

## Isolation and characterization of bacteria isolated from municipal solid waste for industrial enzymes and waste degradation

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A total of 10 samples were collected from waste dump sites of Dhapa and Barrackpore Municipality and 9 isolates of bacteria were isolated using Nutrient Agar medium. The optimal cultural conditions, microbiological characteristics, biochemical characteristics, antagonistic and synergistic activities within the strains, tolerance to 5 heavy metals (Arsenic, Zinc, Lead, Mercury, Cadmium), their sensitivity towards four different antibiotics (Gentamycin, Oxytetracycline, Penicillin, Streptomycin) and production of extracellular enzyme of the bacterial strains were documented. Among the 9 isolates 6 exhibited protease production and 1 was selected for protease production with high titer value. All of the 6 strains capable of producing protease were also applied for waste degradation efficiency test. These results have increased the scope of finding industrially important bacteria from municipal waste dump sites and these isolates could be vital source for the discovery of industrially useful enzymes / molecules.

**Keywords:** Waste dump sites, Bacteria, Antagonism, Extracellular enzymes.

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## Natural products: A molecular target for cancer prevention and treatment

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Cancer is the second leading cause of death worldwide. With few effective therapies cancer results in the death of a significant proportion of patients. As a result, the search for new treatments of cancer has rapidly gained momentum over the recent years. In particular, non-toxic "natural products" from natural resources in combination with conventional chemotherapeutic agents are proven useful in treatment of human malignancies with lower toxicity and higher efficacy. Recent data suggest that natural products like curcumin, tea, pomegranate, neem, extra-virgin olive oil, carrot, lemon, soybean, fish oil, tomato, garlic and amla can work as modifiers of signal transduction pathways to elicit their beneficial effects. These natural compounds are responsible for regulating cellular proliferation or apoptosis mainly by acting through nuclear factor-kappa B, mitogen-activated protein kinase signalling, Akt signalling pathway and several transcription factors, proteins, enzymes. This review will discuss recent research data focusing on these natural product-induced cellular signal transduction pathways. A clear understanding of the molecular mechanisms of action is crucial in the valuation of these potent molecules as potential prophylactic and therapeutic agents.

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## Biotechnological tools: A new strategies for biodegradation of leather industry waste effluent

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Leather industry effluent contributes to one of the major industrial pollution problems and the pollution causing chemicals, viz. Lime, sodium sulphide, salt, solvents, etc. arise mainly from the pre-tanning processes of leather processing. The environment is under increasing pressure from solid and liquid waste effluent emanating from the leather industry. These are inevitable by-products of the leather manufacturing process and cause significant pollution unless treated in some way prior to discharge. Biological treatment is one of the prominent processes for biodegradation of leather industry effluent, which involved both aerobic and anaerobic processes. Tannery waste effluents contain sulfide, chromium, which impart high antibacterial activity. Several problems have been encountered during the biological treatment of tannery wastewater because of high toxicity. The inhibition of biodegradation due to the presence of chromium and sulfides demonstrates the antibacterial activity. So, further application of biotechnological tools like genetic transformation could develop greater strategies for the microbes (i.e. genetically modified microbes) for biodegradation of leather industry waste effluent.

**Keywords:** Tannery effluents, antibacterial, biotechnology, biodegradation.

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