

## BEEGENETICS

### Sampling protocol: workers

#### Material provided

- Numbered sample tubes (containing a buffer solution)
- Sampling clamp: 1 different clamp per colony
- Sampling Spreadsheet (digital)

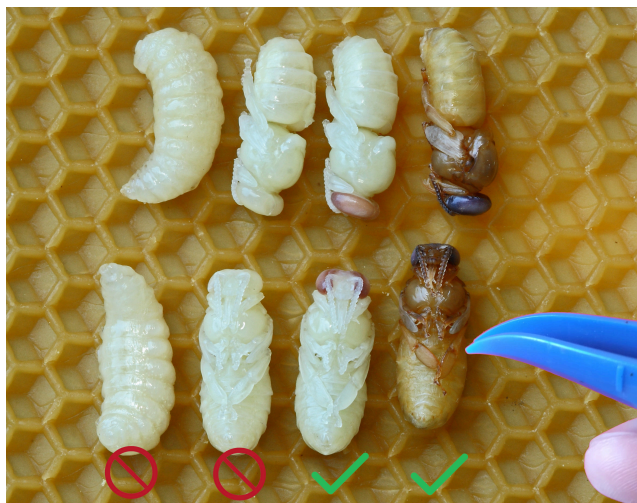
#### Method

For each colony, a sample is taken from a single antenna of **50 worker nymphs**.

Nymphs are used rather than adults to be certain that they come from the queen of the colony. Nevertheless, it is possible to use indoor bees (nannies) if you are sure they come from the colony to be analyzed.

To facilitate the collection of nymphs, you can use a magnifying glass, magnifying glasses and a headlamp or another light source.

1. Remove a frame containing operculated brood from the colony (of workers) and **eliminate all bees by brushing** or gently shaking them.
2. Stand on a flat surface, away from the hive, and position the frame so that you can easily access the cells.
3. Using the handle of the clamp, carefully **remove the operculum from a cell** and inspect the nymph. Perform the samples only on nymphs **with colored eyes** (pink, purple or darker).



*Nymphs at the correct stage of development on the right*



4. Gently grab one of the antennas at the base with the tweezers and pull gently with a slight twisting motion. If the antenna does not remove cleanly, take the other antenna or switch to another cell.



*Carefully take an antenna from a female using pliers*

5. Place the antenna in the tube. You can use another **clean** tool to detach the antenna from the clamp.
6. Do not put any other part of the nymph in the tube. There is no problem if the antenna has broken into several parts.
7. Repeat steps 3 to 7 until you get **50 antennas** (1 per nymph). Close the tube carefully.
8. Tap the bottom of the closed tube on a hard surface to thoroughly immerse the antennas in the buffer solution.
9. Replace the frame in the hive. The bees will repair open cells and remove damaged nymphs.
10. Fill out the sample information sheet for this colony.
11. Let the tube rest **in the refrigerator for 6 to 8 hours**, so that the antennas are well saturated with the buffer solution, before sending.

**Do not freeze!**



**Important:** if you take several colonies, **use a different clamp for each hive** to avoid cross-contamination.

**Note:** *The return of the clamps is optional. Nevertheless, if they are returned, they can be cleaned and reused, thus limiting the use of single-use plastic*

