



How do the honeybees learn waggle dance?

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Honeybees communicate in the hive to share foraging information and to recruit hive mates to visit profitable flowers. The waggle dance allows the communication of spatial information about food sources (von Frisch 1965; Mautz 1971; Bozic and Valentincic 1991; Judd, 1995). The effect of the waggle dance on social foraging has been evaluated theoretically and behaviorally (Seeley, 1983; Seeley and Visscher, 1988, Okada et al., 2008). However it remained unknown how honeybees learn the locations of profitable flowers from waggle dance. We analyzed the development of the waggle dance of honeybees automatically recorded just after the imaginal molt using high-definition camera modules connected with a Raspberry Pi computer and numbered radio-frequency identification tags fitted to the back of each bee. For most honeybees, trophallaxes often appeared for 1 week after the imaginal molt. Learning the scent of flowers at a young age through trophallaxis may facilitate the development of a specific waggle dance. And then waggle dance following preceded the appearance of the first waggle dance from 1 week after the imaginal molt. The duration per trip increased just after waggle dance follow. Before the appearance of the first waggle dance, the honeybee repeatedly follows waggle dances that indicate a limited number (2–6) of food source locations. How do the honeybees learn the location from the waggle dance? We also analyzed the recruited waggle dance following patterns and its developmental process of the successful following. The waggle dance usually repeated waggle phase and return phase, and the dance followers also follow a series of the waggle phases. The recruited individuals followed at the end of a series of followings from the tail of the dancer. The temporal patterns of the following depend both on the location of the follower to the dancer and on the duration of the waggle phase. On this talk we also discuss developmental process of the following patterns.