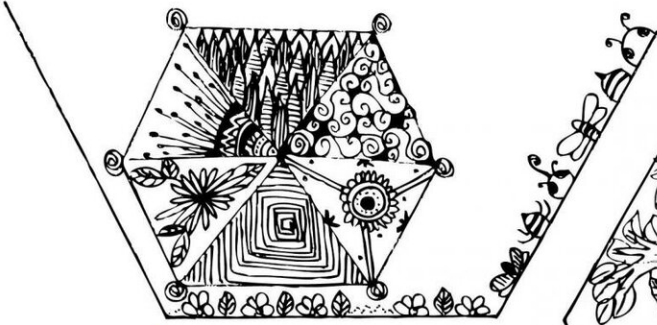


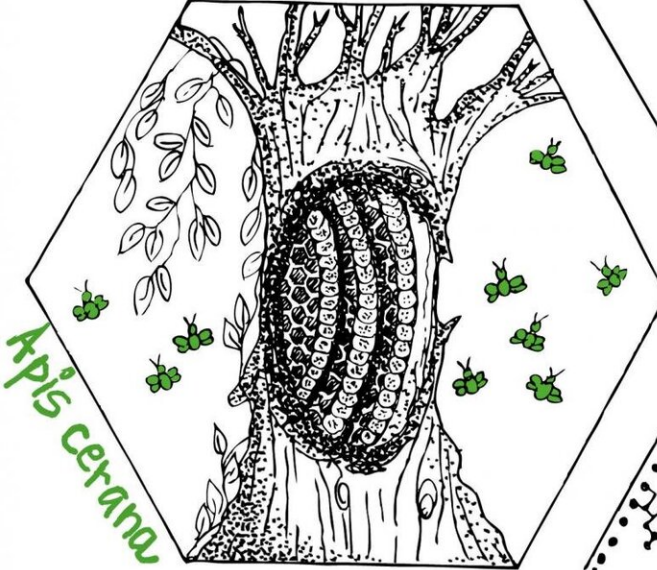
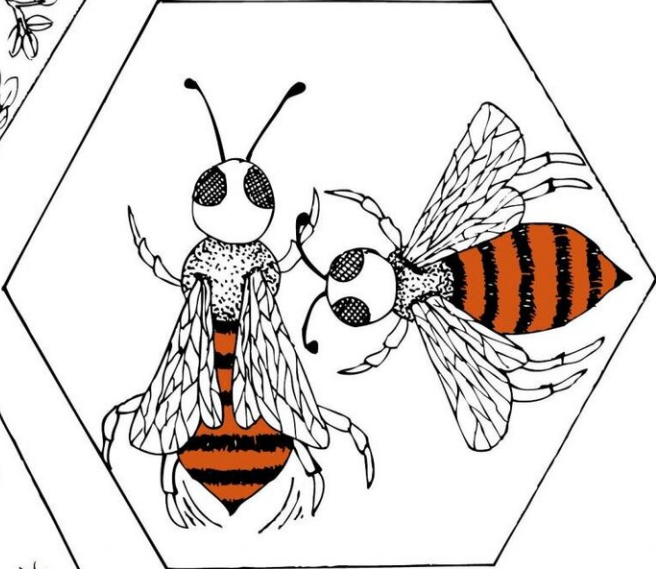
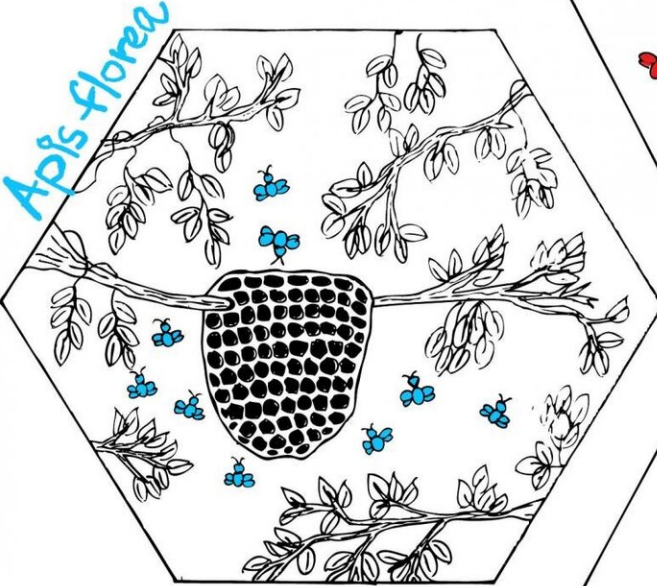
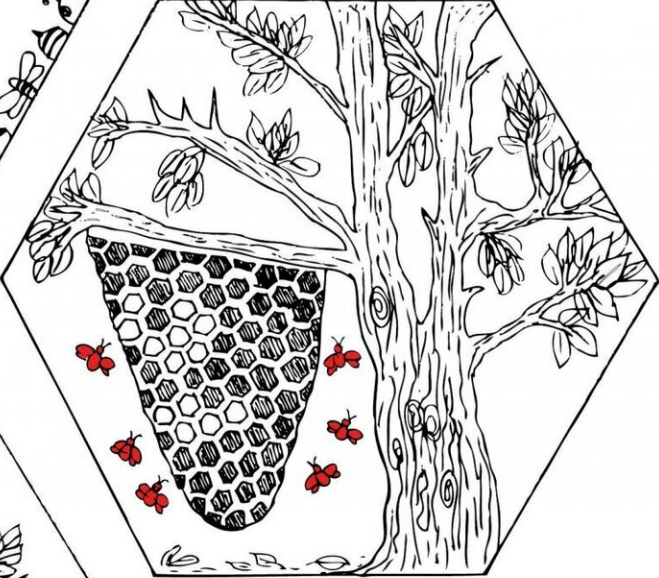
# **Similarities in dance follower behavior across honey bee species suggest a conserved mechanism of dance communication**

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*Apis dorsata*



Sahana Sitaraman

Similarities in dance follower behavior across honey bee species suggest a conserved mechanism of dance communication. Credit: Sahan Sitaraman

It is early in the morning. Ebi and his colleagues try not to twitch as they stare intently at a rectangular box filled with sugary treats. These aren't for them, but for the honey bees that they study. The tiny buzzers toggle between the sugar 'feeder' and the hive, which are a few meters apart. Interestingly, the bees that visit the feeder aren't secretive about this new found food source. They graciously advertise its location to their nest mates and over time more bees are seen buzzing to the feeder.

This behavior has been observed and researched for decades; but still, the question of how bees communicate within the noisy quarters of a beehive continues to sting scientists with curiosity.

"Honey bees are unique in that they not only alert their nest mates, but have also evolved a symbolic communication in the form of a dance—a waggle dance," explains Axel Brockmann, whose lab is trying to untangle this complex social behavior in bees.

The waggle routine is a dance move that looks like the number eight. Unpretentious on the outside, the dance is packed with detailed information about where to find food; both the distance and direction of the food source from the hive. Every [honey](#) bee [species](#) appears to have a customized version of this dance based on which sensory modality it uses to convey the message—visual, olfactory or auditory. While the 'dancers' and the dance itself have been extensively investigated, little is understood about how the bee audience perceives this message.

In the lab's recent paper published in the journal *Animal Behavior*, Axel's group shows that in spite of the diverse signals in the waggle dance

observed among honey bee species, the behavior of responder bees are very much alike. In fact, even the vantage points that they choose to observe the dance are comparable. The researchers suggest that message within the [waggle dance](#) is interpreted by very similar mechanisms across species.

Among the five honey bee species found in India, three have made the serene GKVK and NCBS campus (Bangalore) their home. They are *Apis florea*, *Apis dorsata* and *Apis cerana*. While the former two species build hives on open tree branches, *Apis cerana* hides away within the dark cavities of trees. This fundamental difference in nesting location influences the dance stage, the light that shines on the dancers and ultimately the dance message. Hence the team decided to use this as a paradigm to explore the behavior of responders in the three species.

Before I tell you how the researchers went about finding the answers—let me ask you a question—What is the first thing you would ask for while booking movie tickets?

Most of us would go for seats with the best view, wouldn't we? Well, if a movie viewing experience calls for the finest seat, why wouldn't bees want to take the best spot for a performance that tips them off about a sumptuous meal? This is exactly what the team looked for.

Imagine the dancer bee wagging in a Lilliputian amphitheater. The responders were found to prefer a nice side view, almost perpendicular to the dancer. The authors explain that this is likely a perspective that is convenient to view the dancer's wagging abdomen that holds some crucial clues.

This preference for a particular vantage point and the responder bees' overall behavior were quite similar across all the three species and seemed to follow the footsteps of the textbook species—*Apis mellifera*.

The only parameter that was different among the responder bees of the three species was the number of followers that actually observed the dancer. It turns out that *Apis florea* and *Apis dorsata* had more dance followers than *Apis cerana*.

So what does all this mean?

"Our findings suggest that the mechanisms of distance and direction communication are the same in all the honey bee species and this information is likely transmitted via antennal contacts," explains Ebi. He feels that the other sensory modalities such as the visual and auditory signals generated by the dancer could assist in grabbing the attention of the responders—very much like how humans stress words or gesture while talking.

In the larger context, is there anything other than human curiosity that entices researchers to study [social behavior](#) in bees, I asked Axel.

"Absolutely! Honey bees are nature's premium pollinators, yet research on the biology and behavior of Asian honey bees is sparse. The current study is part of a larger initiative. We hope that this project will boost our understanding of honey bees, which can in turn be used to make significant strides towards their conservation," he says.

So, now we know why the great honey bee [dance](#) creates such a buzz!

**More information:** Ebi Antony George et al, Similarities in dance follower behaviour across honey bee species suggest a conserved mechanism of dance communication, *Animal Behaviour* (2020). [DOI: 10.1016/j.anbehav.2020.09.011](https://doi.org/10.1016/j.anbehav.2020.09.011)

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