

Volatile organic compounds and host-plant specialization in European corn borer E and Z pheromone races

Ene Leppik · Brigitte Frérot

Received: 27 July 2011 / Accepted: 8 February 2012 / Published online: 28 February 2012
© Springer Basel AG 2012

Abstract Plant volatile cues are considered the main source of information for ovipositing moths, which use chemical information to locate and recognize the host plant. In Europe, two sympatric populations of European corn borer (ECB; *Ostrinia nubilalis*, Hübner), the Z and E-pheromone races, feed mainly on maize and hop or mugwort, respectively. We studied the mechanisms of host-plant recognition and fidelity in ECB pheromone races by testing the attractiveness of host plants to gravid females in a flight tunnel and by analyzing the volatiles released from maize, mugwort, and hop during the scotophase, when the ovipositing flight of the ECB females occurs. In the wind tunnel bioassay, the Z-race and E-race females engaged in upwind flight and expressed a strong host fidelity to their respective main host plants; all three of these host plants possess distinctive volatile profiles specific as to blend and ratio. The host plants shared a certain number of ubiquitous volatiles present in various ratios that likely constitute a species-specific cue to host-seeking ECB moths. Our observations therefore suggest that ECB host fidelity is steered by plant volatiles that are present in species-specific ratios of ubiquitous volatile organic compounds.

Keywords *Artemisia vulgaris* · *Humulus lupulus* · *Zea mays* · Wind tunnel · GC–MS · SPME

E. Leppik · B. Frérot (✉)
INRA, UMR 1272, PISC Physiologie de l’Insecte: Signalisation
et Communication, Route de St Cyr, 78000 Versailles, France
e-mail: brigitte.frerot@versailles.inra.fr