

## Phenol and Heavy Metal Tolerance Among Petroleum Refinery Effluent Bacteria

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**ABSTRACT:**

Bacterial isolates from petroleum refinery effluent were evaluated for growth in increasing doses of phenol and heavy metal ions. All the test organisms were able to grow in mineral salt medium with phenol concentration of 15.0 mM ( $\approx$  1412.0 mg/l) except *Pseudomonas* sp. RBD3. *Aeromonas* sp. RBD4, *Staphylococcus* sp. RBD5 and *Pseudomonas* sp. RBD10 showed the highest tolerance to 15.0 mM of phenol followed by *Corynebacterium* sp. RBD7 while *Escherichia coli* RBD2 and *Citrobacter* sp. RBD8 showed the least tolerance to 15.0 mM of phenol. The minimum inhibitory concentrations (MICs) ranged from 1.0 mM for mercury and 4.5 mM for chromium, nickel, lead and copper. The bacterial strains were most susceptible to mercury toxicity. Viable counts of the organism on mineral salt-phenol agar showed a typical growth pattern for inhibitory substrate. The threshold concentration is 0.5 mM for *Bacillus* sp. RBD1, *Escherichia coli* RBD2, *Bacillus* sp. RBD6, *Citrobacter* sp. RBD8, *Streptococcus* sp. RBD9, *Pseudomonas* sp. RBD11 and *Escherichia coli* RBD12 and 1.0 mM for *Pseudomonas* sp. RBD3, *Aeromonas* sp. RBD4, *Staphylococcus* sp. RBD5, *Corynebacterium* sp. RBD7 and *Corynebacterium* sp. RBD10. The results suggest that microorganisms isolated from petroleum refinery effluent are potentially useful for detoxification of phenol impacted systems in the presence of heavy metals.

**Keywords:**

Phenol, heavy metals, refinery effluent bacteria.