GUJARAT ECO
MICROBIAL TECHNOLOGIES PVT. LTD.

BIO TOPAZ

Biological effluent treatments are quickly becoming the more preferred alternative to chemical and/or other methods of treatments. However, many instances have been cited where biological treatment systems have failed to produce desired results. The main reasons for the failure of such biological treatments are:

- Microorganisms are inherently very sensitive when exposed to extreme conditions. For efficient microorganism activity, adequate quantity of oxygen, proper pH, sufficient nutrients and other considerations are required.
- The effluent pollutants continuously vary over time during which peak overloads introduce a shock to microbial cultures, which then deplete rapidly under such circumstances. An understanding of these circumstances is necessary and proper monitoring of such conditions must be ensured so that necessary dosing patterns can be introduced.
- Most biological treatment system use naturally available microorganisms from various sources such as cow dung or sludge. However these sources essentially lack the necessary beneficial microorganism capable of removing specific pollutants present in effluent and hence, satisfactory results are seldom achieved by such method.

Product description

"**Bio Topaz**" contains a research-based consortium of microbial cultures containing all necessary microorganisms in sufficient concentrations along with nutrients, enzymes and stimulants, capable of coping with even the worst environmental conditions. These beneficial facultative microorganisms biodegrade various kinds of complex and harsh pollutants like oil, protein, phenol, chlorinated hydrocarbons found in wastewater streams.

Advantages

1. Digests difficult to degrade compounds that are typically toxic to naturally occurring bacteria or existing generic bacteria.
2. Provides rapid breakdown of difficult-to-degrade substances viz. surfactants, fats, oils, sulfides, mercaptans, phenols, cresylates, hydrocarbons, aromatic compounds, pesticides and others.
3. The microbes grow and act in either the presence or absence of oxygen.
4. "**Bio Topaz**" is the only bio-product that can perform efficiently in effluents having high Total Dissolved Solids (TDS).
5. No modification of the current process required.
6. Low treatment cost. Increases the efficiency of the treatment plants and saves energy cost. Typically costs a fraction of a paisa to treat a liter of effluent.
7. Odor control due to the complete biodegradation of organic compounds.
8. Reduces organic sludge as most of the waste is converted to natural bye products such as carbon dioxide and water.
9. Non-corrosive, non-pathogenic and low quantities of use, make it safe and easy to handle and store.

Application Method

Apply 4 ppm (4 Liters per every 10 Lac Liters of effluent) of "**Bio Topaz**" as a shock dose for one week. Taper the dose to 1 ppm. Depending upon the effluent quality, customization of dose may be required.

Note In case of B.O.D greater than 500 mg/l or retention time less than 48 hrs, double the dose in case of temperature below 18 degree Celsius.

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BIO CRYSTAL

The ecological equilibrium of many lakes have been disturbed due to the overload of organic nutrients; primarily excess nitrogen and phosphorous. This nutrient buildup serves as a food supply for undesirable aquatic plants like various algae and fungi; the overgrowth of which results in poor lake water quality, odor problems, unaesthetic view and an unbalanced ecosystem.

Product Description

"**Bio Crystal**" is biologically enhanced solution specifically designed to enhance water conditions and improve the ecology of a water body. This multi faceted formulation utilizes a synergistic blend of ingredients to bring the lake and pond back into ecological equilibrium.

The primary ingredients of the "**Bio Crystal**" include up to 58 strains of aerobic & facultative bacteria mixed with complex microbial growth stimulators.

Advantages

1. Biodegrades pollutants.
2. Reduces nitrogen and phosphorous levels responsible for algae growth.
3. Biodegrades excess organic sludge and muck accumulating at the bottom of lakes resulting into deeper and cleaner lakes.
4. Improves the aesthetic value of the water body.
5. Promotes the establishment of good fish population due to the improvement in the environment.

Application Method

Apply 4 ppm (4 Liters per every 10 Lac Liters of lake water) of "**Bio Crystal**" as a shock dose. If the lake water is highly polluted (green in color and characterized with a strong foul odor) apply two shock doses at 15-day intervals. Thereafter apply a maintenance dose of 1 ppm every month. Customization of the dosing may be required.

Note:
The lake cleaning effort is recommended as per our standard protocol developed in joint conjunction with our Aerator Company in USA. Depending upon the organic load/ pollution level at the bottom of the lake, the results may vary. Hydrogen sulfide is a dissolved gas coming from decaying plant matter in a "BAD" pond bottom and is particularly deadly. This gas remains trapped in ANAEROBIC conditions. This gas has the smell of rotten eggs and is highly toxic to fish. If oxygen is present in the water, no hydrogen sulfide is formed. Where the pond or lake is "BAD", aeration initially causes more phase distribution and the smell of rotten eggs is strong above the aerator for the first period of time and may even result in a temporary fish kill.

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BIO OPAL

Bacteria are the primary decomposers of all organic waste. They have specific functions of degrading an enormous number of compounds; both simple and complex. When the right strains are chosen, they can even biodegrade man-made or naturally occurring toxic compounds.

In aquaculture, massive quantities of organic compounds leach out from the feed into the pond water. These organic compounds may be rich in nitrate and phosphate, which disturbs the ecology of the pond by stimulating only certain type of life forms. Under these circumstances, the microbial communities become unstable. The toxicity of the pond goes up due to the incomplete decomposition of the organic matter. The discharge of fecal matter by the fish into the pond adds to the toxicity of the water. This deterioration of the water quality increases the fish culture's susceptibility to stress and disease. The partially decomposed sludge starts breeding certain pathogenic bacteria viz. Vibrio cholera. High amount of toxic wastes induces blue green algae to thrive, causing the incidence of disease and stunted growth to increase resulting into higher mortality rates of fishes.

Product Description

"**Bio Opal**" a proprietary blend of carefully selected naturally occurring microorganisms, enzymes and growth stimulating factors. It is a balanced formula of 94 different microbial strains, which work synergistically to lower the toxicity level in the pond and create a healthier and more beneficial environment for fish, prawn and shrimp. The toxic pollutants are broken down to non-toxic by-products such as carbon dioxide and water. This is evident when there is a remarkable reduction in the foul odor in the pond water.

It is preferable to pre-treat the water with "**Bio Opal**" before introduction of the new fish cultures into the pond. Using this high technology product can reduce the number of water exchanges and allow significant cost savings.

Advantages

1. Decomposes organic sludge, reducing the need for water exchanges.
2. Reduces ammonia levels, and hence controls algae growth and prevents brown blood disease.
3. Stabilizes oxygen levels, so that the fish can breathe easier.
4. Reduces BOD and COD levels.
5. Reduces formation of Hydrogen Sulfide.
6. Prevents and treats floating clumps resulting from dead planktons.
7. Stabilizes bloom conditions and prevents over-blooming of algae.
8. Suppresses Coliform, Vibrio and Aeromonas Counts.
9. Promotes growth rate and hence production. Increases product weight.
10. Reduces off-flavored product
11. Boosts immunity of animal, reduces mortality and improves survival rates.
12. Allows higher stocking rates
13. Improves feed conversion ratio
14. Reduces number of days of growth cycle, hence time taken to market is lower.

Application Method

Culture period	Quantity per Hectare (up to 5 pcs/M^2)	Quantity per Hectare (5-10 pcs/M^2)	Quantity per Hectare (10-20 pcs/M^2)
3 days before stocking	1 kg	1 kg	1 kg
15 days after stocking	-	250 gm	500 kg
30 days after stocking	250gm	250 gm	500 kg
45 days after stocking	-	250 gm	1 kg
60 days after stocking	500 gm	250 gm	1 kg
75 days after stocking	-	500gm	1 kg
90 days after stocking	500 gm	1 kg	1 kg
105 days after stocking	500 gm	1 kg	1.5kg
120 days after stocking	500 gm	1 kg	1.5 kg
Total	**3.0 kg**	**5.5 kg**	**9.0 kg**

Equivalent and customized liquid dosing is also available and recommended.

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Bio Coral

General

Composting has been defined as the product of natural degradation of botanical and putrescible waste by the action of bacteria, fungi and other organisms in the presence of an adequate air supply"(Warmer, 1997). Although this is true the word compost is also often used for the decomposition process that is anaerobic.

Composting has been used since man began to plant and harvest for food, when an association between waste products, plant growth and the harvest yield was realized. Different waste products have been used over the centuries that fertilize the soil through the breakdown of waste material known has composting. Although these products have been used extensively the processes involved were not clearly understood until recent. Composting has been defined and even today the reactions in the compost pile, though understood, can be vague.

Product Description

"**Bio Coral**" contains naturally derived enzymes and saprophytic bacteria originally derived from soil which utilize only non-living organic matter as a food source. It is a unique combination of mesophilic, basophilic and thermophilic bacteria, molds and yeasts, consisting different types of microbial cultures, all of which occur naturally in soil, but in very small numbers. These microorganisms are not harmful to either aquatic or land plants, birds, animals or humans and have been released all over the world into marine and fresh water lakes, ponds, rivers, municipal sewer lines, drains, septic systems and soil with complete ecological safety.

Advantages

1. Reduces Foul Odor
2. Works at various temp ranges.
3. Increase composting rate.
4. Effective in various conditions.
5. Reduces processing period.
6. Converts complex nutrients in simple forms.
7. Kills pathogens and weed seeds.

Application Method

For Every ton of Solid Waste, mix 3 to 12 liters of solution in adequate quantity of water and apply evenly on the heap.

MATERIAL SAFETY DATA SHEET

Section 1: Product Identification

PRODUCT NAME: Eco-companion product range
US DOT CLASSIFICATION: Non-Hazardous
DESCRIPTION: A proprietary blend of naturally occurring, non-pathogenic, non-genetically altered soil microorganisms and microbial nutrients in an aqueous base or dry powder.

Section 2: Hazardous Components

None of the ingredients in this material meet the definition of "Hazardous Chemical" 29 CFR1910.1200

Section 3: Physical Data

APPEARANCE: clear / light brown liquid or dry powder with characteristic fermentation odor
SOLUBLE IN WATER: Yes (Aqueous suspension)
BOILING POINT: > 100^{O}C
MELTING POINT: Not applicable
VAPOR PRESSURE: Not applicable
FLASH POINT: Not applicable
SPECIFIC GRAVITY: 1.1 to 1.13

Section 4: Fire and Explosion Data

EXTINGUISHING MEDIA: Use appropriate media for underlying cause product not flammable.
SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

Section 5: Reactivity Data

HAZARDOUS DECOMPOSITION PRODUCT: None
INCOMPATIBILITY: Strong acid & alkali, organic solvents and oxidizing agents
STABILITY: Stable under normal conditions
HAZRDOUS POLYMERIZATION: None

Section 6: Health Hazards

EYE CONTACT: Moderate irritant avoid contact.
INGESTION: No known hazards in small quantities
INHALATION: No known hazards under normal conditions. Avoid breathing excessive mist this may cause irritation to respiratory tract.
DERMAL CONTACT: No known hazards, may be mildly irritating to sensitive individuals.
EXPOSURE LIMIT: No OSHA TLV
TOXICITY: No components of this product are listed as carcinogenic by NTP, IARC or OSHA
OTHER: None

Section 7: First Aid Procedures

SKIN: Wash hands after use. If irritation occurs / persists consult with physician.
EYES: Flush eyes with cool water and consult physician if irritation persists.
INGESTION: Give demulcent (milk) Consult physician if reaction occurs.
INHALATION: Consult physician if problem occurs.
OTHER: None

Section 8: Personal Protection

EYES: Under normal conditions none required if potential for excessive mist exists. Wear goggles. GLOVES: May be worn by individuals with sensitive skin.
VENTILLATION: Under normal conditions none required.
CLOTHING: Wear pants, shirt, shoes and socks
OTHER: None

Section 9: Spill, Leak and Disposal Procedures

STEPS TO BE TAKEN IN CASE OF SPILL: Mop up and discard according to protocol below.
WASTE DISPOSAL METHODOLOGY: In accordance with Federal, State and local naturally occurring soil bacteria regulations.
OTHER: None

Section 10: Storage and Handling

Store in original container. Avoid excessive heat and moisture. Store in a cool, dry place. Always follow label directions!
For additional information call 0265-239-1605

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Technical Specification

Description	Bio Crystal	Bio Topaz	Bio Opel	Bio Coral
Active Ingredients	Proprietary blend of naturally occurring microbes, enzymes, nutrients and growth stimulants.	Proprietary blend of naturally occurring microbes, enzymes, nutrients and growth stimulants.	Proprietary blend of naturally occurring microbes, enzymes, nutrients and growth stimulants.	Proprietary blend of naturally occurring microbes, enzymes, nutrients and growth stimulants.
Product Type	Liquid Formulation	Liquid Formulation	Liquid Formulation	Dry Powder
Count	≥ 1.0 billion CFU/mL	≥ 1.0 billion CFU/mL	≥ 1.0 billion CFU/mL	≥ 10^9 CFU/gm
Type of Bacteria	Aerobic and facultative microbes with the ability to degrade organic pollutants	Aerobic and facultative microbes with the ability to degrade organic, harsh and complex pollutants and toxic compounds.	Aerobic and facultative microbes with the ability to degrade organic pollutants, fecal matter, toxic compounds and suppress pathogens.	Aerobic and facultative microbes with the ability to degrade organic and farm waste
Specific Gravity	1.1	1.1	1.1	1.3
Application Temp & pH	13^o C – 50^o C pH 5.0 to 9.0 Special formulation is available for cold or hot environmental conditions and extreme pH's	13^o C – 50^o C pH 5.0 to 9.0 Special formulation is available for cold or hot environmental conditions and extreme pH's	13^o C – 50^o C pH 5.0 to 9.0 Special formulation is available for cold or hot environmental conditions and extreme pH's	13^o C – 70^o C pH 5.0 to 9.0
Standard Packing	Drums or suitable containers	Drums or suitable containers	Drums or suitable containers	Pouches or Plastic Bags
Solubility	Soluble in water	Soluble in water	Soluble in water	Aqueous Suspension
Boiling point	>100^o C	>100^o C	>100^o C	>100^o C
Melting point	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Vapor Pressure	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Flash point	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Hazardous	Non- Hazardous	Non- Hazardous	Non- Hazardous	Non-Hazardous
Incompatibility	With strong alkali, & acid, organic solvent and oxidizing agent	With strong alkali, & acid, organic solvent and oxidizing agent	With strong alkali, & acid, organic solvent and oxidizing agent	With strong alkali, & acid, organic solvent and oxidizing agent
Stability	Stable	Stable	Stable	Stable
Toxicity	Non-toxic	Non-toxic	Non-toxic	Non-toxic