

Supplementary information to: Novel pathogenic *Mucorales* identified using the silkworm infection model



Supplementary Figure S1. LSU rRNA (a) and ITS (b-c) based phylogenetic analysis of novel *Mucorales* analyzed using MAFFT and RAxML. (a) Both *Mucor* spp and *Backusella* spp (b) *Mucor* spp, and (c) *Backusella* spp.

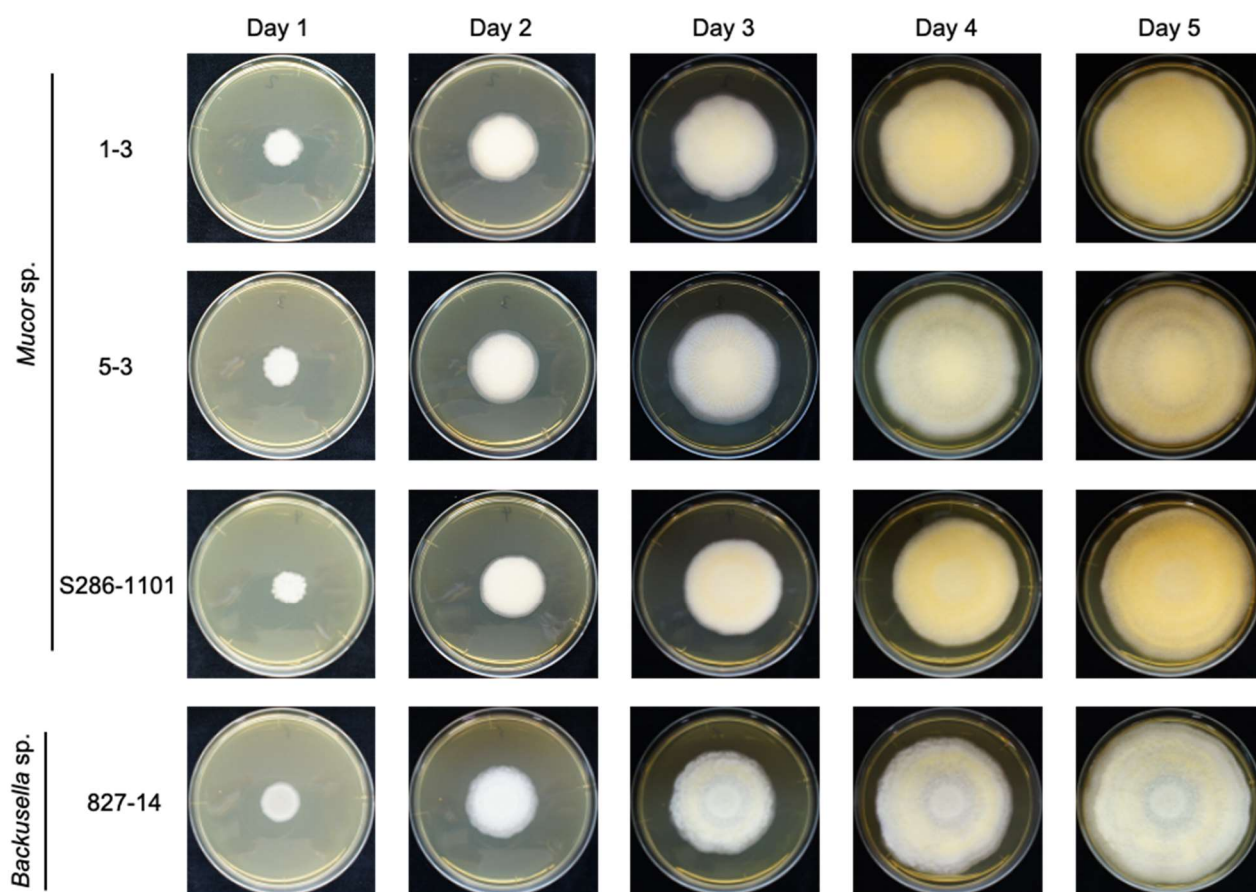
<i>Backusella</i> sp. 827-14	AAAAGAAAATAACAATGATTTCCCTAGTAACGGCGAGTGAAGAGGAAAGAGCTCAAAGTT	60
<i>Mucor</i> sp. 1-3	AAAAGAAAATAACCATGATTTCCCTAGTAACGGCGAGTGAAGAGGAAAGAGCTCAAAGTT	60
<i>Mucor</i> sp. 5-3	AAAAGAAAATAACCATGATTTCCCTAGTAACGGCGAGTGAAGAGGAAAGAGCTCAAAGTT	60
<i>Mucor</i> sp. S286-1101	AAAAGAAAATAACAATGATTTCCCTAGTAACGGCGAGTGAAGAGGAAAGAGCTCAAAGTT	60

<i>Backusella</i> sp. 827-14	GGAATCCGGCTGCCCTAGGTAGTTGGAGTTGTAACTGGAGAGGTGTTTCCAGGCGAGC	120
<i>Mucor</i> sp. 1-3	GGAACCTGTTTGGCTTAGCTAAACCGGATTGTAACTGTAGAGGTGTTTCCAGGCGAGC	120
<i>Mucor</i> sp. 5-3	GGAACCTGTTTGGCTTAGCTAAACCGGATTGTAACTGTAGAGGTGTTTCCAGGCGAGC	120
<i>Mucor</i> sp. S286-1101	GGAACCTGTTTGGCTTAGCTAAACCGGATTGTAACTGTAGAGGTGTTTCCAGGCGAGC	120
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<i>Backusella</i> sp. 827-14	CAAGCAAATAAGTCCTTTGGAACGGGCGATCATAGAGGGTGAGAATCCCGTCTTTGGCTT	180
<i>Mucor</i> sp. 1-3	TTGGTAAATAAGTCCTTTGGAACGGGCGATCATAGAGGGTGAGAATCCCGTCTTTGGCTT	180
<i>Mucor</i> sp. 5-3	TTGGTAAATAAGTCCTTTGGAACGGGCGATCATAGAGGGTGAGAATCCCGTCTTTGGCTT	180
<i>Mucor</i> sp. S286-1101	CTGGCAAATAAGTCCTTTGGAACGGGCGATCATAGAGGGTGAGAATCCCGTCTTTGGCTT	180
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<i>Backusella</i> sp. 827-14	GAGCTATTCGCCTTTTGGGATACACTTTCAAAGAGTCAGGTTGTTTGGGAATGCAGCCTA	240
<i>Mucor</i> sp. 1-3	AAGCAGT-TGTCCTTTTGTGATACACTTTCAAAGAGTCAGGTTGTTTGGGAATGCAGCCTA	239
<i>Mucor</i> sp. 5-3	AAGCAGT-TGTCCTTTTGTGATACACTTTCAAAGAGTCAGGTTGTTTGGGAATGCAGCCTA	239
<i>Mucor</i> sp. S286-1101	GAGCAG--TGTCCTTTTGTGATACACTTTCAAAGAGTCAGGTTGTTTGGGAATGCAGCCTA	238
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<i>Backusella</i> sp. 827-14	AATTGGGTGGTAAATCTCACCTAAAGCTAAATATGGGCGAGAGACCGATAGCGAACAAGT	300
<i>Mucor</i> sp. 1-3	AATTGGGTGGTAAATCTCACCTAAAGCTAAATATCTGCGAGAGACCGATAGCGAACAAGT	299
<i>Mucor</i> sp. 5-3	AATTGGGTGGTAAATCTCACCTAAAGCTAAATATCTGCGAGAGACCGATAGCGAACAAGT	299
<i>Mucor</i> sp. S286-1101	AATTGGGTGGTAAATCTCACCTAAAGCTAAATATCTGCGAGAGACCGATAGCGAACAAGT	298

<i>Backusella</i> sp. 827-14	ACCGTGAGGGAAAGATGAAAAGAACTTTGAAAAGAGAGTTAAACAGTATGTGAAATTGTT	360
<i>Mucor</i> sp. 1-3	ACCGTGAGGGAAAGATGAAAAGAACTTTGAAAAGAGAGTTAAACAGTACGTGAAATTGTT	359
<i>Mucor</i> sp. 5-3	ACCGTGAGGGAAAGATGAAAAGAACTTTGAAAAGAGAGTTAAACAGTACGTGAAATTGTT	359
<i>Mucor</i> sp. S286-1101	ACCGTGAGGGAAAGATGAAAAGAACTTTGAAAAGAGAGTTAAACAGTACGTGAAATTGTT	358

<i>Backusella</i> sp. 827-14	GAAAGGGAACCGTTTGGAGCCAGACCGGCCGTTCTATAATCAATCTCTGCCTCGGTGGGG	420
<i>Mucor</i> sp. 1-3	AAAATGGAACCGTTTGAAGCCAGATTGGCTTGGTTGTAATCAATCTAGGATTGCTCCTGG	419
<i>Mucor</i> sp. 5-3	AAAATGGAACCGTTTGAAGCCAGATTGGCTTGGTTGTAATCAATCTAGGATTGCTCCTGG	419
<i>Mucor</i> sp. S286-1101	AAAATGGAACCGTTTGAAGCCAGACTGGCTTGGTTGTAATCAATCTAGGATTGCTCCTGG	418
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<i>Backusella</i> sp. 827-14	ATGCACTTGTAGGACGTTGGCCTGCCAACAGCAATTTTGTCTGGTGGAAAAAACAGGAG	480
<i>Mucor</i> sp. 1-3	ATGCAGTTGCAGC--CTATGCCTGCCAACGACAGTTTCTTCTGAGGGAAAAAGCCATTGG	477
<i>Mucor</i> sp. 5-3	ATGCAGTTGCAGC--CTATGCCTGCCAACGACAGTTTCTTCTGAGGGAAAAAGCCATTGG	477
<i>Mucor</i> sp. S286-1101	ATGCAGTTGCAGC--CTATGCCTGCCAACGACAGTTTCTTCTGAGGGAAAAAGCTAGAGG	476
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<i>Backusella</i> sp. 827-14	GAATGTGGCCCTTCGGGGTGTATAGCCTCCCGGAAAATACATCGGACGGGATTGAGGAC	540
<i>Mucor</i> sp. 1-3	AAATGTGGCCCTTCGGGGTGTATAGTCTTTGGAAAATACCTTGGGAAAGACTGAGGAA	537
<i>Mucor</i> sp. 5-3	AAATGTGGCCCTTCGGGGTGTATAGTCTTTGGAAAATACCTTGGGAAAGACTGAGGAA	537
<i>Mucor</i> sp. S286-1101	AAATGTGGCCCTTCGGGGTGTATAGTCTTTAGAAAATACCTTGGAAAGAGACTGAGGAA	536
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<i>Backusella</i> sp. 827-14	TGCAGTAAATGCCTTTAGGCG-AAATACCTGGGCGCTTGTGTTGAGGACGTGTAGAATCT	599
<i>Mucor</i> sp. 1-3	CGCAGTGGATGCCTTTATGGCAAGATTGCTGAGTGCTTTTGCTGATGTATGCTAGAATTT	597
<i>Mucor</i> sp. 5-3	CGCAGTGGATGCCTTTATGGCAAGATTGCTGGGTGCTTTTGCTAATGTATGCTAGAATTT	597
<i>Mucor</i> sp. S286-1101	CGCAGTGAATGCCTTTA-GGCAAGATTGCTGGGCGCTTTGTTGATACATGCTAGAATTT	595
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<i>Backusella</i> sp. 827-14	CTGCTTCGGGTGGTGTCTAGCTCT-AATGTGCAACTCGCCTAGATTATTTTCTATTGCT	658
<i>Mucor</i> sp. 1-3	CTGCCTTGGGTGGTGTCTAGTGTACAAAGGTAAACTCGCTTGGTATATTTTTCATCCGCT	657
<i>Mucor</i> sp. 5-3	CTGCCTTGGGTGGTGTCTAGTGTACAAAGGTAAACTCGCTTGGTATATTTTTCATCCGCT	657
<i>Mucor</i> sp. S286-1101	CTGCTTCGGGTGGTGTCTAGTGTAAAGATGGAACCTCGTTAGTATATTTTTCATTCACT	655
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<i>Backusella</i> sp. 827-14	TAGGTTGTTGGCTTAATGACTCTAAATGAC	688
<i>Mucor</i> sp. 1-3	TAGGTTGTTGGCTTAATGACTTTAAATCAC	687
<i>Mucor</i> sp. 5-3	TAGGTTGTTGGCTTAATGACTTTAAATCAC	687
<i>Mucor</i> sp. S286-1101	TAGGTTGTTGGCTTAATGACTTTAAATCAC	685
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Supplementary Figure S2. Sequence alignment of LSU of newly identified Mucorales.



Supplementary Figure S3. Growth of novel Mucorales. 4.0×10^4 spores contained in 40 μ l of normal saline were spotted at the center of the YPD agar plates, dried, incubated at 30°C, and growth was recorded every day until the 5th day.

Supplementary Table S1. Pathogenicity of Mucorales spores in silkworm. Fifty microliter spore suspensions with or without 1/8 dilution were injected into the silkworm hemolymph, and survival was recorded at 15 and 20 hrs. NR: Not Recorded

Sample	No of spores/ml	Dilution fold	Injected silkworms	Survival at	
				15 hr	20 hr
<i>Mucor</i> sp. 1-3	5.5 x 10 ⁸	1	3	NR	0/3
		8	3	2/3	1/3
<i>Mucor</i> sp. 5-3	3.9 x 10 ⁸	1	3	NR	0/3
		8	3	3/3	2/3
<i>Mucor</i> sp. S286-1101	3.5 x 10 ⁸	1	3	NR	0/3
		8	3	3/3	1/3
<i>Backusella</i> sp. 827-14	4.5 x 10 ⁷	1	3	NR	0/3
		8	3	3/3	0/3
Normal saline	0	NA	3	3/3	3/3