

EPPO Datasheet: *Thaumetopoea processionea*

Last updated: 2020-11-26

IDENTITY

Preferred name: *Thaumetopoea processionea*

Authority: (Linnaeus)

Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Lepidoptera: Notodontidae

Other scientific names: *Cnethocampa processionea* (Linnaeus)

Common names: oak processionary caterpillar, oak processionary moth

[view more common names online...](#)

EU Categorization: PZ Quarantine pest (Annex III)

EPPO Code: THAUPR



[more photos...](#)

Notes on taxonomy and nomenclature

The genus name *Thaumetopoea* comes from the Greek words “θαύμαζω” (=miracle) and “ποιέω” (=do), quite likely due to some remarkable biological traits such as the gregarious behaviour through egg and larval stages, the urticating setae for the protection against vertebrate predators and the prolonged (up to nine years) diapause as pupa in soil in order to avoid unfavourable environmental conditions that could put its survival at risk (Battisti *et al.*, 2015). The species name refers to the typical behaviour of the larvae that build up a procession (*processionea*) when searching for a place to pupate in the soil.

HOSTS

Thaumetopoea processionea (oak processionary moth) feeds on the different *Quercus* species that can be found across Europe and the Near East. In general, preferred hosts are *Quercus cerris*, *Q. ilex*, *Q. pubescens*, *Q. petraea*, *Q. pyrenaica* and *Q. robur* (Dissescu & Ceianu, 1968; Pascual, 1988; Moraal, 1996; Stigter *et al.* 1997; Tomiczek & Krehan, 2003; Damestoy *et al.*, 2020) while in the near East, it can also attack *Quercus infectoria* subsp. *veneris* and *Q. calliprinos* (Démolin & Nemer, 1999; Halperin & Sauter, 1999). Based on observations at the Royal Botanical Gardens (Kew, GB), North American and Asian species can also be infested by the oak processionary moth (Townsend, 2009).

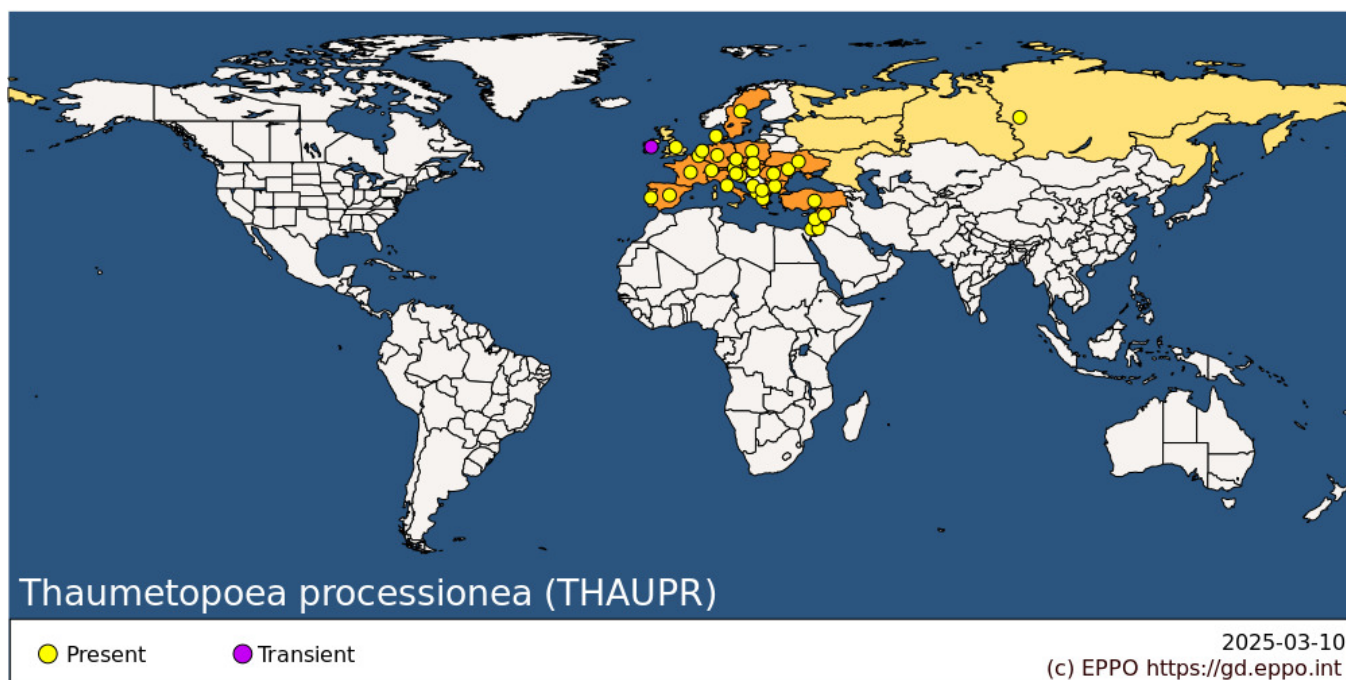
During population outbreaks, other species belonging to genera such as *Acacia*, *Fagus*, *Betula*, *Crataegus*, *Juglans*, *Pistacia*, *Robinia*, *Sorbus* or even *Pinus* have been affected; nevertheless, this pest can complete its development only on *Quercus* spp. and *Fagus* spp. (Nicosia, 1923; Kiriukhin, 1946; Bay, 1961; Carter, 1984; Stigter *et al.* 1997; Evans 2007).

Host list: *Acacia*, *Betula*, *Crataegus*, *Fagus*, *Juglans*, *Pinus*, *Quercus calliprinos*, *Quercus cerris*, *Quercus frainetto*, *Quercus ilex*, *Quercus infectoria* subsp. *veneris*, *Quercus petraea*, *Quercus pubescens*, *Quercus pyrenaica*, *Quercus robur*, *Quercus rubra*, *Sorbus*

GEOGRAPHICAL DISTRIBUTION

T. processionea is present in almost all European countries and also in parts of the Middle East, including Israel, Lebanon and Jordan (Maksymov, 1978; Bogenschütz *et al.* 1988; Stigter & Romejin, 1992; Roskams, 1995; Mirchev *et al.*, 2011; Roversi, 2008; Groenen, 2010; Groenen & Meurisse, 2012). *T. processionea* is present in all countries located on the northern shore of the Mediterranean Sea, in Anatolia (Turkey), and in the mountains surrounding the Dead Sea (Groenen & Meurisse, 2012). In the north of Europe, this species is present in the Netherlands, Germany and Ukraine while recently it has been rediscovered in Poland after a long period of absence (Groenen & Meurisse, 2012). Males of this species have also been caught in Denmark and Sweden (Skule & Vilhelmsem, 1997; Lövgren &

Dalsved, 2005). Finally, this species was caught in the United Kingdom for the first time in 2006, which was considered quite likely to be due to the international plant trade (Baker *et al.*, 2009; Mindlin *et al.*, 2012).



EPPO Region: Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France (mainland), Germany, Greece (mainland), Hungary, Ireland, Israel, Italy (mainland), Jersey, Jordan, Moldova, Montenegro, Netherlands, North Macedonia, Poland, Portugal (mainland), Romania, Russia, Slovakia, Slovenia, Spain (mainland), Sweden, Switzerland, Türkiye, Ukraine, United Kingdom
Asia: Israel, Jordan, Lebanon, Syria

BIOLOGY

T. processionea is univoltine, with the eggs hatching in spring (April to May) depending closely on the temperatures of the preceding period (Pascual, 1988; Custers, 2003; Wagenhoff and Delb, 2011; Meurisse *et al.*, 2012; Wagenhoff *et al.*, 2013), and highly synchronized with oak bud flushing (Stigler *et al.*, 1997; Wagenhoff & Veit, 2011; Wagenhoff *et al.*, 2013; Damestoy *et al.*, 2020). Larvae go through six instars and may feed until the end of June or the start of July, depending on ambient temperatures as higher temperatures favour a more rapid development (Dissescu & Ceianu, 1968). Larvae live in groups, with younger ones moving and feeding during daytime, and older ones feeding during the night as they spend the daytime in a silk tent (Schmidt, 1974; Wagenhoff *et al.*, 2013). From the 3rd instar onwards, *T. processionea* larvae develop urticating setae on the dorsal parts of the abdomen, which are actively released once larvae are disturbed (Lamy, 1990; Maier *et al.*, 2004; Battisti *et al.*, 2011; Petrucco Toffolo *et al.*, 2014). The silk tent is located on the lower part of the trunk, and is constructed during the fifth or sixth instars using silk, hairs, faeces and old larval skins (Battisti *et al.* 2015). Under very warm conditions, tents can be even partially on the ground (Dissescu & Ceianu, 1968).

The population fluctuations of *T. processionea* are largely considered unpredictable, and thus there is still a great debate as to whether their epidemics are cyclic or eruptive (Pascual, 1988; Krehan, 1993; Tomiczek & Krehan, 1996; Wagenhoff & Veit, 2011). However, recently it has been shown that fluctuations are mostly determined by aridity in May-July (Klapwijk *et al.*, 2013; Csóka *et al.*, 2018), and the changing climate appears to be linked to the increase in frequency and intensity of the observed outbreaks (Stigler *et al.*, 1997; Maier *et al.*, 2004; Jans & Franssen, 2008; Moraal & Jagers op Akerhuis, 2011; Groenen & Meurisse, 2012).

DETECTION AND IDENTIFICATION

Symptoms

The main signs of occurrence of *T. processionea* in an oak forest are the following:

- Skeletonized remains of leaves.
- White silken nests at the base of lower branches, on the trunk or at the base of the trunk. Later on, these nests become less bright white due to the shed skins that larvae change during instars.
- Nose-to-tail processions of the caterpillars on the branches of oak trees.

Morphology

Eggs

Eggs are laid by females in batches of 50-200 eggs which are covered by scales. Predominantly these egg batches are laid in rows along the terminal branches of oak trees, most commonly on one- or two-year-old twigs (Dissescu & Ceianu, 1968; Maksymov, 1978; Bin & Tiberi, 1983; Pascual, 1988; Tsankov *et al.*, 1991).

Larva

Larvae go through six larval stages that differ in size and colour, with the newly emerged larvae being brown, and the later instars becoming grey. The 1st instars overwinter within the eggs, and hatch in mid- or late April, just before bud burst. The 3rd instar, larvae which are disturbed produce barbed, urticating setae from the eleventh dorsal segment, that contain thaumetopoein, an allergenic protein. The next larval stages produce urticating setae in other segments (in the 4th instar they are produced in both the 10th and 11th segment, while in the 5th and 6th instars, setae are produced in all abdominal segments). The 5th or 6th instar, larvae build the silken nests.

Pupa

Pupation takes place inside the nests, with the larvae spinning cocoons during mid-summer (late June, early July).

Adult

Adult moths have grey forewings, with white and grey marking, and a wingspan that can be up to approximately 30 mm.

Some diagnostic features for *T. processionea* are included in the EPPO Diagnostic Protocol PM 7/37 *Thaumetopoea pityocampa* (EPPO, 2004).

Detection and inspection methods

Monitoring of *T. processionea* is based on egg and nest counting, visual assessment of the level of tree defoliation (Moller, 2006) or on the use of pheromone traps to assess population dynamics (Bogenschütz 1998b; Breuer *et al.*, 2003; Fransen *et al.*, 2008; Williams *et al.*, 2013).

PATHWAYS FOR MOVEMENT

The pathways that oak processionary moth employs when expanding to new territories include both natural spread and human-mediated transport.

Males are generally considered strong flyers (up to 100 km per year), as in some cases they have been found in light traps far away from places where nests have been reported (Stigter *et al.*, 1997; Lövgren & Dalsved, 2005). On the contrary, females fly much shorter distances, reaching only up to 20 km per year (Stigter *et al.*, 1997).

However, the major pathways that *T. processionea* follows when expanding are human-mediated. Plants-for-planting can be a source of egg masses, larvae or pupae (pupae may be present in nests from April to July). The presence of

nests can easily escape attention, as at low population densities, nests are not larger than the size of a tennis ball, something that makes it more difficult to be detected particularly in the case of larger trees (Stigter *et al.*, 1997). Additionally, transported oak roundwood with bark from infested trees may have small nests that contain viable larvae and/or pupae (from April to late July). Nevertheless, it should be noted that, given the fact that oak trees are normally felled during winter, the probability to already have nests with living larvae and pupae is low. Finally, *T. processionea* may expand its distribution through the trade of cut branches of host trees, though this pathway is of much lesser importance compared to the above-mentioned ones.

PEST SIGNIFICANCE

Economic impact

Though the exact impact of *T. processionea* on tree health remains relatively unknown, repeated defoliation in spring increases tree susceptibility to drought and secondary pests and reduces earlywood width (Blank, 1997; Chauvel, 2000; McManus & Csóka, 2007; Nageleisen, 2008; Roversi, 2008; Hirka *et al.* 2011). Moreover, the infestation by *T. processionea* has been hypothesized to be associated with oak decline which has repeatedly emerged during the past centuries and particularly in the most recent decades. This syndrome of oak decline has been attributed to single or combined effects of abiotic and biotic factors, among which defoliating insects seem to play a significant role (Thomas *et al.*, 2002). However, the exact impact of these biotic factor still needs to be further evaluated.

In addition to the effect on forest health, outbreaks of *T. processionea* have an even greater impact on health due to the urticating setae the larvae produce after the 3rd larval stage that cause ocular and respiratory problems in animals and humans (Lamy, 1990; Maier *et al.*, 2004; Gottschling & Meyer, 2006; Jans & Franssen, 2008; Green 2015; Battisti *et al.* 2011; Petrucco Toffolo *et al.*, 2014; Battisti *et al.* 2017).

Control

A variety of different natural enemies have been described to regulate the populations of *T. processionea* in natural stands (Battisti *et al.*, 2015). These range from egg-, larvae- and pupae-specific parasitoids (Stratan, 1971; Tschorsch, 1993; Stigter *et al.*, 1997; Zwakhals, 2005) to generalist insect predators (Maksymov, 1978; Dajoz, 2000) and birds (Wagenhoff *et al.*, 2013). In addition to these, late instar larvae and pupae have been found to be infected by microsporidia (Hoch *et al.*, 2008) and nuclear polyhedrosis baculovirus (Murphy *et al.*, 1995). Nevertheless, it should be noted that the influence of these natural enemies on the populations oak processionary moth has been investigated only at a qualitative and not quantitative perspective and thus, none of these approaches has been evaluated in their efficacy to control the populations of *T. processionea*.

The only method that is currently used to control the population outbreaks of *T. processionea* is based on the use of *Bacillus thuringiensis* var. *kurstaki* (B.t.k.) agents (Bogenschütz, 1988; Bogenschütz 1998a; Bub *et al.* 2005; Fransen *et al.*, 2008) and insect growth regulators (Pascual *et al.*, 1990; Stigter *et al.*, 1997). These approaches are primarily implemented in highly frequented public places in order to avoid the impact of urticating setae, and secondarily to protect infested oak stands from repeated defoliation. In addition, the physical removal of nests can be effective, in areas where the level of infestation is limited.

Phytosanitary risk

Though the exact impact of *T. processionea* on the health of oak stands and its contribution to the general syndrome of oak decline is still under investigation, the effects on human and animal health have been clearly shown.

PHYTOSANITARY MEASURES

Due to the natural dispersal ability of the species in concert with its broad distribution in Europe, it is highly unlikely that any phytosanitary measures could effectively prevent the natural dispersal of the oak processionary moth. However, measures aimed at plants-for-planting could reduce the probability of introduction in areas where it is currently absent or under control.

Examples of phytosanitary measures for *T. processionea* have been applied in the European Union (EU, 2019) where protected zones have been identified (i.e. Ireland and some areas of the United Kingdom). For these areas, oak trees that are used as plants-for-planting of a girth of at least 8 cm measured at 1.2 m height from the root collar should be examined. In addition oak trees should have a certificate that these plants have been grown throughout their life a) in places of production where *T. processionea* is not known to occur, b) in an area free from *T. processionea* established by the NPPO in accordance with ISPM 4 (2017) and c) in a site with complete physical protection against the introduction of *T. processionea* and have been inspected at appropriate times and found to be free from this pest.

REFERENCES

- Baker R, Caffier D, Choiseul JW, De Clercq P, Dormannsné-Simon E, Gerowitt B, Karadjova OE, Lövei G, Lansink AO, Makowski D, Manceau C, Manici L, Perdakis D, Puglia AP, Schans J, Schrader G, Steffek R, Strömberg A, Tiilikkala K, van Lenteren JC, Vloutoglou I (2009) Scientific opinion of the Panel of Plant Health on a pest risk analysis on *Thaumetopoea processionea* L., the oak processionary moth, prepared by the UK and extension of its scope to the EU territory. *The EFSA Journal* **491**, 1-63.
- Battisti A, Holm G, Fagrell B, Larsson S (2011) Urticating hairs in arthropods: their nature and medical significance. *Annual Review of Entomology* **56**, 203-220.
- Battisti A, Avci M, Avtzis D, Ben Jamaa M, Berardi L, Berretima W, Branco M, Chakali G, Alaoui El Fels M, Frérot B, Hóddar J, Ionescu-Mîncu I, Ipekdağ K, Larsson S, Manole T, Nemer N, Paiva M, Pino J, Protasov A, Rahim N, Rousselet J, Santos H, Sauvard D, Schopf A, Simonato M, Yart A, Zamoun M (2015) Chapter 2: Natural history of the processionary moths (*Thaumetopoea* spp.) – New insights in relation to climate change. In *Processionary moths and climate change: an update* (ed Roques A), pp. 15-81. Springer Dordrecht.
- Battisti A, Larsson S, Roques A (2017) Processionary moths and associated urtication risk. *Annual Review in Entomology* **62**, 323-342.
- Bay E (1961) The distribution of *Pinus sylvestris* in the province of Bolzano [Sul pino silvestre in provincia di Bolzano] *Monti e Boschi* **12**(1), 27-30.
- Bin F, Tiberi R (1983) Notizie preliminari sui parassitoidi oofagi di *Thaumetopoea processionea* L. in Italia centrale (Hym., Chalcidoidea: Lep., Thaumetopoeidae). *Redia* **66**, 449-459.
- Blank R (1997) Ring-porous wood structure and frequent insect defoliation as specific risk factors in oaks. *Forst und Holz* **52**, 235-242.
- Bogenschütz H, Schwartz G, Limberger S (1988) Auftreten und Bekämpfung des Eichenprozessionsspinner, *Thaumetopoea processionea* L., in Südwesdeutschland 1986 bis 1988. *Mitteilungen aus der Biologischen Bundesanstalt für Land- und Forstwirtschaft* **245**, 427-428.
- Bogenschütz H (1998a): Erfahrungen mit dem Eichenprozessionsspinner in Baden-Württemberg. *Mitteilungen der Deutschen Phytomedizinischen Gesellschaft* **28**, 46-47.
- Bogenschütz H (1998b) Sexuallockstoffe zur Überwachung von forstschädlichen Schmetterlingen. *Allgemeine Forstzeitschrift für Waldwirtschaft und Umweltvorsorge/Der Wald* **53**, 438-442.
- Breuer M, Kontzog HG, Guerrero A, Camps F, Loof A de (2003) Field trials with the synthetic sex pheromone of the oak processionary moth *Thaumetopoea processionea*. *Journal of Chemical Ecology* **29**(11), 2461-2468.
- Bub G, Delb H, Schröter H (2005) Bekämpfung des Schwammspinners und Eichenprozessionsspinner in Baden-Württemberg 2005. *Allgemeine Forstzeitschrift für Waldwirtschaft und Umweltvorsorge/Der Wald* **60**, 316-319.
- Carter DJ (1984) Pest Lepidoptera of Europe with special reference to the British Isles. Springer Dordrecht Netherlands. 431 pages.

- Chauvel G (2000) Lepidoptera damaging green spaces, nurseries and urban forests. *PHM Revue Horticole* **18-20**, 22-28.
- Csóka G, Hirka A, Szöcs L, Mórítz N, Rasztoivits E, Pödör Z (2018) Weather-dependent fluctuations in the abundance of the oak processionary moth, *Thaumetopoea processionea* (Lepidoptera: Notodontidae). *European Journal of Entomology* **115**, 249-255.
- Custers CJL (2003) Climate change and trophic synchronization. A case study of the oak processionary caterpillar. Master's Thesis. Landbouw- Universitaet Wageningen, 107 pages.
- Dajoz R (2000) Forests and Insects. The role of diversity of insects in the forest environment. Intercept Ltd/Editions Technique et Documentation/Lavoisier Publishing, Paris. 668 pages.
- Damestoy T, Moreira X, Jactel H, Valdes-Correcher E, Plomion C, Castagneyrol B (2020) Growth and mortality of the oak processionary moth, *Thaumetopoea processionea* L., on two oak species: direct and trait-mediated effects of host and neighbor species identity. *bioRxiv* 865253; doi: <https://doi.org/10.1101/865253>.
- Démolin G, Nemer N (1999) Defoliator insects of *Quercus callyprinos* Webb. and *Quercus infectoria* Oliv. in Lebanon. *Bulletin OILB/SROP* **22**(3), 65-69.
- Dissescu G, Ceianu I (1968) [Studies on the ecology of the oak processionary moth] Cercetari asupra bioecologici omizii procesionare a stejarului (*Thaumetopoea processionea*). 120 pages. [in Romanian]
- Commission Implementing Regulation (EU) 2019/2072 of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants, and repealing Commission Regulation (EC) No 690/2008 and amending Commission Implementing Regulation (EU) 2018/2019 - OJ L 319, 10.12.2019, p. 1–279
- EPPO (2004) EPPO Standards: *Thaumetopoea pityocampa*- PM7/37. *EPPO Bulletin* **34**, 295–298.
- Evans HF (2007) Pest risk analysis record for *Thaumetopoea processionea*. European and Mediterranean Plant Protection Organization. 1-28. Department for Environment, Food and Rural Affairs, The Food and Environmental Research Agency.
- Fransen JJ, Groenendijk D, Spijker JH, Stigter H (2008) Leidraad beheersing Eikenprocessierups. Update 2008 WUR-Alterra. Expertgroep Eikenprocessierups en Plantenziektenkundige Dienst Wageningen. Ministerie van Landbouw, Natuur en Voedselkwaliteit. Netherlands.
- Gottschling S, Meyer S (2006) An epidemic airborne disease caused by the oak processionary caterpillar. *Pediatric Dermatology* **23**, 64-66.
- Green P (2015) Oak processionary moths (*Thaumetopoea processionea*) in deer parks. *Veterinary Records* **177**, 208-208.
- Groenen F (2010) Variation of *Thaumetopoea processionea* (Notodontidae: Thaumetopoeinae) in Europe and the Middle East. *Entomologischen Berichten* **70**, 77-82.
- Groenen F, Meurisse N (2012) Historical distribution of *Thaumetopoea processionea* in Europe suggests recolonization instead of expansion. *Agricultural and Forest Entomology* **14**, 147-155.
- Halperin J, Sauter W (1999) The occurrence of *Thaumetopoea processionea* L. (Lep.: Thaumetopoeidae) on Mt. Hermon. *Phytoparasitica* **27**, 107.
- Hirka A, Szabóky Cs, Szöcs L, Csóka Gy (2011) 50 years of the forestry light trap network. *Növényvédelem* **47**, 474-479. [in Hungarian]
- Hoch G, Verucchi S, Schopf A (2008) Microsporidian pathogens of the oak processionary moth, *Thaumetopoea processionea*

- (L.) (Lep., Thaumetopoeidae), in eastern Austria's oak forests. *Mitteilungen der Deutschen Gesellschaft für allgemeine und angewandte Entomologie* **16**, 225-228.
- ISPM 4 (2017) Requirements for the establishment of pest free areas. Rome, IPPC, FAO.
- Jans HWA, Franssen AEM (2008) The urticating hairs of the oak processionary caterpillar (*Thaumetopoea processionea* L.), a potential problem for animals? *Tijdschrift Voor Diergeneeskunde* **133**, 424-429.
- Kiriukhin G (1946) Les insectes nuisibles au pistacier en Iran. *Entomologie et Phytopathologie Appliquées* **1**, 8-24.
- Klapwijk MJ, Csóka G, Hirka A, Björkman C (2013) Forest insects and climate change: long-term trends in herbivore damage. *Ecology and Evolution* **3**, 4183-4196.
- Krehan ? (1993) Outbreaks of caterpillar forest pests in oak forests in eastern Austria. *Forstschutz Aktuell* **12**, 1-4.
- Lamy M (1990) Contact dermatitis (erucism) produced by processionary larvae (genus *Thaumetopoea*). *Journal of Applied Entomology* **110**, 425-437.
- Lövgren R, Dalsved B (2005) *Thaumetopoea processionea* L. (Lepidoptera: Thaumetopoeidae) found in Sweden. *Entomologisk Tidskrift* **126**, 93-94.
- Maier H, Spiegel W, Nikaciyan T, Hönigsmann H (2004) Caterpillar dermatitis in two siblings due to the larvae of *Thaumetopoea processionea* L., the oak processionary caterpillar. *Dermatology* **208**, 70-73.
- Maksymov JK (1978) *Thaumetopoea*, Prozessionsspinner. *Die Forstschädlinge Europas Bd. 3* (ed Schwenke W), 391-404. Parey Verlag.
- McManus M, Csóka G (2007) History and impact of gypsy moth outbreaks in North America and comparison to recent outbreaks in Europe. *Acta Silvatica & Lignaria Hungarica* **3**, 47-64.
- Meurisse N, Hoch G, Schopf A, Battisti A, Grégoire J-C (2012) Low temperature tolerance and starvation ability of the oak processionary moth: implications in a context of increasing epidemics. *Agricultural and Forest Entomology* **14**, 239-250.
- Mindlin MJ, Polain O, Waroux D, Case S, Walsh B (2012) The arrival of oak processionary moth, a novel case of itchy dermatitis, in the UK: Experiences, lessons and recommendations. *Public Health* **126**, 778-781.
- Mirchev P, Balov S, Kirilova M, Georgieva A (2011) Distribution of *Thaumetopoea processionea* in Bulgaria. *Silva Balcanica* **12**, 71-80.
- Moller K (2006) Participation of defoliators in the oak decline symptoms in Brandenburg in 2004. *Mitteilungen der Deutschen Gesellschaft für allgemeine und angewandte Entomologie* **15**, 209-212.
- Moraal LG (1996) Infestations by insects and mites in 1995: in forests, nature reserves and roadside plantings. *Nederlands Bosbouw tijdschrift* **68**, 111-120.
- Moraal LG, Jagers op Akkerhuis GAJM, Werf DCvd (2011) Changes in insect pests on trees: monitoring since 1946 makes trends visible. *Nederlands Bosbouw tijdschrift* **74**, 29-32.
- Murphy FA, Fauquet CM, Bishop DHL, Ghabrial SA, Jarvis AW, Martelli GP, Mayo MA, Summers MD (1995) Sixth Report of the International Committee on Taxonomy of Viruses. Archives of Virology. Springer Verlag, Wien New York. Supplement 10, 586 pages.
- Nageleisen L, 2008. Actualités sur les dépérissements du "chêne". Bilan de la santé des forêts en 2006. Les Cahiers du Département de la Santé des forêts. Ministère de l'agriculture et de la pêche. France. Available at http://agriculture.gouv.fr/sections/thematiques/foretbois/sante-des-forets/annee2006/downloadFile/FichierAttache_2_f0/depeche_2006.pdf . Accessed on 4 June 2009 Accessed on 4 June 2009.

- Nicosia (1923) Processionary caterpillar. *Cyprus Agricultural Journal* **18**(2), 47-48.
- Pascual JA (1988) Biology of the oak processionary moth (*Thaumetopoea processionea* L.) (Lep. Thaumetopoeidae) in the western central Iberian Peninsula. *Boletín de Sanidad Vegetal* **14**, 383-404.
- Pascual JA, Robredo F, Galante E (1990) Aerial ULV applications of alpha-cypermethrin, diflubenzuron and *Bacillus thuringiensis* against the oak processionary moth (*Thaumetopoea processionea*) (Lep., Thaumetopoeidae). *Boletín de Sanidad Vegetal* **16**, 585-591.
- Petrucchio Toffolo E, Zovi D, Perin C, Paolucci P, Roques A, Battisti A, Horvath H (2014) Size and dispersion of urticating setae in three species of processionary moths. *Integrative Zoology* **9**, 320-327.
- Roskams P (1995) De eikeprocessievlinder in her Vlaamse gewest. *De Boskrant* **25**, 160-166.
- Roversi PF (2008) Aerial spraying of *Bacillus thuringiensis* var. *kurstaki* for the control of *Thaumetopoea processionea* in Turkey oak woods. *Phytoparasitica* **36**, 175-186.
- Schmidt GH (1974) A contribution to the social behavior of the caterpillar of the oak processionary *Thaumetopoea processionea*. *Zeitschrift für Angewandte Entomologie* **75**(2), 174-178.
- Skule B, Vilhelmsem F (1997) *Thaumetopoea processionea* L. found in Denmark. URL: <https://www.lepidoptera.dk/process.htm> (last accessed 13 September 2020)
- Stigter H, Romeijn G (1992) *Thaumetopoea processionea* locally observed in large numbers in the Netherlands after more than hundred years Lepidoptera Thaumetopoeidae. *Entomologische Berichten (Amsterdam)* **52**, 66-69.
- Stigter H, Geraedts WHJM, Spijkers HCP (1997) *Thaumetopoea processionea* in the Netherlands: Present status and management perspectives (Lepidoptera: Notodontidae). *Proceedings of the Section Experimental and Applied Entomology of the Netherlands Entomological Society (N.E.V.)* 3-16.
- Stratan VS (1971) An egg parasite of the oak processionary moth. *Zashchita Rastenii* **16**(5), 42.
- Thomas FM, Blank R, Hartmann G (2002) Abiotic and biotic factors and their interactions as causes of oak decline in Central Europe. *Forest Pathology* **32**, 277-307.
- Tomiczek C, Krehan H (1996) Occurrence of oak processionaries and inter moths in Vienna. *Forstschutz Aktuell* **23**, 17-18.
- Tomiczek C, Krehan H (2003) Increasing problems with the oak processionary moth in Eastern Austria. *Forstschutz Aktuell* **29**, 17-18.
- Townsend M (2009) Report on survey and control of oak processionary moth *Thaumetopoea processionea* (Linnaeus) (Lepidoptera: Thaumetopoeidae) (OPM) in London in 2008. Oxford, UK.
- Tsankov G, Breuer M, Schmidt GH, Maslov A (1991) Scale shape and colour of egg batches of some *Thaumetopoea* species (Insecta Lepidoptera Thaumetopoeidae). *Bollettino di Zoologia Agraria e di Bachicoltura* **23**(1), 45-60.
- Tschorsnig HP (1993) Parasitoide aus dem EichenprozeSSIONsspinner *Thaumetopoea processionea* (Linnaeus) (Lepidoptera: Thaumetopoeidae). *Mitteilungen des entomologischen Vereins Stuttgart* **31**, 105-107.
- Wagenhoff E, Delb H (2011) Current status of *Thaumetopoea processionea* (L.) in south-western Germany. *Biotic risks and climate change in forests*. (eds Delb H, Pontuali S), pp. 175-178. Berichte Freiburger Forstlichen Forschung.
- Wagenhoff E, Veit H (2011) Five years of continuous *Thaumetopoea processionea* (L.) monitoring: tracing population dynamics in an arable landscape of South-Western Germany. *Gesunde Pflanzen* **63**, 51-61.

Wagenhoff E, Blum R, Engel K, Veit H, Delb H (2013) Temporal synchrony of *Thaumetopoea processionea* egg hatch and *Quercus robur* budburst. *Journal of Pest Science* **86**, 193-202.

Williams DT, Straw N, Townsend M, Wilkinson AS, Mullins A (2013) Monitoring oak processionary moth *Thaumetopoea processionea* L. using pheromone traps: the influence of pheromone lure source, trap design and height above the ground on capture rates. *Agricultural and Forest Entomology* **15**(2), 126-134.

Zwakhals CJ (2005) *Pimpla processioneae* and *P. rufipes*: specialist versus generalist (Hymenoptera: Ichneumonidae, Pimplinae). *Entomologische Berichten* **65**, 14-16.

CABI resources used when preparing this datasheet

CABI Datasheet on *Thaumetopoea processionea* (available at <https://www.cabi.org/isc/datasheet/53502>)

ACKNOWLEDGEMENTS

This datasheet was prepared in 2020 by Dimitrios N. Avtzis (Forest Research Institute – Hellenic Agricultural Organization Demeter). His valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2025) *Thaumetopoea processionea*. EPPO datasheets on pests recommended for regulation. Available online. <https://gd.eppo.int>

Datasheet history

This datasheet was first published online in 2020. It is maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.



Co-funded by the
European Union