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Application of multiple enzyme restriction fragment length polymorphism analysis and microchip electrophoresis for estimation of antibiotic-tolerant bacterial group

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Abstract:

A combined method of microchip electrophoresis and multiple enzyme restriction fragment length polymorphism analysis, by which bacterial phylogeny was estimated by comparing the measured multiple enzyme restriction fragment (MERF) to that of the theoretical MERF of various kinds of bacteria, was adapted to monitor an antibiotic-resistant bacterial group in field soils. One hundred and ninety bacteria showing polymyxin B tolerance were newly isolated from experimental field soils where a large amount of liquid livestock feces (600 t/ha/year, 120 t/ha/year) has been applied annually, and neighboring area where feces were not applied (0 t area). In the 0 t area, most bacteria grown on PP agar was *Bacillus* spp. (80%), which decreased to 21.7% in the 120 t field, and 15.6% in the 600 t field. As the percentages gram negative bacteria, Cytophagales, and Spirochaetales increased to 10.0% in the 120 t field, and 33.3% in the 600 t field, and 7 isolates from the 120 t field and 18 isolates from the 600 t field were ordinary bacteria inhabiting in animals and feces, they originated from livestock. As polymyxin B is bactericidal for gram-negative bacteria, some of the gram-negative bacteria isolated from both the feces-applied fields were supposed to be polymyxin B-resistant bacteria.

Keywords:

polymyxin B resistant bacteria, field soil, livestock feces, microchip electrophoresis, multiple enzyme restriction fragment length polymorphism analysis

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