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The levels of (accumulated) pesticides detected within honeybee comb wax

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Pesticide contamination of hives can originate from a range of agricultural sources, i.e. contaminated pollen from crop management (foliar spray or seed dressings) or from treatments of honeybee pests. Pesticides are also easily spread through the hive and can transfer to and from comb wax, leading to potential exposure of developing brood and honey stores which can result in increased brood mortality. Comb wax is often considered a 'chemical sink' and therefore a good indicator of pesticide exposure. Pesticides are very stable and soluble in wax and as a result they can remain within the comb for over 5 years. QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) is often employed as a suitable pesticide extraction method and has been applied to multiple matrices, including beeswax. In this study we adopted a modified QuEChERS technique, followed by analysis (using liquid chromatography-mass spectrometry) of 150 honeybee comb wax samples to identify any pesticides present. We also designed an experiment to monitor the potential accumulation of pesticides over a two year period by providing beekeepers with clean foundation wax. This presentation highlights the levels of pesticides detected within samples of UK honeybee comb wax, as well as those accumulated over a two year period. Potential risk to bees with regards to the levels of pesticides will be discussed.