

Chronic exposure to lead impairs honey bee learning

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Abstract

Pollutants can have severe detrimental effects on insects, even at sublethal doses. Agrochemicals have been identified as important causes of pollinator declines, but the impacts of other anthropogenic compounds, such as metallic trace elements contaminating soils and waters, have received considerably less attention. Here, we exposed honey bee colonies to chronic field-realistic concentrations of lead in food and demonstrate that consumption of this single trace element impaired bee cognition and morphological development. Honey bees exposed to the highest lead concentration had reduced olfactory learning performances and developed smaller heads, which may have constrained their cognitive functions. Our results show that lead pollutants can have dramatic effects on honey bee health and may contribute to the widespread decline of pollinators.

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