

Antifungal Methods Using Isolite CG Private Patent

Abstract:

A composition comprising bacteria and an inert carrier is disclosed. The carrier can be porous, ceramic particles. The composition can also include a growth medium. Bacteria in such a composition can comprise a novel strain designated APM-1. APM-1 is a Gram-positive, aerobic, motile rod, and appears to be most closely related to *Bacillus* spp. Also disclosed are methods for controlling mammalian fungal diseases and of using the disclosed compositions for controlling plant fungal diseases or for bioremediation.

Porous, ceramic particles can be extruded to a diameter from about 1 mm to about 10 mm, and then kiln-fired. Each particle can have a roughly cylindrical shape. The specific surface area can be about 4.6 m²/gram, using American Society of Testing and Materials method C1274-00 and the multipoint equation of Branauer, Emmitt and Teller (BET). The density can be about 32 lbs/ft³ (0.51 g/cm³). The porosity can be about 74%, with a minimum porosity of about 70%. A typical pore size distribution is as follows: 6% are <0.5 micrometers (μ), 12% are 0.5-1.0 μ , 43% are 1-3 μ and 39% are >3 μ . In general, from about 20% to about 100% of the pores are from 0.5 μ to 5 μ . For example, the pore size distribution can be such that from about 25% to 85% of the pores are from 0.5 μ to 5 μ , or about 30% to 75% of the pores are from 0.5 to 5 μ , or about 45% to 75% of the pores are from 0.5 to 5 μ . The maximum size typically is about 15 to about 20 μ . The pores typically are continuous, open-ended and interconnecting, which minimizes the amount of dead-end pore space. Such particles typically are chemically inert and have a degradation loss of less than 2% when measured by American Society of Testing and Materials method ASTM-88. In the case of ISOLITE® OR ISOLITE®-like particles, the chemical composition can be, by weight, about 78% SiO₂, about 12% Al₂O₃ and about 5% by Fe₂O₃. Other components typically are present at less than 5% by weight, e.g., CaO at about 2%, and MgO, K₂O, NaO and TiO₂ at less than about 2%.

All of the bacteria in a composition can belong to a single bacterial strain. Alternatively, bacteria of a single strain can constitute a percentage of the bacteria in a composition. For example, about 5% or less, 10% or less, 20% or less, 30% or less, 40% or less, 50% or less, 60% or less, 70% or less, 80% or less, or 90% or less of the bacteria in a composition can be bacteria of a given strain. The percentage of bacteria of a given strain in a composition is measured as the number of colony-forming units of that strain divided by the total colony-forming units for all bacteria. A desired proportion of different strains of bacteria to be used in a composition can be readily determined by measuring the level of biocontrol achieved at various proportions and using the proportion that provides optimum control of a given pathogen.