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Appendix D from P. Nouvellet et al., "Fundamental Insights into the Random Movement of Animals from a Single Distance-Related Statistic"

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Experimental Setup

In this appendix, we provide a description of the experimental setup. Pharaoh ants *Monomorium pharaonis* were kept in a 15 cm × 30 cm plastic container containing a 7 cm × 7 cm wooden nest box, a constant water supply, and a food source (ox liver with honey). Queens, larvae, and pupae naturally established themselves in the nest box, and workers exhibited activity both inside and outside the nest box (e.g., looking after young or foraging for food). Temperature and photoperiod were held constant at 26°C and 12L : 12D.

Before an experiment, the ants were deprived of food for 2 days, but the water supply was not removed. At time $t = 0$ min, ants were given access, via a bridge, to a new clean platform (the arena) of size 280 cm × 400 cm. Ants were free to travel between the arena and the nest. The application of a layer of fluon (fluon PTFE, Blades Biological) on the upper part of the walls of the container prevented ants from climbing above this layer; thus, the overall system was closed to ant escape. The experiment lasted 70 min. For practical reasons (file size) and because the shape of $\sigma^2(t)$ changed slowly during the course of the experiment, the 70-min experiment was sequenced in 35 films, each of which were 2 min in length. For each of those 2-min sequences we extracted a single 30-s set of ant paths that were localized in the central 80% of the arena.