Extreme weather will lead to a century insect extinctions

March 25 2014, by Dr Andi Horvath

(Phys.org) —Future episodes of extreme weather will lead to mass extinctions of insects and reptiles in the next century, according to a new international study by Danish and Australian scientists.

Cold-blooded species like insects, spiders and skinks are collectively referred to as 'ectotherms' and they rely on the environment to regulate body temperature, so are more vulnerable to environmental changes.

Professor Ary Hoffmann from the University of Melbourne said, "The

study revealed that extreme temperatures will determine the future distribution of insects, rather than increases in the average temperature".

"With more extreme weather expected in the future due to climate change, our study indicates we are going to see substantial extinctions of some ectothermic species in the next 50 years or so."

"Such losses would not only pose a great threat to biodiversity, but also destabilise entire ecosystems," said Professor Hoffmann

Small ectotherms such as bees, worms and spiders provide services that are essential for both the health of ecosystems and the viability of agriculture: pollination, pest control, and soil turnover.

In research published in *Global Change Biology*, Professor Hoffmann and Dr Michael Kearney from the University of Melbourne and Dr Johannes Overgaard from Aarhus University examined in unprecedented detail ten Australian fruit fly species of the Drosophila genus from both temperate and tropical regions of the east coast.

First, the scientists determined the temperatures at which the species could develop and reproduce and their limits of tolerance for hot and cold temperatures. From these results and the present distribution of the fruit fly species, they then examined whether the present distribution of the species correlated with the temperatures required for growth and reproduction, or whether in fact their distribution was limited by weather extremes.

The results clearly indicated that distribution of the species was defined by their tolerance of unusually hot or cold days. While temperate species are more able to adapt to changes in average temperature than tropical species, extreme weather poses an equal threat to both.

"The research implies that extreme events – even though they don't last very long – can have a very large impact on whether a species is going to into a decline or not," Professor Hoffmann said.

Provided by University of Melbourne

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