

Bacillus Velezensis

1x 10¹⁰ cfu/g bacillus velezensis powder

Introduction

Bacillus velezensis is an antagonistic strain agent and plant growth-promoting bacteria, may represent a practical and powerful biocontrol agent that can be used as an effective alternative to synthetic agro-chemicals.

Bacillus Velezensis produces several antimicrobial compounds as secondary metabolites against major plant fungal pathogens, namely *Fusarium oxysporum*, *Fusarium graminearum*, *Botrytis cinerea*, *Alternaria alternata*, *Fulvia fulva*, and *Ustilaginoidea virens*. In addition, the volatile organic compounds (VOCs) produced by *Bacillus velezensis* adversely affected the growth of these fungi. Furthermore, *Bacillus velezensis* produced chitinase, cellulase, β -glucanase, and amylase enzymes and it promoted plant growth as well, by producing indole-3-acetic acid (IAA) and siderophore.



Specification

Bacteria count : 1x 10¹⁰ cfu/g , 100% water solubility

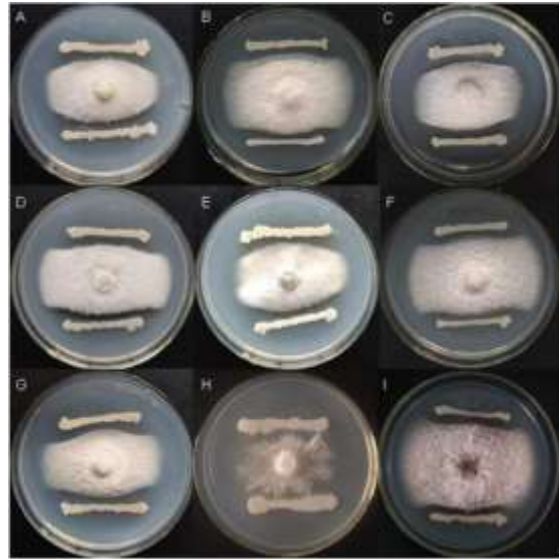
Fineness: 80-200 mesh screen

Moisture: 8%

Target disease

Bacillus Velezensis Strain inhibits some pathogenic fungi of soil-borne plant diseases:

- (A) *Botrytis cinerea*,
- (B) *Fusarium Solani*
- (C) *F. proliferatum*
- (D) *F. vasinfectum*
- (E) *F. solani* (Mart.) Sacc.
- (F) *F. oxysporum*
- (G) *F. sp.*,
- (H) *Sclerotium rolfsii* Sacc.
- (I) *F. verticillioides*.



Principle

- ✓ Secreted the fungal cell wall degrading enzymes and volatile organic compounds (VOCs) to reduce the pathogen disease both under in vitro and in vivo conditions.
- ✓ Produced chitinase, cellulase, β -glucanase, amylase enzymes, indole-3-acetic acid (IAA) and e to promoted plant growth.
- ✓ Biological control mechanisms include competition for nutrient and space, antibiosis or induced systemic resistance (ISR), which alone or together can reduce incidence and/or severity of plant diseases
- ✓ The formation of biofilms in plant rhizospheres can promote plant growth and protect plants from infectious microbes, both through the secretion of antimicrobial compounds and through systemic resistance.
- ✓ Produces high concentrations of the siderophore bacillibactin, inhibits the growth of phytopathogenic bacterial and fungal competitors by depriving them of essential iron ions

Benefit

- ✓ Promote plant growth and health directly or indirectly
- ✓ Significant antibacterial and antifungal performance
- ✓ An effective alternative to synthetic agro-chemicals.
- ✓ Enhance plant defense responses in the root rhizosphere

- ✓ Suppress virulent microbes by VOCS produced in Plant- and soil-associated microorganisms
- ✓ Siderophore production by facilitating the acquisition of ferric ions (Fe^{3+}) from minerals and organic compounds in the rhizosphere

Dosage & Method

- Can be applied via drench, drip-irrigation, or by spray while sowing to the cultivation medium
- Apply 1.5 gram per square meter, as early as possible to the crop for optimal effect.
- Reapply after 10~12 weeks for season-long control

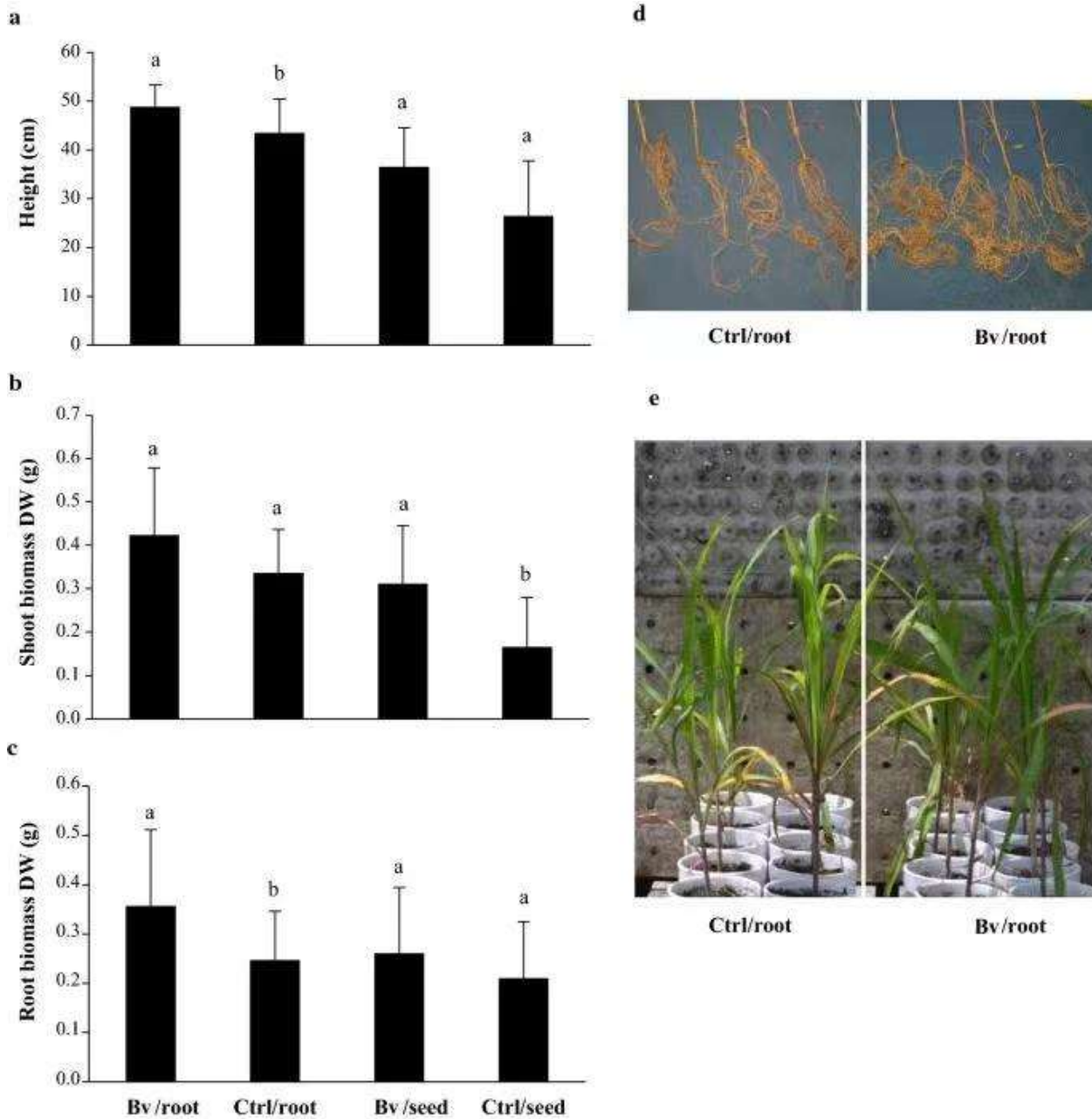
Packing and shelf life

12 months shelf life, 1 kg per bag or 25 kg per bag or paper drum

Storage

Store in cool, dry location, keep out of direct sunshine and moisture. Once opened, should be use it within 30 days to prevent activation. Keep out of reach of children.

Growth-promoting effect of *B. velezensis* on maize seedlings



Growth-promoting effect of *B. velezensis* on maize seedlings. a Height (cm) of the seedlings, b Shoot biomass (g) dry weight (DW) of the seedlings, c Root biomass (g) dry weight (DW) of the seedlings. Bv 83/root: Fungifree AB™ treatment to the root, Ctrl/root: without treatment to the root, Bv /seed: Fungifree AB™ treatment to the seed, Ctrl/seed: without treatment to the seed. d Aspect of the root of seedlings of Ctrl/root and Bv /root treatment. e Aspect of the shoot of seedlings of Ctrl/root and Bv /root treatment. N = 15. Different letters indicate statistically significant differences among treatments at $P \leq 0.05$

Biocontrol efficacy against tomato bacterial wilt



(a)



(b)



(c)



(d)

Biocontrol effect of the whole cultures of *Bacillus velezensis* (a), the culture supernatant (b), 1 mg/mL crude lipopeptides (c), and control (d) against bacterial wilt disease. Note: a. antibacterial b. antifungal