

SUMMARY OF PHEROMONE LURES OF POTENTIALLY INVASIVE MOTHS (LYMANTRIIDAE: LEPIDOPTERA) AND A RANKING OF THEIR POTENTIAL THREAT TO CERTAIN NORTH AMERICAN HABITATS

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ABSTRACT

Many Asian lymantriid moths in the genera *Lymantria* and *Orgyia* pose imminent threats of being accidentally introduced into North America. Based on their (a) extent of polyphagy; (b) potential of transoceanic transportation; (c) likelihood of establishment in North America; and (d) life history traits, we propose a ranked list (descending order) of the 10 most threatening *Lymantria* spp., as follows: *dispar asiatica*, *monacha*, *dispar japonica*, *obfuscata*, *xylina*, *lucescens*, *mathura*, *fumida*, *concolor* and *albescens*. Since 1995, we have studied in laboratory analyses and/or field experiments pheromones of these *Lymantria* and some *Orgyia* spp. Based on our findings, synthetic pheromone lures have been, or can be, developed for deployment in surveys for the earliest possible detection of these exotic moths. These (prospective) lures include: (a) (+)-disparlure [(7R,8S)-cis-7,8-epoxy-2-methyloctadecane] for male *Lymantria dispar asiatica*, *L. japonica*, *L. albescens*, *L. atemeles*, *L. narindra*, *L. obfuscata*, and *L. concolor*; (b) (+)-disparlure plus (7Z)-2-methyl-7-octadecene for male *L. fumida*; (c) (+)-monachalure [(7R,8S)-cis-7,8-epoxy-octadecane]

together with (+)-disparlure and (7Z)-2-methyl-7-octadecene for male *L. monacha*; (d) (+)-xylinalure [(7R,8S)-cis-7,8-epoxy-2-methyleicosane] for male *L. xyлина*, *L. plumbalis* and *L. brunneiplaga*; (e) (+)- and (-)-mathuralure [(9R,10S,3Z,6Z)-cis-9,10-epoxy-3,6-nonadecadiene and (9S,10R,3Z,6Z)-cis-9,10-epoxy-3,6-nonadecadiene] at a 1:4 ratio for male *L. mathura*; (f) bantaizanalure [(7Z,9E)-2-methyl-7,9-octadecadiene] for male *L. bantaizana*; (g) (7Z)-2-methyl-7-octadecene for male *L. lucescens* and *L. iris* (= *L. serva* in Taiwan); (6Z,9Z)-heneicosadien-11-one for male *Teia anartoides*; (h) (6Z)-heneicosen-11-one plus (6Z)-heneicosen-9-one for male *Orgyia thyellina*; and (i) (6Z,9Z)-*trans*-11,12-epoxy-6,9-heneicosadiene for male *O. postica*.

Insofar as habitat susceptibility is concerned, our exercise suggests that temperate mixed oak forests are especially vulnerable to invasion by Asian moths, all AGM's, *L. mathura*, *L. lucescens*, while larch or spruce forests are vulnerable to *L. monacha* or *L. fumida*. Habitats in Hawaii, S. Calif. or Florida are prime for *L. xyлина* and *O. postica*.