

KASTURBA GANDHI DEGREE & PG COLLEGE FOR WOMEN


DEPARTMENT OF MICROBIOLOGY

MICROBIAL SPLASH Uploaded by 3rd year Students

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DEPARTMENT OF MICROBIOLOGY


MICROBIAL SPLASH

DATE: 15-08-2023 POST NO. : 01
DAY: TUESDAY



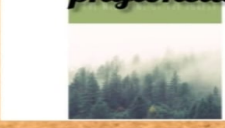
Borqs

FIGHTING CLIMATE CHANGE WITH METHANE EATING BORQS
Borqs are newly discovered DMH1 packages found in bacteria that could assist humans in resisting climate change.



ulcer

An ulcer is a break in the skin or mucous membrane with loss of surface tissue and the disintegration and necrosis of epithelial tissue.



phytoncide

Chemicals released by trees, known as phytoncides, can have an anti-microbial effect on our bodies, boosting the immune system - can reduce blood pressure and improve concentration and memory

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MICROBIAL SPLASH


Date : 22.08.2023 Post no : 2
Day : Tuesday

APPLICATIONS OF MICROBES IN COSMETIC INDUSTRIES

Microbial pigments have several applications in the field of cosmetics due to their photoprotection, antioxidant, and antiaging properties, including inhibiting melanogenesis and acting as natural colorants for cosmetics, as some microorganisms are rich in pigments.



Many cosmetic products are composed of synthetic chemicals, which may cause side effects in the body; for example, some pigments may cause damage to cells and some UV filters may even cause tumor formation.



Microorganisms such as bacteria, fungi, and microalgae provide an alternative supply of natural colors. Pigments such as melanin, carotenoids, prodigiosin, violacein, pyocyanin, zeaxanthin, and actinorhodin are all produced by bacteria. filamentous fungi can produce a variety of colors, including carotenoids, flavins, monascins and phenazines.

Pigments generated by microbes are more than simply colors, they also contain a variety of chemical components with multiple biological functions and benefits.

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MICROBIAL SPLASH

DATE: 29-08-23 POST NO. : 3
DAY: TUESDAY

APPLICATIONS OF MICROBES IN MICROBIAL BIOFUELS

- Microbial produced biofuels provided one Strategy for sustainable energy.
- Many microbial species convert biomass into Biomass into biofuels like bioethanol Biodiesel by using natural metabolic pathways.
- Biofuels are renewable liquid or gaseous fuels made by and/or from Living organisms or the wastes That they produce.
- Microbes play crucial role in the Production of sustainable biofuels



Eg: ethonal and biodiesel , Which represents the first generation of biofuel technology. Bioenergy technologists office (BETO)

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MICROBIAL SPLASH

DATE: 05-09-2023 POST NO. : 04
DAY: TUESDAY

BIOMINING

• **Biomining is the process of using microorganisms (microbes) to extract metals of economic interest from rock ores or mine waste.**

• This techniques may also be used to clean up sites that have been polluted with metals.

• Most current biomining operations target valuable metals like copper, uranium, nickel, and gold that are commonly found in sulfidic (sulfur-bearing) minerals.



Copper recovery process using bio-mining technology

Dumped low-grade sulfide copper ore → Heap bio-leaching → Leaching solution → Solvent extraction / electrowinning (SX/EW) → Copper cathodes

Sulfuric acid → Cultivation inoculator of bacteria



• **Examples: Chemolithotrophic acidophilic microorganisms such as the thermophilic iron- and sulfur-oxidizers Acidianus brierleyi etc.**

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MICROBIAL SPLASH

DATE: 12-09-2023 POST NO. : 05
DAY: TUESDAY

Applications of microbes in organic acids

- Microbes play a crucial role in the production of organic acids. These acids are widely used in various industries, including food and beverage, pharmaceuticals, and agriculture.
- Microbes, particularly bacteria and fungi, are employed in a process called fermentation to produce organic acids
- Microbes possess various metabolic pathways that enable them to produce organic acids.
- Microbes possess specific enzymes that catalyze the conversion of substrates into organic acids.

For example, lactic acid bacteria produce lactate dehydrogenase, an enzyme that converts pyruvate into lactic acid.

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MICROBIAL SPLASH

DATE: 19/09/2023 POST NO. 6
DAY: Tuesday

CRISPR-Cas technology

CRISPR-Cas Technology: It is short for clustered Regularly Interspaced short Palindromic Repeats. It is a revolutionary genetic editing tool that allows scientists to modify DNA with precision. It consists of two main components: CRISPR-associated (Cas) proteins and guide RNA (gRNA). The gRNA is designed to target a specific DNA sequence, and the Cas protein acts like molecular scissors to cut the DNA at that location. This break in the DNA can then be repaired, introducing changes, deletions, or insertions in the genetic code, enabling precise gene editing.

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MICROBIAL SPLASH

DATE: 26-09-2023 POST NO. 7
DAY: TUESDAY

Application of Microbes in 3D Printing

- 3D printing is being used to create custom microfluidic devices and structures for studying microbes and their environments.
- 3D printing of functional living materials by embedding programmed Escherichia coli cells and nonfibers into microbial ink, which can sequester toxic moieties, release biologicals, and regulate its own cell growth through chemical induction

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YEAR: MZC-3RD YEAR



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DEPARTMENT OF MICROBIOLOGY

DATE: 03-10-2023

DAY: TUESDAY

MICROBIAL SPLASH

POST NO. 8

PROBIOTICS- THE MAGICAL THERAPEUTICS

-TO IMPROVE MEMORY Eating a probiotic may help prevent the decline in memory that might come with ageing. Researchers discovered that probiotic *Lactobacillus rhamnosus* GG (LGG) treatment for three months improved the cognitive scores of study participants with mild cognitive impairment. Changes in their gut microbiota were also linked to this improvement in cognition. Modifying the gut microbiome through probiotics could be a strategy to improve cognitive performance, particularly in individuals with mild cognitive impairment.

-TO DETOXYFY METALS IN HUMAN DIET

Human body is constantly accumulated with toxic metals that come through the diet. Methylmercury, a neurotoxin is particularly high in communities reliant on fish based diets. A novel probiotic was developed by inserting the gene from *Bacillus megaterium* bacteria, which is highly resistant to methyl mercury into *Lactobacillus*. This probiotic detoxifies the mercury in stomach.

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YEAR: MZC-3RD YEAR



KASTURBA GANDHI DEGREE & PG COLLEGE FOR WOMEN



DEPARTMENT OF MICROBIOLOGY

DATE: 10/10/23

DAY: TUESDAY

MICROBIAL SPLASH

POST NO.9

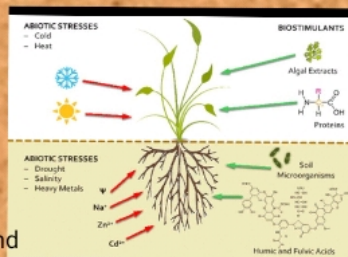
BIOSTIMULANTS

Biostimulants: Microbes in biostimulant products promote plant growth, improve stress tolerance, and enhance nutrient uptake.

Biostimulants contain compounds like humic acids or fulvic acids, which can chelate or complex with essential nutrients, making them more available for plant uptake. This improves the plant's ability to absorb and utilize nutrients.

Microbial Activity: Some biostimulants contain beneficial microorganisms like mycorrhizal fungi or rhizobacteria. These microbes form symbiotic relationships with plants, enhancing nutrient uptake and protecting plants from pathogens.

Microbes such as Mycorrhizal Fungi, *Bacillus subtilis*, *Trichoderma* spp, Lactic Acid Bacteria, etc.



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