

Detection Of Antibiotic Susceptibility Of *Bacillus Cereus* Isolated From Dairy Products At Al-Qasim City

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Abstract :

The present of study was planned to detect of antibiotic susceptibility of *Bacillus cereus* isolated from dairy products at Al-Qasim city. 60 samples were collected randomly from raw milk and dairy products (raw milk, cheese and yoghurt) then transport to the laboratory in ice-cooled box for analyzer .biochemical tests and chromogenic agar was used to detect *Bacillus cereus*.

The result showed that positive culture of *Bacillus cereus* 9(45%) , 12 (60%) and 3 (15%) respectively from raw milk, cheese and yoghurt. Antibiotic susceptibility showed that *B. cereus* isolates were high sensitive to Erythromycin , Ciprofloxacin , Tetracycline ,Gentamicin and Chloramphenicol, while its was high resistance to Ampicillin.

Key word: Raw milk, Cheese ,Yoghurt and Antibiotic resistance.

المعزولة من منتجات الالبان في *Bacillus cereus* الكشف والحساسية للمضادات الحيوية لعصيات البكتيريا مدينة القاسم.

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الخلاصة:

تضمنت الدراسة الكشف والحساسية للمضادات الحيوية لعصيات البكتيريا المعزولة من الحليب الخام، منتجات الألبان (الجبن واليوكرت) في مدينة القاسم. تم جمع 60 عينة عشوائية من إنتاج الألبان (الحليب الخام والجبن واللبن الزبادي) ومن ثم نقلها إلى المختبر ، واستخدم الاختبارات الكيميائية و chromogenic agar الخاصة للكشف عن مستعمرات العصيات الشمعية المكونة للأبواغ.

وأظهرت النتائج الإيجابية العصيات الشمعية 9 (45%) و 12 (60%) و 3 (15%) على التوالي من الحليب الخام والجبن والزبادي. بينت النتائج الحساسية للمضادات الحيوية أن عزلات العصيات الشمعية المكونة للأبواغ كانت حساسة للغاية للإريثروميسين، السيبروفلوكساسين، التتراسيكلين، الجنتاميسين والكلورامفينيكول بينما كانت النتائج مقاومة عالية للأمبيسيلين

الكلمات المفتاحية: الحليب الخام، الجبن، اللبن الزبادي و المضادات الحيوية

1. Introduction

Milk and dairy products are a major part of human food and play a important role in the diet (1). However, it has nutritive values and makes it easily acceptable to consumers which contain many nutrient, such as protein, vitamins, calcium, phosphorus, magnesium, zinc, etc. (2). It constitutes a vital component of human diet in many regions of the world. (3).The Gram-positive bacteria can be present in raw milk, but they also may enter milk products at various points during production, processing and transport (4).

Bacillus cereus is a gram positive bacterium which causes severe food poisoning. It is rod shaped and forms spores. The spores have ability to remain dormant for

many years and stay alive in hot and dry conditions (5) . The bacterium can be found in foods, such as dairy products, eggs, vegetables and meats (6 and 7). *B. cereus* is an important cause of foodborne diseases. It is responsible for two different types of food poisoning: diarrheal syndrome caused by the production of enterotoxin. Diarrhea syndrome is characterized by incubation time of 8-12 hours or 8-16 hours after ingestion the contaminated foods . The symptoms are abdominal cramps and diarrhea accompanied by a feeling of nausea sometimes(8).

Antimicrobial resistance is one of the most serious health threats worldwide and it has a role in the increasing number of foodborne bacterial pathogens resistant to a

variety of antibiotics (9 and 10). Many previous studies have shown that *B. cereus* isolates obtained from different foods have resistance to various antibiotics (11 and 12).

2. Materials and Methods

2.1. Samples collection

Sixty dairy products samples (Milk, Cheese and Yogurt) were collected randomly at weekly intervals (10 samples a week) in sterile 100 ml or gm plastic bags from Hilla city. All samples were immediately transported to the laboratory in an ice-cooled box for analysis.

2.2. Isolation of *B. cereus*

The detection of *B. cereus* in the samples was achieved according to the standard method of the U.S. Food and Drug Administration's (FDA) Bacteriological Analytical Manual (BAM) (13). 1 ml of milk of was taken portions of each sample were homogenized with 9 mL of sterile saline peptone water (0.1%, w/v) for 1 min in a stomacher (Seward, London, UK). Tenfold serial dilutions of homogenates were made in 0.1% peptone water as the diluents (14). Then

1ml of each sample was taken and carried out by spreading on the Chromogenic agar, and incubated at 37 °C for 24 hours . After the incubation period, the colonies were counted in a Colony Counter (UK)(15) . The biochemical tests were implemented to characterize.

2.3. Antibiotic sensitivity test

All *Bacillus cereus* isolates were tested for their sensitivity to antibiotics by a disc diffusion method (16). The organisms were investigated using antibiotics disc containing a number of oxoid-treated antibiotics including Ampicillin (10 µg), Amikacin (10 µg), Ciprofloxacin (10µg), Chloramphenicol (20µg) and Erythromycin (30µg).

The antibiotics disc were sparsely placed on Mueller - Hinton agar plates previously seeded with 6h-broth cultures of *Bacillus cereus* isolates. The plates were incubated at 37°C for 18-24h. The Different zones of inhibition were measured to the nearest millimeter and interpreted as sensitive, moderate sensitive and resistant based on the interpretation table recommended by the disc manufacturer (Oxoid, 1998).

3. Result and Discussion:

3.1. Isolation and identification of bacteria:

In present study, a total (60) samples were collected randomly from dairy product (20 from raw milk, 20 from cheese and 20 from yoghurt). Positive culture of *Bacillus cereus* was 9, 12 and 3 for each dairy product respectively. Our results similar to (17) found that prevalence of *B. cereus* isolated from raw milk 9.8% in Beijing, China . While (15)

record 63.33% bovine milk samples were positive for *Bacillus cereus* from Baghdad. These findings of the present study were in agreement with (18) found that 61 (39.9%) of milk samples were positive for *B. cereus* isolate from raw milk. in current study, agreement with (19) report that *B. cereus* isolated from milk and cheese was 26 (10.04%) .

Table 1: Prevalence level of *Bacillus cereus* bacteria isolated from raw milk and dairy production samples.

Samples	No. of samples	Positive (+)samples	Isolation (%)
Raw Milk	20	9	(45%)
Cheese	20	12	(60%)
Yoghurt	20	3	(15%)

No samples=60

3.2. Antibiotic Susceptibility:

Our results, show that *Bacillus cereus* isolated from dairy product was sensitive to

Erythromycin (70%), Ciprofloxacin (100%) and Tetracycline (85%), Gentamicin (93%) and Chloramphenicol (85%), while it was resistant to Ampicillin (94%). The results are a study done by (20) showed that *Bacillus cereus* were resistant to ampicillin (98.4%) and were sensitive to chloramphenicol (67.2%), erythromycin (84.4%), and gentamicin (100%) isolated from different foods (milk and dairy products, spices, and rice salad) in Morocco. However, (21)

reported that bacteria were resistant to ampicillin (98%) and sensitive to other antimicrobials such as Chloramphenicol (99%), Ciprofloxacin (100%), Erythromycin (92%), Gentamicin (100%) and Tetracycline (97%) isolated from dairy farms. The method used essentially the same as that used by (22 and 23) Previous reports have shown that *B. cereus* were sensitive to Chloramphenicol, Ciprofloxacin, Erythromycin, and Gentamicin.

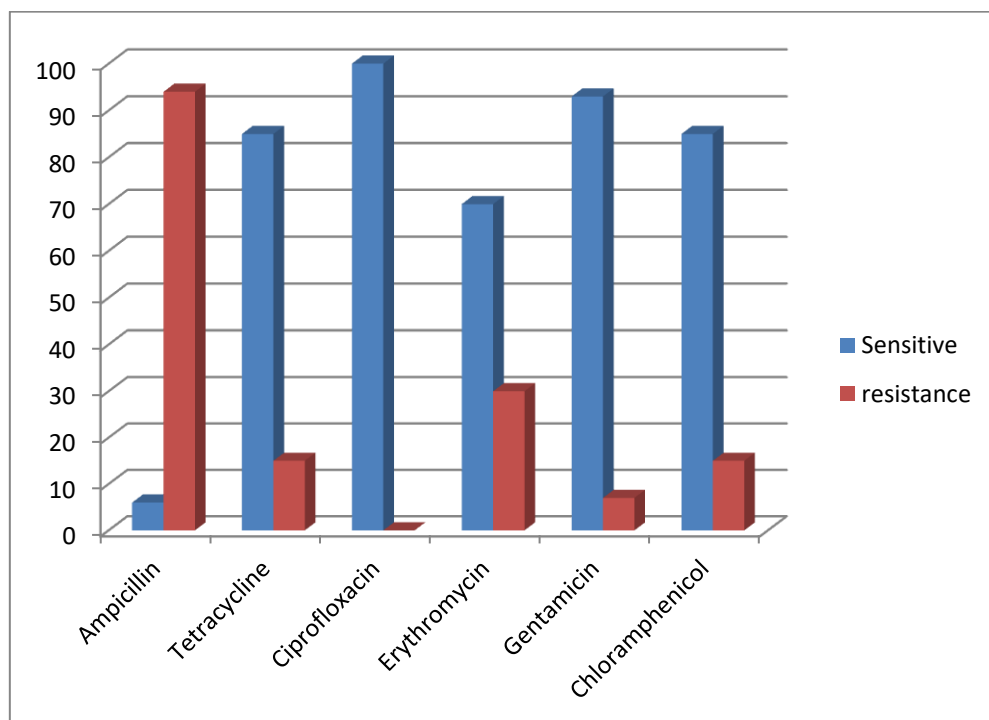


Figure (1) : Distribution of antibiotics resistance of *Bacillus cereus*.

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