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Cloning and functional characterization of three new pheromone receptors from the diamondback moth, *Plutella xylostella*

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Abstract

The highly specialized olfactory receptor neurons (ORNs) on the antennae of male moths can recognize blends of several pheromone components. In previous studies, a total of six candidate pheromone receptor (PR) genes were cloned and functionally characterized in the diamondback moth, *Plutella xylostella*. In the present work, we report on three novel candidate pheromone receptor genes: *PxylOR8*, *PxylOR41*, and *PxylOR45* in the same species. Gene expression analysis revealed that *PxylOR8* is specifically expressed in female adult antennae, while *PxylOR41* and *PxylOR45* are expressed in antennae in both sexes, but with a male bias. *In situ* hybridization revealed that *PxylOR8*, *PxylOR41* and *PxylOR45* are localized in long trichoid sensilla. Functional analyses on the three pheromone receptor genes were then performed using the heterologous expression system of *Xenopus* oocytes. *PxylOR41* was tuned to two minor pheromone components Z9-14:Ac, Z9-14:OH, and their analog Z9-14:Ald.

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