Protein Baits, Volatile Compounds and Irradiation Influence Expression Profiling of Odorant-Binding Protein Genes in *Bactrocera dorsalis* (Diptera: Tephritidae)

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Abstract: Chemical communication among insects is based on odorant-binding proteins (OBPs). Regulatory mechanism of OBPs in the perception of volatiles and host chemicals remain unclear. In present study, *Bactrocera dorsalis OBPs (BdorOBPs)* have been evaluated in response to different attractive protein baits, brewer's yeast volatile compounds and irradiation. Based on our previous study, we analyzed the expression of 10 OBP genes expression in the antennae of *B. dorsalis* during three mature life-stages i.e. pre-mating, post-mating and post-oviposition. *B. dorsalis* (Hendel) is one of the most economically important damaging fruit pest. Selected *BdorOBP* genes were found with one conserved PBP-GOBP except *OBP*8 that contained two conserved domains. An unrooted phylogenetic tree was constructed to show the relationships among the 10 *BdorOBPs* to other insects having same OBP family. We recorded significantly different transcriptome expression in each OBP genes at each stage in response to treatments. OBP2 was significantly expressed in response to baits at each developmental stage while OBP2, OBP5 and OBP1 were largely expressed in response to combined volatiles treatments at all tested stages. OBP3, OBP5 and OBP10 showed high expression in response to irradiation at all tested stages. We infer that our treatments have significant influence on the transcriptome of OBP genes which may act in olfactory perception.

Keywords: Odorant binding protein, transcriptome analysis, protein bait, irradiations, volatiles, Bactrocera dorsalis