

Why China's Asian honeybees are losing out to their Western counterparts

Asiatic honeybee colonies are more prone to disintegration than European honeybee ones because the workers find their queens less attractive, a Sino-American research team has discovered.

For over a century, Asiatic honeybees (*Apis cerana*) have been steadily pushed aside by the European species (*Apis mellifera*), which were introduced to China by beekeepers because the male drone is almost twice as big and the female workers are more focused on their job and produce more honey, which is also sweeter.

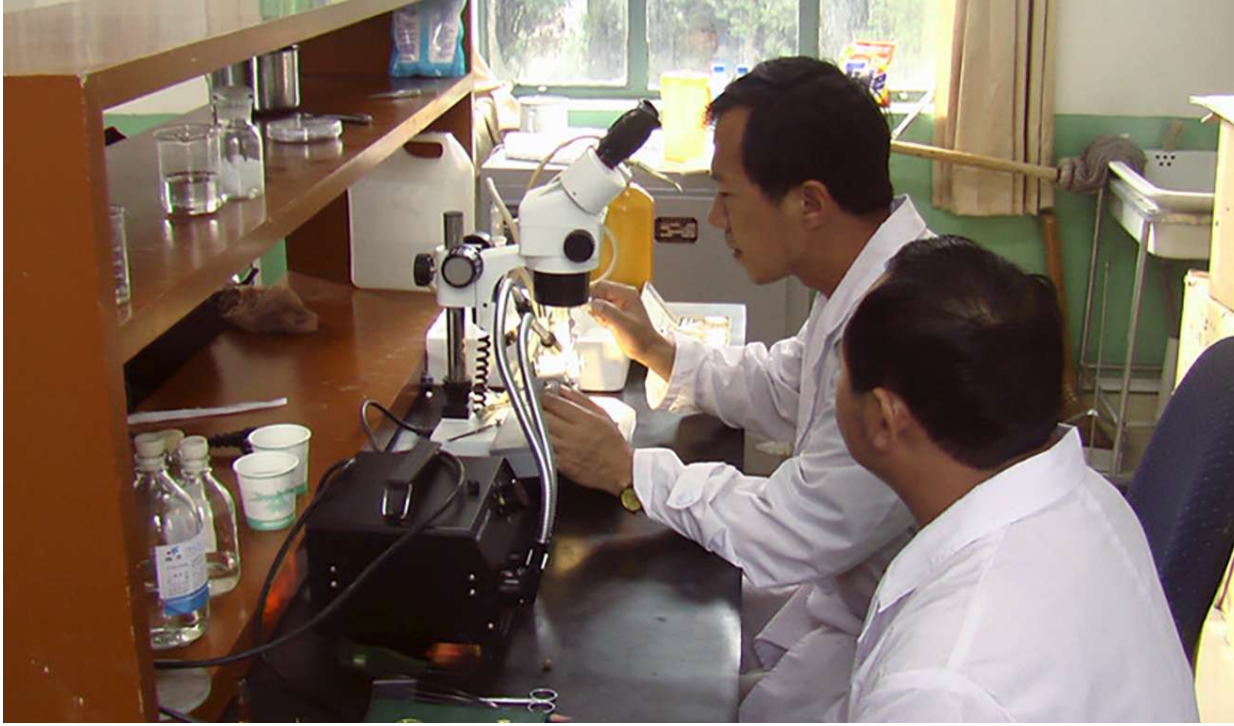
[Honey wars: what's killing New Zealand's manuka bees?](#)

However, the European species also carries a number of deadly, contagious diseases that can devastate colonies.

The researchers estimated that up to 80 per cent of China's native honeybee population has been lost since the first European bee farm in the country was established in the late 19th century.

Many Asiatic subspecies across the region are now close to extinction, and that's a cause for concern as the flowers of many Asian plants are not recognised by European honeybee pollinators.

The study, published in the journal *Scientific Reports* in March, sheds new light on the Asian bee's decline.



Bees are highly social animals, with a social structure characterised by hierarchy, collaboration and division of labour. There is one queen in each hive, and she mates with drones to lay eggs and eats honey produced by workers from pollens.

The queen “rules” the colony by producing a pheromone, released from her jaw, which contains chemicals that carry messages prompting various activities, including sex and feeding. The compound can also signal the queen’s health and mood.

“We found the Western worker bees take the messages from her majesty much more seriously,” said Professor Tan Ken, the lead scientist of the study, who works at the Chinese Academy of Sciences’ Xishuangbanna Tropical Botanical Garden in Yunnan. “They are also more willing to execute her orders, and see to her needs.”

[The queen's dead, long live the queen! Asian honey bees are paranoid about losing their leader, prone to despair - and closet anarchists](#)

In laboratory experiments and field observations, Yan and his colleagues found that European honeybee queens emitted a stronger dose of pheromone, and their workers had antennas that were more sensitive at picking up the chemical signals. That meant they were accompanied by

more “servants” than their Asiatic counterparts.

In fight for territory, the queen’s attractiveness could be an advantage. Previous studies found Asiatic honeybee drones in the comb of a European honeybee colony. Tan said they were probably lured by the similar but stronger pheromone produced by the queen. The misguided Asiatic drones attempted to mate with the European queen, leaving their own queen unattended, which could be one possible cause of population decline.

The more sensitive antennas of European drones could also pick up the weaker pheromone signals of an Asian queen, and once in her colony could prevent or discourage the much smaller Asiatic drones from getting close to her.

The looser bond between Asiatic workers and queens also made such colonies more susceptible to breaking up,

About 5 per cent of Asiatic worker bees have activated ovaries, meaning they are ready to replace their queen or fly away to establish a new colony at any time. In the European species, the rate of worker “disloyalty” was just 0.01 to 0.02 per cent, which made for a much more stable and durable society, a trait favoured by beekeepers.

[‘Beepocalypse now’: Micro-sensors stuck to honey bees to help solve mass deaths](#)

However, Tan said the weaker bond could also help Asiatic bees survive in harsh environments.

When a natural predator such as a hornet invaded a honeybee hive, for instance, the Asiatic species had a higher chance of escaping and establishing a new colony, even if it lost its queen.

Tan said the sweeping expansion of Asia’s European honeybee population

had triggered an ecological crisis. After more than 70 million years of evolution, Asiatic honeybees could pollinate a wide range of plant species in the region. However the European species concentrated its efforts on just a few kinds of flowers.

The mass disappearance of Asiatic honeybees meant many native plants might not be pollinated, causing fundamental changes in the ecological balance.

A solution proposed by bee scientists was to draw a border between European and Asiatic honeybees. In some parts of China and Japan, bee farms are not allowed to use the European species, giving the native bees some breathing space.

Tan, who has spent decades studying the bee “war”, said Asiatic honeybees might still have a chance to mount a “comeback”.

“After years of decline, we have noticed the Eastern honeybees are gaining a foothold, especially in mountains and warm, tropical areas,” he said. “It is because they can deal with the real hardship of life.

“The Western honeybees, on the contrary, rely very much on the protection and care of humans. Without caretakers, they have little chance to survive in Asia, where hornets alone could wipe them out.”

[EU survey finds its bees in far better shape than was feared](#)

US beekeepers lost 44 per cent of their European honeybee population within a year from 2015. Some researchers worried that even worse might be in store due to the changing global climate, with rising temperatures bringing more predators and new diseases.

Dr Lai Jiangshan, an associate researcher on forest ecology with the Chinese Academy of Sciences’ Institute of Botany in Beijing, said it was

impossible to say whether human could survive in a world without bees.

“The Apocalypse will likely never happen,” he said.

But the decline of Asiatic honeybees was alarming because of their important role in the food chain, Lai said.

“Fewer bees, fewer plants; fewer plants, less food; less food, fewer humans,” he said.