

## Introduction

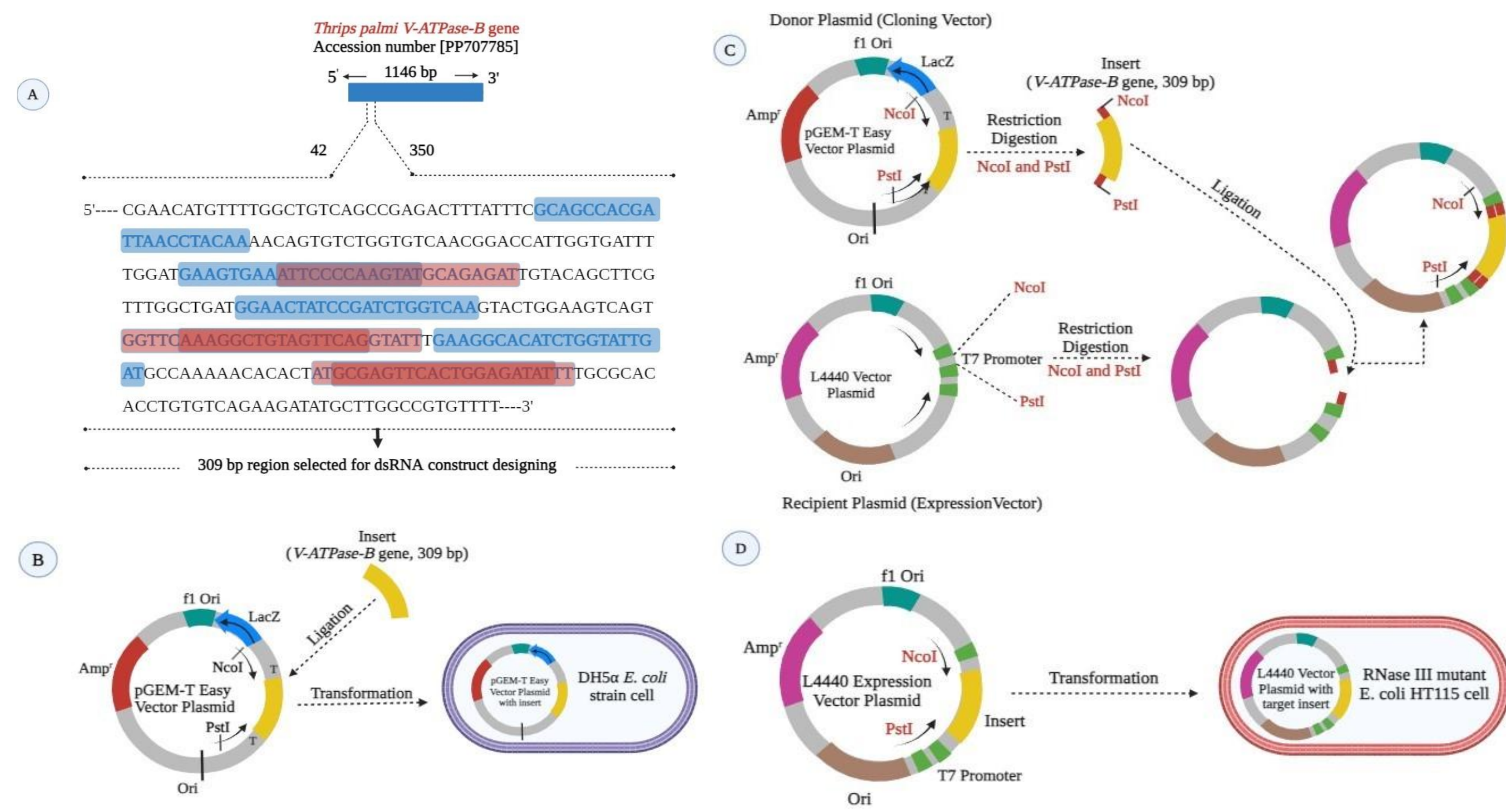
*Thrips palmi* Karny is a widely distributed cosmopolitan species, representing a significant threat to horticultural crops due to its polyphagous nature. Besides causing direct feeding damage, *T. palmi* is a vector for several orthotospoviruses. The primary choice for protecting crops against thrips is chemical insecticides. However, the preeminent reproductive rate and wide host plant range have led to the quick development of resistance to commonly used insecticides in thrips. Recent progress in genome-assisted pest management has led to innovative approaches to pest control. Spray-induced gene silencing (SIGS) by exogenous application of double-stranded RNA (dsRNA) has enormous potential as a non-chemical and eco-friendly novel alternative to hazardous chemical insecticides. Silencing the key genes responsible for the survival, development, and reproduction of thrips by SIGS would be a novel approach to sustainable pest management. In the current study, *T. palmi* *V-ATPase-B* was targeted for suppressing *T. palmi* by lowering survival and offspring development by spray-on application of dsRNA.

## Objectives

- ❖ Effect of silencing *V-ATPase-B* by oral administration of ds*V-ATPase-B* to *T. palmi*
- ❖ Evaluating the stability, persistency, and specificity of spray-applied naked ds*V-ATPase-B* on *T. palmi* survival and offspring development.

## Materials and Methods

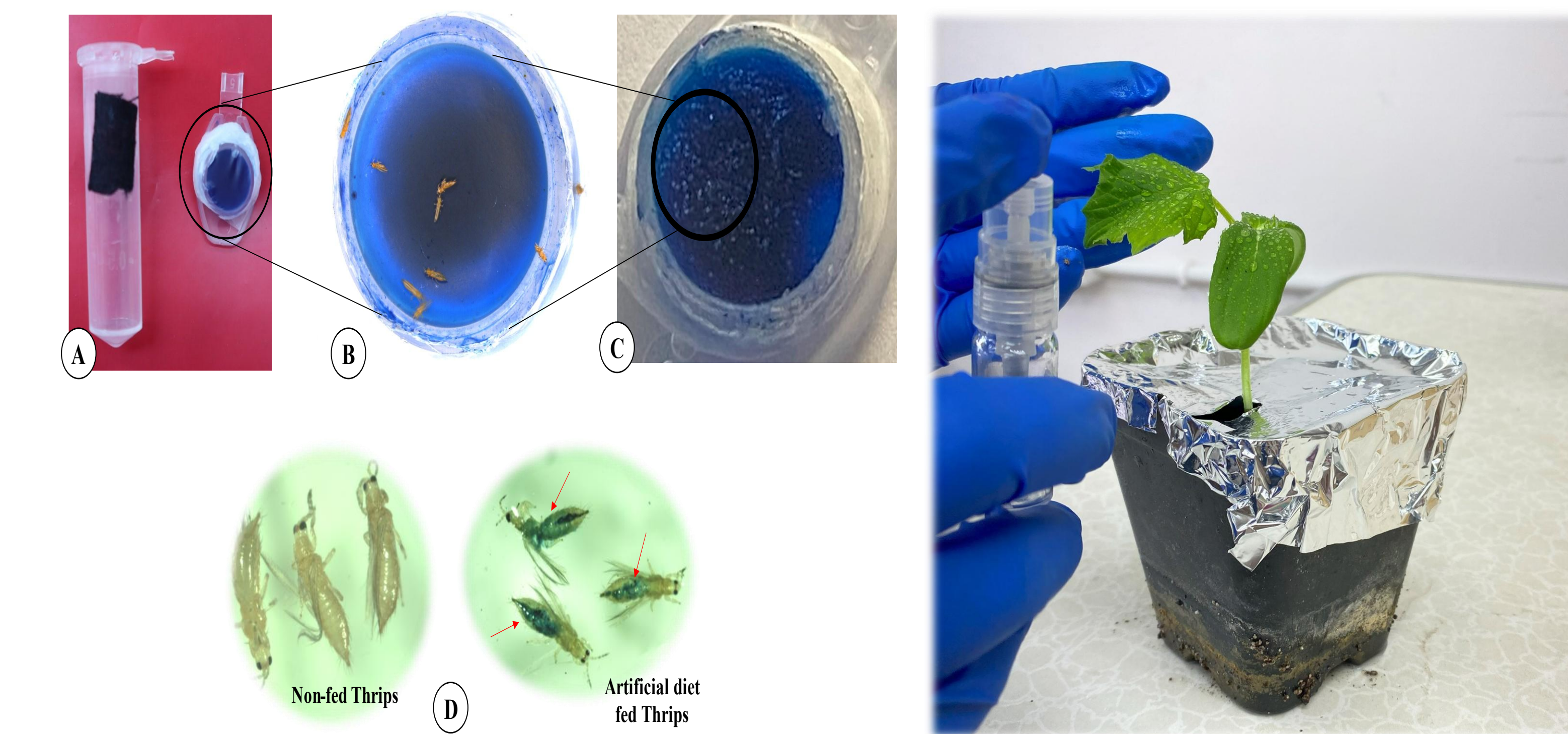
### Designing and synthesis of microbial ds*V-ATPase-B*



- ❖ A recombinant plasmid of L4440 transformed into RNase III mutant *E. coli* HT115 cells and induced for transcription of dsRNA.

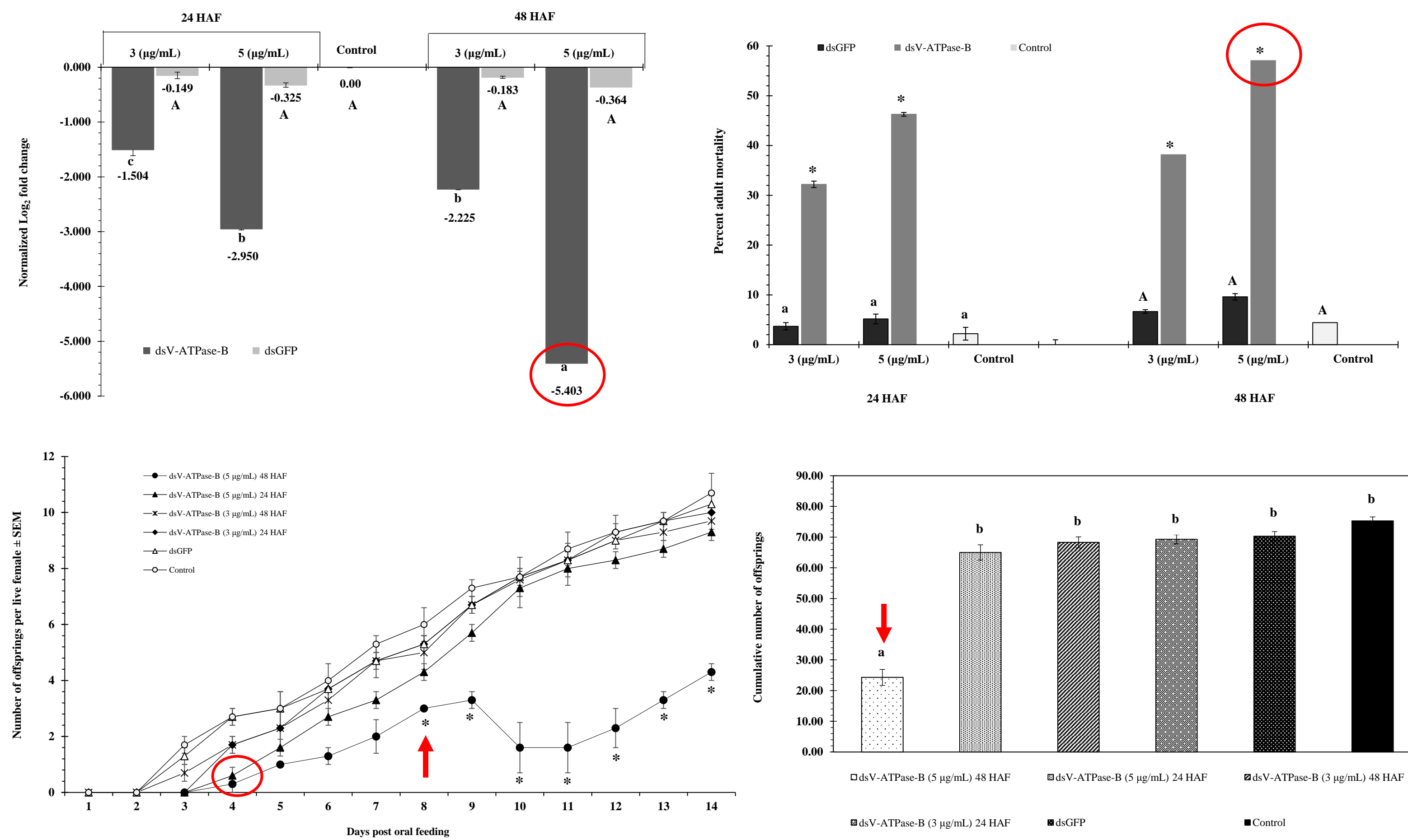
### Oral delivery of ds*V-ATPase-B*

### Foliar spray of ds*V-ATPase-B*



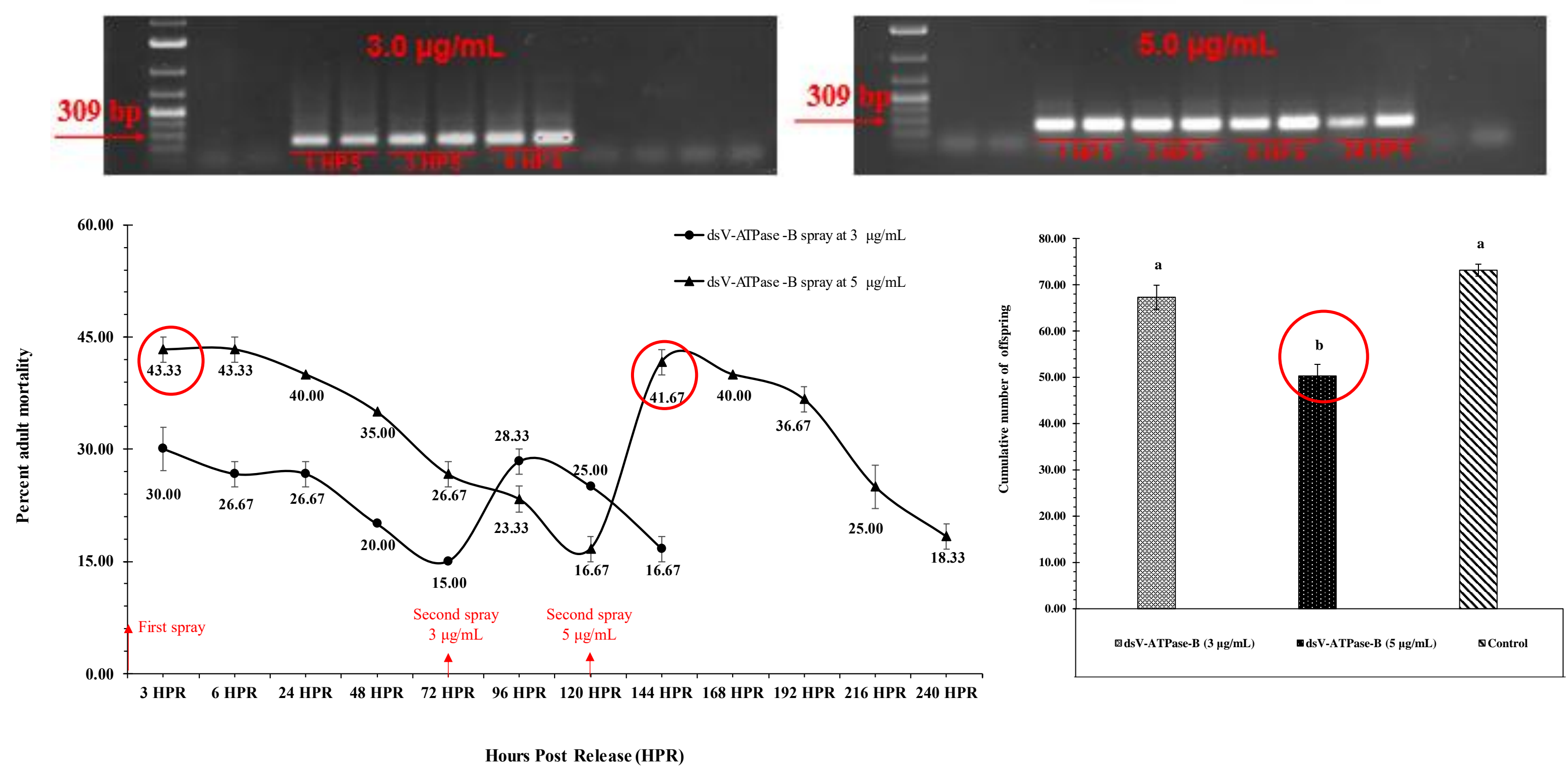
## Results and Discussion

### Oral delivery of ds*V-ATPase-B* induced mortality and reduced reproductive fitness in *Thrips palmi*.



- ❖ 5.40-fold downregulation of *V-ATPase-B* post-ds*V-ATPase-B* feeding.
- ❖ Increased mortality (57.03%) and reduced reproductive fitness (67.73%).
- ❖ Decrease in offspring per day per female for up to 14 days with a delay in the larval emergence for up to three days.

### Spray-on application of naked ds*V-ATPase-B* suppressed the *Thrips palmi* population and affected offspring development



- ❖ The stability of naked ds*V-ATPase-B* increased with increased concentration.
- ❖ Two consecutive sprays provided protection against fresh *T. palmi* releases for 10 days.
- ❖ A maximum of 31.24% decrease in offspring development was recorded.

## Conclusion and Future Thrust

- ❖ The spray-on application of ds*V-ATPase-B* significantly suppressed the *T. palmi* populations by reducing their reproductive fitness and survival.
- ❖ The current findings hold promise for developing sprayable dsRNA formulations as a novel alternative to hazardous pesticides.

## Acknowledgements

