

## Endangered Chinese Honey Bee

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### Introduction

*Apis cerana cerana*, a honey bee species indigenous to China (also known as Chinese honey bee), has nested across the whole country in distinct habitats of complex topography, varying in flora and divergent climates with an evolution history of 70 million years [1]. Sadly, its habitats have shrunk by 75% and the populations of managed Chinese honey bee have declined by 80% from 5 million since the early of 1900s [2-4]. The species was listed as endangered in 2006 and this status was reconfirmed in 2014.

The decline of pollinators including bees is a worldwide problem, mainly because of pesticides, habitat degradation and loss, parasites and pathogens, and invasive species [5-7]. Recently, the U.S. Fish and Wildlife Service announced that seven types of yellow-faced bees in Hawaii had become endangered and artificial light at night was identified to be a new threat to pollinators [8]. *Apis mellifera L.*, indigenous to Europe and introduced into China in 1912, has brought viral diseases, attacks Chinese honeybee hives and interferes with mating, all exacerbating the crisis of Chinese honey bee [1-4,9-11]. Sacbrood disease, first identified in *Apis mellifera* in 1913, was not found to affect Chinese honeybee till 1972 [3] (Figure 1). Since then, the epidemic outbreaks have occurred periodically every 6 to 7 years, infecting 90% of Chinese honeybee and causing massive deaths and collapse of entire colonies [3,9-11].



**Figure 1:** The left is a photo of *Apis mellifera L.* and the right is *Apis cerana cerana*.

*Apis mellifera* tends to forage in dense vegetation for flowers high in nectar and has not adapted to many sporadic, native Chinese floras in mountainous areas. This invasive species has been relying on human management and its wild populations are scarce in China since its

introduction more than a century ago. It does not work at temperatures below 11°C [12]. By contrast, *Apis cerana cerana* thrives in the wild and works 2-3 hours longer a day and at temperatures down to 6-7°C [12,13]. Thus, Chinese honey bee is capable of efficiently pollinating sporadic herbaceous plants, particularly those flowering in early Spring, late Autumn or Winter in many parts of China and plays a critical role in maintaining China's plant diversity and ecosystem [1-4,13].

National nature reserves are considered vital to provide safe habitats for endangered species (e.g. Giant Panda). Along with reducing the use of pesticides, it is essential for the country to take urgent actions and measures in protecting this unique species, the "giant panda" of honey bees, e.g. by creating national reserves in the most suited habitat and breeding new varieties resistant to invasive viral diseases [1-3].

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