Supplemental Information

Homing Ants Get Confused

When Nest Cues Are Also Route Cues
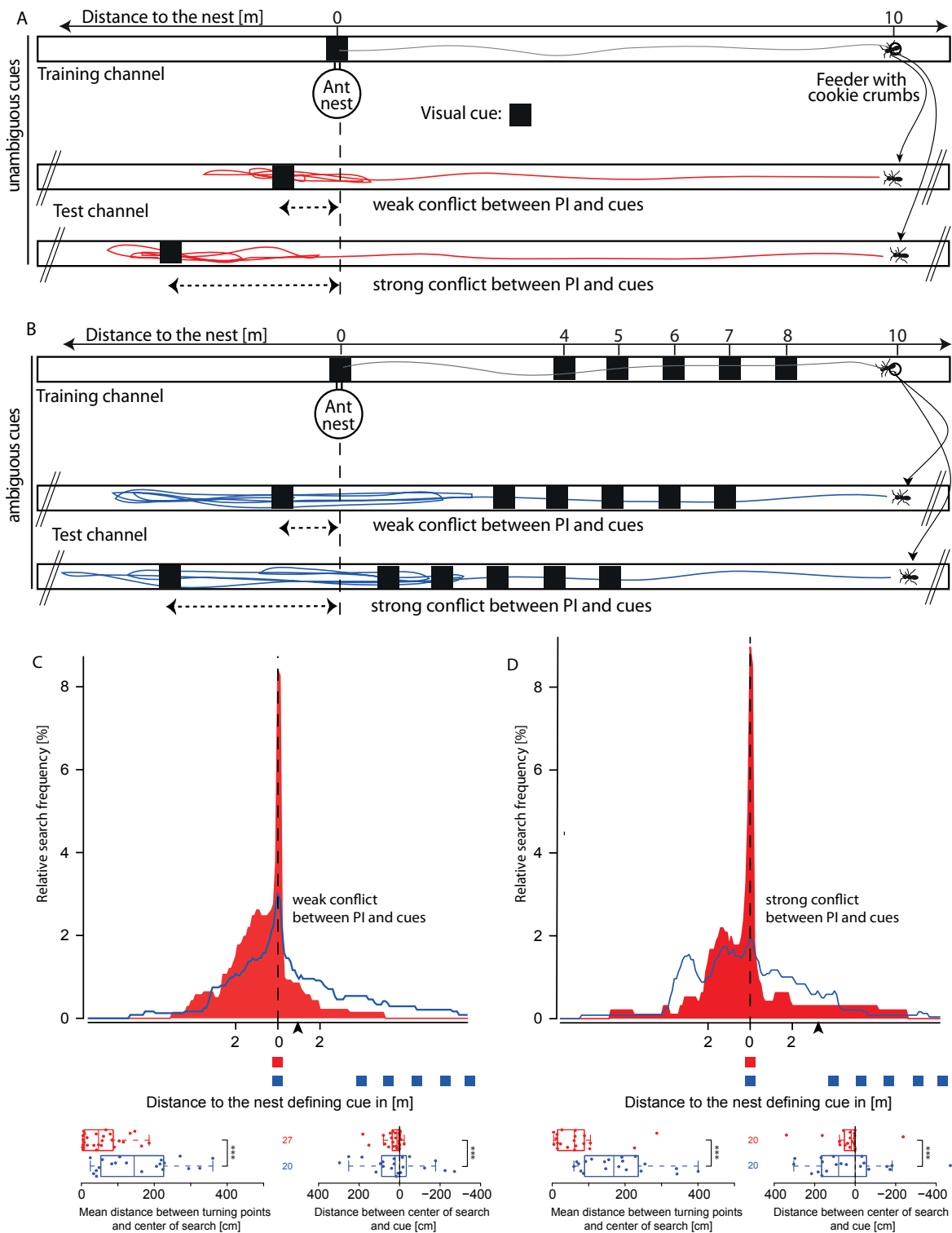
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Figure S1. Ants rely more on unambiguous cues. Related to Figure 2. A+B. Alternative training and test paradigm for ambiguous cues (A) and unambiguous cues (B). Black squares, visual cues. C+D. Search density plots based on the first six turning points (see Figure 1B) after training with single nest cue (red) or nest plus route cues (blue), when cues were in weak (C) or strong (D) conflict with path integrator; dashed line indicates position of nest cue in test channel; black arrow head indicates nest as defined by path integrator. C_1+D_1 Box-plots of the quantified search densities. Each dot depicts the average distances between the first six turning points and the center of search (i.e. the mean of these six turning points) of a

single ant (see Figure 1B). Lower inset figure: Box-plots of the quantified search accuracy (i.e. the distance between average of the first six turning points and the cue). Negative values point towards feeder direction. Box, upper and lower quartile; line, median value of all tested ants; whiskers, minimum and maximum values excluding outliers (i.e. values lying one and a half times the length of the box from either end of the box); numbers beside boxplots depict sample sizes. ***, P<0.001 (Kruskal Wallis test).
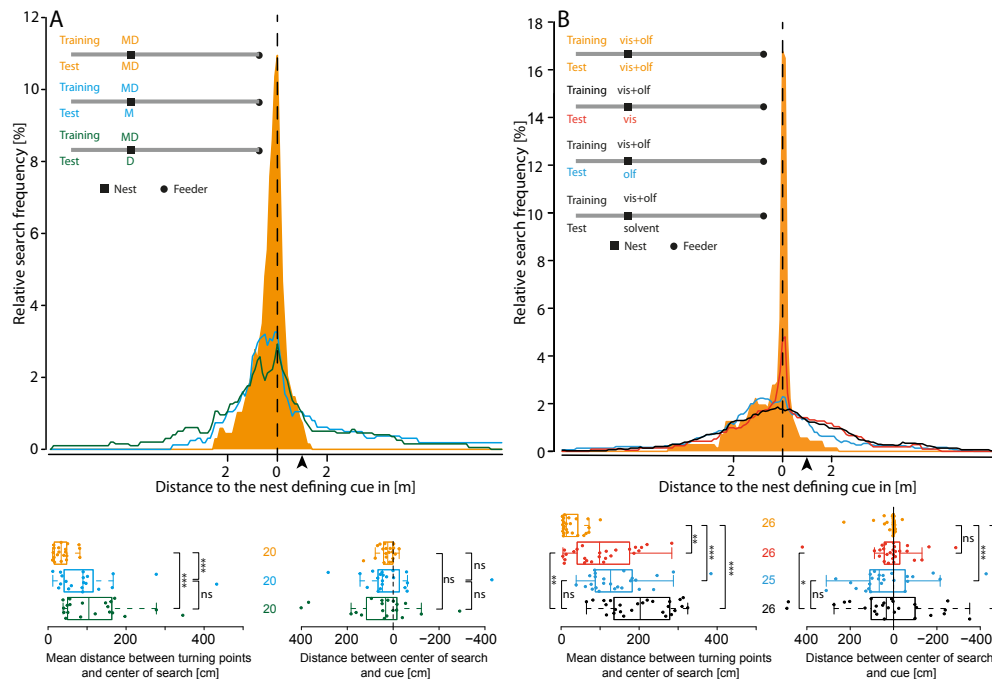

Figure S2 Ants extract the reliable part of a compound cue. Related to Figure 3. A and B. Search patterns of ants that were trained with a combined nest cue consisting either of a binary blend (A) of methyl salycilate (M) and decanal (D) or with a bimodal visual olfactory cue (B) and were tested either with the compound cue or its individual components. Search density plots based on the first six turning points (see Figure 1B). Dashed line, position of nest cue; position of feeder at 10m; arrowhead, position of nest defined by path integrator. Inset figures: Box plots of the quantified search densities. Each dot depicts the average distances between the first six turning points and the center of search (i.e. the mean of these six turning points) (see Figure 1B). Box, upper and lower quartile; line, median value of all tested ants; whiskers, minimum and maximum values excluding outliers (i.e. values lying one and a half times the length of the box from either end of the box). Numbers beside boxplots depict sample sizes. *, P<0.05; **, P<0.01 (Kruskal Wallis test with Dunn's posthoc test). C+D. Search accuracy of ants that were trained and tested as described in Figure 3 of the manuscript. Center of search depicts the mean of the first six turning points. Negative values point towards feeder direction. Box, upper and lower quartile; line, median value of all tested ants; whiskers, minimum and maximum values excluding outliers (i.e. values lying one and a half times the length of the box from either end of the box). Numbers beside boxplots depict sample sizes.