

RESEARCH PAPER:

# Microbial analysis of medicinal waste collected from industrial region of Punjab

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## SUMMARY

Now a day's many industries have developed in Punjab state viz., pharmaceutical, textiles, toy making, colouring, leather, tanning, electro-plating, paint and pigment manufacturing, metal plating etc. Industrial effluents are materials generally discarded from industrial operations or derived from manufacturing processes. A lot of effluents come from the pharmaceutical industries and cause water pollution. There is lot of waste materials which is discharged everyday from the large factories and mixed in the river waters causing water pollution. The sample collection was performed according to standard method. Physicochemical parameters like pH, temperature, turbidity, BOD, COD, DO were measured by using standard method. The microbial isolation was done by streak plate method on nutrient agar and on selective media for their identification. The final identification of recovered isolates was done by their biochemical testing accordance to the Bergey's Manual. Strains of *Staphylococcus aureus* isolated from sample I and strain of *Bacillus subtilis* isolated from sample II were identified. The resulted bacterial isolates, *Staphylococcus aureus* and *Bacillus subtilis* were highly pathogenic. *Staphylococcus aureus* is the most common cause of staph infections. The nature of *S. aureus* infections varies from minor cutaneous soft tissue infections to life-threatening endovascular infections such as endocarditis. *Bacillus subtilis* can contaminate food causing food poisoning. The bulk waste carrying the pathogenic bacteria may harm to the society.

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## Key words :

Industrial effluent,  
Medicinal waste,  
*Staphylococcus aureus*,  
*Bacillus subtilis*

Improper disposal of pharmaceutical waste cause the adverse effects on environment and human health worldwide. Studies have demonstrated these adverse effects and have raised concerns about serious consequences that may occur if appropriate actions are not taken. A small desk survey was conducted in the spring of 2004 to get an overview on the development of waste research (Lagerkvist, 2006). The survey targeted the last 10 years of waste research at Swedish academic institutions trying to identify the total amount of research and trends over time with regard to issues, volume and distribution over academic disciplines. The results of the survey indicate that the academic waste research is very small in comparison to the R&D performed by the industry; there seems to be a lack of interaction between industry and academia and waste research is slowly getting into established academic. Pharmaceutical companies are progressively adopting and introducing the principles of quality by design with the main

purpose of assurance and built in quality throughout the whole manufacturing process (Peinado *et al.*, 2010).

## Solid waste and its types:

Solid wastes are all the waste arising from human and animal activities that are normally solid and that are discarded as useless or unwanted. Solid waste includes organic waste (leaves, animal manure and agricultural waste) and problematic waste *e.g.* domestic and industrial waste, sewage sludge and municipal solid waste (Kumar, 2011).

Solid waste can be classified into different types depending on their sources: Household waste is generally classified as municipal waste, Industrial waste as hazardous waste, and biomedical waste or hospital waste as infectious waste.

Municipal solid waste consists of household waste, construction and demolition debris, sanitation residue, and waste from streets. This garbage is generated mainly from

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