



## Exploration of Novel Bacterial Species from the Abandoned Gold Mine for Bioleaching & Enhancement of Gold Recovery from E-Waste

Anil Kumar<sup>1</sup>, Harvinder Singh Saini<sup>2</sup>, Sudhir Kumar<sup>1\*</sup>

<sup>1</sup> Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology (JUIT), Wakanaghat, Solan, H.P., 173234, India

<sup>2</sup> Department of Microbiology, Guru Nanak Dev University, Amritsar-143005, Punjab, India

Address for Correspondence: Sudhir Kumar; [sudhir.syal@juit.ac.in](mailto:sudhir.syal@juit.ac.in), [sanihs@yahoo.com](mailto:sanihs@yahoo.com), [anilsharma2710@gmail.com](mailto:anilsharma2710@gmail.com)

**ABSTRACT:** E-waste has raised concerns globally because of the variety of toxic and valuable components present in it. E-waste is treated as an 'artificial ore' and under the concept of 'urban mining'; it is seen as a source of income for recyclers due to the presence of precious metals like Au, Ag and Pt etc. Recyclers often use hazards associated pyrometallurgical and hydrometallurgical methods for recovery of metals. Bioleaching of metals with specific microorganisms is seen as an environmental friendly technology to recover valuable metals from e-waste. Keeping all these factors in mind the study was designed in search of a novel organism or consortium from soil obtained from the abandoned gold mine for recovery of precious metals from e-waste employing bioleaching. Chemical leaching with aqua regia was also performed for comparative efficacy. E-waste (discarded printed circuit boards of computer) of particle size less than 100  $\mu\text{m}$  was obtained from an e-waste recycling industry of Haryana. It was observed that the percentage of Au, Ag and Cu in e-waste was 0.07%, 0.41% and 13.88%, respectively. Eight different bacterial species were selected based on their morphology and subjected for two-step bioleaching process. Bacterial isolate G6 exhibited maximum Cu (81.6%) leaching from the e-waste followed by isolate G4 (76.22%) and G8 (74.6%). Maximum Au leaching was observed in case of isolate G1 (55.2%) followed by G2 (46.82%) and G3 (45.26%), respectively at 1% e- scrap concentration. To confirm the identity of bacterial isolates molecular identification by using 16srDNA analysis is in process. © 2014 iGlobal Research and Publishing Foundation. All rights reserved.

---

Conference Proceedings: International Conference on Life Sciences, Informatics, Food and Environment;  
August 29- 30, 2014

Indo Global Journal of Pharmaceutical Sciences( ISSN 2249 1023 ; CODEN- IGJPAI; NLM ID: 101610675) indexed and abstracted in EMBASE(Elsevier), SCIRUS(Elsevier),CABI, CAB Abstracts, Chemical Abstract Services(CAS), American Chemical Society(ACS), Index Copernicus, EBSCO, DOAJ, Google Scholar and many more. For further details, visit <http://iglobaljournal.com>