

Electronic Supplementary Information Original Research Article

Associations of observed home dampness and mold with the fungal and bacterial microbiomes

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Running head: Mold and moisture damage measured visibly and with microbiome

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Data will be available from the corresponding author upon request

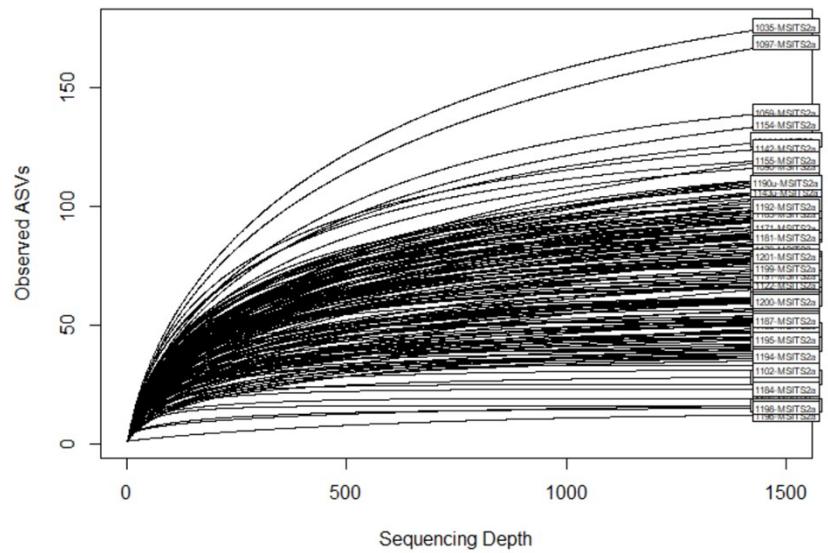


Figure S1. Fungal rarefaction curve of observed ASVs and sequencing depth

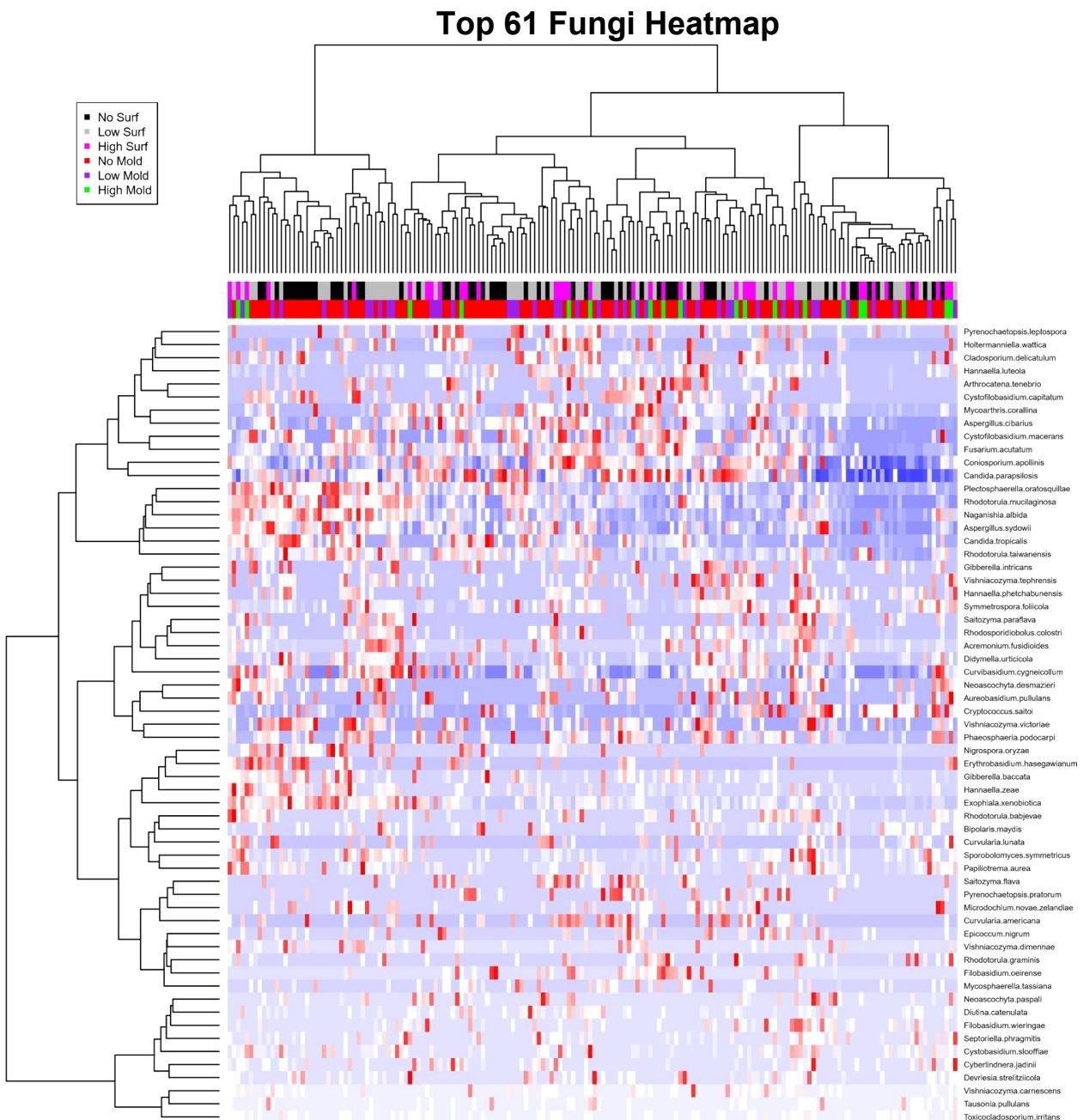


Figure S2. Most abundant 61 fungal species with categorical mold and moisture damage

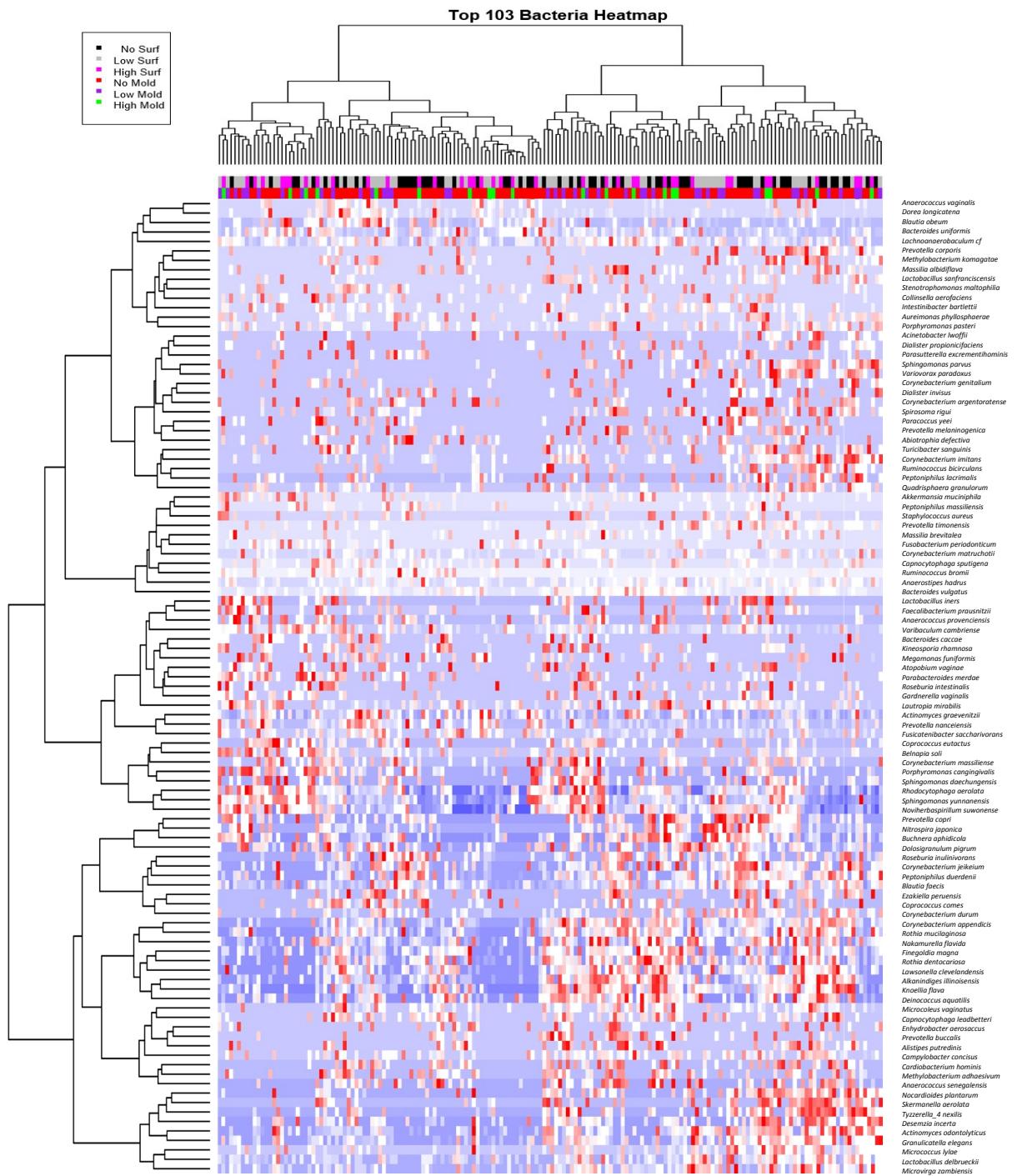


Figure S3. Most abundant 103 bacterial species with categorical mold and moisture damage

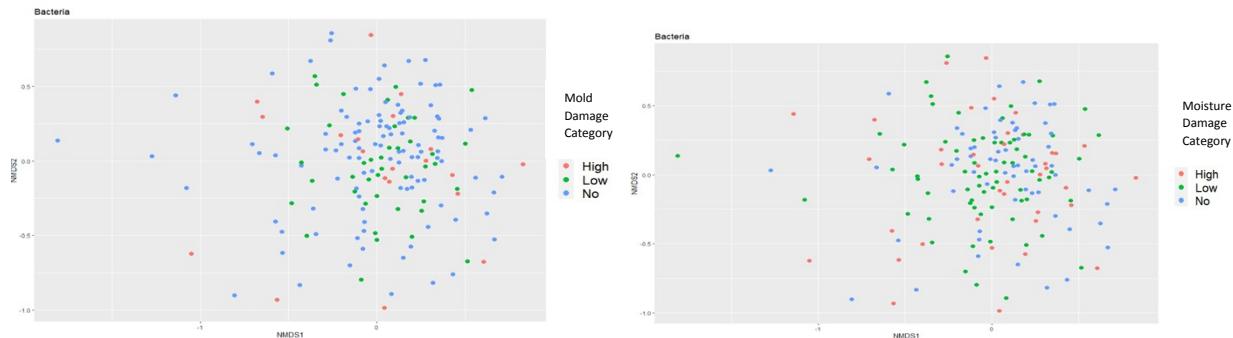


Figure S4. Non-metric multi-dimensional scaling of bacterial species within the mold and moisture high, low and no categories

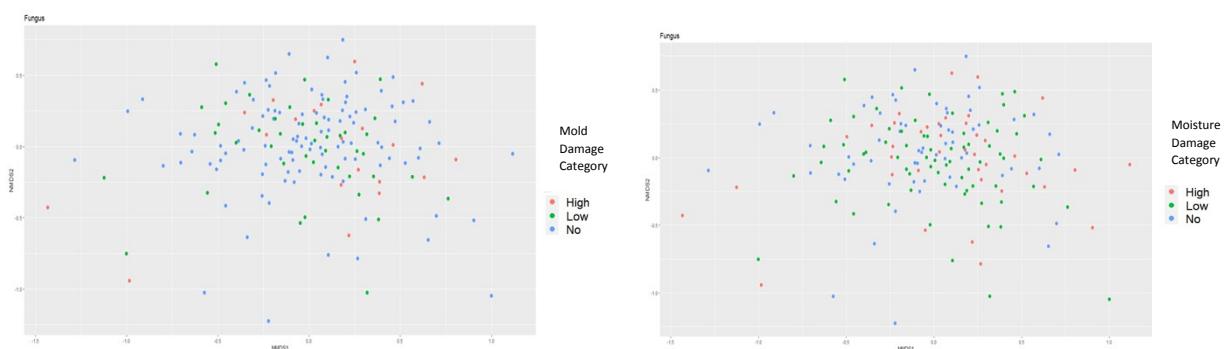


Figure S5. Non-metric multi-dimensional scaling of fungal species within the mold and moisture high, low and no categories

Table S1 Cross-detection of Silva and UNITE ASV determination compared to NCBI database

Fungus Species	ASVs	Potential cross-detection	Fungus Species	ASVs	Potential cross-detection	Fungus Species	ASVs	Potential cross-detection	Bacteria Species	ASVs	Potential cross-detection		
<i>Aspergillus penicilliferoides</i>	ASV3106	NA	<i>Enghitala xenobiotica</i>	ASV155 ASV289 ASV3289	NA	<i>Pichia membranifaciens</i>	ASV129	NA	<i>Akkermansia muciniphila</i>	ASV439 ASV2068	NA		
<i>Aspergillus ruber</i>	ASV833	<i>Aspergillus amstelodami</i> <i>Aspergillus appendiculatus</i> <i>Aspergillus brunneus</i> <i>Aspergillus chevalieri</i> <i>Aspergillus niveoglaucus</i> <i>Aspergillus pseudoglaucus</i> <i>Aspergillus spiculosus</i> <i>Aspergillus torulophilus</i> <i>Eactrocera tivoni</i> <i>Eurotium aethiopum</i>	<i>Filobasidium oeinense</i>	ASV127	NA	<i>Flectosphaerella oroszegii</i>	ASV749 ASV88	<i>Eactrocera tivoni</i> <i>Plectosphaerella cucumerina</i> <i>Plectosphaerella pluriora</i> <i>Plectosphaerella pupula</i>	<i>Alkanindiges illinoiensis</i>	ASV458	<i>Alkanindiges hongkongensis</i>		
<i>Aspergillus sydowii</i>	ASV1950 ASV199 ASV228 ASV560 ASV636	<i>Aschersonia tamarii</i> <i>Aspergillus creber</i> <i>Aspergillus protuberans</i> <i>Aspergillus versicolor</i> <i>Aspergillus versicolor</i>	<i>Fusarium solani</i>	ASV150 ASV2086 ASV2359 ASV871	<i>Eactrocera tivoni</i>	<i>Rhodotorula mucilaginosa</i>	ASV127 ASV145 ASV1861 ASV2291 ASV2613 ASV382 ASV44 ASV58	<i>Hansenula orgiae</i> <i>Phaeosphaeria orgiae</i> <i>Rhodotorula daleensis</i>	<i>Corynebacterium matruchotii</i>	ASV155	NA		
<i>Aureobasidium pullulans</i>	ASV2488	NA	<i>Mucor racemosus</i>	ASV1271	NA	<i>Saccharomyces cerevisiae</i>	ASV1912 ASV1925 ASV67 ASV958	<i>Saccharomyces pastorianus</i>	<i>Dialister invirius</i>	ASV637	NA		
<i>Candida parapsilosis</i>	ASV33	<i>Eactrocera tivoni</i>	<i>Penicillium aurantiogriseum</i>	ASV1927	<i>Penicillium alboconatum</i> <i>Penicillium allii</i> <i>Penicillium aurantioavidum</i> <i>Penicillium gladioli</i> <i>Penicillium hondii</i> <i>Penicillium polonicum</i>	<i>Penicillium brevicompactum</i>	ASV3240	<i>Penicillium alboconatum</i> <i>Penicillium bialowiezense</i>	<i>Septoria phragmitis</i>	ASV157	<i>Phaeospaera festucae</i> <i>Phaeosphaeria canidis</i>		
<i>Candida tropicalis</i>	ASV120 ASV197 ASV3364	<i>Candida dubliniensis</i> <i>Penicillium apiculatum</i>	<i>Penicillium glabrum</i>	ASV1332	<i>Penicillium coniocephalum</i> <i>Penicillium crociola</i> <i>Penicillium expansum</i> <i>Penicillium palens</i> <i>Penicillium thomii</i> <i>Penicillium vezense</i>	<i>Phaeosphaeria podocarpi</i>	ASV143 ASV1785	<i>Diaporthella stewartii</i> <i>Lecidea colletotrichoides</i> <i>Microdochium bolleyi</i> <i>Microsphaeropsis arundinis</i> <i>Neosacccharomyces paspali</i> <i>Paraphoma chrysanthemica</i> <i>Phaeosphaeria oryzae</i> <i>Limebraunia communis</i>	<i>Sistotrema brinkmannii</i>	ASV143 ASV1707 ASV190 ASV194 ASV3711 ASV443	<i>Stachybotrys chartarum</i>	ASV583	<i>Stachybotrys chlorohalonata</i>
<i>Cladosporium delicatulum</i>	ASV561 ASV6	<i>Cladosporium cladosporioides</i> <i>Cladosporium tenuisimum</i>	<i>Cladosporium dominicanum</i>	ASV1785	<i>Cladosporium cylindroca</i> <i>Cladosporium halotolerans</i> <i>Cladosporium pulvincola</i> <i>Filobasidium magnum</i>	<i>Cladosporium cladosporioides</i>	ASV143 ASV1545 ASV1603 ASV2005 ASV2108 ASV242 ASV287 ASV427	<i>Diaporthella stewartii</i> <i>Lecidea colletotrichoides</i> <i>Microdochium bolleyi</i> <i>Microsphaeropsis arundinis</i> <i>Neosacccharomyces paspali</i> <i>Paraphoma chrysanthemica</i> <i>Phaeosphaeria oryzae</i> <i>Limebraunia communis</i>	<i>Toxicocladosporium imians</i>	ASV107 ASV1188 ASV1414 ASV1551 ASV2301 ASV3224 ASV349 ASV355 ASV482 ASV637	<i>Stachybotrys chartarum</i>	ASV583	<i>Stachybotrys chlorohalonata</i>
<i>Cladosporium halotolerans</i>	ASV1685 ASV219 ASV3033 ASV3520	<i>Cladosporium cladosporioides</i> <i>Cladosporium parahalotolerans</i> <i>Cladosporium sphagnorum</i> <i>Cladosporium tenuisimum</i> <i>Digitalaria exilis</i>	<i>Cladosporium remotenellum</i>	ASV102	<i>Cladosporium cladosporioides</i> <i>Cladosporium cocomerinum</i> <i>Cladosporium pulvra</i>	<i>Cladosporium sphaenopter</i>	ASV548 ASV595 ASV691 ASV722 ASV75 ASV785	<i>Vishniacozyma carmescens</i>	ASV105 ASV172 ASV408 ASV83	<i>Eactrocera tivoni</i>	ASV105 ASV172 ASV408 ASV83	<i>Eactrocera tivoni</i>	
<i>Cladosporium sphaenopter</i>	ASV222	<i>Cladosporium cocomerinum</i> <i>Cladosporium ligustris</i>	<i>Debaromyces hansenii</i>	ASV618	<i>Debaromyces fabria</i> <i>Debaromyces subglabosus</i>	<i>Debaromyces hansenii</i>	ASV1 ASV1429 ASV3402 ASV3433 ASV7	<i>Wallenia sebi</i>	ASV381	<i>Eactrocera tivoni</i> <i>Wallenia mellitcola</i> <i>Wallenia muriae</i>	ASV381	<i>Eactrocera tivoni</i> <i>Wallenia mellitcola</i> <i>Wallenia muriae</i>	
<i>Epicrocicum nigrum</i>	ASV1 ASV1429 ASV3402 ASV3433 ASV7	<i>Epicrocicum lajense</i> <i>Epicrocicum mackenziei</i>						<i>Wickerhamomyces anomalis</i>	ASV612	NA			

>98% identity match and >98% query cover match

Table S2. Differential abundance (DESeq) fungal taxa log 2 fold change difference between mold damage and moisture damage categories (all adjusted p-values <0.05)

Kingdom	Phylum	Class	Order	Family	Genus Species		Moisture Damage (Log 2 Fold Change)		Mold Damage (Log 2 Fold Change)			Notes
							No/High	Low/High	No/Low	No/High	Low/High	
Fungus	Ascomycota	Dothideomycetes	Capnodiales	Capnodiales	<i>Arthrocataena tenebrio</i>		2.52					Saprotroph - Rocks (Current <i>Arthrocataena tenebrosa</i>)
	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae	<i>Toxicocladosporium irritans</i>	6.11	-3.83	2.27	5.52	-5.54		Saprotroph - Moldy paint
	Ascomycota	Dothideomycetes	Capnodiales	Mycosphaerellaceae	<i>Mycosphaerella tassiana</i>	2.06						Plant pathogen
	Ascomycota	Dothideomycetes	Pleosporales	Phaeosphaeriaceae	<i>Phaeosphaeria podocarpi</i>			2.42				Plant pathogen - Conifers
	Ascomycota	Dothideomycetes	Pleosporales	Phaeosphaeriaceae	<i>Septoriella phragmitis</i>			-2.25				Plant pathogen
	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	<i>Curvularia americana</i>					-2.24		Plant Pathogen
	Ascomycota	Dothideomycetes	Pleosporales	Pleosporaceae	<i>Curvularia lunata</i>					-2.57		Plant Pathogen
	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	<i>Conioспорум apollinis</i>		2.75					Saprotroph - Marble
	Ascomycota	Eurotiomycetes	Chaetothyriales	Herpotrichiellaceae	<i>Exophiala xenobiotica</i>	2.64		-2.06				Animal pathogen
	Ascomycota	Leotiomycetes	Helotiales	Helotiales	<i>Mycoارثرس coralina</i>	2.14	3.06		2.81			Litter Saprotroph
	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetales	<i>Candida parapsilosis</i>	4.31	-2.17	2.14	-2.60	-2.82		Yeast, Human pathogen
	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetales	<i>Candida tropicalis</i>			-3.69	2.65			Yeast, Human pathogen
	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetales	<i>Diutina catenulata</i>		2.56					Yeast, Human pathogen
	Ascomycota	Sordariomycetes	Hypocreales	Hypocreales	<i>Acremonium fusidioides</i>	2.71			3.08	2.03		Human pathogen
	Ascomycota	Sordariomycetes	Hypocreales	Nectriaceae	<i>Gibberella baccata</i>	2.37						Plant pathogen
	Ascomycota	Sordariomycetes	Glomerellales	Plectosphaerellaceae	<i>Plectosphaerella oratosquilla</i>	2.98		2.69				Animal pathogen
Basidiomycota	Microbotryomycetes	Microbotryomycetes	Microbotryomycetes	Microbotryomycetes	<i>Curvibasidium cygneicolum</i>		2.27	2.84	2.07	2.48		Yeast or yeast-like, Saprotroph
	Basidiomycota	Microbotryomycetes	Sporidiobolales	Sporidiobolaceae	<i>Rhodotorula mucilaginosa</i>	2.55			2.47			Hydrophile; Yeast, Animal pathogen
	Basidiomycota	Microbotryomycetes	Sporidiobolales	Sporidiobolaceae	<i>Rhodotorula taivamensis</i>			-2.85	-2.74	-2.70		Yeast, Plant pathogen
	Basidiomycota	Tremellomycetes	Filibasidiales	Filibasidiaceae	<i>Filibasidium oeirensis</i>	-2.04		-2.29				Yeast, Saprotroph
	Basidiomycota	Tremellomycetes	Tremellales	Bulleribasidiaceae	<i>Hannaea phethabunensis</i>	-2.56		-2.01				Yeast, Plant pathogen
	Basidiomycota	Tremellomycetes	Filibasidiales	Filibasidiaceae	<i>Naganishia albida</i>				2.21			Yeast, Symbiotroph (former, <i>Cryptococcus albidus</i>)
	Basidiomycota	Tremellomycetes	Tremellales	Rhynchogastremataceae	<i>Papiliotrema aurea</i>					2.43		Yeast, Animal pathogen (former, <i>Cryptococcus aureus</i>)
	Basidiomycota	Tremellomycetes	Tremellales	Bulleribasidiaceae	<i>Vishniacozyma carnescens</i>			-2.42	2.86			Yeast, Plant pathogen

Red is negative and green is positive log 2 fold change

Mold damage categorical (high ≥0.19m²; 0>low>0.19m²; no=0m²); Moisture damage categorical (high ≥0.29m²; 0>low>0.29m²; no=0m²)

Table S3. Differential abundance (DESeq) bacterial taxa log 2 fold change between mold damage and moisture damage categories (all adjusted p-values <0.05)

Kingdom	Phylum	Class	Order	Family	Genus Species		Moisture Damage (Log 2 Fold Change)		Mold Damage (Log 2 Fold Change)			Gram Stain
							No/High	Low/High	No/Low	No/High	Low/High	
Bacteria	Actinobacteria	Actinobacteria	Actinomycetales	Actinomycetaceae	<i>Actinomyces graevenitzii</i>		2.10					Positive
	Actinobacteria	Actinobacteria	Corynebacteriales	Corynebacteriaceae	<i>Corynebacterium matruchottii</i>				-2.90	2.79		Positive
	Actinobacteria	Actinobacteria	Corynebacteriales	Corynebacteriaceae	<i>Corynebacterium 1 jeikeium</i>			2.30				Positive
	Actinobacteria	Actinobacteria	Bifidobacteriales	Bifidobacteriaceae	<i>Gardnerella vaginalis</i>	2.07				-2.65		Positive
	Actinobacteria	Actinobacteria	Frankiales	Nakamurellaceae	<i>Nakamurella flavidia</i>				-2.07			Positive
Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae	Lactobacillaceae	<i>Lactobacillus delbrueckii</i>		2.07					Positive
Firmicutes	Bacilli	Bacillales	Staphylococcaceae	Staphylococcaceae	<i>Staphylococcus aureus</i>	-2.10			-2.96			Positive
Firmicutes	Clostridia	Clostridiales	Lachnospiraceae	Coprococcus 2 eutactus	<i>Coprococcus 2 eutactus</i>	2.53			-2.07	4.96	2.89	Positive
Firmicutes	Clostridia	Clostridiales	Ruminococcaceae	Faecalibacterium prausnitzii					2.92			Positive
Firmicutes	Negativicutes	Selenomonadales	Veillonellaceae	<i>Dialister invisus</i>			-2.17		2.05			Negative
Bacteroidetes	Bacteroidia	Bacteroidales	Prevotellaceae	Prevotella timonensis						2.67		Negative
Proteobacteria	Betaproteobacteria	Burkholderiales	Comamonadaceae	Variovorax paradoxus		2.13					2.35	Negative
Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Alkanindiges illinoiensis	2.03				2.36			Negative
Verrucomicrobia	Verrucomicrobia	Verrucomicrobiales	Verrucomicrobiaceae	<i>Akkermansia muciniphila</i>				-2.30	2.48			Negative

Red is negative and green is positive log 2 fold change

Mold damage categorical (high ≥0.19m²; 0>low>0.19m²; no=0m²); Moisture damage categorical (high ≥0.29m²; 0>low>0.29m²; no=0m²)