

A novel *Bacillus toyonensis* Biovar Thuringiensis strain showing strong nematocidal activity

Bacillus thuringiensis (Bt) is a gram-positive bacterium that produces parasporal crystal proteins showing biocidal activity against different invertebrate species. In addition, other gram-positive bacteria such as *Lysinibacillus sphaericus*, *Paenibacillus* spp. and *Brevibacillus laterosporus* have been described for showing insecticidal activity. In 2022, a *Bacillus toyonensis* strain has been described for the first time as producing parasporal crystals with insecticidal activity and designated *Bacillus toyonensis* biovar Thuringiensis. In this study we report the isolation and characterization of another *Bacillus toyonensis* strain showing typical Bt colony morphology on nutrient agar plates and bipyramidal parasporal crystals under phase contrast microscopy. A major *ca.* 130 kDa protein band was revealed when the parasporal crystals were analyzed using SDS-PAGE gel electrophoresis. The strain was isolated from a soil sample obtained from Río Tercero city at the province of Córdoba, Argentina. The genome sequence was obtained and assembled into 93 contigs with a total genomic size of 6,072,356 bp and 34.9 % G+C. The genome analysis performed with the Type (Strain) Genome Server showed that this strain belongs to *B. toyonensis* species, and therefore was designated as *Bacillus toyonensis* biovar Thuringiensis strain Bto_100. Its genome sequence harbors five coding sequences showing homology with Cry7Bb1, Cry7Ga2, Cry73Aa1, Mpp2Aa4 and Xpp22Aa3 proteins. In order to determine the biocidal activity of this novel strain, bioassays were conducted with *Cydia pomonella* (Lepidoptera: Tortricidae), *Anthonomus grandis* (Coleoptera: Curculionidae), *Spodoptera frugiperda* (Lepidoptera: Noctuidae), *Panagrellus redivivus* (Nematoda: Panagrolaimidae) and *Caenorhabditis elegans* (Nematoda: Rhabditidae). Bioassays showed that this strain was very toxic for *P. redivivus* and *C. elegans* (100% mortality) but low toxic for *C. pomonella* (10% mortality) and *A. grandis* (14% mortality) showing no toxicity for *S. frugiperda*. Further studies need to be developed to determine the real biocidal potential of this novel strain.