Giant hornet vs Japanese honeybees. Hot defensive bee ball.

The giant hornet holds the title of being the world's largest hornet. In orchestrated attacks, they target honeybee colonies, pillaging the hive of its pupae, larvae, and honey. In Japan, two honeybee species coexist the imported Western honeybee and the native Japanese honeybee. Unfortunately, the Western honeybee lacks effective defenses against the giant hornet. Merely a few dozen giant hornets have the power to decimate a Western honeybee colony comprised of tens of thousands of worker bees.

Consequently, Western honeybees cannot survive in the wild in Japan, mainly due to the threat posed by giant hornets. In contrast, the native Japanese honeybees have developed a defense mechanism to combat the giant hornets. By joining forces, they can successfully overcome these formidable predators. To witness this incredible phenomenon, an experiment has been arranged to observe how Japanese honeybees triumph over a captured giant hornet. It is important to note that the hornet's stinger has been removed to ensure the safety of all participants. The hornet has been affixed to a wire and placed in front of the hive entrance.

Defensive Measures

Normally, when giant hornets initiate an attack, Japanese honeybees retreat to the safety of their hive. However, they retaliate when the giant hornets invade their sanctuary. As a result, witnessing an altercation between the two within the hive proves exceedingly challenging. Nevertheless, this particular hive is teeming with bees, many of which congregate outside around the entrance. While some honeybees cautiously

approach the giant hornet, they refrain from engaging it directly, maintaining a safe distance. It is essential to note that Japanese honeybees cannot individually overpower a giant hornet; they await the opportune moment to launch a collective attack. Notably, giant hornets seldom target robust colonies such as this one, preferring weaker prey instead, showcasing their remarkable intelligence.

Attack Mode

The assault on the hornet commences as a few bees initiate the offensive. Initially, they do not engage the hornet directly but suddenly shift their approach, launching a relentless assault. Approximately 20 bees mount an attack, and the hornet struggles to break free. The intensity of the assault escalates as more and more bees join the fray. Eventually, the bees overpower the hornet, enveloping its head. Numerous bees swarm the ball-like formation, buzzing with excitement and drawing others into the attack. A thermographic camera captures the momentous event.

Temperature Dynamics

The ball of bees registers a temperature of 40°C (104°F), with some studies indicating that the central region may exceed 46°C (114.8°F). Japanese honeybees demonstrate resilience against temperatures that prove fatal for hornets.

Furthermore, research reveals that the interior humidity within the bee ball exceeds 90%, while the concentration of carbon dioxide rises to 4%. These factors hasten the demise of the hornet. Often, hundreds of bees partake in the formation of the bee ball, typically resulting in the death of the giant hornet within 10 minutes. Curiously, even after the hornet appears lifeless, the bees continue to swarm around it.

Consequences

Active participation in the core of the bee ball reduces the lifespan of a bee. Studies indicate that bees engaging in the formation of a bee ball tend to be the first to attack a giant hornet. However, it is essential to acknowledge that creating a bee ball does not offer a foolproof defense. Japanese honeybees can successfully vanquish one or two giant hornet scouts, but their ability to protect themselves diminishes when faced with dozens of attacking hornets.”