

Abstract for TFISE Poster

Poster Title: Pesticide Detection in Honey

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Abstract:

Honey and beeswax are important biological products, due to nutritional content and cosmetic utility. Pesticides, herbicides, and fungicides are commonly used in agricultural production. These products kill bacteria, fungi, and unwanted pests, but can have harmful effects on humans at high doses. Pesticides on these crops can be internalized when bees collect pollen and nectar. Due to the way honey is manufactured by bees, it can be a source of pollutants and pesticides. This causes a wide range of problems, from Colony Collapse Disorder (CCD) to human pesticide consumption.

We qualitatively tested for pesticides within honey samples. The honey was produced in Lily Cornett Woods in eastern Kentucky on a reclaimed mine site. The reclaiming of former mining sites enables their rehabilitation. These sites are being transformed into an "oases," meaning no pesticides are used within a 5 mile radius. Due to the fact bee collection methods are restricted to a one-mile radius, we hypothesize that bees will not encounter pesticides.

A multi-residue analysis was developed to quantify pesticides in honey and its by-products. It consisted of a single extraction, based on a modified "QuEChERS" method followed by gas chromatography. The "QuEChERS method" combines salting-out liquid-liquid extraction with acetonitrile and a dispersive clean-up. We have tested for Atrazine and its degradation products within our samples, and have deemed our Honey samples free of these contaminants. Finally, after observing pesticide degradation, we have deemed quantitative analysis impossible due to the short half-lives of the pesticides (decomposition over several days).