

## II. Abstract

Phenotypic plasticity in salivary gene expression drives host plant adaptation.

Every year, billions of dollars are spent in controlling insect pests. Most of this control is done through the intensive use of pesticides. However, most pests continue to develop pesticide resistance, leaving researchers with the daunting task of developing new methods of control. In order to do this we must first understand how pests interact with their host plants. Plants are capable of inducing defenses against insects after detecting insect specific cues. Insects on the other hand might suppress these defenses by releasing molecules present in secretions like saliva. Currently, there is limited information on the saliva composition of chewing insects and how it might affect plant defenses. In this study, I propose to investigate the effects of host plants on the saliva of an insect pest, the cabbage looper (*Trichoplusia ni*), by analyzing gene expression in their salivary glands under three diets (cabbage, tomato, and artificial diet) with the use of next generation sequencing techniques. This study will establish an extensive library of genes expressed in the salivary glands of cabbage looper and will provide important information on how host plants affect insect saliva. Ultimately, it will also provide information for the development of new methods of pest control.