Here's a research proposal based on the topic "Sewage and Wastewater Treatment to Screening of Surfactants Producing Microorganisms":

Title

Screening and Characterization of Surfactant-Producing Microorganisms from Sewage and Wastewater Treatment Plants for Bioremediation Applications

Background

Surfactants are amphiphilic compounds that reduce surface tension, making them useful in various industrial applications. However, synthetic surfactants can be toxic and non-biodegradable, leading to environmental pollution. Microorganisms that produce bio surfactants offer a sustainable alternative. Wastewater treatment plants (WWTPs) harbor diverse microorganisms, including those capable of producing bio surfactants.

Research Objectives

1. *Isolation and screening*: Isolate and screen microorganisms from WWTPs for their ability to produce bio surfactants.

2. *Characterization*: Characterize the bio surfactants produced by the isolated microorganisms in terms of their chemical structure, surface activity, and biodegradability.

3. *Bioremediation potential*: Evaluate the potential of the isolated microorganisms and their bio surfactants for bioremediation of contaminated soil and water.

Methodology

1. *Sampling*: Collect wastewater samples from WWTPs.

2. *Isolation*: Isolate microorganisms using selective media and techniques.

3. *Screening*: Screen isolated microorganisms for bio surfactant production using drop collapse test, emulsification index, and surface tension measurements.

4. *Characterization*: Characterize bio surfactants using Fourier Transform Infrared Spectroscopy (FTIR), Nuclear Magnetic Resonance (NMR) spectroscopy, and gas chromatography-mass spectrometry (GC-MS).

5. *Bioremediation studies*: Evaluate the bioremediation potential of isolated microorganisms and their bio surfactants using contaminated soil and water samples.

Expected Outcomes

1. *Identification of bio surfactant-producing microorganisms*: Isolate and characterize microorganisms capable of producing bio surfactants.

2. *Characterization of bio surfactants*: Determine the chemical structure, surface activity, and biodegradability of bio surfactants.

3. *Bioremediation potential*: Evaluate the potential of isolated microorganisms and their bio surfactants for bioremediation of contaminated environments.

Timeline

- *Month 1-3*: Sampling, isolation, and screening of microorganisms
- *Month 4-6*: Characterization of biosurfactants
- *Month 7-9*: Bioremediation studies
- *Month 10-12*: Data analysis, writing, and submission of the research report

References

- *List of sources*: Provide a list of sources cited in the proposal, formatted according to the chosen citation style.

This research proposal provides a framework for investigating the potential of microorganisms from WWTPs to produce biosurfactants and their applications in bioremediation.