Supplementary Material

Spatiotemporal controls on the urban aerobiome

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**Supplementary Figure 1.** Sample selection criteria for the three land cover types.

** Supplementary Figure 2.** Abundance of potential contaminants in experiment samples (x-axis) versus control samples (y-axis).

**Supplementary Table 1.** Breakdown of sampling groups by site, land cover type, and date.

|  |  |  |
| --- | --- | --- |
| Land Cover Type | Group 1 Sites | Group 2 Sites |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Sampling dates:  8.04, 8.18, 9.01, 9.22 | | | Sampling dates:  8.14, 8.25, 9.15, 9.29 | | |
| Code | Lat. | Long. | Code | Lat. | Long. |
| Forest | ABF\* | 44.053 | -123.07 | AMA | 44.030 | -123.09 |
| BRA\* | 44.092 | -123.15 | BLA | 44.000 | -123.10 |
| JAS | 44.036 | -122.98 | DEL | 44.090 | -123.09 |
| MEL\* | 44.031 | -123.13 | HAR | 44.077 | -123.01 |
| SKI\* | 44.059 | -123.09 | OAK | 44.046 | -123.14 |
| WEF | 44.053 | -123.15 | WHT | 44.039 | -123.02 |
| Grass | LAU\*1 | 44.026 | -123.07 | ABG | 44.049 | -123.05 |
| TAF\* | 44.057 | -123.14 | CEM2 | 44.011 | -123.10 |
| TRA | 44.069 | -123.14 | JAM | 44.040 | -123.03 |
| TSF | 44.069 | -122.99 | LIV | 44.058 | -122.92 |
| WES\* | 44.037 | -123.11 | MAU3 | 44.066 | -123.11 |
| WSC | 44.042 | -122.98 | WEG | 44.053 | -123.15 |
| Paved | BIM\* | 44.040 | -123.12 | FAI | 44.044 | -123.11 |
| GRA\* | 44.050 | -123.13 | MPR | 44.059 | -123.12 |
| MIC\* | 44.082 | -123.04 | PET | 44.035 | -123.04 |
| ORG | 44.092 | -123.16 | STR | 44.063 | -123.03 |
| SAF\* | 44.011 | -123.09 | USF | 44.065 | -122.98 |
| SFC | 44.071 | -123.02 | WIL | 44.058 | -122.99 |

\* Samples also collected 7.14 for pilot testing

1 Golf course (highly maintained—mowed, fertilized, irrigated)

2 Cemetery (highly maintained—mowed, irrigated)

3 Public park (highly maintained—mowed, irrigated)

**Supplementary Table 2.** Land cover type, vegetation cover proportion, and structural diversity for each site.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cover Type | Site | Cover  (50 m) | Cover  (100 m) | Cover  (200 m) | Cover  (400 m) | Cover  (800 m) | Structural Diversity | Plant Spp. Diversity |
| Forest | ABF | 0.98 | 0.98 | 0.93 | 0.68 | 0.58 | 2.59 | 2.52 |
| AMA | 1.00 | 0.96 | 0.81 | 0.65 | 0.58 | 2.33 | 0.94 |
| BLA | 1.00 | 1.00 | 0.96 | 0.87 | 0.85 | 2.79 | 1.36 |
| BRA | 1.00 | 0.79 | 0.71 | 0.65 | 0.53 | 2.86 | 1.48 |
| DEL | 1.00 | 0.83 | 0.57 | 0.53 | 0.54 | 2.47 | 1.23 |
| HAR | 1.00 | 0.93 | 0.77 | 0.86 | 0.79 | 2.94 | 2.26 |
| JAS | 0.82 | 0.82 | 0.73 | 0.79 | 0.66 | 2.61 | 1.57 |
| MEL | 1.00 | 1.00 | 0.74 | 0.69 | 0.69 | 3.16 | 1.44 |
| OAK | 1.00 | 0.89 | 0.57 | 0.48 | 0.40 | 2.55 | 1.60 |
| SKI | 0.80 | 0.64 | 0.52 | 0.49 | 0.53 | 3.35 | 2.38 |
| WEF | 1.00 | 0.98 | 0.90 | 0.78 | 0.53 | 2.35 | 1.27 |
| WHT | 1.00 | 0.92 | 0.83 | 0.69 | 0.59 | 2.74 | 1.57 |
| Grass | ABG | 0.99 | 0.99 | 0.98 | 0.77 | 0.60 | 0.58 | 1.67 |
| CEM | 0.97 | 0.92 | 0.90 | 0.80 | 0.73 | 0.51 | 0.98 |
| JAM | 0.93 | 0.78 | 0.56 | 0.47 | 0.51 | 1.28 | 1.76 |
| LAU | 0.97 | 0.98 | 0.93 | 0.83 | 0.76 | 1.41 | 0.54 |
| LIV | 1.00 | 0.99 | 0.94 | 0.90 | 0.82 | 0.32 | 1.47 |
| MAU | 1.00 | 0.94 | 0.74 | 0.53 | 0.43 | 0.58 | 1.00 |
| TAF | 1.00 | 0.93 | 0.73 | 0.36 | 0.30 | 0.69 | 0.85 |
| TRA | 0.92 | 0.78 | 0.53 | 0.38 | 0.37 | 0.69 | 1.10 |
| TSF | 1.00 | 0.79 | 0.71 | 0.65 | 0.53 | 0.22 | 0.79 |
| WEG | 0.87 | 0.90 | 0.74 | 0.55 | 0.40 | 1.03 | 0.94 |
| WES | 0.86 | 0.82 | 0.73 | 0.61 | 0.56 | 0.70 | 1.37 |
| WSC | 0.31 | 0.19 | 0.23 | 0.36 | 0.40 | 0.69 | 0.00 |
| Paved | BIM | 0.02 | 0.16 | 0.40 | 0.55 | 0.55 | N/A | N/A |
| FAI | 0.00 | 0.09 | 0.20 | 0.47 | 0.54 | N/A | N/A |
| GRA | 0.02 | 0.01 | 0.03 | 0.06 | 0.24 | N/A | N/A |
| MIC | 0.11 | 0.10 | 0.18 | 0.25 | 0.39 | N/A | N/A |
| MPR | 0.12 | 0.10 | 0.18 | 0.19 | 0.21 | N/A | N/A |
| ORG | 0.04 | 0.04 | 0.16 | 0.29 | 0.44 | N/A | N/A |
| PET | 0.17 | 0.26 | 0.48 | 0.59 | 0.68 | N/A | N/A |
| SAF | 0.07 | 0.26 | 0.50 | 0.64 | 0.70 | N/A | N/A |
| SFC | 0.34 | 0.34 | 0.43 | 0.47 | 0.58 | N/A | N/A |
| STR | 0.12 | 0.09 | 0.20 | 0.38 | 0.47 | N/A | N/A |
| USF | 0.27 | 0.26 | 0.34 | 0.46 | 0.53 | N/A | N/A |
| WIL | 0.09 | 0.22 | 0.25 | 0.26 | 0.38 | N/A | N/A |

**Supplementary Table 3.** Temperature measurements by sampling date and land cover type. Average temperature refers to the daily average across all sites, while minimum and maximum represent the extreme temperature observed at any site.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Forest** | | | **Grass** | | | **Paved** | | |
| **Avg. Temp. (ºC)** | **Min. Temp. (ºC)** | **Max. Temp. (ºC)** | **Avg. Temp. (ºC)** | **Min. Temp. (ºC)** | **Max. Temp. (ºC)** | **Avg. Temp. (ºC)** | **Min. Temp. (ºC)** | **Max. Temp. (ºC)** |
| 7.14 | 21.0 | 13.0 | 34.0 | 22.5 | 10.5 | 36.0 | 23.4 | 12.5 | 37.5 |
| 8.04 | 21.8 | 14.0 | 32.0 | 23.1 | 9.0 | 36.0 | 23.7 | 12.5 | 41.5 |
| 8.14 | 20.7 | 13.5 | 37.5 | 21.8 | 12.0 | 38.5 | 21.9 | 14.0 | 36.0 |
| 8.18 | 21.8 | 11.5 | 37.5 | 22.4 | 9.0 | 35.5 | 23.6 | 11.0 | 41.0 |
| 8.25 | 19.3 | 9.0 | 34.5 | 19.9 | 5.5 | 33.0 | 20.9 | 8.0 | 38.0 |
| 9.01 | 19.6 | 12.5 | 31.5 | 20.8 | 11.5 | 31.0 | 21.9 | 12.5 | 36.0 |
| 9.15 | 13.3 | 5.5 | 26.5 | 13.1 | 4.0 | 27.5 | 13.8 | 5.0 | 26.0 |
| 9.22 | 15.7 | 7.0 | 29.5 | 16.2 | 4.5 | 27.5 | 17.9 | 6.0 | 36.5 |
| 9.29 | 14.8 | 6.5 | 26.0 | 14.5 | 3.5 | 30.5 | 16.4 | 6.0 | 36.5 |
| Average | 18.7 | 10.3 | 32.1 | 19.4 | 7.7 | 32.8 | 20.4 | 9.7 | 36.6 |

**Supplementary Table 4.** Wind measurements by sampling date.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Avg. Wind (m/s)** | **Max. Wind (m/s)** | **North** | **East** | **South** | **West** |
| 7.14 | 2.2 | 5.7 | 71% | 0% | 5% | 24% |
| 8.04 | 2.6 | 5.7 | 67% | 5% | 19% | 10% |
| 8.14 | 3.3 | 7.2 | 4% | 0% | 57% | 39% |
| 8.18 | 4.0 | 7.7 | 88% | 8% | 0% | 4% |
| 8.25 | 2.1 | 4.6 | 83% | 0% | 6% | 11% |
| 9.01 | 2.5 | 4.6 | 21% | 0% | 54% | 25% |
| 9.15 | 3.7 | 7.2 | 52% | 3% | 41% | 3% |
| 9.22 | 5.0 | 9.3 | 97% | 0% | 0% | 3% |
| 9.29 | 2.5 | 8.2 | 44% | 0% | 50% | 6% |



**Supplementary Figure 3.** Unconstrained PCoA plots for each sampling date individually.

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**Supplementary Figure 4.** Differentially abundant genera in forest vs. paved sites.

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**Supplementary Figure 5.** Differentially abundant genera in forest vs. grass sites.

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**Supplementary Figure 6.** Differentially abundant genera in grass vs. paved sites.

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**Supplementary Figure 6** **(cont).** Differentially abundant genera in grass vs. paved sites.

** Supplementary Figure 7.** Change in a) explanatory power and b) statistical significance of the PERMANOVA model for vegetation cover with varying buffer zone radii.

**Supplementary Data Sheets 1-9**: Genera and relative abundance values for top 25 most abundant SVs shown in Figure 6.