

Odorant Binding Proteins in *Lygus Lineolaris*

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INTRODUCTION:

Tarnished plant bug, *Lygus Lineolaris* is a polyphagous crop pest that feed on several crops in the United States and Canada. Among many agronomic crops affected by this pest are soybeans, strawberries, alfalfa, and cotton. OBPs are small soluble proteins in the sensory organs of animal species and they detect odorants that are hydrophobic. OBPs stimulate neurons housed within the sensilla which triggers a signal cascade that culminates in a behavioral response. Insects use odorant binding proteins (OBPs) and chemosensory proteins to detect signals from various sources that trigger behavioral responses such as host detection, mating, oviposition, aggregation, and avoidance. Identification of OBPs and characterization of their expression in *Lygus* sensory appendages help in improving our understanding of olfaction in *Lygus* species.



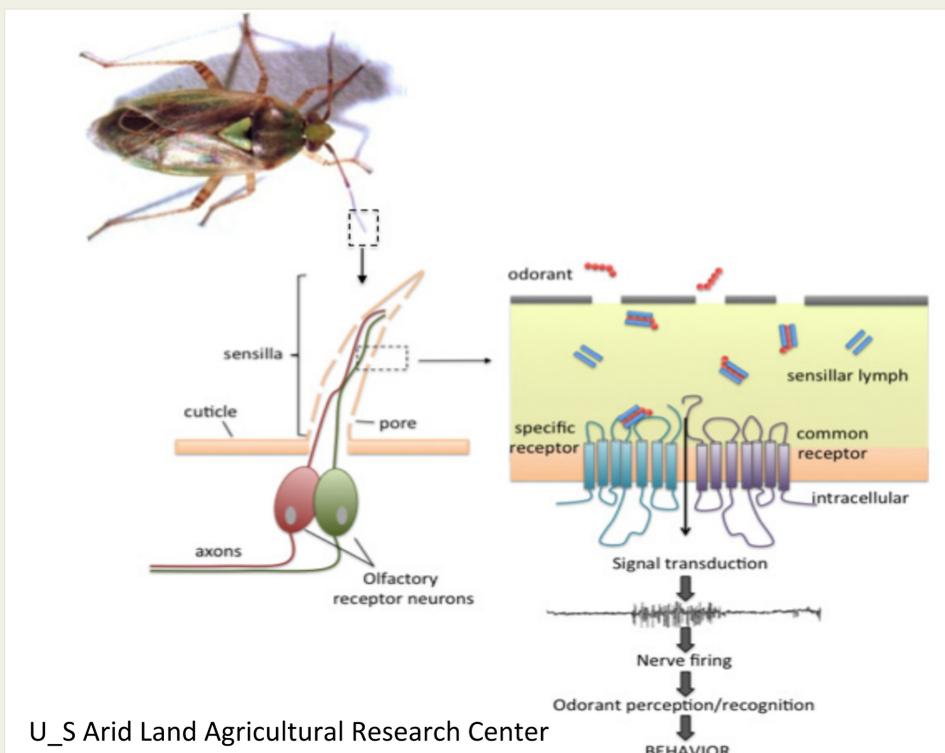
Gene expression was analyzed in *L. lineolaris* through real time PCR of cDNA synthesized from RNA extracted from various tissues. Real time polymerase chain reactions is a laboratory technique based on the polymerase chain reaction, which is used to amplify and simultaneously quantify a targeted DNA molecule. For one or more specific sequences in a DNA sample, real time-PCR enables both detection and quantification. The quantity can be either an absolute number of copies or a relative amount when normalized to DNA input or additional normalizing genes.

MATERIALS AND METHODS:

1. Insect rearing

Lygus Lineolaris were obtained from a laboratory colony maintained at 25°C under 20% humidity. Insects were reared on green beans and an artificial diet mix. Some of the artificial were reared on bio-assay trays whenever we wanted to screen a certain toxin.

2. Total RNA was extracted from the (legs, antennae, and proboscis) of the *L. Lineolaris* Using the TriZol reagent.



RESULTS AND DISCUSSION:

An initial step in elucidating the molecular basis of olfaction in *L. Lineolaris*, the transcriptomic approach was used to identify genes encoding proteins exhibiting OBP- like features. Expression profiling revealed that transcripts for a number of the putative “Plus-C” OBPs were enriched in the antennae. A total of 33 OBPs, including previously identified LAP, were identified from *L. lineolaris*. Twenty of the 33 OBPs were classified as classic OBPs. They were also similar putative OBP sequences identified from other hemipteran species such as green plant bug *Apolygus lucorum* and lucerne plant bug *Adelphocoris lineolatus*.

REFERENCES:

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- Steinbrecht R (1998). Odorant binding proteins: Expression and function. *Ann N Y Acad Sci* 855: 323-332.

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