

PLANT-POLLINATOR INTERACTIONS IN EAST ASIA: A REVIEW

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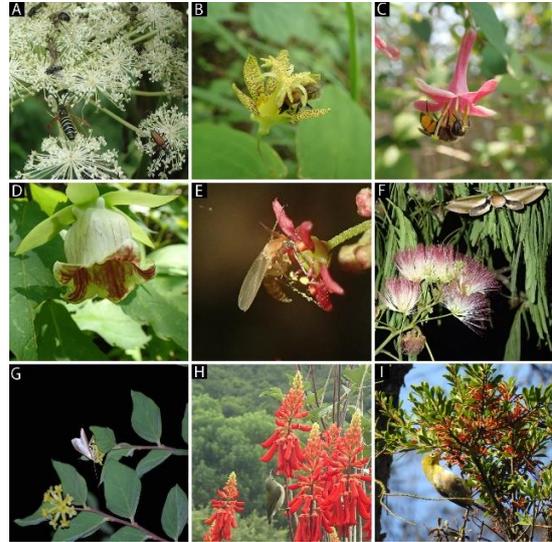
Pollination studies in East Asia have been developing rapidly in recent decades. East Asia may provide important information on many aspects of plant-pollinator interactions because of the rich fauna and flora and highly heterogeneous environments that occur there.

In this review, plant-pollinator interactions in East Asia were summarized. This review specifically highlights the diversity of pollinators and the plants with which they interact in this region. I selected representative papers published on East Asian pollination from 1956 to 2019.

Bumblebees are important pollinators of many plant species in East Asia, as well as in Europe and North America. Native honeybees may also have important roles in pollination in East Asia. However, the roles of *Apis* species as pollinators in natural ecosystems are still poorly known in East Asia. Bird pollination and hawkmoth pollination may be less common in East Asia than in North America. Opportunistic nectar-feeding vertebrates may have important roles in pollination where specialized nectar-feeding vertebrates are absent.

Human impacts on plant pollinator interactions are understudied in this region. However, climate change, habitat degradation, and invasive species may have negative impacts on plant-pollinator interactions and thus plant reproductive success there.

The information available on the plant-pollinator interactions in East Asia is still limited because many plant and pollinator taxa and many types of habitats are understudied. Further studies are needed to reveal the general trends in plant-pollinator interactions in East Asia.



Representatives of flowers and pollinators in East Asia.

(A) Generalist: *Angelica pubescens* attracts a diverse assemblage of flower visitors. (B) Bumblebee: *Bombus honshuensis* visiting *Tricyrtis latifolia*. (C) Solitary bee: *Andrena loniceræ* visiting *Lonicera gracilipes*. (D) Wasp: *Codonopsis lanceolata*, a wasp-pollinated flower. (E) Fungus gnat: a fungus gnat visiting *Micranthes fusca*. (F) Hawkmoth: a hawkmoth, *Theretra* sp., approaching *Albizia julibrissin*. (G) Settling moth: a settling moth, *Palpita nigropunctalis*, visiting *Diplomorpha sikokiana*. (H) Sunbird: *Aethopyga christinae* visiting a non-native South African tree, *Erythrina humeana*. (I) White-eye: *Zosterops japonicus* visiting *Taxillus kaempferi*. All photographs except (H) were taken in Japan, in natural habitats, while (H) was taken in a non-natural habitat, Fairy Lake Botanical Garden, in southern China. (A)–(H) were taken by Daichi Funamoto. (I) was modified from Sugiura (2018).