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| **Supplementary File 3A: Antimicrobials, ARBs and ARGs in different water bodies** | | | | | | | | | | | | |
| **FRESH AND WASTE WATER** | | | | | | | | | | | | |
| **S. No.** | | **Antimicrobials** | **Concent-rations** | | **ARGs** | | **Bacteria** | | **Environmental**  **Factors** | | **Reference** | |
|  | | **Streptomycin** | 2700-3400 ng/L | | NA | | NA | | NA | | [1] | |
|  | | **Gentamycin** | 1600-1400 ng/L | | *aaaC2, blaSHV, floR, ermA, mefA, sulI, sulII, tetA, tetC, tetO, tetW, int1* | | *E. coli, E. faecium, A. hydrophyla, A. caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [1,2] | |
|  | | **Amikacin** | 1200-2300 ng/L | | NA | | NA | | NA | | [1] | |
|  | | **Amoxicillin** | 3800-6400 ng/L | | *blaCTX, blaTEM, blaOXA, blaSHV, tetA, teteB, teteO, tetM, tetW, tetQ, ermB, emrC,ermF, qnrS, sulI, sulII, vanA, mecA* | | NA | | NA | | [3,4,24] | |
|  | | **Penicillin** | 29 ng/L | | *blaCTX, blaTEM, blaOXA, blaSHV, tetA, teteB, teteO, tetM, tetW, tetQ, ermB, emrC,ermF, qnrS, sulI, sulII, vanA,* *mecA* | | NA | | NA | | [4,5] | |
|  | | **Cefuroxime** | 49-24380 ng/L | | NA | | NA | | NA | | [6] | |
|  | | **Vancomycin** | 61-249 ng/L | | *floR,, aaaC2, blaSHV, ermA, mefA, sulI, sulII, tetA, tetC, tetO, tetW, int1* | | *E. coli, E. faecium, A. hydrophyla, A. caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [7,2,24] | |
|  | | **Erythromycin** | 9-586 ng/L | | *mefA, aaaC2, int1, blaSHV, floR, ermA, sulI, sulII, tetA, tetC, tetO, tetW,* | | *E. coli, E. faecium, A. hydrophyla, A.*  *caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [4,2] | |
|  | | **Ciprofloxacin** | 0.82-323 ng/l | | *aaaC2, sulI, blaSHV, floR, tetC, ermA, mefA, sulII, tetA, tetO, tetW, int1* | | *E. coli, E. faecium, A. hydrophyla, A. caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [8,9,2,16,26] | |
|  | | **Ofloxacin** | 11.1-13625 ng/L | | *sulII, tetA, aaaC2, floR, blaSHV, ermA, mefA, sulI, tetC, tetO, tetW, int1* | | *E. coli, E. faecium, A. hydrophyla, A.*  *caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [10,4,2,17] | |
|  | | **Norfloxacin** | 11.2-367 ng/l | | *int1, int2, sul1, sul2, tetA, tetB, tetE, tetW, tetM, tetZ,* | | NA | | NA | | [9,10,4,17] | |
|  | | **Trimethoprim** | 100-730.19 ng/L | | *sulII, tetA, aaaC2, floR, blaSHV,* *ermA, mefA, sulI, tetC, tetO, tetW, int1* | | *E. coli, E. faecium, A. hydrophyla, A.*  *caviae, Streptococcus, C. perfrigens, Faecalibacterium, A. sobria, A. butzleri, Enterobacter, Serratia* | | NA | | [7,2] | |
|  | | **Sulfamethazine** | 220-4010 ng/L | | NA | | NA | | NA | | [12,7] | |
|  | | **Doxycycline** | 1.8-264 ng/L | | *blaCTX, blaTEM, blaOXA, blaSHV, tetA, teteB, teteO, tetM, tetW, tetQ, ermB, emrC,ermF, qnrS, sulI, sulII, vanA, mecA* | | NA | | NA | | [13,4] | |
|  | | **Tetracycline** | 58-1960 ng/L | | *blaTEM, mecA, vanA, strA, strB, aadA, int1* | | *Lactococcus, Bacillus, Cloacibacterium, Hydrogenophaga,Polynucleobacte, Acidovorax, Cloacibacterium, Sulfurospirillum,* | | Electrical conductivity,Temperature, pH and Dissolved oxygen | | [14] | |
|  | | **Sulfadiazine** | 2.1-23 ng/L | | NA | | NA | | NA | | [15] | |
|  | | **Sulfdimide** | 1.2-23.5 ng/L | | NA | | NA | | NA | | [16] | |
|  | | **Sulfamethoxazole** | 2.0-40.6 ng/L | | NA | | NA | | NA | | [16] | |
|  | | **Enrofloxacin** | 5.6-21.5 ng/L | | NA | | NA | | NA | | [17] | |
|  | | **Erythromycin** | 3.5- 126 ng/L | | NA | | NA | | NA | | [16] | |
|  | | **Roxithromycin** | 1.5-12.0 ng/L | | NA | | NA | | NA | | [17] | |
|  | | **Methicillin** | 247-420 ng/L | | NA | | NA | | NA | | [18] | |
|  | | **Ampicillin** | 3920 ng/l | | NA | | NA | | NA | | [25] | |
|  | | **Azithromycin** | 2500 ng/l | | NA | | NA | | NA | | [26] | |
|  | | **Ceftazidime** | 2430 ng/l | | NA | | NA | | NA | | [26] | |
|  | | **Meropenem** | 433.6 ng/l | | NA | | NA | | NA | | [27] | |
|  | | **Cefixime** | 318.6 ng/l | | NA | | NA | | NA | | [28] | |
|  | | **Enrofloxacin** | 2869 ng/l | | NA | | NA | | NA | | [24] | |
|  | | **Lincomycin** | 1968 ng/l | | NA | | NA | | NA | | [24] | |
|  | | **Clindamycin** | 29 ng/l | | NA | | NA | | NA | | [24] | |
|  | | **Tylosin** | 1500 ng/l | | NA | | NA | | NA | | [30] | |
| **MARINE WATER** | | | | | | | | | | | | |
| **S. No.** | **Anti-microbials** | | | **Concentrations** | | **Bacteria** | | **ARGs** | | **Environmental Factors** | | **References** |
|  | **Sulfamethoxazole** | | | 3.0-880 ng/L | | NA | | NA | | NA | | [19,20] |
|  | **Trimethoprim** | | | 2.6-330 ng/L | | NA | | NA | | NA | | [20,21] |
|  | **Sulfadimidine** | | | 0.24- 292 ng/L | | NA | | NA | | NA | | [20] |
|  | **Sulfadiazine** | | | 0.24- 294 ng/L | | NA | | NA | | NA | | [20] |
|  | **Erythromycin** | | | 2.6- 1340 ng/L | | NA | | NA | | NA | | [20] |
|  | **Roxithromycin** | | | 0.96- 630 ng/L | | NA | | NA | | NA | | [20] |
|  | **Azithromycin** | | | 0.32- 2.5 ng/L | | NA | | NA | | NA | | [21] |
|  | **Clarithromycin** | | | 0.34- 2.6 ng/L | | NA | | NA | | NA | | [21] |
|  | **Tetracycline** | | | 12,340 ng/L | | NA | | NA | | NA | | [29] |
|  | **NA** | | | NA | | *Alteromonas,*  *Vibrio, Acinetobacter, Nautella, Pseudo-alteromonas, Phaeobacter* | | *sul3, sul1, sul2, tetQ, tetW, tetX, tetB, tetO, tetA* | | NA | | [31] |
|  | **NA** | | | NA | | NA | | *tetA, ermB, sul2, blaCTXM, qnrS,* | | czcA (cadmium‑zinc‑cobalt resistance gene) | | [32] |
|  | **NA** | | | NA | | *Gammaproteobacteria* | | *OTC, SMX, sul1, sul2, sul3, tetM* | | NA | | [33] |
|  | **NA** | | | NA | | Cyanobacteria, Proteobacteria, Bacteroidetes, Actinobacteria, Chloroflexi, Planctomycetes, Acidobacteria, Firmicutes, Fusobacteria, Spirochetes, Chlamydiae etc. | | *Sul1, sul2,qnrA, qnrD, qnrS, cmlA, floR* | | Total organic carbon, Dissolved organic carbon, Suspended solids, Chemical oxygen demand, Ammonia nitrogen, Nitrate nitrogen, Nitrite nitrogen, Total alkalinity, Silicate | | [34] |
|  | **NA** | | | NA | | NA | | *blaTEM-B,*  *blaTEM-P,*  *blaSHV-B,*  *qnrS-B,*  *qnrS-P,*  *sul1-B,*  *sul1-P,* | | NA | | [35] |
|  | **NA** | | | NA | | NA | | *tetB, tetc, tetM, tetQ, ermA, ermB, sul1, sul2, sul3, blaNDM-1, ampC, blaTEM, qnrA, aadA, catA, rpo B, dfrA1, vanA, kat* | | NA | | [36] |
|  | **NA** | | | NA | | NA | | *flor, sul1, sul2, tetB, tetM, qnrS and ermB* | | pH, Temperature, Salinity, Dissolved oxygen, Molybdate-reactive phosphorus, Chemical oxygen demand, Dissolved inorganic nitrogen, Ammonium nitrogen, Nitrate nitrogen, Nitrite nitrogen, | | [37] |

NA: Not applicable

Note: Fresh Water (Ground water, Surface water, River, Ponds, Lakes, Streams)

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| **Supplementary File 3B: Different key words used for this study.** | |
| **S. No.** | **Key words** |
| 1. | "Antimicrobial" and "antibiotic resistance gene "and "water" |
| 2. | "Antimicrobial" and "antibiotic resistance gene" and "freshwater", |
| 3. | "Antibiotic" and "antibiotic resistance gene" and "water", |
| 4. | "Antibiotic" and "antibiotic resistance gene" and "freshwater" |
| 5. | "Antimicrobial" and "Antimicrobial resistance gene" and "water" |
| 6. | "Antimicrobial" and "Antimicrobial resistance gene" and "freshwater" |
| 7. | "Antimicrobial" and "antibiotic resistance gene" and "Marine water" |
| 8. | "Antibiotic" and "antibiotic resistance gene" and "Marine water" |
| 9. | "Antimicrobial" and "Antimicrobial resistance gene" and "Marine water" |
| 10. | "Antimicrobials" and "Antibiotic resistance gene" and "environmental factors" and "water" |
| 11. | "Antibiotics" and "Antibiotic resistance gene" and "environmental factors" and "water" |
| 12. | "Antimicrobials" and "Antibiotic resistance gene" and "environmental factors" and "freshwater" |
| 13. | "Antibiotics" and "Antibiotic resistance gene" and "environmental factors" and "water bodies" |
| 14. | "Antimicrobials" and "Antimicrobial resistance gene" and "environmental factors" and "water bodies" |
| 15. | "Antimicrobials" and "Antibiotic resistance gene" and "Heavy metals" and "water" |
| 16. | "Antimicrobials" and "Antibiotic resistance gene" and "Heavy metals" and "water bodies" |
| 17. | "Antibiotics" and "Antibiotic resistance gene" and "Pollutants" and "water" |
| 18. | "Antibiotics" and "Antibiotic resistance gene" and "Pollutants" and "water bodies" |
| 19. | "Antibiotics" and "Antibiotic resistance gene" and "Pollutants" and "water bodies" |
| 20. | "Antimicrobials" and "Antibiotic resistance gene" and "Pollutants" and "water" |
| 21. | "Antimicrobials" and "Antibiotic resistance gene" and "Pollutants" and "water bodies" |

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