

Section 1 - Infectious Agent

Agent Name: *Bacillus megaterium*

Agent Type: Bacteria

Taxonomy:

Family: Bacillaceae

Genus: Bacillus

Species: *B. megaterium*

Subspecies/Strain/Clonal Isolate:

Synonym/Cross Reference

Characteristics

Brief Description: *Bacillus megaterium* is a gram positive, motile, endospore forming, rod shaped bacteria, typically 1.2 - 1.5 by 2.0 - 5.0 μm in size.

Properties: Heterotrophic organism. Able to fix atmospheric nitrogen. Some other *Bacillus* species show variable motility and may often be nonmotile. These species include *B. megaterium*.

Section 2 - Hazard Identification

Pathogenicity/Toxicity

Rarely, these species cause important clinical diseases such as bacteremia, sepsis, meningitis, pneumonia, empyema, ophthalmitis, osteomyelitis, endocarditis, soft tissue infection, and intravascular catheter-acquired sepsis.

Predisposing Factors: Immunocompromised patients.

Communicability

Not communicable.

Epidemiology

World-wide distribution. Soil borne organism.

Host Range

Natural Host(s): None.

Other Host(s): None.

Infectious Dose

Unknown.

Incubation Period

Unknown.

Section 3 - Dissemination

Reservoir

Soil

Vectors

None.

Zoonosis / Reverse Zoonosis

None.

Section 4 - Dissemination**Drug Susceptibility**

Demonstrated susceptibility to imipenem, ciprofloxacin, vancomycin, penicillins, cephalosporins, and chloramphenicol.

Drug Resistance

None reported.

Susceptibility to Disinfectants

Gram positive bacteria are generally susceptible to a number of disinfectants, including phenolic compounds, hypochlorites (1% sodium hypochlorite), alcohols (70% ethanol), formaldehyde (18.5 g/L; 5% formalin in water), glutaraldehyde, iodines (0.075 g/L).

Physical Inactivation

Bacteria are generally sensitive to moist heat and dry heat(8) . Growth of micrococci may be significantly reduced at temperatures >45 °C, pH <6, and in high salt concentrations (>15%).

Survival Outside Host

Soil-borne organism.

Section 5 - First Aid and Medical**Surveillance**

At the community laboratory level, once the Bacillus colonies are identified as catalase-positive, nonhemolytic, nonmotile gram-positive rods, the organism should be packaged properly and transported to a state or county public health laboratory for confirmation.

First Aid / Treatment

Antibiotic therapy may be required in more serious cases particularly in young, elderly or immunocompromised patients.

Immunization

None.

Prophylaxis

None.

Section 6 - Laboratory Hazards**Laboratory Acquired Infections**

None reported.

Sources / Specimens

May be isolated from soils.

Primary Hazards

None.

Special Hazards

None.

Section 7 - Exposure Controls and Personal Protection

Risk Group Classification

What is the Risk Group classification in humans and animals for the pathogen?

Human Risk Group Classification RG1

Animal Risk Group Classification RG1

Containment Requirements

Containment Level: CL1

Containment Zone Requirements:

Containment Level 1 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials, animals, or cultures.

Protective Clothing

Lab coat. Gloves when direct skin contact with infected materials or animals is unavoidable. Eye protection must be used where there is a known or potential risk of exposure to splashes.

Other Precautions

All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC). The use of needles, syringes, and other sharp objects should be strictly limited. Additional precautions should be considered with work involving animals or large scale activities.

Section 8 - Handling and Storage**Spills**

Allow aerosols to settle. Wearing protective clothing, gently cover the spill with absorbent paper towel and apply suitable disinfectant, starting at the perimeter and working towards the centre. Allow sufficient contact time before clean up.

Disposal

Decontaminate all wastes that contain or have come in contact with the infectious organism by autoclave, chemical disinfection, gamma irradiation, or incineration before disposing.

Storage

The infectious agent should be stored in appropriately labelled leak-proof containers in a locked area. Containers of infectious material or toxins stored outside the containment zone must be labelled, leakproof, impact resistant, and kept either in locked storage equipment or within an area with limited access.

Section 9 - Regulatory Information

The import, transport, and use of pathogens in Canada is regulated under many regulatory bodies, including the Public Health Agency of Canada, Health Canada, Canadian Food Inspection Agency, Environment Canada, and Transport Canada. Users are responsible for ensuring they are compliant with all relevant acts, regulations, guidelines, and standards.

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References

Risk Group determination from "PHAC Biological Agent Search".

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Dib EG, Dib SA, Korkmaz DA, et al. Nonhemolytic, Nonmotile Gram-Positive Rods Indicative of *Bacillus anthracis*. *Emerging Infectious Diseases*. 2003;9(8):1013-1015. doi:10.3201/eid0908.030205.