Migratory hoverflies 'key' as many insects decline

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Marmalade Hoverfly -- *Episyrphus balteatus*. Credit: Will Hawkes

Migratory hoverflies are "key" to pollination and controlling crop pests amid the decline of many other insect species, new research shows.

University of Exeter scientists studied the movements of migratory hoverflies and were surprised to find up to four billion migrate to and from Britain each year.

The study shows these numbers have been relatively stable over the last decade, and such abundance means migratory hoverflies pollinate many billions of flowers and produce larvae that eat up to ten trillion aphids.

Recent research has suggested more than 40% of insect species worldwide are "threatened with extinction", creating a major threat to "ecosystem services" (benefits to humans from the natural environment, such as pollination of crops).

"The number of migrating hoverflies coming and going over Britain was much higher than we had expected," said Dr. Karl Wotton, Royal Society research fellow at the University of Exeter.

"They are widely considered to be the second most important pollinators, after bees.

"They are especially important pollinators of wildflowers, soft fruits and brassica crops, and their larvae prey on various species of aphids—which are the key crop pest in Europe.

"This dual role makes them uniquely beneficial to humans."

Migrating hoverflies arrive in Britain in spring and, with a month-long life cycle, those that leave are descendants of the spring arrivals.

"We are net exporters of hoverflies," said Dr. Jason Chapman, of the Centre for Ecology and Conservation on the University of Exeter's Penryn Campus in Cornwall.

"Each female can lay up to 400 eggs and, though many die as eggs or larvae, the departing population in autumn is larger than that arriving in spring.

"As well as their vital pollinating and aphid-eating roles, migrating hoverflies provide food for a range of predators including birds."

The study, supported by colleagues at Nanjing Agricultural University, Rothamsted Research, the University of Greenwich and the Max Planck Institute, used radar data on insects flying between 150m and 1km above the ground.

The hoverflies wait for favourable winds before migrating between Britain and mainland Europe.

Dr. Chapman added: "Migrating insects are generally bucking the trend of decline that we're seeing with many other insects.

"Their mobility is probably a key part of this, as it allows them to move on to find the best habitats.

"Hoverflies are also generalists—the adults feed on many kinds of pollen and the larvae eat many aphid species.

"Considering that many beneficial insects are seriously declining, our results demonstrate that migrant hoverflies are key to maintaining essential ecosystem services."

The paper, published in the journal *Current Biology*, is entitled: "Mass seasonal migrations of hoverflies provide extensive pollination and crop protection services."

More information: Mass seasonal migrations of hoverflies provide

extensive pollination and crop protection services, *Current Biology* (2019). DOI: 10.1016/j.cub.2019.05.036