

Figure S1. Number of cut blades and ant flow rates dependent on the treatment sequence (long detour first or short detour first). **A**) Colonies which first faced the long detour initially displayed similar cutting rates when confronted with the short detour at least 5 days later, which then increased to twice as much cut blades in the long detour after 48 hours, although the difference was not significant. Sample sizes from left to right: $n = 9$, $n = 9$, the rest $n = 8$ each. **B**) As in (B), colonies which first faced the long detour were more likely to also traverse the obstacle, although significantly more ants traversed the obstacle in the long detour irrespective of treatment sequence (long first: ratio = .47, $p = 0.0267$; short first: ratio = 0.13, $p < 0.0001$). Sample sizes from left to right: $n = 9$, $n = 9$, $n = 9$, the rest $n = 8$ each.

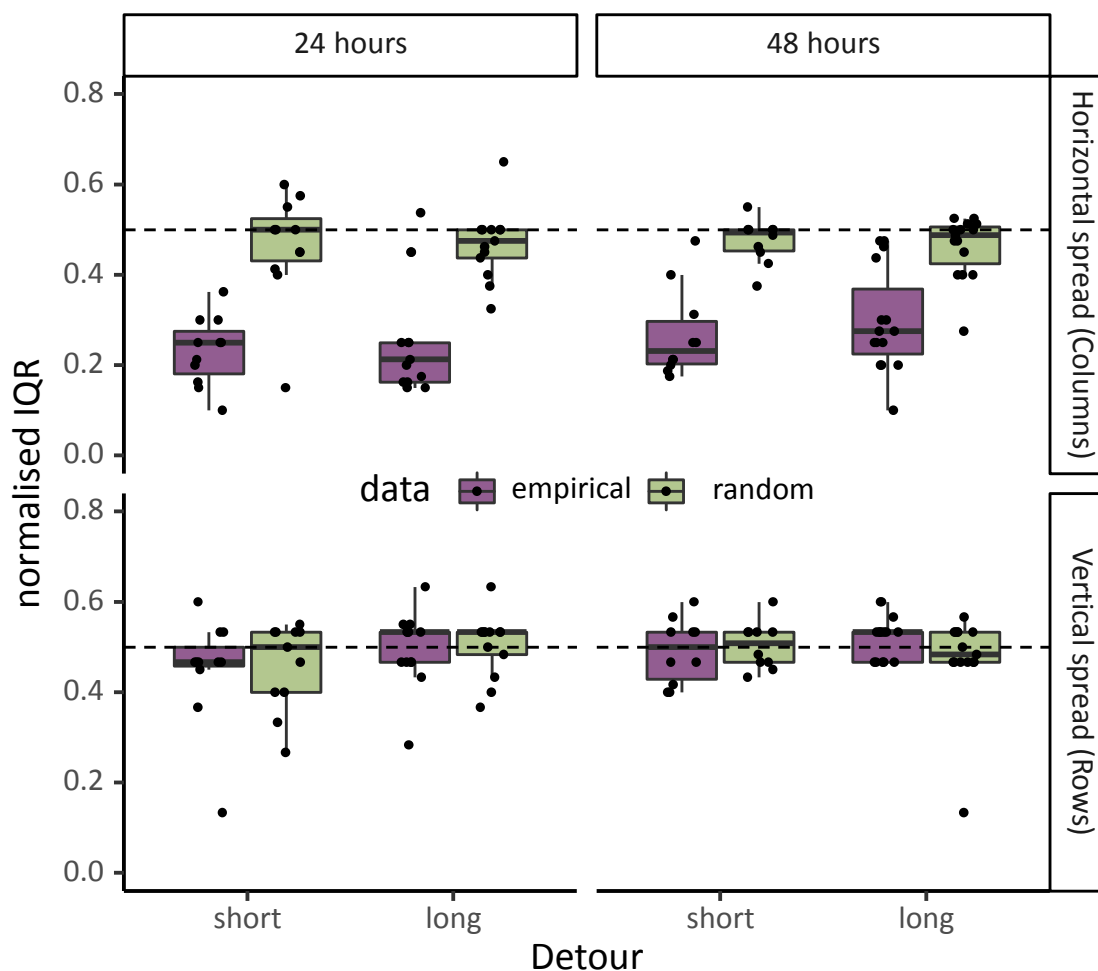


Figure S2. Normalised interquartile range (IQR) obtained from the experiment (empirical) or from randomly generated cut patterns (random) for columns (horizontal spread of cut blades) and rows (vertical spread) after 24 and 48 hours in the short and long detour treatment. A normalised IQR of 0.5 (dotted line) means that 50% of blades were cut in 50% of rows/columns, i.e. were cut randomly. The lower the IQR, the less spread was found. Empirical column IQRs were significantly lower than random IQRs ($\chi^2 = 136.79$, $p < 0.0001$), while detour length and duration had no effect ($\chi^2 = 1.6$, $p = 0.2059$; $\chi^2 = 1.94$, $p = 0.1633$, respectively). Empirical row IQRs were not significantly different from random IQRs ($\chi^2 = 0.25$, $p = 0.6172$), nor had detour length or duration a significant effect ($\chi^2 = 2.22$, $p = 0.1362$; $\chi^2 = 2.33$, $p = 0.1272$, respectively). The IQR data thus demonstrate that the cutting pattern of the ants formed narrow, vertically oriented trails from the entrance to the exit of the obstacle. Sample sizes (identical between empirical and random, so only one given) clockwise from top left: $n = 11$, $n = 13$; top right: $n = 10$, $n = 15$; bottom right: $n = 10$, $n = 15$; bottom left: $n = 11$, $n = 13$.

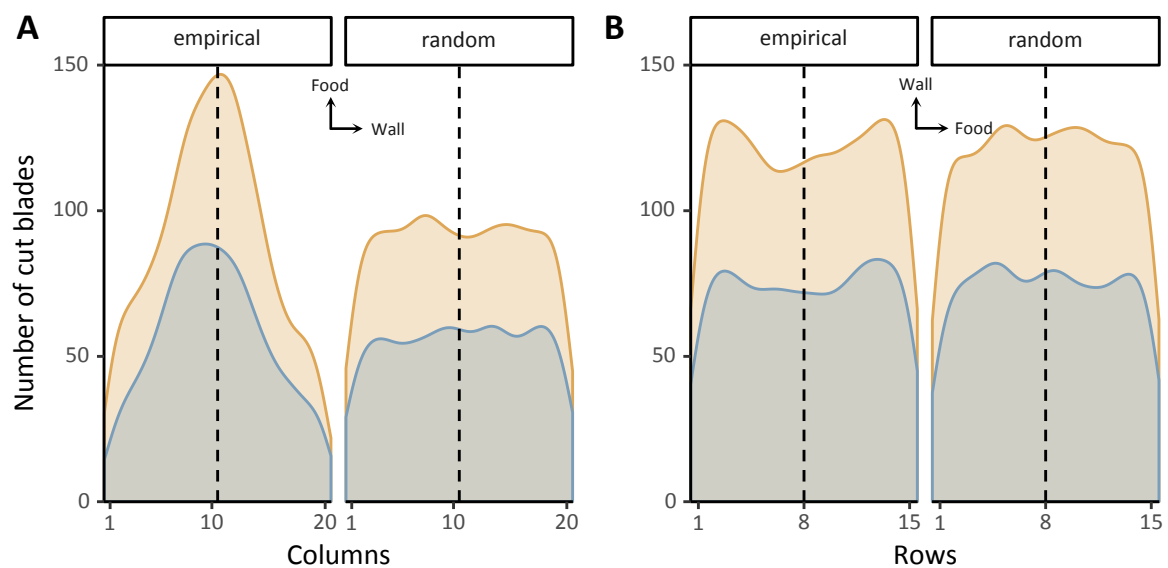


Figure S3. Distribution of cut paper blades. The smaller blue curves correspond to the short detour treatment, the larger brown curves to the long detour treatment. **A)** Ants cut more blades along the centre of the obstacle than on its periphery on the vertical axis from food to nest. This is not the case in simulated data based on random cutting. **B)** Ants tended to cut more blades at the beginning and end of the obstacles, although the difference is subtle. Again, simulated data based on random cutting was evenly distributed. The vertical dotted line represents the centre of the obstacle from wall to wall (A) or food to nest (B).