

Temperature preferendum of single, young honeybees

S. HAHSHOLD, R. PLODER, G. RADSPIELER, T. SCHMICKL & K. CRAILSHEIM

It is known from literature that young honeybees have a temperature preferendum near 36°C and that also the mean temperature in the brood area is 36 °C. Young honeybees show thermotaxis and they locate themselves at their preferred temperature area.

We conducted experiments to investigate the temperature preferendum of single, young honeybees in a temperature organ. Similar experiments were conducted by HERAN (1951) with groups of bees. What Heran never investigated in this experimental set-up was the behavior and temperature preferendum of single bees. In previous experiments in a circular arena we found a strong, social component in this thermotactic behaviour. To exclude the social influence in this experiment we made trials with single bees (n=98). Only a few single, young honeybees are able to find the temperature optimum when introduced in a flat gradient and a round arena, so we wanted to know how they behave in a rather steep gradient, what is given in a temperature organ (15-50 °C). To investigate this we introduced bees in a temperature organ and recorded their position every minute. Experiments lasted for 30 minutes. The mean temperature of the preferendum of young, single bees in our experiments was at 33 °C, in contrast to Heran where the mean temperature for groups of bees was at 36 °C. The median temperature preferendum of the single bees was 34,5 °C. The maximum temperature where bees were located was at 49,9 °C and the minimum at 12,6 °C. 1. and 3. Quartiles are at 29,8 and 37,25 °C, which means that 50% of the bees were located between 29,8 and 37,25 °C. We also examined the duration until the bees found their preferred temperature and stayed there. Results show that it takes only little time until the bees find their temperature preferendum (about 4 minutes). Once they found it they did not leave the area until the end of the experiment. We could experimentally show that single, young honeybees in a temperature organ show a different thermotactic behaviour than groups of bees in a temperature organ.

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HERAN (1951): Untersuchungen über den Temperatursinn der Honigbiene (*Apis mellifica*) unter besonderer Berücksichtigung der Wahrnehmung strahlender Wärme. — Zeitschrift für vergleichende Physiologie **34** (1952): 179-206.

Anschrift der Verfasser: Mag.^a Sibylle HAHSHOLD, R. PLODER, G. RADSPIELER
Ass.-Prof. Mag. Dr. Thomas SCHMICKL
Univ.-Prof. Dr. Karl CRAILSHEIM
Forschungsgruppe Stoffwechsel, Verhalten und Modelling
Institut für Zoologie, Karl-Franzens-Universität Graz
Universitätsplatz 2, 8010 Graz, Austria
E-Mail: sibylle.hahshold@uni-graz.at

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Autor(en)/Author(s): Hahshold Sibylle, Ploder R., Radspieler Gerald, Schmickl Thomas, Crailsheim Karl

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