

2-Methyl-(Z)-7-Octadecene — The Sex Pheromone of Allopatric *Lymantria serva* and *Lymantria lucescens*: Two Potential Invasive Species in the Orient

Paul W. Schaefer¹, Gerhard Gries², Regine Gries², Yasutomo Higashiura³, and Yi-Bin Fan⁴

¹USDA, Agricultural Research Service, Beneficial Insects Research Laboratory
501 South Chapel Street, Newark, Delaware 19713, USA

²Simon Fraser University, Department of Biological Sciences,
8888 University Drive, Burnaby, B.C. V5A 1S6, Canada

³Ecology Laboratory, Tokyo University of Pharmacy and Life Science, Horinouchi, Hachioji,
Tokyo 192-0392, Japan

⁴Taiwan Forestry Research Institute, Taipei 10728, Taiwan, Republic of China

Abstract

Our objective was to identify the sex pheromones of two allopatric *Lymantria* species (Lepidoptera: Lymantriidae): (1) *L. serva* (Fabricius) in Taiwan whose larvae attack and occasionally defoliate *Ficus* spp. and (2) *L. lucescens* (Fabricius) in Honshu, Japan, whose larvae feed on *Quercus* spp. Coupled gas chromatographic-electroantennographic (GC-EAD) analyses of pheromone gland extracts revealed one antennally-active compound produced by female *L. serva*, and the same compound by female *L. lucescens*. This compound was identified as 2-methyl-(Z)-7-octadecene (2me-Z7-18Hy) by retention index calculations on DB-5, DB-23 and DB-2 10 columns, and by comparative GC-mass spectrometric (MS) and GC-EAD analyses of the insect-produced candidate pheromone and synthetic 2me-Z7-18Hy. Field trapping experiments in the Taipei Botanical Garden, Taiwan, and in mixed oak forests in Mifune, Toyota City, Aichi Prefecture, Japan, confirmed attraction of respectively male *L. serva* and male *L. lucescens* to 2me-Z7-18Hy. Allopatric distribution of *L. serva* and *L. lucescens* seems to allow both species to use the same sex pheromone without compromising specificity of either species. Synthetic 2me-Z7-18Hy can now be utilized for pheromone-based detection surveys of these exotic moths.