Geophysical Research Abstracts, Vol. 8, 02942, 2006
SRef-ID:

Gypsy moth feeding (*Lymantria dispar*) triggers local and systemic changes in the constitutive production of monoterpenes and induces the production of new volatiles in leaves of the evergreen Holm oak (*Quercus ilex*).

M. Staudt and L. Lhoutellier

CNRS Centre for Evolutionary and Functional Ecology, Montpellier, FranceMichael.staudt@cefe.cnrs.fr

Leaves of the evergreen Holm oak, one of the dominant tree species of the Mediterranean vegetation, release large amounts of monoterpenes under photosynthetic conditions. In 2005 the massive invasion of Gypsy moth caterpillars in Southern France caused the partial defoliation of thousands of hectares of Holm oak forests, which may have substantially decreased VOC fluxes on a regional scale. In the present study we examined whether Gypsy moth attack may induce quantitative and qualitative changes in the VOC production of Holm oak leaves. We fed caterpillars on Holm oak saplings overnight and monitored foliar VOC emissions and CO_2/H_2O gas exchange over 2 weeks on attacked leaves (local response) and non-attacked leaves (systemic response) of infested plants as well as on leaves of non-infested plants (controls). Compared to controls, the emission of constitutive VOC (monoterpenes) from infested plants temporary increased in non-attacked leaves by up to 30 % while photosynthesis remained almost unchanged. In attacked leaves, constitutive VOC emissions were similar than in controls during the first four days but dropped at the end of the experiment, which was accompanied by a reduction in photosynthesis. This reduction in emission and photosynthesis may be partly explained by the continuous desiccation and decline of some leaf lamina fragments during the measuring period, which led to additional losses of physiologically active leaf tissues. However, the same attacked leaves emitted an array of new VOCs, which peaked in the first day after feeding and rapidly dropped the days afterwards. Some of these locally induced VOCs were also tempo-

rary released by non-attacked leaves of the same plants but in much lower amounts. Induced VOCs consisted mainly of semi-volatiles, of which two were tentatively identified as the sesquiterpene Germacrene and the phenolic compound methyl-jasmonate, compounds that have been frequently observed in plant responses to herbivore stress.