Do ants perceive the content of the trophallactic fluid that they receive during trophallaxis?

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How does communication work in communities? How can communities take common decisions? We address these questions with social insects, by understanding how ants sense information transmitted in the colony. Among the many means of communication of social insects, trophallaxis plays an essential role in the transmission of food and information through the whole colony. In this study, we investigated whether ants perceive important compounds that nestmates diffuse through trophallaxis. In other words, if ants can read their nestmates' votes before passing them on. Do the individuals need to know everything or is it sometimes advantageous to be blind toward some information? In addition, we studied whether ants carrying out different roles within the colony – foraging or nursing – are able to perceive different compounds within the trophallactic fluid. Different roles might lead to different needs of sensation: foragers, that collect food, might be more sensitive to food-related compounds, while nurses, that feed larvae, might be more aware of the growth regulators. By giving ants the choice between two food sources, we explored the perception of the trophallactic fluid and in particular of juvenile hormone. We found that both foragers and nurses avoided a mix of trophallactic fluid collected from various colonies and could not perceive the presence of juvenile hormone. These experiments shed light on sensory differences between workers and how they impact communication among nestmates and decision-making inside a colony.

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