Japanese honeybees swarm huge hornet predator to kill it with heat

March 14 2012

Japanese honeybees face a formidable foe in the Asian giant hornet, a fierce predator that can reach 40mm long or larger, but the bees have developed a novel defense mechanism: they create a "hot defensive bee ball," swarming around the hornet and literally cooking it.

Now, a new study published Mar. 14 in the open access journal PLoS ONE uncovers some of the neural activity that underlies this unusual behavior, which is not practiced by the Japanese honeybee's European relative.

The researchers, including Takeo Kubo of the University of Tokyo and Masato Ono of Tamagawa University, actually sampled honeybees as they were engaged in a hot defensive bee ball, plucking them off the ball at different time points to investigate the brain function behind this unique adaptive behavior. Using a novel marker gene to detect the neural activity evoked in the brains of the honeybees that form the bee ball, they found that neurons that make up the higher brain center are active while the bees are part of the hot ball. This neural activity differs from that seen in European honeybees.

More information: Ugajin A, Kiya T, Kunieda T, Ono M, Yoshida T, et al. (2012) Detection of Neural Activity in the Brains of Japanese Honeybee Workers during the Formation of a "Hot Defensive Bee Ball". *PLoS ONE* 7(3): e32902. doi:10.1371/journal.pone.0032902