

Title Assessments of Plant and Microbial Interactions of *Escherichia coli* 0157:H7 and *Salmonella* on Romaine Lettuce and Development of Molecular Tools for Detection and Source Matching of Pathogenic and Commensal *Escherichia coli* Applied to Regional Investigations Relevant to Sources of Lettuce Outbreaks.

Author Wendy Anne Maduff

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Abstract

Growth kinetics and adherence dynamics of *Escherichia coli* 0157:H7 isolates and *Salmonella* serotypes were compared on Romaine lettuce leaves which were inoculated with S. Michigan, S. Agona, S. Montevideo, or one of three *E. coli* 0157:H7 isolates and were recovered over 72 hours. The results show a significant increase ($p < 0.05$) in recovered colony forming units (CFU)/leaf over 72 hours from the primary and secondary washes for all bacteria inoculated on greenhouse- and field-grown Romaine lettuce.

The influence of biosurfactant-producing *Pseudomonas fluorescens* on growth kinetics and adherence dynamics of *E. coli* 0157:H7 on greenhouse- grown Romaine lettuce was investigated. The effect of biosurfactant secreted by *P. fluorescens* 123 (biosurfactant+) or the presence of *P. fluorescens* EG3 (biosurfactanC) on the adherence of *E. coli* 0157:H7 on non-wounded greenhouse-grown Romaine lettuce over 72 hours was examined. Data showed, despite increased removal of CFU/leaf, an infectious dose remained. Recoveries of *E. coli* 0157:H7 with *P. fluorescens* EG3 and *E. coli* 0157:H7 with *P. fluorescens* 123 were compared, 88.8% ($R^2=0.888$) of the variance can be explained by the presence of biosurfactant and the effect of time ($p < 0.05$). Approximately 60% and 86% of the variance in the recovery between *E. coli* 0157:H7 alone, with *P. fluorescens* EG3, or with *P. fluorescens* 123, respectively, can be explained by treatment and time ($R^2=0.597$, $R^2=0.861$) ($p < 0.05$).