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ISOLATION AND IDENTIFICATION THE PATHOGENIC BACTERIA THAT ASSOCIATION WITH *LEISHEMAIA TROPICA* INFECTIONS AT PATIENTS THAT COME TO ALHUSSEN HOSPITAL IN NASSERIA PROVINCE

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ABSTRACT

Collecte 25 samples from patients that come to Al-Hussen hospital when them infections by *Leishmania tropica* at foot, hands and face at different patients for sex and age, isolation the pathogenic bacteria from infections by *Leishmania tropica*, the isolate take to biology libratory, act culcuring and biochemical test to identification the bacteria from patients that come to ALHussen Hospital in Nasseria city**,** *Bacillus cereus* were isolated from *Leishemaia tropica* infections, the isolates were compared by cultural, microbial and biochemical characteristic,the bacteria (*Bacillus cereus*) identification by biochemical test and API 20, *Bacillus cereus* infection association with *Leishmania tropica* that cuase **Foodborne poisoning caused by** *Bacillus cereus* and live at the surface infection on hand, face, foot, *Bacillus cereus* causes a toxin-mediated food poisoning. *Bacillus cereus* is an aerobic and facultatively anaerobic, spore-forming, gram-positive bacillus, the emetic syndrome is caused by a preformed heatstable toxin. The diarrhea syndrome is caused by in vivo production of a heat-labile enterotoxin, the test for antibiotic Pencillin, Ampicillin, Amoxicillin, Chloramphenicol, co-trimoxazol, Trimethaxazol, Ciprofloxacin, Doxycyclin, the result for the ciprofloxamin, tetracycline, trimethaxazol is sensitive and the ether antibiotic is resetance, the aim of study, isolation and Identification the pathogenic bacteria that association with *Leishemaia tropica* infections from patients that come to ALHussen Hospital in Nasseria province.

KEYWORDS: *Leishmania tropica*, association, *Bacillus cereus*, Soil, Trimethaxazol.

INTRODUCTION

The genus *Leishmania*, widely distributed in nature, has a number of species that are nearly identical morphologically, differentiation therefore is based on a number of biochemical and epidemiologic criteria: electrophoretic mobility profile of a battery of isoenzymes (zymodeme pattern); excretory factor serotyping; kinetoplast DNA restriction analysis (schizodemes); lectin conjugation patterns on the parasite surface; use of monoclonal probes to detect specific antigens; promastigote growth patterns in vitro in the presence of antisera; developmental characteristics of promastigotes in the specific sandfly vector; and vectors, reservoir hosts, and other epidemiologic factors, clinical characteristics of the disease produced are traditional differentiating characteristics, old World leishmanias are transmitted by sandflies of the genus *Phlebotomus*, the cutaneous leishmaniasis (Oriental sore, Baghdad boil, wet cutaneous sore, dry cutaneous sore, chiclero ulcer, uta, and other names)(Kayser,2005).

Leishmania :-Mediterranean region ,southwestern Asia to India Incubation :-2-24 months. Dry (= urban, "or "orthroponotic") development of lesions and persistence longer than with *Leishmania* major, reservoir hostshumans,vectors:*Phleptomus* species (*Phleptomus papatasi* ,*Phleptomus sergeate*) *Leishmania tropica* cause dermal lesion at the site of inoculations by the sand fly; cutaneous leishmaniasis ,Oriental sore ,Delhi boil ,Baghdad boil,Wet cutaneous sore,dry cutaneous sore ,chilero ulcer ,Uta ,the dermal layers are first affected ,with cellular infiltration and proliferation of amastigotes intracellulary and spreading extracellulary ,until the infection penetrates the epidermis and causes ulceration ,the new world forms are all carried by sandflies of genus *Leishmania* ,old World leishmanias are transmitted by sandflies of the genus *Phlebotomus*,the different leishmanias present a range of clinical and epidemiologic characteristics Leishmania tropica grows more quickly ,promastigotes forming small rosettes attached by their flagella in the fluid (Jawetz,2007).

Description of the organism

Bacillus cereus is a Gram-positive, motile (flagellated), spore-forming, rod shaped bacterium that belongs to the *Bacillus* genus, *Bacillus cereus* is widespread in nature

and readily found in soil, where it adopts a saprophytic life cycle; germinating, growing and sporulating in this environment (Vilain et al. 2006). Spores are more resistant to environmental stress than vegetative cells due to their metabolic dormancy and tough physical nature (Jenson and Moir 2003).

Bacillus cereus produces two types of toxins – emetic (vomiting) and diarrhoeal – causing two types of illness,the emetic syndrome is caused by emetic toxin produced by the bacteria during the growth phase in the food, the diarrhoeal syndrome is caused by diarrhoeal toxins produced during growth of the bacteria in the small intestine (Ehling-Schulz et al. 2006).

Bacillus cereus is a spore-forming bacterium that occurs naturally in many kinds of foods and can cause illness in humans, it can form spores that are resistant to heating and dehydration and can therefore survive cooking and dry storage,when foods containing *B. cereus* spores are in the 'temperature danger zone' the spores may germinate, and the bacteria may grow, produce toxins, and make people sick. Such illness is frequently linked with starchy foods of plant origin such as rice, pasta, potatoes, pastry and noodles .(Holt,1994).

B. cereus can cause vomiting or diarrhoea and, in some cases, both. This depends on the kinds of toxin it produces,enterotoxins produced by *B. cereus* (diarrhoeal toxin) result in the diarrhoeal form of the disease and most often follow ingestion of contaminated food, local bacterial growth and subsequent toxin production in the intestines of the host (Berthold-Pluta *et al*., 2015).

Emetic toxin produced by *B. cereus* (cereulide) can result in the vomiting form of the disease following ingestion of food containing pre-formed toxin (Rajkovic, 2014).

Growth and survival characteristics

Strains of *Bacillus cereus* vary widely in their growth and survival characteristics ,isolates from food and humans can be subdivided as either mesophilic or psychrotrophic strains, mesophilic strains grow well at 37°C but do not grow below 10°C; psychrotrophic strains grow well at refrigeration temperatures but grow poorly at 37°C (Wijnands et al. 2006a).

All isolates of *B. cereus* associated with emetic toxin production have been found to be mesophilic in nature (Wijnands et al. 2006b).The maximum salt concentration tolerated by *B. cereus* for growth is reported to be 7.5% (Rajkowski and Bennett 2003).

B. cereus growth is optimal in the presence of oxygen, but can occur under anaerobic conditions, *B. cereus* cells grown under aerobic conditions are less resistant to heat and acid than *B. cereus* cells grown anaerobically or microaerobically (Mols et al. 2009). Mesophilic strains of *B. cereus* have been shown to have greater acid resistance than psychrotrophic strains (Wijnands et al. 2006b).

Symptoms of disease

B. cereus causes two types of foodborne illness – emetic (vomiting) and diarrhoeal syndromes, the emetic syndrome is an intoxication that is caused by ingestion of a cyclic peptide toxin called cereulide that is pre-formed in the food during growth by *B. cereus*, this syndrome has a short incubation period and recovery time, the symptoms of nausea,vomiting and abdominal cramping occur within 1–5 hours of ingestion, with recovery usually within 6–24 hours (Senesi and Ghelardi 2010).

The diarrhoeal syndrome is caused by enterotoxins produced by *B. cereus* inside the host,the incubation period before onset of disease is 8–16 hours and the illness usually lasts for 12–14 hours, although it can continue for several days. Symptoms are usually mild with abdominal cramps, watery diarrhoea and nausea (Granum 2007).

Mode of transmission

B. cereus food poisoning can be caused by either ingesting large numbers of bacterial cells and/or spores in contaminated food (diarrhoeal type) or by ingesting food contaminated with pre-formed toxin (emetic type). Transmission of this disease results from consumption of contaminated foods, improper food handling/storage and improper cooling of cooked foodstuffs (Schneider et al. 2004).

Occurrence in foods

The presence of *B. cereus* in processed foods results from contamination of raw materials and the subsequent resistance of spores to thermal and other manufacturing processes. During the cooling processes, spores may germinate, enabling *B. cereus* to multiply in the food and/or produce high levels of the emetic toxin cereulide, depending on the strain(s) present (Wijnands 2008).

Mesophilic strains of *B. cereus* have been shown to have greater acid resistance than psychrotrophic strains (Wijnands et al. 2006b).

Spores are more resistant to dry heat than moist heat, with heat resistance usually greater in foods with lower water activity. Spores are also more resistant to radiation than vegetative cells (Jenson and Moir 2003). Nisin is a preservative that is used to inhibit the germination and outgrowth of spores, antimicrobials which inhibit the growth of *B. cereus* include benzoate, sorbates and ethylenediaminetetraacetic acid (Jenson and Moir 2003).

Bacillus cereus: is an endemic .soil .dwelling. gram positive, Rod shape.motile beta hemolytic bacterium,some strains are harmful to human and causes foodborn illness, *Bacillus cereus* :type of bacteria that are produces toxins can cause two type of illness, one

type characterized by diarrhea and other called emetic toxin, these bacteria are present in food and can multiply quickly at room temperature Production of the emetic toxin has been shown to occur in skim milk within the temperature range of 12–37°C, with more toxin produced at 12 and 15°C compared to higher temperatures (Finlay et al. 2000).

The emetic toxin is highly resistant to environmental factors, showing stability from pH 2–11 and during heating to 100°C for 150 minutes (pH 8.7–10.6) (ESR 2010).

Three types of enterotoxins are associated with the diarrhoeal form of disease, these are:the three component enterotoxin haemolysin BL (HBL), the three component non-haemolytic enterotoxin (NHE) and the single component enterotoxin cytotoxin K, after consumption of food containing *B. cereus*, the enterotoxins are released into the small intestine during vegetative growth following spore germination, and by any surviving vegetative cells (Wijnands et al. 2009).

The diarrhoeal enterotoxins can be produced in the temperature range of 10–43°C, with an optimum of 32°C (Fermanian et al. 1997). Production occurs between pH 5.5–10, with an optimum of pH 8 (Sutherland and Limond 1993). The diarrhoeal enterotoxins are stable at pH 4–11 and inactivated by heating to 56°C for 5 minutes (Jenson and Moir 2003). Maltodextrin is known to stimulate growth of *B. cereus* and to aid diarrheal enterotoxin production in reconstituted and stored infant milk formulae (Rowan and Anderson 1997).

COLONIZATION

The natural environmental reservoir for *B. cereus* consists of decaying organic matter, fresh and marine waters, vegetables and fomites, and the intestinal tract of invertebrates, from which soil and food products may become contaminated, leading to the transient colonization of the human intestine,eating food containing preformed toxin, most commonly fried rice, may cause the emetic, short incubation syndrome, in some restaurants, boiled rice is allowed to "dry off" at ambient temperature, after which it may be stored overnight, before it is fried quickly with beaten egg. Spores originally present in raw rice survive. At ambient temperature, the spores germinate in the cooked rice, and there is rapid growth of vegetative bacteria. Levels of *Bacillus cereus* in foods incriminated in the emetic form of food poisoning have ranged from 1,000 to 50 billion colony-forming units (cfu)/gram; high numbers are also present in fecal samples from affected persons (Kayser,2005).

Eating food contaminated with *B. cereus* spores, which produce toxin in the gastrointestinal tract, is more commonly caused by contaminated meat or vegetables and results in the longer incubation period syndrome, there is no evidence that human carriage of the organism or other means of contamination play a role in transmission, it is not known whether the ingested organisms multiply and make toxin in vivo or whether a preformed toxin is present in food (van Netten *et al*. 1990).

Emetic *Bacillus cereus* foodborne intoxications were frequently linked to rice and pasta dishes. In particular, cooking rice and keeping it unrefrigerated several hours before frying or re-heating led to several emetic intoxication outbreaks, because the emetic toxin cereulide was produced during storage of the cooked rice but was not destroyed by the frying or re-heating step (Kramer and Gilbert, 1989).

Epidemiology

Bacillus cereus is found in about 25% of food products sampled, including cream, pudding, meat, spices,dry potatoes, dry milk, spaghetti sauces and rice, contamination of the food product generally occurs prior to cooking, vegetative forms can grow and produce enterotoxins over a wide range of temperatures from 25°C to 42°C (77°-108°F). Spores can survive extreme temperatures, and when allowed to cool relatively slowly, they will germinate and multiply(ICMSF, 1996).

The aim of study

Isolation and Identification the pathogenic bacteria assocation with *Leishmania tropica* infections at patients that come to Al Hussen Hospital in Nasseria city.

MATERIALS AND METHODS

Isolation

B. cereus were isolated from *Leishemaia tropica* infections from patients that come to Alhussen hospital, smear by disbosable swabs and culturaing at nutrient and blood agar in biology labretary in Scinsce college, to identification microbial and biochemical characteristic and API 20**.**

Samples collecte

Collecte 25 samples from patients that come to Al-Hussen hospital when them infections by *Leishmania tropica.*

Table (1) The samples collecte from different region at Nasseria province

NO.	Age	Sex	Habitate	Site of infection
1	2 year	Male	Habobi	Foot
2	35 year	Male	Aredo	Foot
3	6 month	Male	Alfrehi	Hand
4	11 year	Female	Al graff	Hand
5	20 year	Male	Algraff	Hand
6	42 Year	Male	Al batihaa	Foot
7	18 Year	Female	Aredo	Foot
8	45 Year	Female	Summer	Hand
9	15 Year	Male	Alsidenawia	Hand
10	16 Year	Female	Algraff	Foot
11	3 Year	Male	Algraff	Face
12	29 Year	Male	Alfidaa	Hand
13	39 Year	Male	Al batihaa	Hand
14	13 Year	Female	Al madena	Hand + Foot
15	15 Year	Male	Aredo	Hand
16	15 Year	Female	Al mansoria	Hand
17	3 Year	Female	Al shofa	Face
18	38 Year	Male	Ur	Hand
19	2 year	Female	Ur	Hand
20	10 year	Male	Ur	Hand + Foot
21	4 year	Female	Al mansoria	Foot
22	8 year	Female	Alsidenawia	Hand + Face
23	10 year	Male	Alshatra –Abed Alrazag village	Face
24	28 year	Female	Alshatra –Abed Alrazag village	Hand + Foot
25	8 year	Male	Alshatra –Abed Alrazag village	Hand + Face

Identification

The pathogenic bacteria diagnosis by biochemical test from patients that come to ALHussen Hospital in Nasseria city**,** when the infections in foots, hands, face by *Leishemaia tropica* infections, the isolates were compared by cultural, microbial and biochemical characteristic and API 20**.**

Antibiotic test

The antibiotic that uses Pencillin, Ampicillin, Amoxicillin, Chloramphenicol, co-trimoxazol Trimethaxazol, Ciprofloxacin, Doxycyclin, ciprofloxamin, tetracycline, trimethaxazol, the medium Muller –Hintin agar use for antibiotic, sensitive, resestance or intermediate for diameter the antibiotic.

Culture media

MIS medium., Methyl red Voges proskauer broth, Simmon s citrate agar, Triple Sugar Iron agar, Lactose fermentation medium, Urea agar, Nitrate broth medium, MacConkey agar, Nutrient agar, Nutrient broth +7%NaCL, Muller –Hinton agar, Blood agar, Nutrient broth.

MATERIALS

1-peteri dish 2-cylinder 3-cotton 4-normal saline 5-crying 6-flask 7-auto clave 8-swab 9-hood 10-pirner.

Antibiotic 1-penicillin 2- ampicillin 3-tetracycline 4- erythromycin 5-amoxicillin 6-chloramphenicol 7-co_trimoxazol 8-doxycyclin 9-ciprofloxacin

Data analysis

The data statistical analysis.Groups tests were performed using student (analsis of variance) use percentage between male and female for collecte the pathogenic bacteria from deferent regions in Nasseria city was 25 samples, 56% from male and 44% from female from collecte samples.

RESULTS

Table (1): The name bacteria that isolation from Leishmania tropica infections :- explain the kind of isolated bacteria from Leishmania tropica infections

NO.	Name of Bacteria	NO.	Name of Bacteria
1	*Bacillus cereus*	14	*Bacillus cereus*
2	*Bacillus cereus*	15	*Bacillus cereus*
3	*Bacillus cereus*	16	*Bacillus cereus*
4	*Bacillus cereus*	17	*Bacillus cereus*
5	*Bacillus cereus*	18	*Bacillus cereus*
6	*Bacillus cereus*	29	*Bacillus cereus*

7	*Bacillus cereus*	20	*Bacillus cereus*
8	*Bacillus cereus*	21	*Bacillus cereus*
9	*Bacillus cereus*	22	*Bacillus cereus*
10	*Bacillus cereus*	23	*Bacillus cereus*
11	*Bacillus cereus*	24	*Bacillus cereus*
12	*Bacillus cereus*	25	*Bacillus cereus*
13	*Bacillus cereus*		

Table (2) The zone diameter breakpoint nearst whole mm for *Bacillus cereus*

NO.	Antimicrobial agent	Desk content	Zone Diameter breakpoint ,nearest whole mm		
			S	I	R
1	Pencillin	10 µ g	≥47	27-46	≤ 26
2	Ampicillin	10 µg	≥22	19-21	≤18
3	Tetracycline	30 µ g	≥19	15-18	≤14
4	Erythromycine	15 µg	≥23	14-22	≤13
5	Amoxicillin	10 µg	≥18	14-17	≤13
6	Chloramphenicol	30 µg	≥18	13-17	≤12
7	Co-trimoxazol	30 µg	≥21	18-20	≤17
8	Doxcycycline	30 µg	≥14	11-14	≤10
9	Ciprofloxacin	5 µg	≥21	16-20	≤15
10	Tobramycin	5 µg	≥35	33-34	≤32

Table (3) The samples collecte from different regions at Nasseria province from patients that come to Al-Hussen hospital when them infections by *Leishmania tropica*

NO.	Age	Sex	Habitate	Site of infection
1	2 year	male	Habobi	Foot
2	35 year	male	Aredo	Foot
3	6 month	male	Alfrehi	Hand
4	11 year	female	Al graff	Hand
5	20 year	male	Algraff	Hand
6	42 Year	male	Al batihaa	Foot
7	18 Year	female	Aredo	Foot
8	45 Year	female	Summer	Hand
9	15 Year	male	Alsidenawia	Hand
10	16 Year	female	Algraff	Foot
11	3 Year	male	Algraff	Face
12	29 Year	male	Alfidaa	Hand
13	39 Year	male	Al batihaa	Hand
14	13 Year	female	Al madena	Hand + Foot
15	15 Year	male	Aredo	Hand
16	15 Year	female	Al mansoria	Hand
17	3 Year	female	Al shofa	Face
18	38 Year	male	Ur	Hand
19	2 year	female	Ur	Hand
20	10 year	male	Ur	Hand + Foot
21	4 year	female	Al mansoria	Foot
22	8 year	female	Alsidenawia	Hand + Face
23	10 year	male	Alshatra –Abed Alrazag village	Face
24	28 year	female	Alshatra –Abed Alrazag village	Hand + Foot
25	8 year	male	Alshatra –Abed Alrazag village	Hand + Face
The percentage between male and female (56% at male and 44%at femal)from 25samples				

Table (4) The results for antibiotic for bacteria *Bacillus cereus* :- explain the results for antibiotic that uses for the isolation bacteria

The antibiotic		Desk content Mm	Diameter the antibiotic	Results
1	Pencillin	10µ g	0	R
2	Ampicillin	10µg	0	R
3	Tetracycline	30 µ g	8 ml	I
4	Erythromycine	15 µg	0	R
5	Amoxicillin	10 µg	0	R
6	Chloramphenicol	30 µg	10 ml	S
7	Co-trimoxazol	30 µg	0	R
8	Doxcycycline	30 µg	0	R
9	Ciprofloxacin	5 µg	8 ml	S
10	Tobramycin	5µg	0	R

DISCUSSION

Leishmania tropica, is a dermal lesion at the site of inoculation by the sandfly: cutaneous leishmaniasis, Oriental sore, Delhi boil, etc. Mucous membranes are rarely involved, the dermal layers are first affected, with cellular infiltration and proliferation of amastigotes intracellularly and spreading extracellularly, until the infection penetrates the epidermis and causes ulceration, the persons are pollution by bacteria from food or from the soil ,and the infections association with the lesions may be found in the dermal layers (hypersensitivity or recidivans type of cutaneous leishmaniasis) that contain few or no parasites, do not readily respond to treatment, and induce a strongly granulomatous scarring reaction, and burrowing rodents are the main reservoir; the "dry" type Other reported conditions associated with *B. cereus* infection,include bacteremia, septicemia, fulminant sepsis with hemolysis,meningitis, brain hemorrhage, ventricular shunt infections, infections associated with central venous catheters, endocarditis (which may be associated with prosthetic valves or intravenous drug abuse), pseudomembranous tracheobronchitis, pneumonia, empyema, pleurisy, lung abscess, brain abscess, osteomyelitis, salpingitis,urinary tract infection and primary cutaneous infections, wound infections, mostly in otherwise healthy persons, have been reported following surgery, road traffic and other accidents, scalds, burns, plaster fixation, drug injection (including a case associated with contaminated heroin) (Jawetz,2007).

The organism / toxin

Bacillus cereus is a spore-forming bacterium that occurs naturally in many kinds of foods and can cause illness in humans,It can form spores that are resistant to heating and dehydration and can therefore survive cooking and dry storage,When foods containing *B. cereus* spores are in the 'temperature danger zone' the spores may germinate, and the bacteria may grow, produce toxins, and make people sick. Such illness is frequently linked with starchy foods of plant origin such as rice, pasta, potatoes, pastry and noodles(Jawetz,2007).

B. cereus can cause vomiting or diarrhoea and, in some cases, both. This depends on the kinds of toxin it produces, Enterotoxins produced by *B. cereus* (diarrhoeal toxin) result in the diarrhoeal form of the disease and most often follow ingestion of contaminated food, local bacterial growth and subsequent toxin production in the intestines of the host (Berthold-Pluta *et al*., 2015).

Emetic toxin produced by *B. cereus* (cereulide) can result in the vomiting form of the disease following ingestion of food containing pre-formed toxin (Rajkovic, 2014). Illness from *B. cereus* can be prevented by making certain that hot foods are kept hot and cold foods are stored cold, it is important to remember that re-heating food that has been 'temperature abused' will not make it safe (Fernandez *et al* 2002).

Bacillus cereus is a spore forming bacterium that produces toxins that cause vomiting or Diarrhea, symptoms are generally mild and short-lived (up to 24 hours), *B. cereus* is commonly found in the environment (e.g. soil) as well as a variety of foods. Spores are able to survive harsh environments including normal cooking temperatures and association with Leishmania tropica through pollution the hands, foot and face (Holt,1994).

Bacillus cereus is a spore-forming bacterium, it can form spores that are resistant to heating and dehydration and can therefore survive cooking and dry storage,when foods containing *B. cereus* spores are in the 'temperature danger zone' the spores may germinate, and the bacteria may grow, produce toxins, and make people sick, such illness is frequently linked with starchy foods of plant origin such as rice, pasta, potatoes, pastry and noodles, spores more resistant to dry than moist heat, and are also more resistant in oily foods, Cooking at or below 100°C may allow spore survival (van Asselt and Zwietering, 2006).

Bacillus cereus can cause vomiting or diarrhoea and, in some cases, both, this depends on the kinds of toxin it produces, enterotoxins produced by *B. cereus* (diarrhoeal toxin) result in the diarrhoeal form of the disease and most often follow ingestion of contaminated food, local bacterial growth and subsequent toxin production in the intestines of the host (Berthold-Pluta *et al*., 2015).

Emetic toxin produced by *B. cereus* (cereulide) can result in the vomiting form of the disease following ingestion of food containing pre-formed toxin, emetic toxins remain stable for 80 minutes at 121°C and 60 minutes at 150°C (pH 9.5) (Rajkovic, 2014).

Heat resistance of *Bacillus cereus* spores can be modified by the pH survival of *Bacillus cereus* spores at 95 ºC decreased by three fold when the pH of the heating substrate was decreased from 6.2 to 4.7 (Fernandez *etal* 2002).

Bacillus cereus is found in about 25% of food products sampled, including cream, pudding, meat, spices,dry potatoes, dry milk, spaghetti sauces and rice, contamination of the food product generally occurs prior to cooking. Vegetative forms can grow and produce enterotoxins over a wide range of temperatures from 25°C to 42°C (77°-108°F). Spores can survive extreme temperatures, and when allowed to cool relatively slowly, they will germinate and multiply Sterilization is the most effective way to control *Bacillus cereus* spores. Considering heat resistance data (Fernandez *et al* 1999).

ENTERIC DISEASE

Emetic food poisoning due to *B. cereus* is characterized by a shorter onset period of 1–6 h,and the symptoms resemble those of *S. aureus* food poisoning. Nausea, vomiting and malaise, occasionally with diarrhea, characterize the disease. There are rarely complications, and recovery within 24 h is usual, but fulminant liver failure associated with the emetic toxin has been reported (Mahler *et al*., 1997).

OCULAR DISEASE

Bacillus cereus is one of the most virulent and destructive of ocular pathogens. The most serious of these conditions is panophthalmitis, a rapidly developing infection which may follow penetrating trauma of the eye , intraocular surgery, or hematogenous dissemination of the organism from another site (typically in intravenous drug abusers). Either way, the condition usually evolves so rapidly that irreversible damage occurs before effective treatment can be started; vision is therefore lost, and loss of the eye is normal. *Bacillus cereus*keratitis associated with contact lens wear has also been reported (ICMSF, 1996).

TOXIN PRODUCTION IN FOODS

Diarrhoeal infection. Several evidences support the assumption that diarrhoeal infection occurs through production of enterotoxins in the small intestine and not by toxins produced in the food (Granum and Lund 1997). Production of enterotoxins in foods by *B. cereus* is possible (van Netten *et al*. 1990), but is presumably of little importance to assess the risk of diarrheal infection.

Emetic intoxication. Emetic intoxication occurs through ingestion of emetic toxin (cereulide) preformed in the food. Therefore determining conditions in the foods that would lead to production of cereulide by emetic *B. cereus* is important for risk assessment of emetic intoxication. Cereulide is not easily destroyed by heat treatments. For instance, it can resist 90 min at 126°C (ICMSF, 1996).

Three types of enterotoxins are associated with the diarrhoeal form of disease. These are:
the three component enterotoxin haemolysin BL (HBL), the three component non-haemolytic enterotoxin (NHE) and the single component enterotoxin cytotoxin K. After consumption of food containing *B. cereus*, the enterotoxins are released into the small intestine during vegetative growth following spore germination, and by any surviving vegetative cells (Wijnands et al. 2009).

The diarrhoeal enterotoxins can be produced in the temperature range of 10–43°C, with an optimum of 32°C (Fermanian et al. 1997). Production occurs between pH 5.5–10, with an optimum of pH 8 (Sutherland and Limond 1993). The diarrhoeal enterotoxins are stable at pH 4–11 and inactivated by heating to 56°C for 5 minutes (Jenson and Moir 2003). Maltodextrin is known to stimulate growth of *B. cereus* and to aid diarrheal enterotoxin production in reconstituted and stored infant milk formulae (Rowan and Anderson 1997). It has also been shown that *B. cereus* produces more HBL and NHE under conditions of oxygen tension (low oxygen reduction potential) that simulate the anaerobic,highly reducing fermentative conditions encountered in the small intestine (Zigha et al.2006). Up to 26% of *B. cereus* vegetative cells can survive conditions that simulate passage through the stomach. The survival rate of the vegetative cells is dependent on the strain type, phase of vegetative cell growth and the gastric pH (Wijnands et al. 2009). As diarrhoeal enterotoxins are unstable at low pH and are degraded by digestive enzymes, any enterotoxins pre-formed in food would be destroyed during passage through the stomach and so not cause illness if ingested (Jenson and Moir 2003).

In contrast, spores of *B. cereus* are able to pass unaffected through the gastric barrier. The spores contain receptors that need triggering by certain low molecular weight substances to commence germination. These inducers may be present in the food as well as the intestinal epithelial cells. In the small intestine the spores germinate, grow and produce enterotoxins (Wijnands 2008).

A crucial virulence factor required for causing the diarrhoeal symptoms is the ability of the vegetative cells and spores of *B. cereus* to adhere to the epithelial cell wall of the small intestine. The adhesion efficiency of spores and cells has been shown to be low, approximately 1% (Wijnands 2008).

The ability of the enterotoxins to act as tissue-destructive proteins and damage the plasma membrane of the epithelial cells of the small intestine suggests a role for

these enterotoxins in causing diarrhoea (Beecher et al. (1995) showed HBL causes fluid accumulation in ligated rabbit ileal loops, implicating a role in diarrhoea. However, direct involvement of NHE and cytotoxin K in causing diarrhoea is yet to be demonstrated (Senesi and Ghelardi 2010).

CONCLUSIONS

1- Cleaning is an essential step in preventing machines and equipments used to move food inside the processing plant to support growth of *Bacillus cereus*.

2-Persons with *B. cereus* food poisoning require only supportive treatment. Oral rehydration or, occasionally, intravenous fluid and electrolyte replacement for patients with severe dehydration is indicated. Antibiotics are not indicated.

3- *Leishmania tropica* infectisons different all sexes and ages.

4- The bacterial infections association with the *Leishmania tropica* infections because the *Bacillus cereus* depend on execration the *Leishmania tropica* if can wet or attach the surface the soil.

5-Bacillus cereus causes two types of foodborne illness – emetic (vomiting) and diarrhoeal syndrome.

RECOOENDATIONS

1-Sterelization the infection place by parasite continue if the bacterial did not colonization.

2-Donot pollution by different speciesofpathogenic bacteria that cause posion.

3-Kill the insects that transport the disease.

4-Clean the house and kill the animals that reservoir the the parasite.

5-Donot near the *Leishmania tropica* hosts(eg. muse, Humans, rodents).

REFERANCES

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