Identification of Cefoxitin resistant *Acinetobacter lwoffii* Isolated from Decayed Apple Tissue

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Abstract

Acinetobacter lwoffii is a Gram-negative, aerobic, non-motile, non-fermenting coccobacillus widely distributed in soil, water, and plant surfaces. It can also colonize human skin and hospital environments. While infections are uncommon, *A. lwoffii* can cause severe disease in immunocompromised individuals and is often multidrug-resistant, making accurate identification essential for effective treatment and infection control. Its presence on contaminated fruits underscores potential foodborne exposure and public health risks. This study aimed to investigate microbial contamination on a spoiled apple and to isolate and characterize the bacterial strain responsible. A sterile swab from the decayed region of the apple was inoculated onto nutrient agar and MacConkey agar and incubated at 37°C for 24 hours. Colony morphology and Gram staining were observed. The isolate underwent biochemical characterization including oxidative-fermentative (OF) glucose, urease, nitrate reduction, bile esculin hydrolysis, and lactose fermentation tests. Antibiotic susceptibility testing was performed on Mueller-Hinton agar using cefoxitin to assess resistance. On MacConkey agar, the isolate produced small, smooth, pale colonies, indicative of non-lactose-fermenting behavior. Gram staining revealed pink-stained cocco-bacilli, consistent with Gram-negative, non-motile bacteria. Biochemical testing demonstrated negative results in OF glucose, urease, nitrate reduction, bile esculin hydrolysis, and lactose fermentation, indicating a non saccharolytic, strictly aerobic, non-fermentative profile. These morphological and biochemical characteristics collectively confirmed the isolate as *A. lwoffii*. Cefoxitin susceptibility testing revealed a zone of clearance of 18 mm, below the 22 mm threshold, indicating that the strain was cefoxitin-resistant. These results demonstrate the isolate's environmental origin, metabolic profile, and antibiotic resistance pattern, highlighting its potential clinical and public health relevance. The isolation of cefoxitin-resistant A. lwoffii from a spoiled apple indicates that environmental contamination during harvesting, handling, or storage can introduce opportunistic, multidrug-resistant pathogens

into the food supply. This finding is clinically significant, as consumption of contaminated produce may pose a health risk, particularly to immunocompromised individuals, and contributes to the dissemination of resistant bacteria. These results emphasize the importance of thorough fruit washing, hygienic handling, and proper storage conditions to reduce microbial contamination and safeguard public health.

Keywords: *Acinetobacter lwoffii*; Food safety; Antibiotic resistance; Biochemical characterization; Opportunistic pathogen; Public health.