

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-48362-8

[? Decisions on the LMO ? Risk Assessments](#)

LAST UPDATED: 29 APR 2020

Living Modified Organism identity


The image below identifies the LMO through its unique identifier, trade name and a link to this page of the BCH. Click on it to download a larger image on your computer. For help on how to use it go to the LMO quick-links page.



BPS-PH048-1
Fortuna potato

CBD

<https://bch.cbd.int/database/record?documentID=48362>



Read barcode or type above URL into internet browser to access information on this LMO in the Biosafety Clearing-House © SCBD 2012

Name

Fortuna potato

EN

Transformation event

PH05-026-0048

Unique identifier

BPS-PH048-1

Developer(s)

- [PERSON](#): BASF PLANT SCIENCE GMBH | [BCH-CON-DE-48128-3](#)

PERSON

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Description

The potato was modified for resistance to *Phytophthora infestans* through the expression of the resistance (R) genes *Rpi-blb1* and *Rpi-blb2* from a wild relative *Solanum bulbocastaneum*.

EN

The R genes encode nucleotide-binding site-leucine rich repeat type proteins and play a role in host defence against the pathogenic fungus.

Additionally, a selectable marker, *Arabidopsis thaliana* acetohydroxyacid synthase, was included for imidazolinone selection during transformation. The enzyme carries a point mutation, S653N, which confers herbicide tolerance.

Recipient Organism or Parental Organisms

The term “Recipient organism” refers to an organism (either already modified or non-modified) that was subjected to genetic modification, whereas “Parental organisms” refers to those that were involved in cross breeding or cell fusion.

BCH-ORGA-SCBD-12106-6 ORGANISM | SOLANUM TUBEROSUM (POTATO, SOLTU) |
Crops

Characteristics of the modification process

Vector

Vector VCPMA16 derived from pPZP200 EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

P-Rpi-blb2 1.530 kb	CS-Rpi-blb2 3.890 kb	T-Rpi-blb2 2.530 kb
P-Rpi-blb1 1.173 kb	CS-Rpi-blb1 3.592 kb	T-Rpi-blb1 0.406 kb
P-nos-RHIRD 0.288 kb	CS-ahas-ARATH 2.013 kb	T-nos-RHIRD 0.253 kb

Introduced or modified genetic element(s)

Some of these genetic elements may be present as fragments or truncated forms. Please see notes below, where applicable.

BCH-GENE-SCBD-41318-3 PHYTOPHTHORA INFESTANS RESISTANCE GENE 2 | (ORNAMENTAL NIGHTSHADE, POTATOES) |
Protein coding sequence | Resistance to diseases and pests (Phytophthora infestans resistance)

BCH-GENE-SCBD-41317-5 PHYTOPHTHORA INFESTANS RESISTANCE GENE 1 | (ORNAMENTAL NIGHTSHADE, POTATOES) |
Protein coding sequence | Resistance to diseases and pests (Fungi)

BCH-GENE-SCBD-100270-6 NOPALINE SYNTHASE GENE PROMOTER |
Promoter

BCH-GENE-SCBD-48073-8 ACETOHYDROXY ACID SYNTHASE GENE | (THALE CRESS) |
Protein coding sequence | Resistance to herbicides (Imidazolinone, Sulfonylurea)

BCH-GENE-SCBD-100269-8 NOPALINE SYNTHASE GENE TERMINATOR |

Terminator

BCH-GENE-SCBD-103775-1 PHYTOPHTHORA INFESTANS RESISTANCE GENE 2 PROMOTER |
(ORNAMENTAL NIGHTSHADE, POTATOES) |

Promoter

BCH-GENE-SCBD-103776-1 PHYTOPHTHORA INFESTANS RESISTANCE GENE 2 TERMINATOR |
(ORNAMENTAL NIGHTSHADE, POTATOES) |

Terminator

BCH-GENE-SCBD-103777-1 PHYTOPHTHORA INFESTANS RESISTANCE GENE 1 PROMOTER |
(ORNAMENTAL NIGHTSHADE, POTATOES) |

Promoter

BCH-GENE-SCBD-103778-1 PHYTOPHTHORA INFESTANS RESISTANCE GENE 1 TERMINATOR |
(ORNAMENTAL NIGHTSHADE, POTATOES) |

Terminator

BCH-GENE-SCBD-101415-9 TI PLASMID LEFT BORDER REPEAT |

Plasmid vector

BCH-GENE-SCBD-101416-6 TI PLASMID RIGHT BORDER REPEAT |

Plasmid vector

Notes regarding the genetic elements present in this LMO

Expression cassettes:

The insertion contains three gene expression cassettes: *Solanum bulbocastaneum* *Phytophthora infestans* resistance gene 1 (*Rpi-blb1*), *Solanum bulbocastaneum* *Phytophthora infestans* resistance gene 2 (*Rpi-blb2*) and *Arabidopsis thaliana* acetohydroxyacid synthase (*ahas*).

Transcription of *Rpi-blb1* and *Rpi-blb2* are under control of the native promoters and terminators. Transcription of *ahas* is under control of the *Agrobacterium tumefaciens* nopaline synthase promoter and terminator. The R gene cassettes were originally excised from the donor genome as genomic fragments and inserted into the vector.

The coding sequence of *ahas* contains a point mutation S653N (serine to asparagine at amino acid position 653), which confers herbicide tolerance.

EN

LMO characteristics

Modified traits

Resistance to diseases and pests

Fungi

Phytophthora infestans resistance

Resistance to herbicides

Imidazolinone

Sulfonylurea

Resistance to antibiotics

Streptomycin

Common use(s) of the LMO

Food

Detection method(s)

Additional Information

Low level of expression of both *Rpi-blb1* and *Rpi-blb2* was detected by real-time PCR analysis in leaves, stems, tubers and roots. In flowers, low expression of *Rpi-blb2* was detected. However, the expression of *Rpi-blb1* was not detected in floral tissues.

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Due to the *nos* promoter, low expression levels in all parts of the plant are expected for *ahas*. Expression of *ahas* was essential for the selection of transformants during tissue culturing.

Additional Information

Additional Information

Vector information

Derivate of pPZP200. Reference: Hajdukiewicz et al (1994) Plant Mol. Biol., 25, 989-994.

Other relevant website addresses and/or attached documents

? [07-r42-01-app-a1.pdf](#) (English)

? [European Patent Application - EP2535416A1.pdf](#) (English)

BCH-LMO-SCBD-48362-8

Further Information

Questions about the Cartagena Protocol on Biosafety or the operation of the Biosafety Clearing-House may be directed to the Secretariat of the Convention on Biological Diversity.

Secretariat of the Convention on Biological Diversity

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