

YERSINIA

ISOLATION OF *YERSINIA PESTIS* FROM FOOD USING IMMUNOMAGNETIC BEADS COATED WITH MONOCLONAL ANTIBODY 6B5

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Yersinia pestis is notoriously known for causing the plague. Most immunoassays available for detecting *Y. pestis* in humans or environmental samples are based on recognition of the organism's fraction-1 antigen (F-1). Studies have revealed that the production of F-1 is temperature-sensitive and is produced at 37°C, but not at temperatures less than 26°C. *Y. pestis*, when present in water, fruit juice, milk, food and the environment, may not produce sufficient F-1 for detection because of this temperature dependence of F-1 production. Hence, currently available immunological methods based on detection of *Y. pestis* F-1 would not likely detect *Y. pestis* directly without pre-culturing samples at 37°C. We have previously reported a non-F-1-specific monoclonal antibody (MAb 6B5) that was developed for detection of *Y. pestis*. The objective of this study was to test and compare the ability of magnetic beads coated with MAb 6B5 or polyclonal antibodies against *Y. pestis* to isolate *Y. pestis* from foods and water.

Water and food samples (milk, ground beef, ground chicken and ground pork) were spiked with *Y. pestis* at cell numbers of 0, 1, 10, and 100 CFU/ml or g. Magnetic beads, which were coated with either purified polyclonal (rabbit) antibody against *Y. pestis* or MAb 6B5, were used for the isolation of *Y. pestis* in the food samples by using a Pathatrix cell concentration apparatus. Two enrichment times (6 and 24 h) in brain heart infusion broth at 37°C were evaluated. All presumptive colonies of *Y. pestis* were confirmed by biochemical and PCR assays. Results revealed MAb 6B5-coated magnetic beads were similar in concentrating *Y. pestis* for detection as magnetic beads coated with polyclonal antibodies, especially when samples were enriched for 6 h. However, the selectivity for *Y. pestis* of the magnetic beads coated with MAb 6B5 was greater than those coated with polyclonal antibodies. There were about 10 times less bacterial colonies on *Yersinia* selective agar plates from MAb 6B5-coated magnetic beads than from polyclonal antibody-coated beads. Furthermore, ca. 30% of the colonies from MAb 6B5-coated beads were *Y. pestis*, whereas only ca. 5% of colonies from polyclonal antibody-coated beads were *Y. pestis*. The magnetic beads coated with MAb 6B5 more selectively isolated *Y. pestis* from foods and water than polyclonal antibody-coated beads.