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SIMRU REPORT

'Identification of the western tarnished plant bug (*Lygus Hesperus*) olfactory co-receptor Oreo: Expression profile and confirmation of a typical membrane topology' research manuscript by J. J. Hull, E. J. Hoffmann, O. P. Perera and G. L. Snodgrass present the molecular basis of olfaction by identifying the *Lygus* Oreo gene product and to determine its expression profile. This research has been accepted for publication in Archives of Insect Biochemistry and Physiology.

In this study, *Lygus hesperus* (western tarnished plant bug) is an economically important pest that damage plant reproductive tissue affecting more than 150 important plants. *Lygus* spp. Interacts with their environment by chemical signals. Putative sex pheromone components of *L. rugulipennis* females have been shown to have an attractive effect on males in field tests and these responses are strongly correlated with their olfactory system. In insects, olfactory detection of chemical odorants involves the activation of odorant receptors (Ors) expressed within the olfactory sensory neurons of the antennae.

Hence, to understand olfaction in *Lygus*, attempts were made in this study to identify *Lygus* Oreo gene product and its expression profile. The authors cloned and characterized *L. Hesperus* Oreo (LhOrco) to understand the molecular basis of olfaction in *Lygus*. As Oreo had functional importance in controlling insect olfaction, and the degree of sequence conservation in closely related species, *L. lineolaris* was determined. Sequence comparison between the LhOrco and UOrco coding sequences were identical, and thus supporting the essential function of this gene product in insect olfaction.

The *L. Hesperus* olfactory receptor co-receptor (LHOrco) shares significant sequence homology with known Oreo proteins in other insects. Parallel experiments using the sympatric sister species, *L. lineolaris* (tarnished plant bug), confirmed that the *Lygus* Oreo gene was completely conserved.

Olfaction is expected to have a dominant role in *Lygus*. LhOrco transcripts are mainly localized in antennae, proboscis, and legs.

The authors found LhOrco had similarities in sequence, membrane topology and expression profile with *Oreo* orthologs and in other insects playing an important role in controlling odorant perception and discrimination. The author suggests targeting *Oreo* expressions to disrupt the functionality as a novel means of controlling pest populations.

Work Cited

Hull, J.J., E.J. Hoffmann, O. P. Perera, and G.L. Snodgrass. 2012. Identification of the western tarnished plant bug (*Lygus hesperus*) olfactory co-receptor Oreo: Expression profile and confirmation of a typical membrane topology. *Arch. Insect. Biochem. Physiol.* Online