

Interface between managed and wild pollinators

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ABSTRACT:

Over the last 50 years the agricultural sector globally is more and more depending on animal pollination, in particular Asia and Africa. It is not only question of satisfying the demand but to do so in sustainable quantities, especially in light of an increasing human population and the challenges of climate change. To ensure such sustainability one has to understand, manage and conserve pollinators supplying such services for crop production and ecosystems.

However, treating animal pollinators as one entity, would not work especially in the Asian context where all honeybee species are occurring and not taking potential interactions into account is paramount. In light of the global distribution of universal bee pollinators, like honeybees and bumblebees, and a wide range of human controlled pollination service, e.g. beekeeping, results in a high variability of potential scenarios.

To understand these scenarios and to ensure sustainable pollination service it is crucial to separate the different pollinator populations, and take their potential beneficial but also deleterious interactions into account. A prime example of such a deleterious interaction between the wild and managed populations of two sister species is the host shift of the Varroa mite from the Eastern honeybee to the Western honeybee. It also shows that the different populations of the Western honeybee were differentially affected by the host shift, while the populations in Europe mostly collapsed, in Africa and Americas the impact is less significant and resilience can be observed in these populations.

Such resilience is mainly observed in regions where a large proportion of the total honeybee population is wild, which would allow the wild population to adapt to new parasites/pathogens, without human interference. Therefore, besides taking the interactions into account, it is crucial to have robust data on the populations sizes on different spatial scales of the different pollinator species involved. Our current understanding of the interaction between wild and managed populations suggests that transporting of species or even subspecies out of their endemic range should be done with great caution.

KEYWORDS:

bees, biodiversity, eco-system services, interface, pollinators, resilience, resistance