

# Improvement of the identification technology for Asian Spongy Moth(Lepidoptera: Erebidae) based on SS-COI

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November 9, 2022

## Abstract

Spongy moths, *Lymantria dispar* Linnaeus, are economically significant quarantine pests. The Asian spongy moth (ASM), *Lymantria dispar asiatica* and *Lymantria dispar japonica*, is more invasive compared with the European spongy moth (ESM) because females are capable of flight and larvae feeding on more host plants. Many countries have implemented strict quarantine policies for areas where ASM is present to prevent its introduction. ASM is distributed in most provinces of China, in view of the high morphological similarity between *Lymantria*, especially larvae and pupae, accurate identification is a necessary condition to prevent ASM from invading new areas. Although the identification technology of ASM has been developed previously, we have recently found that there are potentially complex subspecies differentiation of spongy moth in China, and there are new subspecies in South China and Yunnan (unpublished data). The original identification method was more or less incomplete in response to the newly discovered variation. Therefore, the purpose of this study is to update the rapid detection technology of ASM: based on the cytochrome oxidase I gene, a pair of ASM specific primers were designed from samples obtained from known areas where spongy moth occurs in China. These primers can effectively identify ASM of all life stages, and can be used to identify ASM of all geographic populations in China. It was confirmed that the primer provided accurate identification of ASM in a wide range of annealing temperatures, indicating that it was extremely stable. The sensitivity test explained that the lower limit of detection was 30 pg/μl. In addition, the analysis of *Lymantria* samples mixed with ASM captured in the field also showed the specificity of ASM. Experimental methods allow accurate monitoring of ASM and reduce the risk of ASM spreading to other regions.

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