

SUPPLEMENTAL MATERIAL

Variability of Indoor Fungal Microbiome of Green and Non-Green Low-Income Homes in Cincinnati, Ohio

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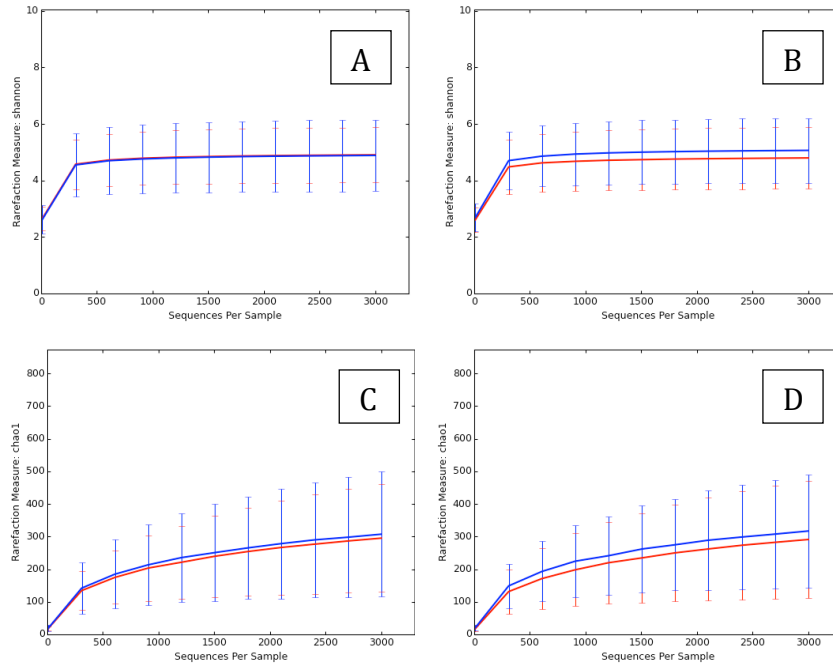


Figure S1. Rarefaction curves depicting within-sample (α) Shannon diversity (A and B) and Chao 1 richness (C and D) of fungal populations based on (A and C) renovation status: green (red line) and non-green (blue line); (B) and D time: baseline (red line) and 12-month (blue line) samples.

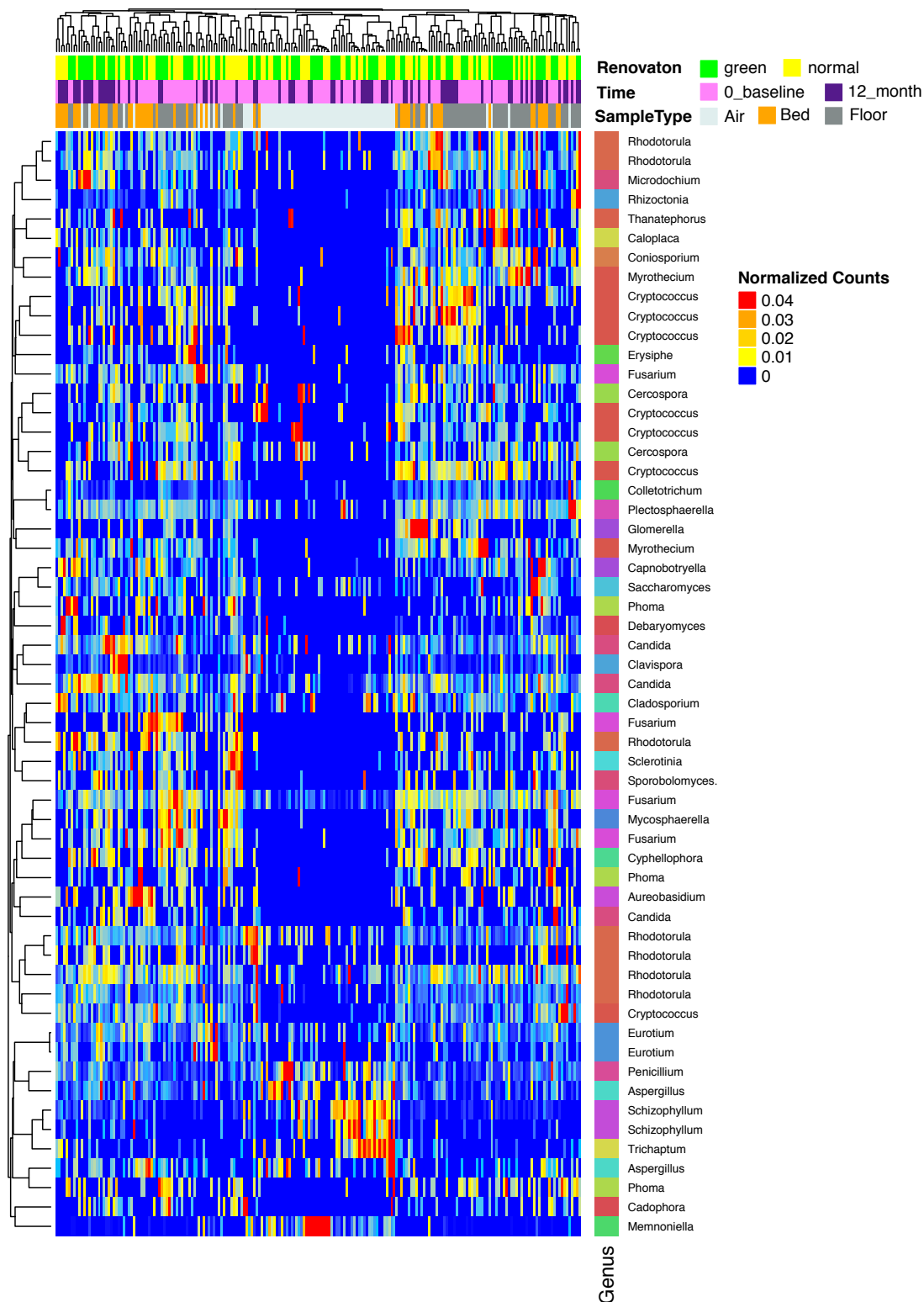


Figure S2: Hierarchical clustering of samples (columns) and OTUs (rows with color coded genus annotation in the last column) reveals differences between air an other types of samples

Table S1. Results on resident reported water damage, moldy smell and visible mold.

| Variable | Baseline | | 12-month follow-up | |
|------------------------------------------------------------------------------------|-------------------|------------------|--------------------|------------------|
| | Control (n=26) | Green* (n=22) | Control* (n=8) | Green* (n=20) |
| During the past 6, months, has there been water damage to your home (in any room)? | 35% | 14% | 25% | 5% |
| During the past 6, months, have you <u>smelled</u> any mold in your home? | 46%** | 0% | 0% | 5% |
| During the past 6, months, have you <u>seen</u> any mold in your home? | 46%** | 10% | 12.5% | 0% |

* Several questionnaires were missing responses to these questions

** Control homes were higher than Green homes (Chi-Square Fisher's exact test, $p < 0.05$)

Table S2. Summary of calculated alpha diversity values, showing differences within comparison groups.

| Comparison | Alpha Diversity Metric | Mean Diversity/Richness | | p-value |
|-------------------------------------------------------------|------------------------|-------------------------|----------------------|---------------|
| | | Green / Baseline | Non-Green / 12-month | |
| 1) <u>All green vs. non-green samples</u> | | | | |
| all green vs. non-green | Chao 1 | 393.3697 | 418.1952 | 0.61 |
| all green vs. non-green | Shannon | 3.44 | 3.42 | 0.93 |
| 2) <u>All baseline vs. 12-month</u> | | | | |
| all baseline vs. 12 months | Chao 1 | 395.8249 | 419.7805 | 0.44 |
| all baseline vs. 12 months | Shannon | 3.36 | 3.56 | 0.049* |
| 3) <u>Green vs. non-green by sample type</u> | | | | |
| air green v non-green | Chao 1 | 146.3194 | 105.6543 | 0.11 |
| air green v non-green | Shannon | 3.24 | 2.96 | 0.19 |
| bed green v non-green | Chao 1 | 419.9167 | 518.1404 | 0.014* |
| bed green v non-green | Shannon | 3.78 | 4.00 | 0.13 |
| floor green v non-green | Chao 1 | 592.6141 | 615.498 | 0.67 |
| floor green v non-green | Shannon | 3.41 | 3.38 | 0.77 |
| 4) <u>Baseline vs. 12-months by sample type</u> | | | | |
| air baseline vs. 12 months | Chao 1 | 108.5992 | 167.5396 | 0.049* |
| air baseline vs. 12 months | Shannon | 2.95 | 3.45 | 0.03* |
| bed baseline vs. 12 months | Chao 1 | 482.086 | 456.7663 | 0.71 |
| bed baseline vs. 12 months | Shannon | 3.86 | 3.94 | 0.48 |
| floor baseline v 12 months | Chao 1 | 609.5313 | 590.7516 | 0.63 |
| floor baseline v 12 months | Shannon | 3.44 | 3.33 | 0.98 |
| 5) <u>Green vs. non-green by sample type and time point</u> | | | | |
| air baseline green vs. non-green | Chao 1 | 118.72924 | 97.58837 | 0.2 |
| air baseline green vs. non-green | Shannon | 3.13 | 2.76 | 0.13 |
| air 12 months green vs. non-green | Chao 1 | 192.3031 | 126.2672 | 0.53 |
| air 12 months green vs. non-green | Shannon | 3.44 | 3.47 | 0.98 |
| bed baseline green vs. non-green | Chao 1 | 450.3896 | 508.1889 | 0.19 |
| bed baseline green vs. non-green | Shannon | 3.90 | 3.83 | 0.81 |
| bed 12 months green vs. non-green | Chao 1 | 387.0997 | 532.2384 | 0.026* |

| | | | | |
|----------------------------------------------------------------|----------------|-------------|-------------|---------------|
| bed 12 months green vs. non-green | Shannon | 3.66 | 4.24 | 0.014* |
| floor baseline green v non-green | Chao 1 | 606.8617 | 612.2009 | 0.97 |
| floor baseline green v non-green | Shannon | 3.46 | 3.42 | 0.93 |
| floor 12 months green v non-green | Chao 1 | 574.0922 | 624.0704 | 0.57 |
| floor 12 months green v non-green | Shannon | 3.36 | 3.27 | 0.57 |
| 6) Baseline vs. 12-months by sample type and renovation status | | | | |
| air green baseline v 12 months | Chao 1 | 118.7292 | 192.3031 | 0.29 |
| air green baseline v 12 months | Shannon | 3.13 | 3.44 | 0.35 |
| air non-green baseline v 12 months | Chao 1 | 97.58837 | 126.2672 | 0.16 |
| air non-green baseline v 12 months | Shannon | 2.76 | 3.47 | 0.042* |
| bed green baseline v 12 months | Chao 1 | 450.3896 | 387.0997 | 0.33 |
| bed green baseline v 12 months | Shannon | 3.90 | 3.66 | 0.33 |
| bed non-green baseline v 12 months | Chao 1 | 508.1889 | 532.2384 | 0.69 |
| bed non-green baseline v 12 months | Shannon | 3.83 | 4.24 | 0.14 |
| floor green baseline v 12 months | Chao 1 | 606.8617 | 574.0922 | 0.52 |
| floor green baseline v 12 months | Shannon | 3.46 | 3.36 | 0.69 |
| floor non-green baseline v 12 months | Chao 1 | 612.2009 | 624.0704 | 0.97 |
| floor non-green baseline v 12 months | Shannon | 3.42 | 3.27 | 0.67 |

*Bolded comparisons: borderline significant difference (p<0.008 would be significant due to Bonferroni correction)

Table S3. Summary of significant differences found in the LefSe analysis at the genus or species level enrichment of taxa in air, bed dust and floor dust samples between green and non-green homes and sampling time-points (baseline and 12-month) within green and non-green samples.

| Sample type and enriched taxa | Community Composition Change | Habitat Note for Genus and Species |
|--------------------------------------------------------------------------------|--------------------------------------|------------------------------------|
| Air Baseline: Green vs. Non-Green | | |
| Species <i>Rhodotorula glutinis</i> | Higher relative abundance in green | Soil, water, milk, fruit, air |
| Genus <i>Fomitopsis</i> | Present more frequently in green | Wood |
| Species <i>Penicillium spinulosum</i> | Present more frequently in green | Wheat and flour |
| Genus <i>Antrodia</i> | Present more frequently in green | Wood |
| Family <i>Morchellaceae</i> , Genus <i>Morchella</i> , Species <i>M. gigas</i> | Present more frequently in green | Wood |
| Genus <i>Trametes</i> , Species <i>T. cervina</i> | Present more frequently in green | Wood rot |
| Air 12-Month: Green vs. Non-Green | | |
| Family <i>Schizophyllaceae</i> Genus <i>Schizophyllum</i> | Higher relative abundance non-green | Wood rot |
| Species <i>Rhodotorula glutinis</i> | Present more frequently in green | Soil, water, milk, fruit, air |
| Class <i>Microbotryomycetes</i> | Higher relative abundance green | |
| Bed Baseline: Green vs. Non-Green | | |
| No Difference | | |
| Bed 12 Month: Green vs. Non-Green | | |
| No Difference | | |
| Floor Baseline: Green vs. Non-Green | | |
| No Difference | | |
| Floor 12 Month: Green vs. Non-Green | | |
| Uncultured Species of Endophytic fungus | Present more frequently in non-green | Plant symbiont |
| Species <i>Aspergillus unguis</i> | Present more frequently in non-green | Soil, food |
| Uncultured Species of Order <i>Hypocreales</i> | Present more frequently in non-green | Unknown |
| Air Green: Baseline vs. 12-Month | | |
| Family <i>Sistotrema</i>, Genus <i>Sistotrema</i> | Higher relative abundance 12 months | Wood rot |
| Genus <i>Junghuhnia</i> | Present more frequently at 12 months | Marine and non-marine |
| Species <i>Coprinellus micaceus</i> | Present more frequently at 12 months | Wood rot |

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|-------------------------------------------------------------|--------------------------------------|-------------------------------------------|
| | months | |
| Family Stereaceae, Genus Stereum, Species S. sanguinolentum | Present more frequently at 12 months | Wood rot |
| Species Polyporus squamosus | Present more frequently at 12 months | Wood rot |
| Species Hyphoderma puberum | Present more frequently at 12 months | Wood rot |
| Family Incertae Sedis of Order Saccharomycetales | Present more frequently at 12 months | Budding yeasts |
| Order Trechisporales | Present more frequently at 12 months | |
| <u>Air Non-Green: Baseline vs. 12 Month</u> | | |
| Genus Ischnoderma, Species I. benzoinum | Present more frequently at baseline | Wood |
| Genus Coprinellus, Species C. disseminatus | Present more frequently at 12 months | Wood rot |
| Order Russulales | Present more frequently at 12 months | |
| Phylum Ascomycota, Species Sordariomycetes sp SAB 2009a | Present more frequently at 12 months | Soil, dung, leaf litter, wood rot |
| Phylum Ascomycota, Species Penicillium spinulosum | Present more frequently at 12 months | Wheat and flour |
| Family Sistotremataceae, Genus Sistotrema | Higher relative abundance 12 months | Wood rot |
| Family Steccherinaceae | Higher relative abundance 12 months | |
| Genus Trametopsis, Species T. cervina | Present more frequently at 12 months | Wood rot |
| Genus Fomitopsis | Present more frequently at 12 months | Wood |
| Species Polyporus squamosus | Present more frequently at 12 months | Wood rot |
| <u>Bed Green: Baseline vs. 12 Month</u> | | |
| No Difference | | |
| <u>Bed Non-Green: Baseline vs. 12 Month</u> | Community Composition Change | Habitat Note for Genus and Species |
| Genus Podospira, Species P. prethopodalis | Present more frequently at 12 months | Dung, soil |
| Species Oidium mutisiae | Present more frequently at 12 months | Plant pathogen |
| Species Polyporus squamosus | Present more frequently at 12 months | Wood rot |
| Family Incertae sedis of order | Present more frequently at 12 months | Wood rot |

| | | |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------|
| Helotiales, Genus Scytalidium, Species S. circinatum | months | |
| Species Penicillium concentricum | Present more frequently at 12 months | Soil, fruit, seeds |
| Genus Trichothecium | Present more frequently at 12 months | Soil, forests, crop land, salt-marsh, compost, fruit |
| Genus Cercophora | Present more frequently at 12 months | Plant pathogen |
| Class Dothideomycetes, Genus Pyrenophora | Present more frequently at 12 months | Marine, plant pathogen |
| Class Dothideomycetes, Genus Stagonosporopsis | Present more frequently at 12 months | Plant pathogen |
| Order Saccharomycetales | Present more frequently at 12 months | |
| Genus Valsa | Present more frequently at 12 months | Plant pathogen |
| Uncultured Species of Alatospora | Present more frequently at 12 months | Marine |
| Class Pucciniomycetes, Order Platygloelales, Family Platygloeaceae, Genus Insolibasidium, Species I. deformans | Present more frequently at 12 months | Plant pathogen |
| Family Stereocaulaceae, Genus Lepraria | Present more frequently at 12 months | Lichen |
| Floor Green: Baseline vs. 12 Month | | |
| Species Trichaptum biforme | Present more frequently at 12 months | Wood |
| Family Corticiaceae | Present more frequently at 12 months | |
| Floor Non-Green: Baseline vs. 12 Month | | |
| Species Cryptococcus flavecens | Present more frequently at 12 months | Yeast |
| Genus Sphaeropsis, Species S. sapinea | Present more frequently at 12 months | Pine tree pathogen |
| Family Polyporaceae | Present more frequently at 12 months | |

Taxa that were enriched in more than one sample type are bolded.