Mobilization of "non-mobilizable" plasmids by the aggregation-mediated conjugation system of Bacillus thuringiensis

The aggregation-mediated conjugation system of Bacillus thuringiensis subsp. israelensis (Bti), encoded by the 200-kb plasmid pXO16, is highly potent in transferring itself and efficient in mobilizing other nonconjugative plasmids. In the present study we have analyzed the native Bacillus cereus plasmid pBC16. This plasmid has previously been shown to harbor a mob gene (ORF beta) and a locus functioning as an oriT site in plasmid pLS20-mediated conjugation in Bacillus subtilis. However, in the conjugation system of Bti we found that a derivative of pBC16 deleted for both these loci was mobilizable, although at a reduced frequency. Another derivative of pBC16, containing a deletion spanning the BsrI half of the coding region of the mob gene, was found to be nearly as mobilizable as the intact pBC16, suggesting its dispensability in the transfer process. Other plasmids based on the theta-replicating origins, pAM beta 1, pLS20, ori43, ori44, and ori60, were also consistently mobilized in the conjugation system encoded by Bti plasmid pXO16. Analyzing the conjugation process by the use of scanning electron microscopy revealed the presence of connections between cells in the mating mixtures. These connections did not appear in monocultures of the donor strain or the recipient strain and may be conjugal junctions. (C) 1996 Academic Press, Inc.