

## Abstract

Many mites rely on fungi for nutrients, and fungi benefit from them with regard to spore dispersal, or nutrient resources. The interactions among mites and fungi are still not clear in most cases. This study analyzed volatile natural products from the liquid and solid cultures of the edible fungi, *Flammulina velutipes* (Fr.) Sing, and the solid mycelia induced by the storage mite, *Tyrophagus putrescentiae* Schrank, using HS-SPME-GC-MS/MS. Five new monoterpenes and 30 new sesquiterpenes were isolated from the two cultures of *F. velutipes* and a newly monoterpene and 14 newly sesquiterpenes found in the solid mycelia induced by the storage mite. Sesquiterpenes were abundant in the mycelial stage of *F. velutipes*. The mite was attracted by some volatiles from host fungi, dihydrocarveol, cedrol,  $\beta$ -caryophyllene,  $\alpha$ -terpilene,  $\beta$ -pinene and benzaldehyde, analyzed by four-arm olfactometer. Some terpenes induced by *T. putrescentiae*, such as caryophyllene oxide, bicyclogermacrene, and (-)-spathulenol, would have potential biological function. These results suggest that some volatile sesquiterpenes play an important role in enabling the mite to recognize host fungi.