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From: [Johannes Gutenberg Universitaet Mainz](#) via [EurekAlert!](#)
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Neonicotinoid pesticides cause harm to honeybees

One possible cause of the alarming bee mortality we are witnessing is the use of the very active systemic insecticides called neonicotinoids. A previously unknown and harmful effect of neonicotinoids has been identified by researchers at the Mainz University Medical Center and Goethe University Frankfurt. They discovered that neonicotinoids in low and field-relevant concentrations reduce the concentration of acetylcholine in the royal jelly/larval food secreted by nurse bees. This signaling molecule is relevant for the development of the honeybee larvae. At higher doses, neonicotinoids also damage the so-called microchannels of the royal jelly gland in which acetylcholine is produced. The results of this research have been recently published in the eminent scientific journal PloS ONE.

"As early as 2013, the European Food Safety Authority published a report concluding that the neonicotinoid class of insecticides represented a risk to bees," said Professor Ignatz Wessler of the Institute of Pathology at the University Medical Center of Johannes Gutenberg University Mainz (JGU). "The undesirable effect of neonicotinoids now discovered is a further indication that these insecticides represent a clear hazard to bee populations and this is a factor that needs to be taken into account in the forthcoming reassessment of the environmental risks of this substance class." Working in collaboration with Professor Bernd Grünewald of the Bee Research Institute at Goethe University Frankfurt, Professor Ignatz Wessler and his team uncovered this previously unknown damaging effect of neonicotinoids that impairs the development of honeybee larvae.

Wessler and Grünewald were able to directly demonstrate that neonicotinoids reduce the acetylcholine content of the larval food produced by nurse bees. Acetylcholine is a signaling molecule produced in the microchannels of the royal jelly gland of nurse bees. Comparable to neonicotinoids, it stimulates the nicotinic acetylcholine receptors that are also present in this gland.

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