

BEES IN SOUTHEAST ASIA

CLIMBING TREES TO HARVEST GOLD

In Europe, we are accustomed to bees that nest in hives, making it easy to harvest the honey. In Southeast Asia, the bee species are different: honey hunters must climb trees to cut down the combs of wild bee species. Even these bees are threatened by modern farming methods.

Among the nine honeybee species known worldwide, only one is native to Europe and Africa. The other eight species are native to Asia, and all are present in Southeast Asia. Asian native honeybee species can be divided into three groups based on their morphology, and the structure and location of their nests. Giant honeybees build a massive single comb suspended beneath a branch or cliff overhang. Medium-sized honeybees build parallel combs inside a cavity. Dwarf honeybees build a single comb around a twig.

Asian honeybees have the unique characteristic of moving their nest in response to changes such as the flowering seasons. These migrations may cover just a few kilometres,

or hundreds. Some bee species migrate to higher altitudes in the rainy season and to lower altitudes in the dry season, or avoid harsh winter weather by migrating downhill. Colonies of the giant honeybees *Apis dorsata* travel up to a distance of 200 km during their seasonal migrations.

Agricultural yields in Southeast Asia can be maximized in terms of both quantity and quality by abundant and diverse populations of pollinators. Having several native honeybee species is an asset for agriculture. The productivity of 70 percent of the 1,330 tropical crops is increased by pollinators (mainly, but not exclusively, bees). The latest data (from 2009) calculates the economic value of insect pollination at around 700 million US dollars for the Philippines and 1.76 billion US dollars for Vietnam. In addition, people with low incomes in the region depend heavily on crops pollinated by animals to supply them with key nutrients. Feral colonies of Southeast Asian native honeybees are particularly beneficial for crops grown on small-scale farms because the bees can find nesting sites and additional food sources on neighbouring land.

Even though none of the eight native honeybee species seems to be threatened with extinction in the short term, studies highlight the decline throughout the whole region. Thai and Vietnamese researchers mentioned the decline of *Apis Andreniformis* in Thailand and Vietnam, and the species is also rare in Cambodia. In Malaysia, *Apis koschevnikovi* is decreasing. The Vietnamese population of *Apis laboriosa* has undergone a dramatic loss since its discovery in 1996, and *Apis dorsata* has also strongly declined in extended areas of Cambodia, Indonesia, Thailand and Vietnam.

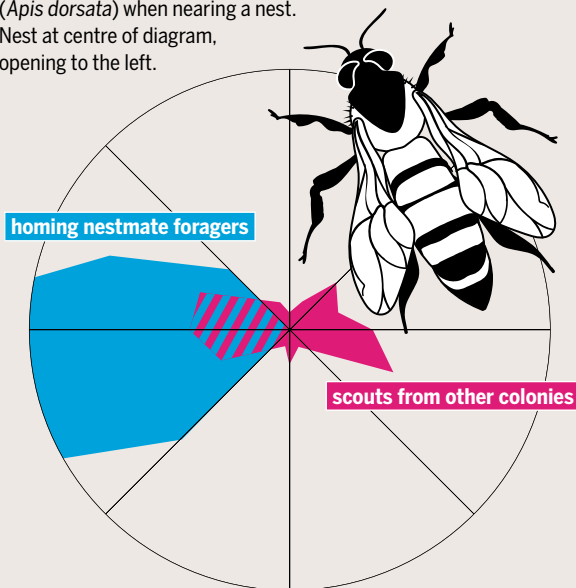
Deforestation and large-scale monoculture constitute the main threats to honeybee populations because they deprive bees of nesting sites and flowers to visit, and may also disturb their natural migration patterns. Southeast Asia is among the world's major deforestation hotspots. Between 1990 and 2010, 33.2 million hectares of forest were lost in the region, a decline of 12 percent. A large part of the land has been converted into oil palm plantations with a very low bee density compared to undisturbed forests.

Pesticides, in particular systemic insecticides, are an additional threat to the bees. Thai bee researchers consider pesticides to be the main factors affecting beekeeping in Thailand. Pesticide treatments in commercial fruit crops that are highly attractive to bees, such as longan, litchi and citrus, or that make ideal nesting sites for dwarf bees, like mangosteen and rambutan, are particularly harmful.

“Honey hunting” is another risk. The collection of wild honey generates income for tens of thousands of honey hunters throughout Southeast Asia, mostly members of the poorest communities. Nearly all the Asian native honey-

THE FLIGHT OF THE GIANT HONEYBEE

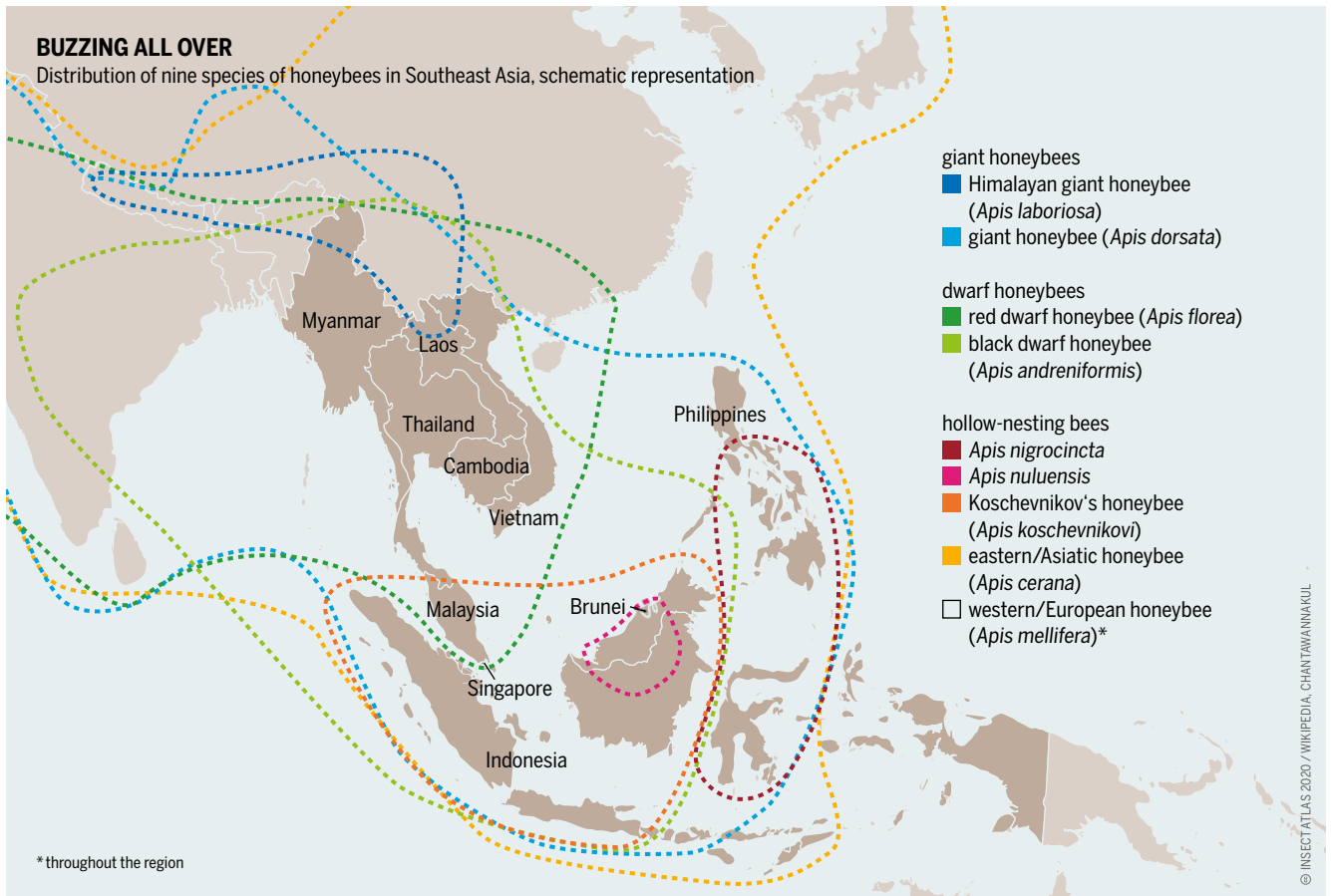
Approach paths of the Southeast Asian giant honeybee (*Apis dorsata*) when nearing a nest. Nest at centre of diagram, opening to the left.



The nests of the Southeast Asian giant honeybee (*Apis dorsata*) are located not in beehives but hang under branches or specially positioned rafters where they are easy for people to reach. The honeycombs are guarded by a protective layer of worker bees. Depending on the temperature, rainfall and location of flowers, the bees may move their nest site one or several times a year. Scout bees go out in search of a new site, and often come close – too close – to other swarms. If a scout lands on another nest, the worker bees there respond quickly – after a reaction time of just 40 milliseconds, several guards arrive and sting the perceived intruder to death. The alarm signals seem to be the erratic flight patterns of the scouts, which do not know the best way into the nest, and that the workers associate with the intruder once it has landed.

© INSECT ATLAS 2020 / WEHMANN ET AL.

Defending their nests against wasps and birds is vital for bees that have free-hanging nests. They use their stings to keep other swarms of their own species away



bee species are hunted, though at different levels of intensity. The two giant species are the most commonly hunted due to the amount of honey they produce, along with the red dwarf honeybee, *Apis florea*, whose docile behaviour makes it an easy target. Over-harvesting and destructive honey-hunting practices, in which villagers cut the whole nests or sometimes even use fire and insecticides to reach the honey, also put pressure on wild bee populations.

Colonies can survive the destruction of their nest, provided the queen has not been killed. They rebuild a new nest a little further away, but the loss of their food stock and brood reduces their ability to swarm. Non-destructive honey harvesting methods, in which only part of the honey is harvested while leaving the brood intact, should be encouraged. Populations should be monitored to ensure that the level of harvest is compatible with sustainable management. Rafter beekeeping, a sustainable bee-management method developed by several communities throughout Southeast Asia, could be introduced to communities unfamiliar with the method.

Local initiatives contribute to the protection and restoration of Southeast Asian bee populations. By encouraging small-scale organic farming, the Agroecology Learning Alliance in South East Asia helps restore bee-friendly habitats in rural communities in Cambodia, Laos, Myanmar and Vietnam. The Non-Timber Forest Products Exchange

Exports are stimulating honey production in Southeast Asia. The biggest demand comes from Indonesia

Their nests hang on rocks, branches and twigs, or are hidden in hollow trees and in beehives – all species of honeybees are found in Southeast Asia

Programme, a network of NGOs, promotes sustainable honey harvesting techniques as part of forest conservation throughout the region. Local initiatives to encourage sustainable beekeeping contribute to the restoration of local cavity-nesting bee populations and encourage hunters to refrain from destructive honey collection. ●

