

Northernmost Collection Record of *Lymantria narindra* (Lepidoptera: Lymantriidae) in Thailand: Males Captured in (+)-Disparlure-Baited Traps¹

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Lymantria narindra Moore (Lepidoptera: Lymantriidae) is distributed from Thailand, Vietnam and the Malay peninsula southeastward through Borneo, Sumatra, Java (Type Locality), and other Indonesian islands as far east as Bali (Barlow 1982, An introduction to the moths of South East Asia. The Malayan Nature Soc., Kuala Lumpur, 305 pp; Schintlmeister 1994, Hetero. Sumatr. 7: 113-180; Schintlmeister 2004, Quadrifina 7: 1-248). This species is one of the largest representative of the genus *Lymantria* with spread wing expanse measuring approximately 74 mm in males and 95.2 to 118 mm in females (Horsfield and Moore, 1859, A catalogue of the lepidopterous insects in the Museum of Natural History at the East-India House. Vol. 2. London; Unpubl. museum data). A very similar newly described species, *L. sapaensis* Kishida occurs in northern Thailand and Vietnam (Kishida 1998, Trans. Lep. Soc. Japan 49: 211-212; Schintlmeister 2005) and was an intended target species. In Malaysia, *L. narindra* is recorded as feeding on *Cinnamomum* spp. (Schintlmeister 1994). Otherwise, very little is known of the biology and behavior of both these large and striking *Lymantria*.

In March 2001, we captured males of *L. narindra* at one location during an opportunity to expose sticky traps baited with new synthetic *Lymantria* spp. sex pheromone lures in several locations in Thailand.

Delta-like sticky traps, constructed of milk carton cardboard (Gray et al. 1984, Can. Entomol. 116: 1525-1532), were used and baited with synthetic sex pheromones, provided by Regine and Gerhard Gries (Simon Fraser Univ., Burnaby, B.C., Canada).

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Sets of traps were deployed in various locations in central Thailand. For simplicity, only the trapping as it applies to *L. narindra* is reported here. Traps contained one of the three following lures: Lure 1 was (+)-Disparlure 100 µg, or (7R,8S)-cis-7,8-epoxy-2-methyloctadecane, the sex pheromone of *Lymantria dispar*, or gypsy moth of Europe and North America (Bierl et al. 1970, Science 170: 87-89; Plimmer et al. 1977, Environ. Entomol. 6: 518-522; Cardé et al. 1977, Environ. Entomol. 6:768-77). Lure 2 was the corresponding hydrocarbon of disparlure, 2-methyl-Z7-octadecene, 50 µg and major pheromone of *Lymantria serva* and *L. lucescens* (Gries et al. 2002, J. Chem. Ecol. 29: 469-478). Lure 3 was a monachalure blend, combining Lure 1 at 50 µg, Lure 2 at 5 µg, and (+)- monachalure, or (7R,8S)-cis-7,8-epoxy-octadecane, 50 µg, the sex pheromone of *Lymantria monacha*, or nun moth of Eurasia (Gries et al. 1996, Naturwissenschaften 83: 382-385, 1997 Can. Entomol. 129: 1177-1178). All traps were placed about 2 m above ground on tree branches.

The location of the positive trap catches was a rural site (N 14° 23.46', E 98° 55.66') near Sai Yok, along highway route 323 between Kancharaburi and Thong Pha Phum in the valley of the River Khwae. The habitat was at the transition between rather flat agricultural lands and adjacent forested steep hills which may still contain a resemblance of the diverse trees of the original tropical forests. The dominant component of the so-called "Bamboo Forest" was a large tree-like bamboo, *Bambusa blumeana* Schult (Gramineae: Bambuseae), but many other tropical hardwood tree species occurred on the nearly inaccessible upper slopes.

The initial trapping event used one set of traps deployed between 20 and 22 March 2001 (two nights) while the second opportunity occurred during a return trip 28 to 30 March 2001 (two nights and traps checked after each night) during which we exposed both sticky traps (Lure 1, Lure 2 and a trap control) and a new improvised trap design, a clear lexan cylinder (10 cm diam × 30 cm) with ends made with inward directing truncated cones with central openings 3 cm in diam. These traps were baited only with Lure 1 (+)-disparlure and charged with half of a Vaportape™ II, insecticidal strip (Hercon Environmental Co., Emigsville, PA) for killing any trapped moths.

The initial trapping event captured three males (all in one trap), and the second trapping captured two males each in the same trap but on consecutive nights. All males, later confirmed as *L. narindra*, were captured only in sticky traps baited with (+)-disparlure (Lure 1). The other trap lures failed to attract and trap these males.

Our unexpected capture of males of *L. narindra* near Sai Yok constitutes a new northernmost collection record for this species in Thailand and in all of Southeast Asia (Schintlmeister 2004). By extending the known distribution more northerly in Thailand, it also reduced the known gap between the recorded distribution of *L. sapaensis* in northern Thailand and that of *L. narindra* to the south (Schintlmeister 2004). We gained new insight into the sex pheromone specificity in *L. narindra* because all five males responded to the (+)-disparlure alone and failed to be attracted to the corresponding hydrocarbon (Lure 2) and lures containing monachalure (Lure 3). Specimens were removed from the adhesive, damaging them slightly, and deposited in the collections of PWS (3 spec.), NBCRC, Kamphaeng Saen (1) and A. Schintlmeister (1) (Dresden, Germany). Our findings re-confirm earlier trapping of *L. narindra* in (+)-disparlure baited traps in Sumatra (Kamata et al. 2000, Tropics 10: 473-480). Unfortunately, no males were captured in a new cylinder trap design which was specifically included in the second trapping event in the hope of obtaining specimens which were not stuck in the sticky, damaging trap adhesive. We can now focus more intensely on *L. narindra* knowing where to find this species in Thailand and that males will respond

to (+)-disparlure, the sex pheromone of the notorious gypsy moth, *L. dispar* L., of temperate regions of Eurasia and North America. Although we still have no data on just what *L. narindra* females emit, males show an attraction to only (+)-disparlure and, therefore, we now have a usable trap lure to attract *L. narindra* males. In time, perhaps further study will enhance the effectiveness of this trapping system and provide a basis for a greater understanding of the biology, behavior, and distribution of this rather exceptional tropical species of *Lymantria*.

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