Antimicrobial Activities of Pseudomonas spp. and *Pedobacter* sp. from King George Island

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Bacteria compete for the limited nutrients in the Antarctic soils, and some of the bacteria produced antimicrobial compounds to gain competitive edge to grow (Russell, 2006; Lo Giudice *et al.*, 2007). Nevertheless, there are relatively few data on the bacteria with antimicrobial activities from the Antarctic. Hence, this project was carried out to determine the population of soil bacteria with anti-microbial activities from the King George Island of the maritime Antarctic. A *Pedobacter* sp. (strain BG5) and five *Pseudomonas* spp. (strains MTC3, WEK1, WEA1, MA2 and CG21) had the ability to inhibit the growth of one or more food-borne pathogens such as, *Escherichia coli*, *Salmonella* spp., *Klebsiella pneumonia*, *Enterobacter cloacae*, *Vibrio* spp. and *Bacillus cereus* (Table 1). It is rather interesting to observe that *Pseudomonas* spp. dominated the types of bacteria that produced antimicrobial compounds.

Table 1: Identification of antimicrobial producers against the food-borne pathogens

Bacterial Isolates	√ = inhibition of food-borne pathogen mm); - = no inhibition													
	E. coli			*Salmonella* spp.				*K. pneumonia*	*E. cloacae*	*V. parahaemolyticus*				*B. cereus*
	Strains			Strains				Strain	Strains	Strains				Strains
	1	2	3	1	2	3	4	1	1	1	2	3	4	1
BG5	√	√	√	√	√	-	-	√	√	-	-	-	-	√
MTC3	√	√	√	√	-	-	-	√	√	-	-	-	-	-
WEK1	-	-	-	-	-	-	-	-	-	√	√	√	√	√
WEA1	-	-	-	-	-	-	-	-	-	√	√	√	√	√
MA2	-	-	-	-	-	-	-	-	-	√	-	√	√	√
CG21	√	√	√	-	-	-	-	-	√	-	-	-	-	-

On another test, the six isolates were exposed to 15 types of conventional antibiotics. They were resistant to multiple antibiotics. All the six isolates were resistant to ampicillin and vancomycin but were susceptible to imipenem, ciprofloxacin and tetracycline. Isolates WEK1, WEA1, MA2 and CG21 were resistant to 7 out of the 15 antibiotics tested while the isolates BG5 and MTC3 were resistant to 9 out of the 15 antibiotics tested. The results of this work suggest that the six isolates carry genes encoding for both antimicrobial compounds and antibiotic resistant. These two capabilities probably provide the Antarctic bacteria with the ability to compete and survive in the harsh environment while bacteria lacking those capabilities would probably be suppressed or eliminated.

References

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