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Short Review

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Bacillus Cereus Bacterium: A Human Pathogen

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Abstract

Bacteria belonging to genus Bacillus are endospore-forming bacteria Gram-positive and aerobic that are distinguished by the rod-designed cell morphology. Besides, they are found in varied environments. *Bacillus sp.*, is known to have an economic interest. In fact, various strains or species are employed in animal and human food manufacture. Among *Bacillus sp.*, Bacillus cereus is particularly dangerous for humans. This bacterium is a source of food toxin and involves severe infections.

Introduction

Species of genus Bacillus are rods capsules of producing endospores and they develop aerobically [1,2] although a few are facultative in the majority of cases in nutrient agar as well as are catalase positive [3]. Bacteria belonging to genus Bacillus are endospore-forming bacteria Gram-positive and aerobic that are distinguished by the rod-designed cell morphology and also catalase generation [4]. Moreover, they are found in varied environments like for example the soil, dust, vegetation, food and gastro-intestinal tracts of different animals and insects [5]. This aptitude to stay alive and develop in such diverse ecosystems is established on the make of their strong endospores [6], their multiplicity in physiological attributes and their growth conditions.

Characteristics of Bacillus species

Bacillus species show quite various physiological characteristics such as the capacity to reduce a lot of diverse substrates obtained from animal and plant origins as well as starch, cellulose, proteins, etc. [7]. A number of Bacillus species are alkalophiles, acidophiles or heterotrophic, thermophiles [8]. This multiplicity is revealed by significant assortment of Bacillus strains, which permit those bacteria, to settle an extensive diversity of natural environments. Some Bacillus Groups are judged as excellent producers of antimicrobial matters including lipopetides [9], peptides, bacteriocins and antibiotics [10].

The occurrence of Bacillus species in food does not constantly entail food poisoning or spoilage. In fact, various strains or species are employed in animal and human food manufacture. *Bacillus subtilis* stains are employed in Natto fermented food in East Asia [11] and as an inoculum culture for fermenting soybean foods in West Africa [12]. A Nontoxigenic Bacillus cereus species having probiotic characteristics is besides employed as an additive for animal food [13]. Furthermore, Bacillus strains or species have been involved in food spoilage and food poisoning. These comprise Bacillus sphaericus, Bacillus licheniformis, and Bacillus cereus [14]. Consequently, a precise selection procedure is necessitated for the growth and selection of Bacillus probiotic applicants [15] or inoculum cultures, considering the intra species different virulence attributes. Normally, Bacillus cultures are the Gram-positive when it is youthful, however may become Gram-negative as they become aged. Bacillus species are sporulating aerobic, rod-molded bacteria which are present in nature, organized separately or in small chains.

Bacillus cereus: a harmful bacterium

Bacillus cereus is spore-forming micro-organism that can be commonly isolated from soil and also nutriments. Bacillus cereus spores are mainly resistant to high temperature and chemical treatments than vegetative micro-organisms such as Listeria monocytogenes, Salmonella, *E. coli* and Campylobacter [16]. If Bacillus cereus can occur two classes of food-borne infection in persons-regurgitating brusquely after consuming infected rations or diarrhoea after an extended incubation [17].

Bacillus cereus is a source of food toxin that is principally correlated with the consumption of rice-based dishes. The body produces a diarrheal disease caused by an emetic toxin and enterotoxin, correspondingly [18]. Other toxins are generated through development, comprising phospholipases, proteases and hemolysins, one of which cereolysin, defined as a thiol-activated hemolysin [19].

These toxins may possibly supply to the pathogenicity of Bacillus cereus is non-gastrointestinal illness [20]. Bacillus cereus is frequently isolated from clinical material other than faeces or vomits were usually released as an impurity, nevertheless increasingly it is being distinguished as species with pathogenic capacity [21]. It implies severe non-gastrointestinal illness, principally in drug consumers, the postsurgical immunosuppressed, and neonate's patients, particularly when prosthetic implants such as ventricular shunts are introduced. Visual infections are the strong infection, comprising keratitis, usually with the characteristic formation of corneal ring abscesses [22], septicaemia and surgical and traumatic wound diseases are other symptoms of severe illness [23]. Bacillus cereus produces beta-lactamases, and so is resistant to antibiotics based on beta-lactam; it is typically inclined to treatment with erythromycin, chloramphenicol, gentamicin, clindamycin and vancomycin. Synchronized treatments by several routes may be necessitated.

Conclusion

There is obviously a great deal to study the metabolism and the biochemistry of various Bacillus soil bacteria. This review indicate that the Bacillus cereus group have evolved a number of behaviors and metabolic regulatory mechanisms to respond to these changing biotic and abiotic environmental stresses, and which are recognized to be pathogenic to humans and also animals.

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