

Abstract

In the mating season, bumblebee males leave pheromone track on different objects on their flight routes to attract females of the same species. Synthesis of pheromones, which takes place in the labial gland of bumblebee males, involves enzymes called fatty acid reductases (hereinafter reductases). They catalyse the reduction of fatty acids bound in the form of acyl-coenzyme A to the alcohols. In this work, I functionally characterized two reductases highly expressed in labial gland of the two most common species of bumblebees *Bombus lucorum* and *Bombus terrestris* in order to verify their role in the biosynthesis of species specific male pheromones.

I expressed these reductases in yeast *Saccharomyces cerevisiae*. I confirmed the heterologous expression of reductases and prepared lipid extracts from yeast cells, in which we identified by gas chromatography with mass spectrometric detection (GC/MS) alcohols derived from fatty acids with long chain. These were octadecanol, icosanol and docosanol. These results lead us to conclusion that reductases are involved in the biosynthesis of alcohols with long hydrocarbon chains, which are components of marking pheromones of mentioned bumblebee species. These partial results will be used in a future study that wants to reveal the molecular mechanisms of male bumblebee pheromone evolution.

Key words: *Bombus lucorum*, *Bombus terrestris*, reductase fatty acids