The Waggle dance

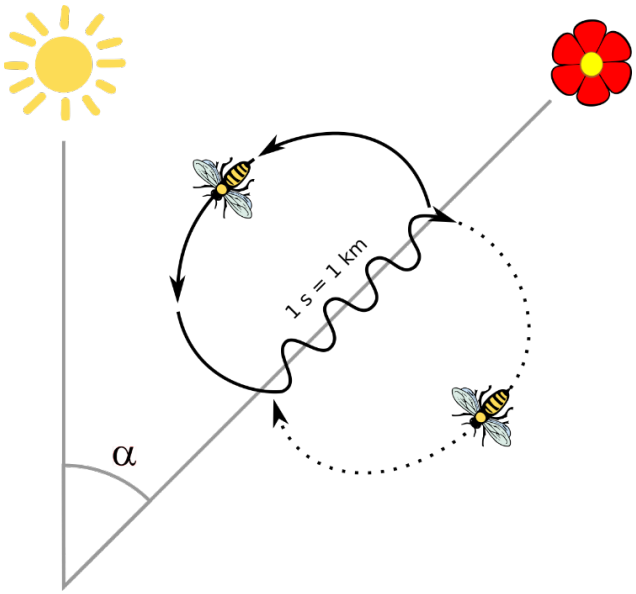
The Waggle dance

Foraging bees are crucial members of any honeybee colony. When foraging, worker honeybees fly out of the nest or hive, and seek flowers to collect nectar and pollen within a foraging range that could extend several kilometres from the nest or hive.

Upon finding a suitable source of nectar, they gather it, return and perform a waggle dance, or 'figure-eight dance', to tell other colony members about the location of the food they have brought back home. It is a type of round dance, with intermittent waggles of the tail and 'buzzing' of the wings which takes place inside the nest, on top of the comb.

The movements

Each waggle dance consists of a series of dance circuits including a waggle run and a return run, which is a miniaturised re-enactment of the bee's recent trip over the countryside. After running a certain distance, the bee turns to her right or left and comes back around to the starting point, making a circular loop. She runs again in the same direction and turns to the opposite side this time, coming back around to the original position. The bee keeps making this figure-eight shaped dance for a few minutes, so that other bees get the information.



The duration of the waggle run is directly proportional to the length of the outward journey, and both duration and rate of waggle-run production increase with rising food-source profitability. To motivate other bees to find the correct flower patch, the dancing bee regurgitates a sample of the nectar stored in her stomach and shares it with them. On average, one second of the total dance represents about 1km of flight.

The sun

Bees have an internal sun compass (or internal clock) and use solar navigation in the dance. The angle of the waggle run, relative to 'straight up' on the vertical comb, represents the angle of the outward journey relative to the direction of the sun.

Bees learn the sun's position during their initial orientation flights, and they use this knowledge to adjust their dance as the sun moves throughout the day. In addition, bees can locate the sun based on the pattern of light polarisation.

Research suggests individual honeybees may also perform a waggle dance when they wish to be cleaned by other bees, or they want to communicate the location of water or of a potential new nest site.

Adapted from: *https://www.buzzaboutbees.net/Honey-Bee-Dance.html*

comb: *favo*
compass: *bussola*
to gather: *raccogliere*
patch: *zona*
re-enactment: *riproduzione*
to retrieve: *recuperare*
scattering: *dispersione*

The Green Planet - Copyright © EDISCO Editrice - Vietata la vendita e la diffusione

1 Decide if the sentences are true or false. Correct the false ones.

		T	F
1.	Bees communicate the flower location using special dances outside the hive.	☐	☐
2.	'Figure-eight dance' indicates the number of bees performing the dance.	☐	☐
3.	The waggle dance tells the watching bees only the distance of the flower away from the hive.	☐	☐
4.	The angle at which the bee is waggling and the duration of time she spends doing it tells bees where to go to find food.	☐	☐
5.	The dancing bee shares a sample of nectar she collected with her nestmates.	☐	☐
6.	A waggle dance helps to locate just a source of food.	☐	☐
7.	When a bee does a waggle dance, she moves in a certain way to show other bees where to find food.	☐	☐
8.	The direction of the food is shown by the angle the bee moves during the "waggle run," or straight part of the dance.	☐	☐

2 Complete the text with the words given below.

atmosphere • compass • compensate • function • knowledge • insects • polarization • sun

Compass Mechanisms

For many insects, the **1.** ..... plays a major role in providing compass information, as it is evident from the waggle dance of honeybees. To use the sun as a compass, these **2.** ..... must solve two fundamental issues. Firstly, the sun moves during the day, and secondly, the sun is often hidden by clouds. Insects can **3.** ..... for the daily movement of the sun by learning its position relative to the time of day. Insects have some innate **4.** ..... of the sun's movements. Combining this knowledge with observed sun positions relative to stable environmental landmarks allows an insect to learn an accurate **5.** ..... describing how the sun moves throughout the day.

When the sun is obscured by clouds, but portions of blue sky remain, honeybees are able to derive compass information from the **6.** ..... patterns created by the scattering of sunlight in the upper **7.** ..... The orientation of polarised light forms concentric circles around the sun's position, and if an insect knows the time of day, she can retrieve **8.** ..... information from any patch of blue sky. Honeybees are, therefore, able to use the sun as a compass even when it is not in view.

Adapted from: *https://www.sciencedirect.com/topics/veterinary-science-and-veterinary-medicine/waggle-dance*

The Green Planet - Copyright © EDISCO Editrice - Vietata la vendita e la diffusione