Supplementary Table S1. Fluorescence intensity in cells of *L. capsici* strains.

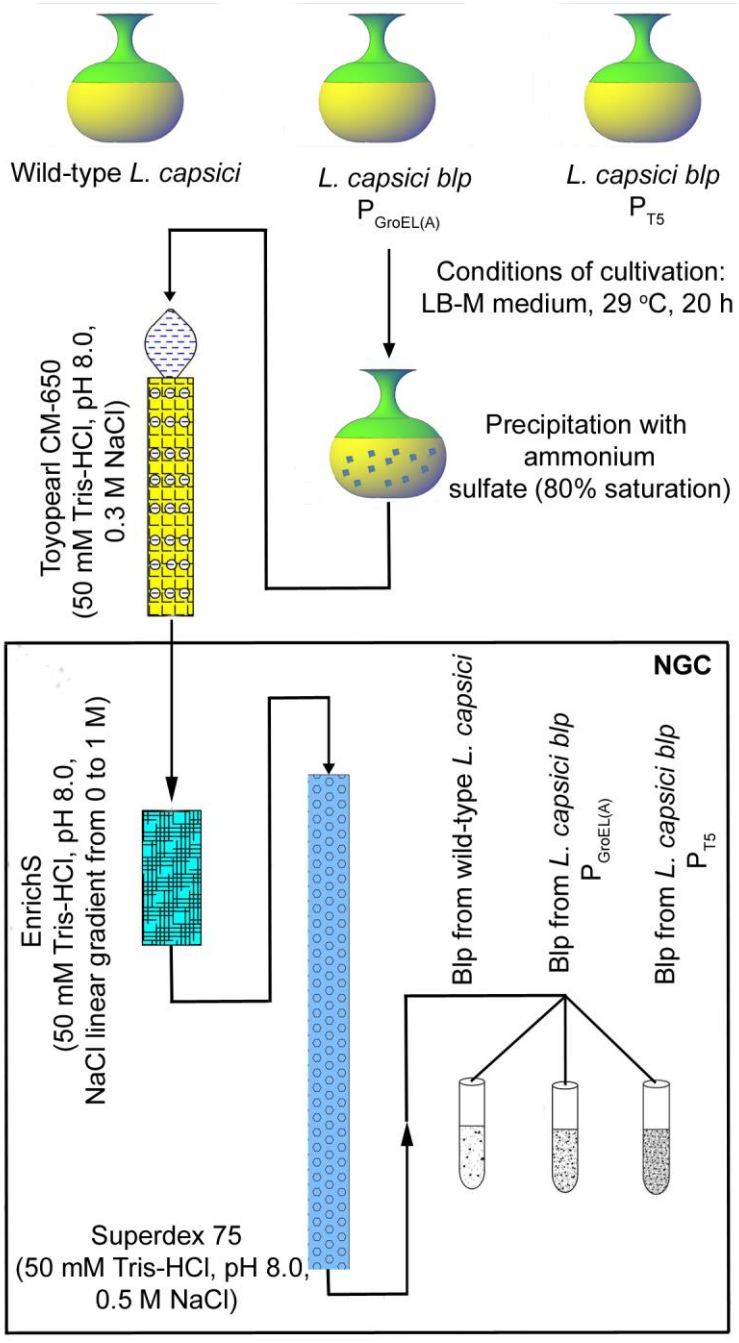
***L. capsici* strains**	**Fluorescence intensity, arbitrary units x 10^7**
Wild-type *L. capsici* VKM B-2533^T	0.083±0.011
L. capsici P_{GroEL}-*gfp*	1.557±0.101
L. capsici $P_{GroEL(A)}$-*gfp*	3.625±0.377
L. capsici P_{T5}-*gfp*	46.750±3.366

Results are shown as means ± standard deviations. The mean values were obtained in three independent experiments: two independent experiments with two technical replicates and one independent experiment with six technical replicates.

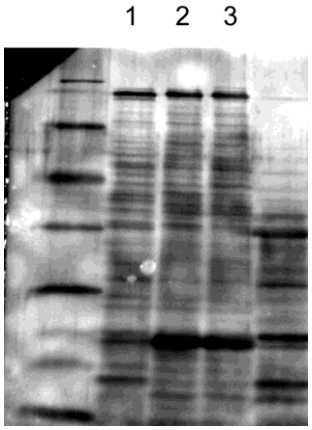
Supplementary Table S2. Relative level of expression of the *blp* gene in cells of *L. capsici* strains.

***L. capsici* strains**	**Relative level of expression of the *blp* gene**
L. capsici VKM B-2533^T	1.02±0.21
L. capsici $P_{GroEL(A)}$-*blp*	250.59±82.42
L. capsici P_{T5}-*blp*	679.94±271.38

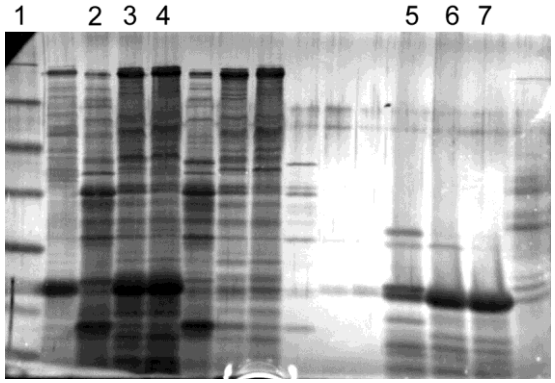
Results are shown as means ± standard deviations.
The mean values were obtained in four independent experiments, each with two technical replicates.



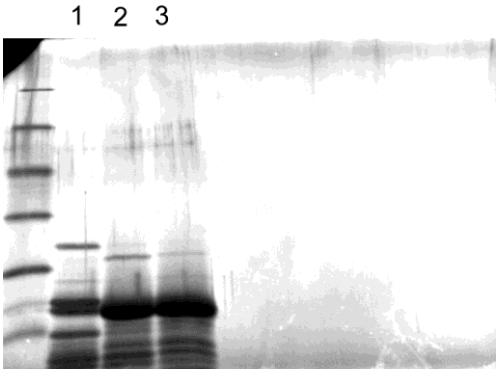
Supplementary Figure S1. Scheme of Blp protein purification from the culture liquid of *L. capsici* strains.



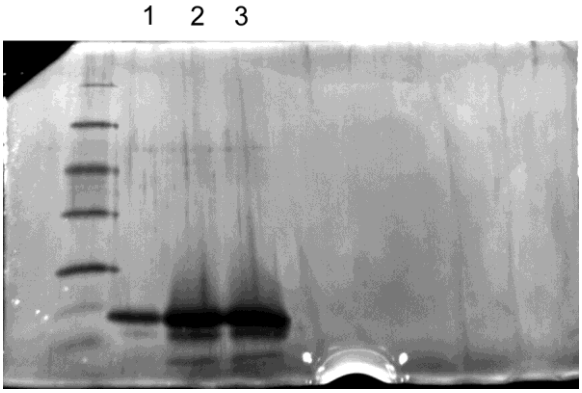
Supplementary Figure S2. Original gel image for Figure 3a: lanes 1, 2, 3 correspond to samples of culture liquid of *L. capsici* strains of Figure 3a.



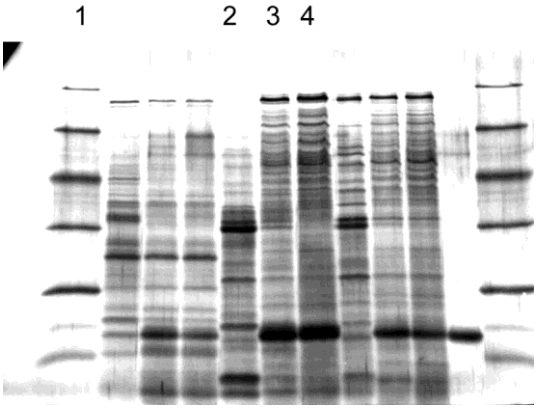
Supplementary Figure S3. Original gel images for Figure 3a: lane 1 corresponds to M of Figure 3a; lanes 2, 3, 4 correspond to samples after ammonium sulfate precipitation of Figure 3a; lanes 5, 6, 7 correspond to samples after Toyopearl CM-650 of Figure 3a.



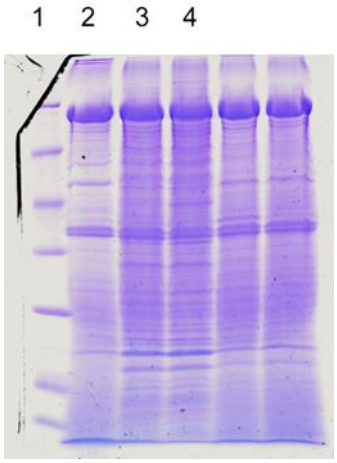
Supplementary Figure S4. Original gel images for Figure 3a: lanes 1, 2, 3 correspond to samples after EnrichS of Figure 3a.



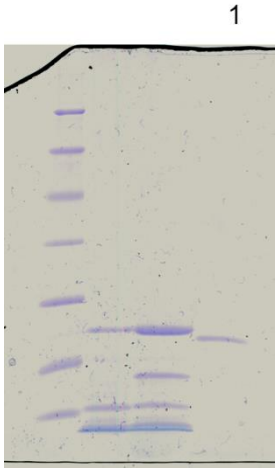
Supplementary Figure S5. Original gel images for Figure 3a: lanes 1, 2, 3 correspond to samples after Superdex75 of Figure 3a.



Supplementary Figure S6. Original gel images for Figure 4a: lane 1 corresponds to M of Figure 4a; lanes 2, 3, 4 correspond to samples of culture liquid of *L. capsici* strains of Figure 4a.



Supplementary Figure S7. Original gel images for Figure 4b: lane 1 corresponds to M of Figure 4b; lines 2, 3, 4 correspond to samples of *L. capsici* strains cells of Figure 4b.

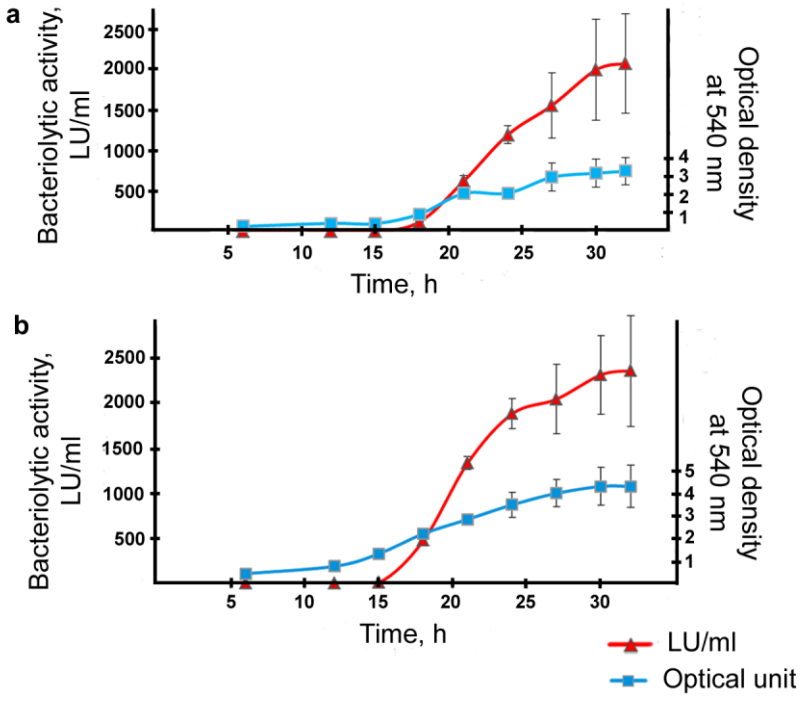


Supplementary Figure S8. Original gel images for Figure 4b: lane 1 corresponds to sample of purified Blp of *L. capsici* VKM B-2533^{T} strain of Figure 4b.

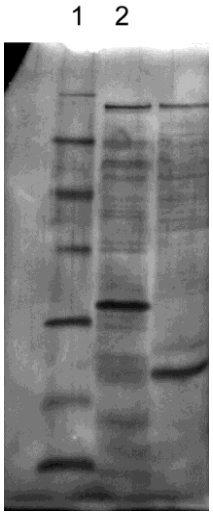
Supplementary Table S3. Relative level of expression of the *alpA* gene.

L. capsici strains	Relative level of expression of the *alpA* gene
L. capsici VKM B-2533^{T}	1.04±0.30
L. capsici P$_{T5}$-*blp*	0.17±0.09***

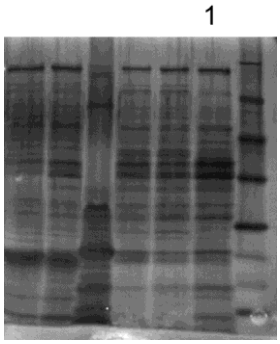
Results are shown as means ± standard deviations. The mean values were obtained in four independent experiments, each with two technical replicates. The two groups were compared using Student's *t*-test, $p = 8.014 \times 10^{-9}$.



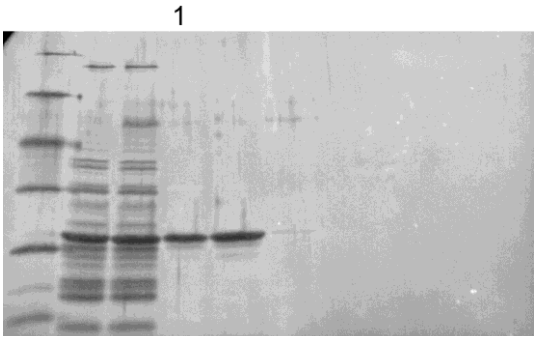
Supplementary Figure S9. Dynamics of growth and development of the bacteriolytic activity of *L. capsici* P$_{T5}$-*blp* strain at the cultivation on RM medium. **(a)** Cultivation in flask. **(b)** Cultivation in ANKUM-2M fermenter.



Supplementary Figure S10. Original gel images for Figure 6a: lane 1 corresponds to M of Figure 6a; lane 2 corresponds to sample of culture liquid of *L. capsici* P_{T5}-*serp* strain of Figure 6a.



Supplementary Figure S11. Original gel images for Figure 6a: lane 1 corresponds to sample of culture liquid of wild-type *L. capsici* strain of Figure 6a.



Supplementary Figure S12. Original gel images for Figure 6a: lane 1 corresponds to sample of purified Serp of *L. capsici* VKM B-2533^T strain of Figure 6a.

Supplementary Table S4. Relative level of expression of the *serp* gene.

L. capsici strains	Relative level of expression of the *serp* gene
L. capsici VKM B-2533^T	1.04±0.27
L. capsici P_{T5}-*serp*	608.58±238.17***

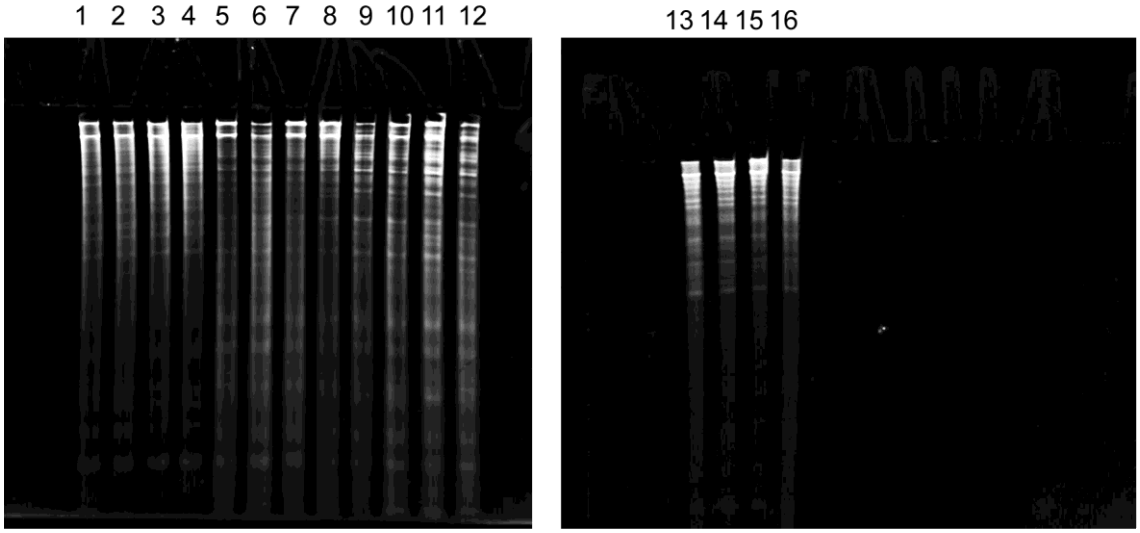
Results are shown as means ± standard deviations. The mean values were obtained in four independent experiments, each with two technical replicates. The two groups were compared using an unpaired two-tailed Student's *t*-test, $p = 2 \times 10^{-15}$.

Supplementary Table S5. Oligonucleotides used in this work for cloning and sequencing.

Primers	Sequence	Purpose
Oligonucleotides used for cloning		
T5_KpnI (for)	GGTACCGTGCCACCTGACGTCTAAG	To amplify a 1063 bp fragment containing T5 promoter – *gfp* – lambda t0 terminator from plasmid pTurboGFP-B
T5_XbaI (rev)	TCTAGACTGAAAATCTCGCCA AGCTAGC	
Gro_KpnI (for)	GGTACCCGGACCGACGCCTGTCA	To amplify a 199 bp promoter GroEL from *L. enzymogenes* VKM B-2235^T DNA
Gro_HindIII (rev)	AAGCTTGGCGACCTCTGTAAGTAATTGAATTG G	
GFP_HindIII (for)	AAGCTTATGGAGAGCGACGAGAGCGG	To amplify a 705 bp *gfp* from plasmid pTurboGFP-B
GFP_BamHI (rev)	GGATCCTCATTCTTCACCGGCATCTGC	
Term_BamHI (for)	GGATCCCAAATAAAACGAAAGGCTCAGTCG	To amplify a 230 bp *rrnB* T1 and T2 transcriptional terminators from plasmid pEX18
Term_XbaI (rev)	TCTAGAAGAGTTTGTAGAAACGCAAAAAGGC	
Gro_KpnI (for)	GGTACCCGGACCGACGCCTGTCA	To amplify a 200 bp promoter GroEL from plasmid PBBR1-MCS5 P_{GroEL}-*gfp*
Gro(A)_HindIII (rev)	AAGCTTTGGCGACCTCTGTAAGTAATTGAATT GG	
Blp1_HindIII (for)	AAGCTTATGAAGGCGATTTCGGGAGC	To amplify a 1143 bp *blp* from *L. capsici* VKM B-2533^T DNA
BlpI_BamHI (rev)	GGATCCTCAGTTCGGGCCTGGG	
Blp2_BamHI (for)	GGATCCATGAAGGCGATTTCGGGAGC	To amplify a 1143 bp *blp* from plasmid PBBR1-MCS5 $P_{GroEL(A)}$-*blp*
Blp2_HindIII (rev)	AAGCTTTCAGTTCGGGCCTGGG	
Serp_BamHI (for)	GGATCCATGATCCGCAAGAACGCACTTTG	To amplify a 1383 bp *serp* from *L. capsici* VKM B-2533^T DNA
Serp_HindIII (rev)	AAGCTTTCA GGGATTGAAATAGCTCGACACG	
Oligonucleotides used for sequencing		
Gro_KpnI (for)	GGTACCCGGACCGACGCCTGTCA	To confirm the correctness of the cloned fragments and the absence of random mutations in the constructed vectors PBBR1-MCS5 P_{GroEL}-*gfp*, PBBR1-MCS5 $P_{GroEL(A)}$-*gfp*, PBBR1-MCS5 $P_{GroEL(A)}$-*blp*
Term_XbaI (rev)	TCTAGAAGAGTTTGTAGAAACGCAAAAAGGC	
T5_KpnI (for)	GGTACCGTGCCACCTGACGTCTAAG	To confirm the correctness of the cloned fragments and the absence of random mutations in the constructed vectors PBBR1-MCS5 P_{T5}-*gfp*, PBBR1-MCS5 P_{T5}-*blp*, PBBR1-MCS5 P_{T5}-*serp*
T5_XbaI (rev)	TCTAGACTGAAAATCTCGCCAAGCTAGC	

Supplementary Table S6. Concentration of DNA template for PCR reaction.

DNA template	Final concentration, ng/μL	Purpose
pTurboGFP-B	1.58	To amplify a 1063 bp fragment containing T5 promoter – *gfp* – lambda t0 terminator
L. enzymogenes VKM B-2235^T DNA	0.14	To amplify a 199 bp promoter GroEL
pTurboGFP-B	1.58	To amplify a 705 bp *gfp*
pEX18	8.39	To amplify a 230 bp *rrnB* T1 and T2 transcriptional terminators
PBBR1-MCS5 P_{GroEL}-*gfp*	3.18	To amplify a 200 bp promoter GroEL with modification
L. capsici VKM B-2533^T DNA	0.31	To amplify a 1143 bp *blp* for construction of PBBR1-MCS5 $P_{GroEL(A)}$-*blp*
PBBR1-MCS5 P_{GroEL}-*blp*	1.94	To amplify a 1143 bp *blp* for construction of PBBR1-MCS5 P_{T5}-*blp*
L. capsici VKM B-2533^T DNA	0.31	To amplify a 1383 bp *serp*



Supplementary Figure S13. 4% PAG with 8 M urea: 1, 2, 3, 4 – samples of wild-type *L. capsici* RNA; 5, 6, 7, 8 – samples of *L. capsici* $P_{GroEL(A)}$-*blp* RNA; 9, 10, 11, 12 – samples of *L. capsici* P_{T5}-*blp* RNA; 13, 14, 15, 16 – samples of *L. capsici* P_{T5}-*serp* RNA.

Supplementary Table S7. Oligonucleotides used in this work for RT-qPCR.

Gene	locus tag (Protein id)	Sequence	Amplicon, bp	PCR efficiency
*gntR**	IEQ11_RS12995 (WP_036104172.1)	GntR_(for) TATCGCCAGCTCAAGGAACG GntR_(rev) CGCGAGACAGTGATGGGATT	125	1.97
alpA	IEQ11_RS15580 (WP_191823338.1)	AlpA_(for) CTGCAGACCGAAAAACTCGC AlpA_(rev) GCAACTGCTTGAGGCTATGC	196	1.94
blp	IEQ11_RS04180 (WP_191821694.1)	Blp_(for) GGGAGCAAGAATCACGCTGT Blp_(rev) GTGCTTGGCCAGATAGGTG	154	1.92
serp	IEQ11_RS08595 (WP_191822808.1)	Serp_(for) ATCCGCAAGAACGCACTTTG Serp_(rev) GGATCGAGAAGCAGGACAGG	58	2.07

* reference gene