

2<sup>nd</sup> World Congress on **CARDIOLOGY**  
&  
39<sup>th</sup> Annual Congress on  
**MICROBIOLOGY AND MICROBIAL INFECTION**

July 23 - 24, 2018 | Rome, Italy

Bikram Gautam et al., Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C1-003

**HEAVY METAL AND ANTIBIOTIC RESISTANT BACTERIA ISOLATED FROM GUHESWORI SEWAGE TREATMENT PLANT, NEPAL**

**Bikram Gautam<sup>1,2</sup> and Rameshwar Adhikari<sup>2</sup>**

<sup>1</sup>St. Xavier's College, Nepal

<sup>2</sup>Tribhuvan University, Nepal

The aim of this project is to simply determine the resistance level of microorganisms isolated from the treated sewage effluent. To accomplish this first their resistance pattern against antibiotics and heavy metals were screened as per Clinical and Laboratory Standards Institute, 2017 and British pharmacopeia, 2016 respectively. This study also provides evidence that these microorganisms have metabolized the heavy metals and hence might be very useful in tackling problems of metal poisoning due to both spillage and/or due to geographical location. Sewage contains chemicals (biocides, detergents, heavy metals etc.) and microorganisms. Bacteria get exposed to the chemicals and acquire resistance to antibiotic(s) and heavy metal(s). The aim of this study was to the isolated bacteria from the treated sewage and assess resistance pattern of the isolates against antibiotics and heavy metals. Grab sampling was performed from the treated effluent at the Guheswori sewage treatment plant. To assess the resistance pattern for antibiotic(s) and heavy metal(s), antibiotic susceptibility test and minimum inhibitory concentration by cup well method were performed as per Clinical and Laboratory Standards Institute, 2017 and British pharmacopeia, 2016 respectively. *Staphylococcus aureus*, *Enterococcus faecalis*, *Citrobacter freundii*, *Escherichia coli*, *Enterobacter aerogenes*, *Proteus mirabilis*, *P. vulgaris*, *Salmonella Typhi*, *Pseudomonas aeruginosa* were isolated from the treated sewage. Multi drug resistant and heavy metal resistant isolates were screened. *P. aeruginosa* was able to resist the heavy metal concentration up to 10000 g/L dilution of Fe<sup>++</sup>. Pearson's chi square test shows that there is a significant association ( $p < 0.001$ ) between isolates and antibiotic resistance pattern; isolates and heavy metal resistance pattern at dilution 10000 g/L, 5000 g/L, 2500 g/L, 1250 g/L. The findings of the study show that the sewage treatment plant is not capable of effluent polishing. The isolates from treated sewage were found to be resistant to multiple heavy metals and antibiotics. Heavy metal resistant bacteria could be utilized in lower metal pollution through bio-absorption, mineralization, enzymatic oxidation/reduction to a less toxic form etc.

**BIOGRAPHY**

Bikram Gautam is a fourth semester MSc Microbiology student at Department of Microbiology, St. Xavier's College, Maitighar, Nepal. He has published three research papers to date. He is serving as a Research Assistant at RECAST and working as a Quality Controller at Senior Shree Krishna Beverage, Kathmandu, Nepal.

[gautambikr@gmail.com](mailto:gautambikr@gmail.com)

