

Oak processionary moth (OPM)

The oak processionary moth (*Thaumetopoea processionea*) is a major defoliator of oak in Europe. The larvae feed on the foliage of many species of oaks, including English, Sessile and Turkey oaks (*Quercus robur*, *Q. petraea* and *Q. cerris*). Hornbeam, hazel, beech, sweet chestnut and birch are also reported to be attacked, although mainly when growing next to severely defoliated oaks. It gets its common name from its caterpillars' striking habit of forming long lines, or 'processions', on trees and other substrates. Infestations of feeding larvae were found on oak trees in London in 2006 and the moth is subject to control and possible eradication. Additional hazards arise from the extremely irritating hairs on the larvae that can affect humans and animals.



Research evidence has revealed

- It is possible to monitor for male moth populations using pheromone traps, but the chemical lure is not particularly effective or stable.
- The moth has one generation per year in the UK, overwintering as eggs which hatch in April.
- Early application of the microbial insecticide *Bacillus thuringiensis* (*Bt*) to newly hatched larvae is effective in reducing moth populations.
- Location of the silken nests produced by larvae provides good evidence of moth presence; nest removal when the late larvae and pupae are present offers potential for population reduction.
- A vacuum system has been developed for nest removal, providing a high degree of protection against the irritating hairs.
- The northward progression of the moth in Europe suggests a link to climate change.

Known evidence gaps

The presence of OPM in an urban environment poses particular difficulties in mounting a survey, control and eradication campaign. Particular requirements are:

- The need for a more reliable and efficient pheromone lure that can be used in a more effective monitoring system.
- Development of degree-day parameters to produce a predictive model for spring egg hatch of the moth to enable precise timing of insecticide applications.
- Methods for efficient delivery of the preferred insecticide, the microbial control agent *Bt*, to the upper canopies of large trees.
- Improved methods for safe removal of nests containing late stage larvae and pupae.
- Assessment of natural biological control and population behaviour in the UK compared with that on the continent.

Potential impact

Within its natural and expanding range in Europe, the moth reaches population densities that result in complete defoliation of oak trees, loss of growth increment and weakening of trees making them vulnerable to other biotic and abiotic factors such as AOD (see AOD for economic impact). Additional societal impacts arise from the extreme irritation that can arise from contact with the urticating hairs of mature larvae