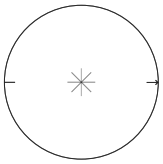
CT Main Sampling Protocol

The goal is to record standardized bait transport trials in ant species with **known cooperative transport abilities**. Ants can be sampled both in the field or in laboratory colonies.

Preparation

Print 5 arena templates for your ant species. Templates are on the microSD card in the "printables" folder.



Glue the arenas onto a rigid, smooth, unperforated cardboard surface.

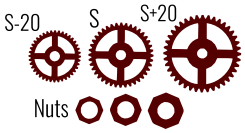
Make sure you have enough of the preferred food(s) for your ant species. If you don't know your species preferred food, try ham, cheese, cat food, tuna, or egg.

You will need a camera, tripod, and shading structure.

The remaining materials are in the CT KIT B

Cogwheels

Inside the CT KIT A you will find 3D-printed cogwheels of 3 sizes:
→ **S** = Scaled cogwheel to your target species, and two backups:
→ **S–20** = 20% smaller relative to S,
→ **S+20** = 20% larger relative to S.
You will also find 3-D printed nuts to adjust weight if necessary. Nuts are attachable to the cogwheel axis.



Preliminary test: preparation

Before running the experiment, do a small preliminary test using:
1 × S cogwheel,
1 × S–20, and
1 × S+20
A few 3D-printed nuts.
Scent all of these with the species' preferred food for 2–5h inside a Ziploc bag.

Preliminary test: selecting the correct cog wheel size

Place an arena template next to a nest entrance at a distance of one arena diameter. Place a 1cm² piece of food pinned on the arena X mark, wait 5 minutes until recruitment is good, and then replace the food item with the **S cogwheel**. Follow the decision tree.

Decision tree

If several ants surround the S cog and successfully perform cooperative transport:
→ Then **use S cogwheel**.
If one ant or only a few ants can move S easily:
→ Add extra weight to S using the 3D-printed nuts and repeat the test.
→ If ants still move S + nuts easily, **use S+20**.
If ants cannot move S:
→ Then **use S–20**.
If ants do not recruit to any cogwheel at all:
→ Improve cogwheel scenting or try a different preferred food, then repeat the preliminary test.

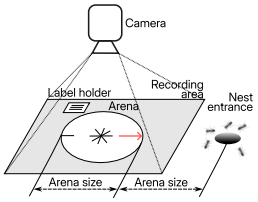
If possible, repeat these tests in 3 nest entrances. Do not record these tests.

Experiment: scenting

Place the chosen cogwheel size inside Ziploc bags with the species' preferred food. Keep the cogwheels in direct contact with the food.
Seal the bags and leave them for at least 2 – 5 h; ideally, leave them overnight (12–24 h) in the fridge.

Experiment: recording set-up

Place the arena at a distance of approximately one arena diameter (see picture) and directly under the recording setup.



The arena arrow should point towards the nest entrance.
Make sure that the arena, metadata label, and label holder are visible in the recording area.

Before each trial, fill in the metadata label. Instructions are inside the label box in the CT KIT.

Experiment: run each trial

Each trial has two phases:
1. **Recruitment phase**: pin a piece of preferred food (~1cm²) at the X mark on the arena for 5 min. If ants recruit, continue to the transport phase; otherwise, try another nest entrance. Do not record this phase.
2. **Transport phase**: remove the pinned food and place the scented cogwheel and start recording immediately. Record for 10 min, or until the cogwheel is removed from the circular arena.
Video settings: 1080p/30fps as the standard setting. Use 4K/30 fps when feasible.

→ Avoid using cogwheels that are still wet with food juices. Let them dry for 5 min after removal from the Ziploc bag.
→ Rotate between the chosen cogwheel and arenas across consecutive trials.

Run a total of 30 trials. Both successful and unsuccessful transport bouts count as trials.
If possible, distribute the trials
→ across 5 nest entrances and
→ across 3–5 days.

Experiment: finalization

Save the videos on the micro-SD card using the following format:
Genus_species_Trial**Number**
(Example: Lasius_niger_T03.mp4)

Once you have saved the 30 trial videos, send us only the microSD cards, stored inside its protective box. Shipping costs will be covered.

Return address:
Dr. Andrés Devegili
Freie Universität Berlin
Albrecht-Thaer-Weg 6
14195 Berlin
Germany

Please keep a local video backup until we confirm the microSD arrived safely.

For any issues, contact me via email (**andres.devegili@fu-berlin.de**) or WhatsApp (**+54 9 351 5320340**).

Enjoy the recording!