloxacin and fleroxacin by ultraviolet irradiation (UVA) and natural room light in liquid medium. Fluoroquinolone carboxylic acids were photodegradable in aqueous medium (Burhenne et al., 1997a, b).

The photodegradation studies of fluoroquinolones have been performed in the aquatic medium (Lovdahl et. al., 2000, de Vries et. al., 2000, Araki et. al., 2002, Hubicka et. al., 2012). Balcioglu et al., (2003) studied, that the degradation of three synthetic antibiotics such as ceftriaxone sodium, enofloxacin and penicillin VK in pharmaceutical waste water with the help of O₃ and O₃/H₂O₂. Wojciech et al., (2006) focused on the degradation of sulfonamides antibiotic by photo-catalytic process in aqueous medium. Peters et al., (2007) noticed that the
degradation of nine antibiotics (oxytetracycline, chlorotetracycline, Sulfanilamide, sulfadimidine, sulfadiazine, sulfadimethoxine, sulfapyridine, fenbendazole and p-aminobenzoic acid), which belonged to tetracycline, sulfonamides and benzimidazoles group in slurry and soil surface. Fernando et al., (2008) also reported the degradation of sulfamethoxazole with the help of ozone and photo-catalytic process in liquid medium. Alam et al., (2009) focused the degradation of sulfamethoxazole with the help of Photo-Fenton chemical in water.

Bhakta et al., (2009) studied that the degradation of antibiotics sulphamethoxazole and trimethoprim with the help of UV in aqueous medium. Yang et al., (2010) detected the degradation of ciprofloxacin in aquatic medium with the help of advanced oxidation process. Lai et al., (2011) noticed the solar degradation of sulfonamides in aquatic medium. They also observed that the sulfonamides were faster degraded under natural light when compare to the dark. Wu et al., (2011) recorded that the temperature, pH, exposure duration, light source and aqueous solution were very important for photodegradation of sulfapyridine, trimethoprim and sulfamethoxazole antibiotics. The sulfamethoxazole and sulfapyridine antibiotics were easily degradable but trimethoprim showed low rate of degradation. Fulias et al., (2011) noticed the thermal degradation of cephalosporins antibiotics such as cephalaxin, cefadroxil and cefoperazone. Hayder et al., (2012) concluded that the complete degradation of ciprofloxacin was possible by TiO$_2$, TiO$_2$ nano-particles and UV light treatment.
Hernandez et al., (2012) also observed that the ciprofloxacin was completely degraded by the exposure of UV/H$_2$O$_2$ for the photochemical degradation at different concentration (50, 100, 200, 300, 400 and 500 ppm). Naddeo et al., (2012) studied the degradation of diclofenac in the waste water antibiotic with the help of sonolysis and ozonation. Jianhui et al., (2012) investigated that the degradation of sulfa-mono-methoxine sodium antibiotic was degraded with the help of photo-fenton oxidation in aqueous solution.

Zhang et al., (2012) reported the degradation of three sulfonamides such as sulfamethazine, dimethoxine and sulfamethoxazole by biodegradation and abiotic process, the photolysis. They further studied that the degradation process was increased by organic matter content and inorganic photo-sensitizers the iron compounds and nitrates. UV and heat the moxifloxacin and levofloxacin. Chu et al., (2012) observed the photodegradation of norfloxacin with the help of solar light mediated bismuth tungstate process in the liquid medium. Vasquez et al., (2013) studied the degradation of antibiotic ofloxacin with the help of UV radiations in the presence of TiO$_2$ in waste water.

Hubicka et al., (2013) studied the photo-degradation of moxifloxacin, ciprofloxacin, norfloxacin and ofloxacin by ultra-violet exposure in aquatic medium and noticed that these antibiotics were degraded in several products. Dehghani et al., (2013) reported that the degradation of sulfamethoxazole was easier with the help of Fenton’s oxidation and optimizations of parameters. They further studied that this process was also applicable for the degradation of other antibiotics which
have similar structure. Guo et al., (2013) studied the photodegradation of sulfamethazine antibiotic with the help of bismuth molybdate a photocatalyst in liquid medium. They further observed that the photocatalyst was more effective under solar radiation. Singh et al., (2014) have noticed the photodegradation of ciprofloxacin antibiotic by the exposure of sunlight and UV radiations in liquid medium. Chen et al., (2014) observed the solar degradation of norfloxacin with the help of bismuth loaded carbon-iron complexes in cylindrical reactor.

Zhang et al., (2015) noticed the degradation of sulfamethoxazole, N$_4$-acytyl-sulfamethoxazole and trimethoprim antibiotics with the help of low intensity of UV, UV+H$_2$O$_2$ and per-oxydisulfate in synthetic, fresh and hydrolyzed urine medium. Sturini et al., (2015) studied the solar photodegradation of four fluoroquinolones, the ciprofloxacin, danofloxacin, enrofloxacin and marbofloxacin and one penicillin, the ampicillin in treated waste water effluents. Ge et al., (2015) recorded the direct solar light degradation of six fluoroquinolones, the ciprofloxacin, sarafloxacin, difloxacin, enrofloxacin, danofloxacin and levofloxacin in liquid medium. Santos et al., (2015) investigated the photodegradation of norfloxacin antibiotic with the help of direct UV exposure, Fenton’s oxidation process and photolysis in the presence of H$_2$O$_2$ in waste water effluent. Liu et al., (2015) studied the photodegradation of antibiotics the florfenicol and thiamphenicol with the help of the exposure of UV irradiations and addition with H$_2$O$_2$ and Fe (II) ions.

Tantis et al., (2015) recorded the photodegradation of ciprofloxacin antibiotic, the fluoroquinolones, with the help of titaniananocrystalline
film in pure water and also in the presence of NaOH or NaCl. Gul et al., (2015) noticed the degradation of fluoroquinolones antibiotics ciprofloxacin, moxifloxacin and levofloxacin and concluded that different parameters the acidic and basic pH. Peres et al., (2015) reported the photodegradation of ofloxacin antibiotic in liquid medium with the help of UV radiation exposure in the presence of TiO$_2$ as catalyst and the H$_2$O$_2$. Tay et al., (2015) recorded the degradation of ofloxacin antibiotic with the help of ozonation process in the aquatic medium. They also recorded that in this degradation process many by-products were formed out of which some were harmful to humans. They further studied that the ozone and hydroxyl radicals were effected the ofloxacin degradation. Chen et al., (2015) noticed the photodegradation of norfloxacin with the help of Bi$_2$WO$_6$ photocatalysis.

Lansky and Halling-Sørensen, (1997) and Migliore et al., (1997) have been concluded through their experiments that antibiotics cannot be completely eliminated through biological treatment, when released in aquatic system. Ozone with hydrogen peroxide combination enhanced the oxidizing ability of pharmaceutical products in waste water which has been studied recently and was considered to be a good alternative for the organics removal from aqueous solutions (Glaze et al., 1987; Masten and Davies, 1993). Balcioglu et al., (2002) studied the biodegradability of antibiotics in waste water and were of opinion that ozonation could be successfully used as a pretreatment step to improve the degradation.

In present study all three categories of antibiotics have been considered for its biological and physical degradation. These are
BIOLOGICAL AND PHYSICAL DEGRADATION OF PHARMACEUTICAL PRODUCT WITH SPECIAL REFERENCE TO ANTIBIOTICS

erithromycin (natural), ampicillin, cephalexin (semi synthetic), ofloxacin and ciprofloxacin (synthetic).

Kim and Aga (2007) noticed that the antibiotics provoked the establishment of resistance microorganisms in the environment. After body metabolism some active amount of antibiotic compound is defecated and may find their way to municipal sewage treatment plants from the defecations. Khetan and Collins et al., (2007) noticed that pharmaceutically active compound get defecated from the animal or human body in the assortment of days and may reach the aquatic environment through faeces and urine effluent. Consequently, tons of antibiotics are annually administered to humans and animals, especially to livestock (Thiele-Bruhn, 2003). Most pharmaceutical antibiotics are designed to be quickly excreted from the treated body, either unaltered or as metabolites, some of which are still bioactive (Zuccato et al., 2001). Thus, sewage sludge and manure, used as fertilizer for agricultural land, are often contaminated with antibiotics (Thiele-Bruhn, 2003).

Concentration of antibiotics in environment is intensely lethal. In the aquatic environments some microorganisms develop the capability to degrade antibiotics (Leahy and Colwell, 1990). For the biodegradation of antibiotics the oxygen, moisture, absence of alternative sources of carbon and nitrogen and the presence of acclimatized consortium of microbes was essential (Fenton et al., 1973; Badalucco et al., 1994; Drillia et al., 2005; Gartiser et al., 2007; Wang et al., 2006). In the environment, the antibiotics were present in higher concentration as contaminating compounds, which produced the bacterial resistance (Hernandez et al.,
2012). They further recorded that microorganism developed the resistance when they come in contact with such antibiotic.

Among different processes, photodegradation possibly contributed to the decomposition of antibiotics in soil (Miller and Donaldson, 1994). They further investigated that the organic fertilizers containing antibiotic spread over soil surface were photodegraded in solar light. Substances that are photodegradable, water-soluble and non-volatile were especially susceptible to photodegradation on the soil surfaces (Thiele-Bruhn, 2003).

Ibrahim and Moats (1994), Rose et al., (1995), Isidori et al. (2005), and Hassani et al., (2008) discovered that antibiotics residues are destroyed by cooking procedures, pasteurization, or canning processes. A reduction in the general productivity of the ecosystem and a disruption in the food chain have occurred due to the affects by antibiotics in normal physiological and biochemical functions of some major primary and secondary producers (Halling-Sorensen et al., 1997, 1999, 2000; Wollenberger et al., 2000).

The pollution caused by antibiotics has not been paid as the pesticides have been seriously studied (Halling-Sorensen et al., 1998; Kummerer, 2001). Bacterial resistance posing serious problems in terms of human and animal health and on the other hand the eco-toxicological effects of antibiotics has been studied scarcely due to the limited potential effects of antibiotics in the environment (Pang et al., 1994; Rooklidge, 2004). When antibiotics entered in the ecosystem of the arable land by causing the harm to the growth of vegetation and reducing the soil
microbial activity (Jjemba, 2002a, b). In the wastewaters the concentration of antibiotics is increasing tremendously and in coming years the degradation of antibiotics will be a big challenge for humans.