A Letter

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Bt S3076-1, A Novel Strain with Larvacidal Toxicity Against *Lepidopteran* Insects

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Bt Research, 2017, Vol.8, No.1 doi: [10.5376/bt.2017.08.0001](https://doi.org/10.5376/bt.2017.08.0001)

Received: 25 Jan., 2017

Accepted: 26 Mar., 2017

Published: 24 May, 2017

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Preferred citation for this article:

Wu Z.Q., 2017, Bt S3076-1, A novel strain with larvacidal toxicity against *Lepidopteran* insects, Bt Research, 8(1): 1-2 (doi: [10.5376/bt.2017.08.0001](https://doi.org/10.5376/bt.2017.08.0001))

Abstract Bt S3076-1 Strain, Isolate No: 20070720S3076, was isolated from the soil that sampled from the Diaoluoshan National Nature Reserve in Hainan island of China by Hainan Institute of Tropical Agricultural Resources (HITAR) in 2007. Scanning electron microscope showed that the strain can generate high-yielding spherical crystal and square crystal during the later sporulation. SDS-PAGE analysis showed that the protein profile mainly contains six protein bands with the molecular weight about 140kDa, 90 kDa, 70 kDa, 50 kDa, 45 kDa and 25 kDa. The genome-wide predictive analysis indicated that this strain might contain 12 toxic protein genes, including *cry35Ac-like*, *cry35Ab-like*, *cry39Ab-like*, *cry39Ab-like*, *cry19-like*, *cry56Aa-like*, *cry1Aa3-like*, *cry1Ba-like*, *cry41Aa1-like*, *cry31Aa6-like*, *vip1Ac-like* and *cry54-like*. The bioassays carried out on *Lepidopteran* cotton bollworm (*Helicoverpa armigera* Hubner) exhibited that the strain Bt S3076-1 has significantly toxic to third instar larva of cotton bollworm.

Keywords *Bacillus thuringiensis*; Bt isolate 20070720S3076; Bt S3076-1; Cotton bollworm (*Helicoverpa armigera* Hubner)

1 General Description

Bt Strain: S3076-1

Isolate: 20070720S1028

Isolate source: Soil

Collected By: Wenfei Zhang, Liu Xie, Fang Xuanjun

Collection Date: July-20-2007

Collection Site: Diaoluoshan National Nature Reserve in Hainan, China

Subspecies: Unknown

Serovariety: Unknown

Identified By: Zhongqi Wu, Xuanjun Fang

Deposited At: the HITAR Bacillus Collections with Accession No 20070720S3076; China General Microbiology Culture Collection Center (CGMCC), Accession No: CGMCC No.13277

Owned by: HITAR Institute of Tropical Agricultural Resources Ltd.

2 Molecular Features

Crystal shape: Spherical crystal, Square crystal

Protein profile: 140 kDa, 90 kDa, 70 kDa, 50 kDa, 45 kDa, 25 kDa

Plasmid profile: Three plasmids of 130 kb size about

Genotype: *cry35Ac-like*, *cry35Ab-like*, *cry39Ab-like*, *cry39Ab-like*, *cry19-like*, *cry56Aa-like*, *cry1Aa3-like*, *cry1Ba-like*, *cry41Aa1-like*, *cry31Aa6-like*, *vip1Ac-like*, *cry54-like*

Cloned gene: *cry35Ac-like*, *cry35Ab-like*, *cry1Aa3-like*, *cry1Ba-like*, *cry41Aa1-like*, *vip1Ac-like*, *cry54-like*

Target insect: *Lepidopteran* insect: Cotton bollworm (*Helicoverpa armigera* Hubner)

3 Featured Photos

Figure 1: Morphological identification of spores and crystal protein of Bt S3076-1 strain by optical microscope

Figure 2: Morphological identification of spores and crystal protein of Bt S3076-1 strain by SEM

Figure 3: SDS-PAGE analysis of crystal protein from Bt S3076-1 strain

Figure 1 Morphological identification of spores and crystal protein of Bt S3076-1 strain by optical microscope

Note: Carbol-fuchsin staining (100×); C: crystal protein; S: spore

Figure 2 Morphological identification of spores and crystal protein of Bt S3076-1 strain by SEM

Note: Scanning electron microscopy (SEM) observation (10.0kV, 7.4 mm×5 k); C: crystal protein; S: spore

Figure 3 SDS-PAGE analysis of crystal protein from Bt S3076-1 strain

Note: 1~6: 140 kDa, 90 kDa, 70 kDa, 50 kDa, 45 kDa and 25 kDa

4 Related Publication

Wu et al., 2016, Draft genome sequence of *Bacillus thuringiensis* strain S3076-1, Bt Research, Vol.7, No.1 1-7 (doi:10.5376/bt.2016.07.0001)

5 Filed Patent or Related to This Strain

None.