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Expression of a Fusion Protein between Cry1Ac and Enhanced Green Fluorescent Protein in an Acrystalliferous *Bacillus thuringiensis*

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The expression of a fusion gene comprised of the *B. thuringiensis* crystal protein, Cry1Ac1, and enhanced green fluorescent protein (e*gfp*) genes in *B. thuringiensis* Cry$^-$B strain was examined. The *cry1Ac1* gene was cloned in the *B. thuringiensis-E. coli* shuttle vector, pHT3101, under the control of the native *cry1Ac1* gene promoter while the e*gfp* gene was inserted between ribosomal binding site and start codon of the *cry1Ac* gene (pProMu-EGFP). The *B. thuringiensis* Cry$^-$B strain carrying pProMu-EGFP (ProMu-EGFP/CB) produced mRNA transcripts encoding the *cry1Ac1*-e*gfp* fusion gene and produced an small inclusion body, ≤ 200 nm in size. Although its expression level was relatively lower than that of ProAc/CB, this recombinant strain expressed the fusion protein, confirmed by immunoblot analysis using GFP and Cry1Ac1 antibodies. Furthermore, the spore-crystal mixtures of ProMu-EGFP/CB exhibited insecticidal activity against *Plutella xylostella* larvae. However, fluorescence of its parasporal inclusion body was not detected because faint light of EGFP in the gram-positive cell was not discriminated between parasporal inclusion and cell body. The current results suggest that the front region-fusion expression of foreign protein in the *B. thuringiensis* crystal protein can be functionally expressed and produced fusion parasporal inclusion in *B. thuringiensis*.