

Backyard Farms Represent a Source of Wide Host Range Salmonella Phages That Lysed the Most Common Salmonella Serovars

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Resumen

The genus *Salmonella* has more than 2,600 serovars, and this trait is important when considering interventions for *Salmonella* control. Bacteriophages that are used for biocontrol must have an exclusively lytic cycle and the ability to lyse several *Salmonella* serovars under a wide range of environmental conditions. *Salmonella* phages were isolated and characterized from 34 backyard production systems (BPSs) with a history of *Salmonella* infections. BPSs were visited once, and cloacal or fecal samples were processed for phage isolation. Four hosts, *Salmonella* serovars Enteritidis, Heidelberg, Infantis, and Typhimurium, were used for phage isolation. The host range of the phages was later characterized with a panel of 23 *Salmonella* serovars (serovar diversity set) and 31 isolates obtained from the same farms (native set). Genetic relatedness for 10 phages with a wide host range was characterized by restriction fragment length polymorphism, and phages clustered based on the host range. We purified 63 phages, and 36 phage isolates were obtained on *Salmonella* Enteritidis, 16 on *Salmonella* Heidelberg, and 11 on *Salmonella* Infantis. Phages were classified in three clusters: (i) phages with a wide host range (cluster I), (ii) phages that lysed the most susceptible *Salmonella* serovars (serogroup D) and other isolates (cluster II), and (iii) phages that lysed only isolates of serogroup D (cluster III). The most susceptible *Salmonella* serovars were Enteritidis, Javiana, and Dublin. Seven of 34 farms yielded phages with a wide host range, and these phages had low levels of genetic relatedness. Our study showed an adaptation of the phages in the sampled BPSs to serogroup D *Salmonella* isolates and indicated that isolation of *Salmonella* phages with wide host range differs by farm. A better understanding of the factors driving the *Salmonella* phage host range could be useful when

designing risk-based sampling strategies to obtain phages with a wide lytic host range for biocontrol purposes.

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