Droughts mean fewer flowers for bees

April 11 2018

Bumblebee. Credit: University of Exeter

Bees could be at risk from climate change because more frequent droughts could cause plants to produce fewer flowers, new research shows.

Droughts are expected to become more common and more intense in

many parts of the world, and researchers studied the impact on flowering plants using a field experiment.

They found that drought roughly halved the overall number of flowers. This means less food for bees and other pollinators, which visit flowers for the nectar and pollen that they provide.

The research was carried out by the University of Exeter in collaboration with the University of Manchester and the Centre for Ecology and Hydrology.

"The plants we examined responded to drought in various ways, from producing fewer flowers to producing flowers that contained no nectar," said lead researcher Ben Phillips, of the Environment and Sustainability Institute on the University of Exeter's Penryn Campus in Cornwall."But overall there was a very clear reduction in the number of flowers that were available - and obviously this means less food for flower-visiting insects such as bees."

Bees are already under pressure from a variety of threats including habitat loss, the use of particular pesticides, and the spread of diseases and alien species.

Honeybee. Credit: University of Exeter

"Not only are these insects vital as pollinators of crops and wild plants, but they also provide food for many birds and mammals," said joint lead researcher Dr Ros Shaw, also of the University of Exeter.

The study took place in Wiltshire on chalk grassland, which is an important habitat for UK pollinator species. The plant species studied included meadow vetchling (*Lathyrus pratensis*), common sainfoin (*Onobrychis viciifolia*) and selfheal (*Prunella vulgaris*).

"Previous studies of the impacts of drought on flowers and bees have looked at individual species, often in the laboratory, but we used an

experiment with rain shelters to examine the effects on real communities of plant species living in chalk grassland," said Dr Ellen Fry from the University of Manchester, who set up the experiment.

"The level of drought that we looked at was calculated to be a rare event, but with climate change such droughts are expected to become much more common."

Drought experiment. Credit: University of Exeter

The findings suggest that chalk grasslands may support lower pollinator populations in the future, but the scientists warn that the results are likely to be broadly applicable to other regions and habitats.

The research was part of the Wessex Biodiversity and Ecosystem Service Sustainability project, and was funded by the Natural Environment Research Council.

The paper, published in the journal *Global Change Biology*, is entitled: "Drought reduces floral resources for pollinators."

More information: *Global Change Biology* (2018). DOI: 10.1111/gcb.14130

Provided by University of Exeter