

Hybridization and functional complementation of the hrp gene cluster from *Erwinia amylovora* strain Ea321 and DNA of other bacteria

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The hrp gene cluster of *Erwinia amylovora* strain Ea321 was used as a probe for testing the presence of sequence variation in *E. amylovora* strains of diverse host and geographic origins. All *E. amylovora* strains tested yielded hybridization patterns identical to that of Ea321, except for those strains isolated from *Rubus* species, which yielded similar but distinct hybridization patterns. With lowered stringency hybridization conditions, portions of the hrp cluster of Ea321 contained in the cosmid pCPP430 also hybridized with genomic DNA from numerous other erwiniae and from *Pseudomonas syringae* pv. *syringae*. Restriction fragments of pHIR11, a cosmid containing a cloned *P. syringae* hrp gene cluster, and pES1044, a cosmid containing portions of the wts gene cluster of *E. stewartii*, hybridized colinearly with restriction fragments representing approximately 12 and 18 kb of pCPP430, respectively. Several Hrp⁻ mutant strains of *E. amylovora* with transposon insertions within the region of hybridization were restored to the Hrp phenotype by the hybridizing DNA of the other two species.