



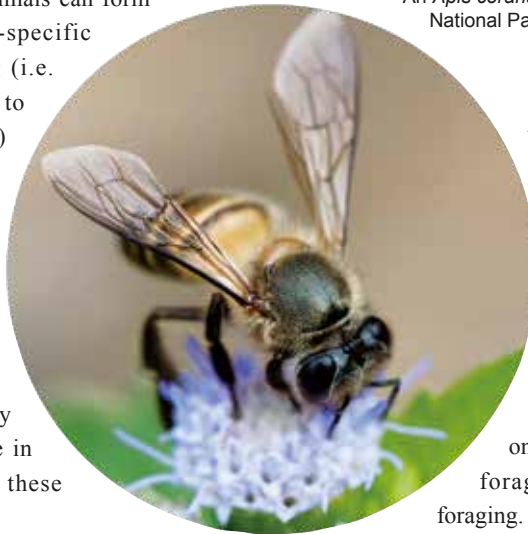
Asian Honey Bees Use Trace Amount Chemical to Avoid Danger

While foraging, animals can form inter- and intra-specific social signaling (i.e.

one organism using signals to alert another about danger) networks to avoid similar predators. Honey bee sting alarm pheromones are multi-component blends, for instance isopentyl acetate (IPA), octyl acetate (OA), benzyl acetate (BA), etc. However, the primary inter-specific differences lie in the relative abundances of these different compounds.

Researchers from the Xishuangbanna Tropical Botanical Garden (XTBG), CAS have recently analyzed the volatile alarm pheromone produced by attacked workers of the most abundant native Asian honey bee, *Apis cerana*, and tested the responses of other bee species to these alarm signals. They wanted to better understand the function of different honey bee alarm pheromone components in *A. cerana*, to determine if BA varies according to *A. cerana* task specialization, and to test if the sympatric species, *A. dorsata* and *A. florea*, can intercept and use this information.

They found that *A. dorsata*, *A. florea*, and *A. cerana* avoided BA on floral food and that *A. cerana* also avoided BA at its own nest. Therefore, the alarm information was honestly produced and mutualistically



An *Apis cerana*, or Asiatic honey bee, in Khao Yai National Park, Thailand. (Credit: Rushenb)

used by sympatric social bee species. As compared to nest guards, *A. cerana* foragers produced higher levels of BA. In foragers, BA and (*E*)-*dec-2-en-1-yl* acetate (DA) generated the strongest antennal electrophysiological responses. BA was also the only compound that alerted flying foragers and inhibited *A. cerana* foraging. BA thereby decreased *A. cerana* foraging for risky sites.

Interestingly, although BA occurs only in trace amounts and is nearly absent in sympatric honeybee species, these floral generalists detected and avoided BA as strongly as they did to their own alarm pheromone on natural inflorescences.

The results showed that at foragers of different native Asian honey bee species can detect and use benzyl acetate (BA) to avoid danger. Their paper, "Foragers of sympatric Asian honey bee species intercept competitor signals by avoiding benzyl acetate from *Apis cerana* alarm pheromone", has been published in *Scientific Reports*.

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