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Evaluation of different virulence factors across *Acinetobacter* species

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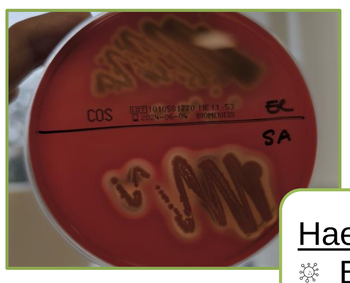
INTRODUCTION & AIM

Several *Acinetobacter* species are prevalent in different food-related environments, including fresh produce, dairy products and meat (1). These species have been identified as potential causative agents of a wide range of foodborne diseases, affecting both consumer health and food safety (2,3). Although traditionally regarded as low-grade pathogens, recent studies suggest that the pathogenesis of *Acinetobacter* infections in food is complex and multifactorial. This complexity likely involves a myriad of virulence determinants that interact synergistically to facilitate contamination and infection. Understanding these virulence factors is crucial, but much remains to be explored (4). Current research aims to elucidate these mechanisms to better understand how *Acinetobacter* species transition from environmental contaminants to important foodborne pathogens.

METHOD

Twenty-one *Acinetobacter* spp. isolated from meat were evaluated

Five virulence factors were assessed:

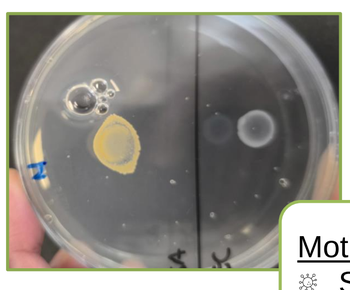


Haemolysis
- Blood agar

Lipase
- TSA + Tween 80

Phospholipase
- TSA + NaCl + egg yolk

Protease
- Skim milk powder agar



Motility
- Soft agar (TSA)

RESULTS & DISCUSSION

Table 1. Presence of virulence traits and their expression

Microorganisms	Haemolysis	Lipase	Phospholipase	Motility	Protease
A. baumannii 114.3	γ	-	-	-	-
A. baumannii 116.2	γ	-	-	-	-
A. baumannii 133.1	γ	-	-	-	-
A. baumannii 133.2	γ	-	-	-	-
A. baumannii 135.2	γ	-	-	-	-
A. baumannii 136.2	γ	-	-	-	-
A. baumannii 150.1	γ	-	-	-	-
A. calcoaceticus 109.11	γ	-	-	-	-
A. calcoaceticus 120.4	γ	-	-	-	-
A. johnsonii 112.1	γ	-	+	-	-
A. johnsonii 114.1	γ	+	+	-	-
A. johnsonii 116.1	γ	-	+	-	-
A. johnsonii 118.9	γ	-	+	-	-
A. johnsonii 121.1	γ	+	+	-	-
A. johnsonii 145.3	γ	-	+	-	-
A. johnsonii 146.1	γ	+	+	-	-
A. johnsonii 147.11	γ	+	+	-	-
A. portensis 72	γ	-	-	-	-
A. portensis 73	γ	+	+	-	-
A. guerrae 74	γ	+	+	-	-
A. guerrae 75	γ	+	+	-	-
S. aureus	β	+	+	+	-
*E. coli/Bacillus cereus**	α	-	-	-	+*

- While *Acinetobacter* species are generally not considered to pose a significant risk to consumers, certain strains have shown remarkable virulence factors.
- In particular, isolates of *A. johnsonii* have been shown to possess virulence determinants such as lipase and phospholipase, which play a critical role in bacterial pathogenicity and survival in food environments.
- In addition, emerging species such as *A. portensis* and *A. guerrae* have shown similar virulence factors, although these species are still under investigation.
- These findings highlight the importance of continued monitoring and research on *Acinetobacter* species in the context of food safety.
- Understanding the presence and function of these virulence factors is essential for developing effective strategies to mitigate the potential risks associated with these bacteria in the food supply chain.

CONCLUSION

The presence of *Acinetobacter* species in various foods is a major public health concern because of their potential to cause foodborne illness. Despite their classification as low-grade pathogens, the synergistic action of multiple virulence determinants, such as biofilm formation, antibiotic resistance and toxin production, underscores their pathogenic potential. Understanding these virulence factors is essential for developing effective strategies to detect, control and prevent *Acinetobacter* contamination in the food supply chain. Further research is essential to fully elucidate the mechanisms of virulence and to establish comprehensive measures to ensure food safety and protect consumer health. By addressing these challenges, we can reduce the risks associated with *Acinetobacter* in food and improve the overall safety of our food systems.

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