**Supplemental Materials**

# An eagerness for conspecifics: The distribution of nests of the sunflower leafcutting bee, *Megachile pugnata* (Megachilidae), when nesting cavities are in excess

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CONTENT

**Figure S1.** Three-panel nesting shelter with positioned nest blocks. Each block contained drilled cavities lined with paper straws.

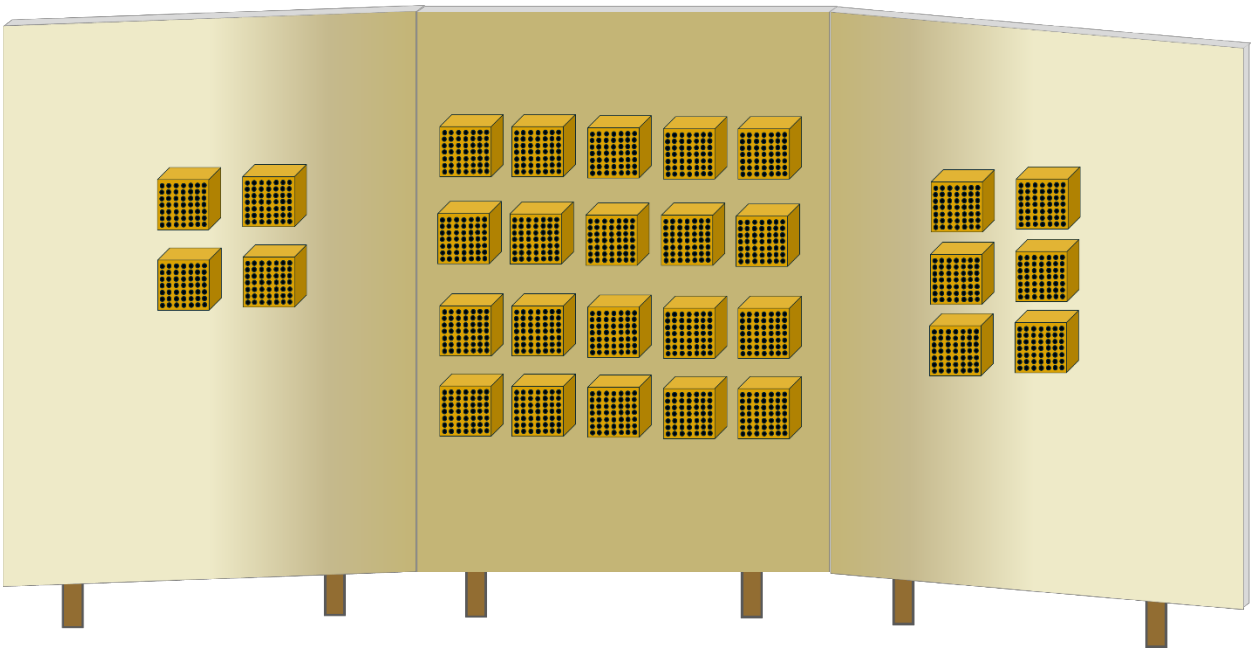

**Figure S2.** Percentage of plugs in each of 4 groups for Shelters 1 (plain) and 2 (hatched).

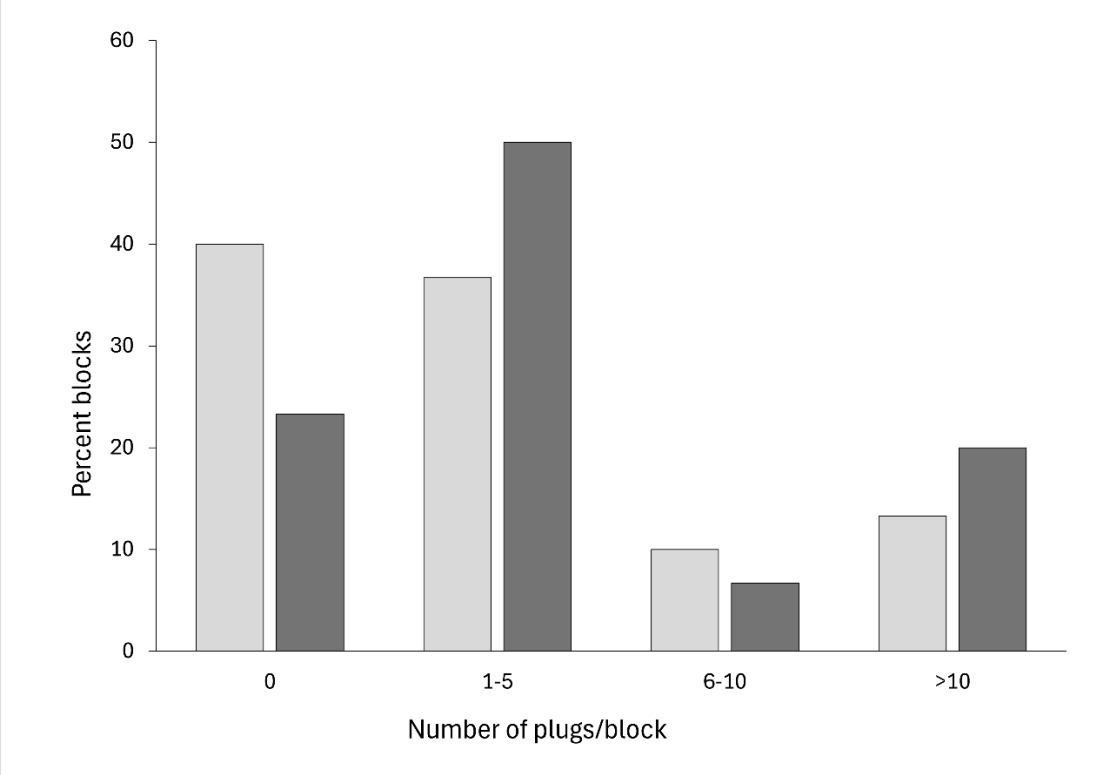

**Table S1.** Complete list of observed nearest neighbor distances (cm) for each nest block, average nearest neighbor distances from 99 randomized nest placements for the same block. Significant values in bold. For each block numbers of nests and block size.

| | Average nearest neighbor distance | | | | | Block size | | |
|---|---|---|---|---|---|---|---|---|
| BlockID | observe average/ random | | Pvalue | Aggregation index | Aggregated /Dispersed | n | r | c |
| S2_B_1_ | 1.69 | 2.942 | 0.095 | 0.573 | Aggregate | 3 | 7 | 8 |
| S2_B_1_ | 1.26 | 1.28 | 0.455 | 0.984 | Aggregate | 13 | 7 | 7 |
| S2_B_1_ | 1 | 1.98 | **0.010** | 0.505 | Aggregate | 5 | 7 | 7 |
| S2_B_2_ | 1.06 | 1.271 | **0.025** | 0.833 | Aggregate | 15 | 7 | 8 |
| S2_B_2_ | 2.21 | 2.314 | 0.450 | 0.957 | Aggregate | 4 | 7 | 7 |
| S2_B_3_ | 1.69 | 2.05 | 0.245 | 0.828 | Aggregate | 5 | 7 | 7 |
| S2_B_3_ | 1 | 3.55 | **0.045** | 0.281 | Aggregate | 2 | 7 | 6 |
| S2_B_4_ | 1.07 | 1.23 | 0.075 | 0.873 | Aggregate | 14 | 7 | 7 |
| S2_B_4_ | 1.41 | 3.10 | 0.055 | 0.456 | Aggregate | 3 | 7 | 8 |
| S2_A_1_ | 1.64 | 1.852 | 0.250 | 0.886 | Aggregate | 6 | 7 | 7 |
| S2_A_2_ | 1.41 | 2.45 | 0.080 | 0.578 | Aggregate | 4 | 7 | 8 |
| S2_A_2_ | 1.05 | 1.49 | 0.025 | 0.703 | Aggregate | 9 | 7 | 7 |
| S2_C_1_ | 1.16 | 1.282 | 0.220 | 0.909 | Aggregate | 13 | 7 | 7 |
| S2_C_2_ | 1.07 | 1.08 | 0.380 | 0.985 | Aggregate | 19 | 7 | 6 |
| S2_C_2_ | 2.33 | 2.79 | 0.315 | 0.836 | Aggregate | 3 | 7 | 7 |
| S2_C_3_ | 1.07 | 1.132 | 0.135 | 0.944 | Aggregate | 19 | 7 | 7 |
| S1_B_1_ | 1.56 | 1.71 | 0.330 | 0.913 | Aggregate | 8 | 7 | 8 |
| S1_B_1_ | 6 | 3.71 | 0.890 | 1.616 | Disperse | 2 | 7 | 7 |
| S1_B_1_ | 1.15 | 1.11 | 0.760 | 1.031 | Disperse | 22 | 7 | 8 |
| S1_B_1_ | 5 | 3.65 | 0.055 | 1.369 | Disperse | 2 | 7 | 7 |
| S1_B_1_ | 1.37 | 1.44 | 0.360 | 0.948 | Aggregate | 10 | 7 | 7 |
| S1_B_2_ | 2.04 | 2.533 | 0.310 | 0.806 | Aggregate | 3 | 7 | 7 |
| S1_B_3_ | 6.32 | 4.112 | 0.855 | 1.538 | Disperse | 2 | 7 | 7 |
| S1_B_3_ | 1 | 2.584 | **0.020** | 0.387 | Aggregate | 3 | 7 | 7 |
| S1_B_4_ | 1.35 | 1.30 | 0.640 | 1.035 | Disperse | 14 | 7 | 8 |
| S1_B_4_ | 2.52 | 2.26 | 0.200 | 1.116 | Disperse | 4 | 7 | 6 |
| S1_A_1_ | 1.28 | 1.16 | 0.990 | 1.107 | Disperse | 18 | 7 | 7 |
| S1_A_1_ | 1.71 | 1.60 | 0.660 | 1.067 | Disperse | 8 | 7 | 7 |
| S1_A_2_ | 2.12 | 2.572 | 0.330 | 0.824 | Aggregate | 4 | 7 | 8 |
| S1_C_1_ | 1 | 3.65 | **0.045** | 0.274 | Aggregate | 2 | 7 | 7 |
| S1_C_1_ | 1.09 | 1.14 | 0.260 | 0.958 | Aggregate | 18 | 7 | 7 |
| S1_C_3_ | 5 | 3.87 | 0.745 | 1.291 | Disperse | 2 | 7 | 7 |
| S1_C_3_ | 2.87 | 2.36 | 0.860 | 1.216 | Disperse | 4 | 7 | 7 |

Randomizations are for n randomly placed nests within block of r x c holes, n – number of nests in the observed block and r and c are the numbers of available holes in a row and column for that block. P-values based on rank of the observed near-neighbor distance with 99 randomizations. Aggregation index = ratio of observed / average nearest neighbor distances, where values <1 are aggregated and >1 dispersed.

Supplement 2 Notes on NNI.

The nearest neighbor index (NNI) is a ratio that measures how clustered a set of points are. It's calculated by dividing the observed mean distance between points by the expected mean distance between points in a random distribution.

Formula

= /

is the observed mean distance between neighbors

is the expected mean distance between neighbors in a random distribution

What it means

- If the NNI is less than 1, the points are clustered
- If the NNI is greater than 1, the points are spread out

Why it's useful

- The NNI can be used to compare the distribution of different types of things, like residential quarters and villas
- The NNI can be used to determine if a pattern is random or clustered