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Scientific paper – *Artículo científico*

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Abstract

In the present paper the author carries out a list with the quality – not quarantine for the UE - *Lepidoptera* species identified as pests on woody ornamental crops of Galicia, as part of his independent consultancy service, carried out from 1999 to 2022. A total number of 9 different species on 15 different hosts, were identified: *Lymantria dispar*, *Phyllocnistis citrella*, *Leucoptera malifoliella*, *Rothschildia erycina*, *Phyllonorycter leucographella*, *Spodoptera littoralis*, *Plutella xylostella*, *Cameraria obstrictella* and *Autographa gamma*. Considering only crop pests all of them are referenced for the first time as pests on woody ornamental crops in Galicia, either in this paper or on previous papers.

Key words: *Lymantria dispar*, *Phyllocnistis citrella*, *Leucoptera malifoliella*, *Rothschildia erycina*, *Phyllonorycter leucographella*, *Spodoptera littoralis*, *Plutella xylostella*, *Cameraria obstrictella*, *Autographa gamma*, Galicia, woody ornamental crops.

Resumen

En el presente trabajo el autor relaciona la totalidad de especies de lepidópteros de calidad – no cuarentenarios para la UE - identificadas por el mismo en cultivos de especies leñosas ornamentales de Galicia, basándose en la información obtenida de su trabajo como consultor entomológico independiente, desde 1999 a 2022. Se identificaron las siguientes especies: *Lymantria dispar*, *Phyllocnistis citrella*, *Leucoptera malifoliella*, *Rothschildia erycina*, *Phyllonorycter leucographella*, *Spodoptera littoralis*, *Plutella xylostella*, *Cameraria obstrictella* y *Autographa gamma*. En condiciones de cultivo todas las especies incluidas en el artículo son nuevas citas para Galicia, tanto las publicadas en el presente artículo por primera vez, como otras referenciadas en anteriores publicaciones escritas por el mismo autor.

Palabras clave: *Lymantria dispar*, *Phyllocnistis citrella*, *Leucoptera malifoliella*, *Rothschildia erycina*, *Phyllonorycter leucographella*, *Spodoptera littoralis*, *Plutella xylostella*, *Cameraria obstrictella*, *Autographa gamma*, Galicia, cultivos de leñosas ornamentales.

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1. Introduction

The list of quality –not quarantine for the UE– lepidoptera species referenced, up to the present moment, as pests of woody ornamental crops in

Galicia (NW Spain), is not long due to the lack of information and specialized papers dealing with this matter: *Pammene fasciana*, *Cydia fagiglandana*, *Cydia pomonella*, *Laspeyresia splendana*, *Cydalina perspectalis*

(Mansilla *et al.*, 1999 a; 1999 b; Mansilla & Pérez, 2006; Pérez-Otero *et al.*, 2018), *Lymantria dispar*, *Phyllocnistis citrella* and *Leucoptera malifoliella* (Andrés, 2017).

The list of lepidoptera species referenced as pest of ornamental crops in other parts of Spain is significantly longer due to the specific entomological works carried out on garden conditions: *Phyllocnistis citrella*, *Euproctis chryso-rrhoea*, *Nymphalis polichloros*, *Malacosoma neustria*, *Abraxas pantaria*, *zeuzera pyrina*, *Cossus cossus*, *Sesia apiformis*, *Paranthrene tabaniformis*, *Thaumetopoea pityocampa*, *Anarsia lineatella*, *Cydia molesta*, *gypso-mona aceriana*, *Argyroplote ochroleucana*, *Ocneuostoma piniarella*, *Clarigestis sylvestrana*, *Exoteleia dodecella*, *Ceolestis gysselella*, *Ceolestis subfaciella*, *Argyrotoxa bergmanniana*, *Cacoecimorpha pronubana*, *Paysandisia archon*, *Cameraria orchidella*, *Cacyreus marchalli* and *Cydalina perspectalis* (Martin Gil *et al.*, 2020; Ferrer & Salvador, 1986; Villalva, 1996; Serra *et al.*, 1996).

The identification of the main species of these lepidoptera, on woody ornamental crops, is specially useful for the design of sustainable plant protection programs due to the problem of resistance to insecticides referenced, up to the present moment, on different ornamental lepidoptera species –*Spodoptera frugiperda*, *Spodoptera exigua*, *Spodoptera litura*, *Cydia pomonella*, *Plutella xylostella* and *Tuta absoluta* (IRAC, 2022). Their exact determination is also necessary, at the present moment, due to the increasing quarantine lepidoptera number of species for certain countries of the world.

2. Material & methods

2.1. Production centres where the study was performed

The study was carried out only on woody ornamental production centres of Galicia, intermittently, from 1999 to 2022. The samples were obtained from 10 nurseries belonging to the following Galician provinces: 6 in Pontevedra, 3 in A Coruña and 1 in Lugo. The entomological monitoring of the pests was carried out every 15 or 30 days, sampling periodically in order to identify the Lepidoptera species by means of classical entomological determination methods.

2.2. Sampling methods

The adults and larvae were sampled using plastic boxes for urine samples and carried to the entomological laboratory of Consultorías Noroeste S.C. for its taxonomical classification.

2.3. Taxonomical methods

The author used the following descriptions and taxonomical criteria for the species determinations: Waring *et al.*, (2009), Alford (1995) and Sterling *et al.*, (2012). The taxonomy was made with the aid of a stereomicroscope. All of the species included in the paper were confirmed as pest of the specified host by the author.

2.4. Previously referenced species

Some of these species were referenced on a technical visual guide written, edited and published by the author of this paper. We have decided to include them in this paper as the previous publication was not strictly considered a scientific paper. In order to difference these species from the rest we have decided to include their reference on the results section.

3. Results

List of identified pest species and host classified by family

FAMILY EREBIDAE

3.1. *Lymantria dispar* Linnaeus

Host observed in Galicia: *Phyllostachys aurea*.

Type of crop: container.

3.2. *Lymantria dispar* Linnaeus

Host observed in Galicia: *Quercus ilex*.

Type of crop: container.

(Andrés, 2017)

3.3. *Lymantria dispar* Linnaeus

Host observed in Galicia: *Photinia × fraserii*.

Type of crop: container.

FAMILY GRACILLARIIDAE

3.4. *Phyllocnistis citrella* Stainton

Host observed in Galicia: *Citrus × aurantifolia*.

Type of crop: soil.

(Andrés, 2017)

3.5. *Phyllonorycter leucographella* Zeller

Host observed in Galicia: *Leptospermum scoparium*.

Type of crop: container.

3.6. *Cameraria obstrictella* Clemens

Host observed in Galicia: *Quercus robur*.

Type of crop: soil

FAMILY LYONETIIDAE

3.7. *Leucoptera malifoliella* O. Costa

Host observed in Galicia: *Malus sp.*

Type of crop: soil.

(Andrés, 2017)

FAMILY SATURNIIDAE

3.8. *Rothschildia erycina*

Host observed in Galicia: *Boronia crenulata*.

Type of crop: container.

FAMILY NOCTUIDAE

3.9. *Spodoptera littoralis* Boisduval

Host observed in Galicia: *Arbutus unedo*.

Type of crop: container.

3.10. *Autographa gamma* Linnaeus

Host observed in Galicia: *Argyranthemum*.

Type of crop: container.

3.11. *Autographa gamma* Linnaeus

Host observed in Galicia: *Melissa officinalis*.

Type of crop: container.

3.12. *Autographa gamma* Linnaeus

Host observed in Galicia: *Solanum betaceum*.

Type of crop: container.

FAMILY PLUTELLIIDAE

3.13. *Plutella xylostella* Linnaeus

Host observed in Galicia: *Photinia × fraserii*.

Type of crop: container.

3.14. *Plutella xylostella* Linnaeus

Host observed in Galicia: *Mentha spicata*.

Type of crop: container.

3.15. *Plutella xylostella* Linnaeus

Host observed in Galicia: *Solanum betaceum*.

Type of crop: container.

4. Discussión

It is important to mention that this paper, as well as the former publication on 2017, are the first references for Galicia (NW Spain) of the species *Lymantria dispar*, *Phyllocnistis citrella*, *Leucoptera malifoliella*, *Rothschildia erycina*, *Phyllonorycter leucographella*, *Spodoptera littoralis*, *Plutella xylostella*, *Cameraria obstrictella* and *Autographa gamma* as pests of woody ornamental crops. It is also important to mention that some of these species are also first references for Spain as pests of ornamental crops: *Rothschildia erycina*, *Phyllonorycter leucographella* and *Cameraria obstrictella* (Villalva, 1996; de Liñán, 1998). We must also mention that *Lymantria dispar*, *Phyllonorycter leucographella*, *Spodoptera littoralis* and *Autographa gamma* have been already cited as pests of ornamental crops in the United Kingdom, a country with similar climate to Galicia (Alford, 1995). It is also important to describe the references of some of these species on publications of *Lepidoptera collected* in Galicia but not specifically as pests of ornamental crops: *Lymantria dispar* and *Autographa gamma* (Fernandez Vidal, 2010, 2011 and 2012).

Some of the species referenced in this paper are considered quarantine pests in some

parts of the world. This fact is increasing in importance due to an increasing internationalized plant material market. Following the information supplied by EPPO *Lymantria dispar* is considered as a quarantine pest in Argentina, Brazil, Canada, Chile, Mexico, USA, Uruguay, Israel, Azerbaijan, Georgia, Russia and New Zealand. *Phyllocnistis citrella* is also considered quarantine pest in Chile, Mexico, Paraguay, USA, Uruguay, Bahrain, Uzbekistan, Azerbaijan, Belarus and Georgia. *Leucoptera malifoliella* is banned as a quarantine pest in Egypt, Argentina, Brazil, Canada, Chile and USA; *Spodoptera littoralis* is a quarantine pest in Argentina, Brazil, Mexico, USA, Kazakhstan, Uzbekistan, Azerbaijan, Belarus, Georgia, Moldova, Norway, Russia, Turkey, Ukraine and the United Kingdom and *Aurographa gamma* is banned as quarantine agent in Mexico and USA (EPPO, 2022).

Plutella xylostella is, up to the present moment, referenced as resistant to almost all insecticides, including recently introduced compounds with new modes of action (IRAC, 2022). This fact makes it difficult to develop new chemical management methods situating the biological control methods as obliged alternatives for the future.

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