

## ABSTRACT

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Title: Extraction and Identification of Antimicrobial Peptides from Black Soldier Fly Larvae as a Sustainable Alternative to Antibiotic Feed Additives

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Antimicrobial resistance (AMR) continues to make diseases harder to treat for medical professionals. Antibiotic feed additives in the livestock industry play an integral role in the rise of AMR. Antimicrobial peptides (AMPs) serve as a promising alternative to the antibiotics traditionally employed by the livestock industry. The black soldier fly (*Hermetia illucens*) has an immune system which produces these AMPs. This project's focus was identifying a means of extraction which could produce a high concentration of AMPs. Early extraction protocol investigated four different solvents and the effects of an acid and a protease inhibitor. It was found that the acid, trifluoroacetic acid, decreased the concentration in nearly all cases. The addition of the protease inhibitor, aprotinin, had inconsistent results. In half of the solvents the addition of aprotinin increased concentration and in the other half it led to a decrease in concentration. This was attributed to random error. By varying the ratios of water and methanol a revised extraction method was created. A trichloroacetic acid precipitation was also added to allow concentration of proteins. The precipitates were reconstituted in varying ratios of ammonium bicarbonate and methanol. 100% water was found to be the most effective extraction medium, and 100% ammonium bicarbonate the capable of solvating solid samples.