Volume 2, Part 2 November 2026 ISSN 3051-6781

ARTIMELIA

LEPIDOPTERA IBÉRICA

Biannual Scientific Journal dedicated to research and scientific studies on the Lepidoptera of the Iberian Peninsula.



Artimelia

Lepidoptera Ibérica

Volume 2, Part 2, November 2026
ISSN 3051-6781

Biannual scientific journal dedicated to research and scientific studies on the Lepidoptera of the Iberian Peninsula.

Published on-line by Rede de Estações de Borboletas Noturnas.

Editor

Martin Corley (B.A., Oxon).
E-mail: martin.corley@btinternet.com

Layout Editor: Ana Valadares.

© 2026 Rede de Estações de Borboletas Noturnas.

Front page photo: *Gortyna flavago* (Denis & Schiffermüller, 1775), Nadadouro; 30.viii.2026 (© Paulo Lemos).

Contents

Valadares, A. *Cerura erminea* (Esper, 1783) (Lepidoptera: Notodontidae): primeiro registo para Portugal 65

Lemos, P. Rediscovering *Gortyna flavago* (Denis & Schiffermüller, 1775) (Noctuidae) in Portugal after six decades: host-plant fidelity at the Atlanto-Mediterranean interface..... 69

King, G. Una contribución al estudio de los geométridos de los alrededores de Valencia capital y su provincia (Insecta: Lepidoptera) con observaciones sobre su biología 101

Corley, M., Ferreira, S. and Fabião, J. The genus *Hellinsia* Tutt, 1905 (Pterophoridae) in Portugal..... 111

Lemos, P. Overlooked for 29 years: natural history and conservation of *Globia sparganii* (Esper, 1790) (Noctuidae) at Lagoa de Óbidos, West-Central Portugal..... 119

King, G. Una contribución breve a los conocimientos de la biología de los geométridos recogidos en varias localidades de Madrid (Geometrinae, Sterrhinae) 134

Corley, M. Mothing in the rain 144

Valadares, A. Uma viagem às Flores 148

Guidance for authors 153

Index of papers published in *Artimelia – Lepidoptera Iberica* (Volumes 1–2)..... 155

Cerura erminea (Esper, 1783) (Lepidoptera: Notodontidae): primeiro registo para Portugal

Ana Valadares

Casa da Amendoeira, Sargaçal, 8600-316 Lagos, Portugal; email: ana.valadares@gmail.com;
https://orcid.org/0000-0001-6970-7301

Resumo

Cerura erminea (Esper, 1783) é adicionada à fauna conhecida de Portugal, com base numa fêmea registada em 20.vi.2026 em Castro Laboreiro, Melgaço, no Parque Nacional da Peneda-Gerês. Este registo constitui a segunda espécie do género *Cerura* Schrank, 1802 conhecida em Portugal e representa uma extensão da distribuição conhecida da espécie na Península Ibérica.
Palavras-chave: *Cerura erminea*; Notodontidae; Portugal; Castro Laboreiro; primeiro registo.

Abstract

Cerura erminea (Esper, 1783) is added to the known fauna of Portugal, based on a female recorded on 20.vi.2026 in Castro Laboreiro, Melgaço, Peneda-Gerês National Park. This record represents the second species of the genus *Cerura* Schrank, 1802 known from Portugal and extends the known distribution of the species in the Iberian Peninsula.
Keywords: *Cerura erminea*; Notodontidae; Portugal; Castro Laboreiro; first record.

Na noite de 20.vi.2026, em Castro Laboreiro (Minho: M), Lugar da Vila, junto ao rio Laboreiro (42.03505 N, 8.15674 W; 939 m), área integrada no Parque Nacional da Peneda-Gerês, foi registada uma fêmea de *Cerura erminea* (Fig. 1). O local caracteriza-se por um mosaico de matos de urze, lameiros e bosques ribeirinhos, com presença de *Quercus pyrenaica* Willd., *Betula pubescens* Ehrh. e *Salix atrocinerea* Brot.

O indivíduo foi facilmente identificado pelo corpo robusto, com a região dorsal negra, e pelo padrão alar característico da espécie, que inclui duas marcas negras em forma de V em cada asa anterior, fortemente contrastantes com o fundo branco-acinzentado. A distinção entre *C. erminea* e *C. iberica* é clara pelo padrão alar, sendo a morfologia larvar um elemento adicional de confirmação. Até ao presente registo, *Cerura iberica* (Templado & Ortiz, 1966) era a única espécie do género conhecida em Portugal (de Juana & Nunes, 2025). *Cerura erminea* apresenta uma distribuição eurossiberiana na Península Ibérica, estando documentada sobretudo no norte peninsular. A recente revisão da distribuição dos Notodontidae ibéricos permite enquadrar o presente registo no contexto geográfico conhecido para a espécie (de Juana & Nunes, 2025).



Figura 1. Fêmea de *Cerura erminea* coletada em 20.vi.2026 em Castro Laboreiro
(Fotografia: © Ana Valadares)

A fêmea coletada foi posteriormente mantida viva em condições controladas, onde realizou uma postura. A autora acompanhou o desenvolvimento da descendência, criando as lagartas em *Populus nigra* L. até à pupação (Figs. 2–3). O uso desta espécie como planta hospedeira está de acordo com a biologia conhecida de *C. erminea*, para a qual são referidas diversas espécies dos géneros *Populus* e *Salix* (Ebert, 1994; Huemer, 2024).

No último estádio, as larvas apresentaram as características manchas brancas de *C. erminea*, constituindo este caráter larvar um elemento adicional de confirmação da identificação (Ebert, 1994). Quando perturbadas, exibiram um comportamento defensivo, também descrito para *C. erminea* (Huemer, 2024). As larvas completaram a pupação, formando um casulo compacto, e os adultos resultantes da criação emergiram em agosto.



Figura 2. (a) ovos (24.vi.2026); (b) larva no 1.º ínstar (28.vi.2026); (c) larva no 2.º ínstar (29.vi.2026), todos obtidos da postura da fêmea de *Cerura erminea* coletada em Castro Laboreiro
(Fotografias: © Ana Valadares)

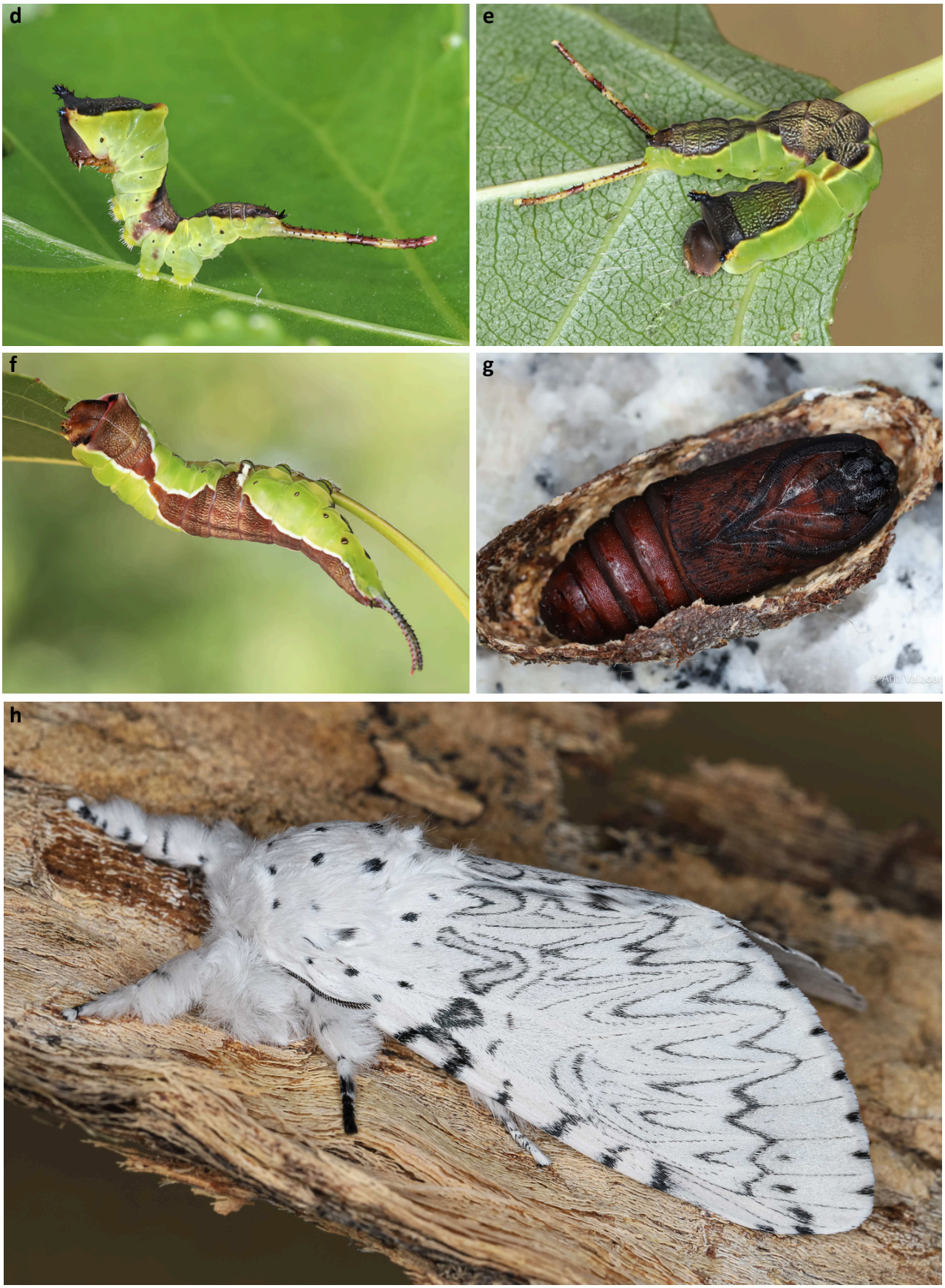

Figura 3. (d) larva no 3.º ínstar (04.vii.2026); (e) larva no 4.º ínstar (06.vii.2026); (f) larva no 5.º ínstar (22.vii.2026); (g) pupa (07.viii.2026); (h) adulto fêmea (09.viii.2026), todos obtidos da postura da fêmea de *Cerura erminea* coletada em Castro Laboreiro
(Fotografias: © Ana Valadares)

A fêmea registada confirmou a ocorrência de *C. erminea* em território português, e a criação completa até à emergência dos adultos forneceu elementos adicionais que reforçam a identificação e documentam o desenvolvimento da espécie. Este primeiro registo amplia para Portugal a distribuição conhecida da espécie na Península Ibérica e constitui também a segunda espécie do género *Cerura* conhecida em Portugal. O achado contribui para o conhecimento da fauna nacional de Lepidoptera e evidencia a importância da prospeção continuada em áreas montanhosas do noroeste português, onde poderão ainda ocorrer outras espécies de distribuição predominantemente eurossiberiana, ainda não conhecidas da fauna portuguesa, como sugerem os registos de *Idaea trigeminata* e *Trisateles emortualis*, recentemente documentados para Portugal (Valadares & Cardoso, 2025).

Agradecimentos

Agradeço ao casal Joaquim Teixeira e Célia Vieira a companhia e colaboração durante as sessões de armadilhagem realizadas em Castro Laboreiro.

Referências

Corley, M. F. V. 2015. Lepidoptera of Continental Portugal. A fully revised list. Martin Corley, Faringdon, 288 pp.

de Juana, F. & Nunes, J. 2025. Notodontidae of Iberian Peninsula: an update on geographical distribution (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **53** (212): 641–691.

Ebert, G. (Hrsg.). 1994. *Die Schmetterlinge Baden-Württembergs. Band 4: Nachtfalter II*. Stuttgart: Verlag Eugen Ulmer, 535 pp.

Huemer, P. 2024. Unexpected diversity of moths (Lepidoptera) in the Gardens of Trauttmansdorff Castle (Prov. Bolzano–South Tyrol, Italy). *Gredleriana*, **24**: 67–116.

Valadares, A. & Cardoso, H. 2025. Primeiros registos de *Idaea trigeminata* (Haworth, 1809) e *Trisateles emortualis* (Denis & Schiffermüller, 1775) para Portugal e outros registos notáveis de Lepidópteros noturnos em Montalegre e Castro Laboreiro. *Artimelia*, **1** (2): 78-84.

Rediscovering *Gortyna flavago* (Denis & Schiffermüller, 1775) (Noctuidae) in Portugal after six decades: host-plant fidelity at the Atlanto-Mediterranean interface

Paulo Lemos [1,2]

[1] *Independent Researcher, Caldas da Rainha, Portugal.*
[2] *Escola Superior de Turismo e Tecnologia do Mar; Politécnico de Leiria, Campus 4; Rua do Conhecimento 4; P-2520-614 Peniche; Portugal. email: paulolemos@live.com.pt;* https://orcid.org/0000-0002-3917-0520

Abstract

The noctuid moth *Gortyna flavago* ([Denis & Schiffermüller], 1775) was recently rediscovered in Portugal, following a 63-year absence of collection and observation records. Surveys conducted between 2023 and 2026 in central-western Portugal identified localised core populations strongly associated with humid riparian ecotones supporting *Eupatorium cannabinum.* In contrast to its broader ecological plasticity elsewhere in Europe, the species appears to exhibit host-plant specialization in the study area, and the local distribution suggests a metapopulation structure linked to fragmented microhabitats. This report documents aspects of the regional ecology and reproductive behaviour of *G. flavago* and provides preliminary insights into its population structure. These findings suggest that riparian megaforb communities may function as bioclimatic refugia for moisture-dependent taxa in Mediterranean landscapes, underscoring the need for targeted habitat management to support the long-term persistence of *G. flavago* in central-western Portugal.
Keywords: Insecta; Lepidoptera; Noctuidae; Apameina; host-plants; riparian habitats; conservation; Portugal.

Resumo

O noctuídeo *Gortyna flavago* ([Denis & Schiffermüller], 1775) foi recentemente redescoberto em Portugal, depois de 63 anos sem observações nem registos de coleção no país. Prospecções realizadas entre 2023 e 2026 no Litoral Oeste identificaram populações localizadas, fortemente associadas a ecótonos ripícolas húmidos com *Eupatorium cannabinum* na sua composição. Ao contrário da plasticidade ecológica registada noutras regiões da Europa, parece aqui ocorrer uma especialização relativamente a esta planta hospedeira, enquanto a distribuição local sugere uma estrutura metapopulacional associada a microhabitats fragmentados. O presente trabalho descreve a ecologia desta borboleta, o seu comportamento reprodutivo e, preliminarmente, a estrutura populacional da espécie a nível regional. Os resultados sugerem que as comunidades de megafórbias ripícolas poderão funcionar como refúgios bioclimáticos para taxa dependentes de humidade em paisagens mediterrânicas. A persistência de *G. flavago* salienta o valor de conservação das formações higrófilas de ervas altas, fundamentando a necessidade de uma gestão de habitat mais direcionada em Portugal.
Palavras-chave: Insecta; Lepidoptera; Noctuidae; Apameina; plantas hospedeiras; habitats ribeirinhos; conservação; Portugal.

Introduction

Gortyna flavago is a Palearctic noctuid with scattered and localized occurrences across Eurasia. Although widespread in Europe, the ecology of this moth remains poorly understood in the Iberian Peninsula.

A single historical Portuguese specimen was collected in Vouzela, by Timoteo Gonçalves in September 1960 (Silva Cruz & Gonçalves, 1961), deposited at Museu de História Natural e da Ciência da Universidade do Porto, with no subsequent records for over six decades (Corley, 2015). The locality lies within the Lafões Mountain Range, a transitional zone towards the north of the country.

The rediscovery of *G. flavago* in Portugal took place within small patches of relict riparian systems, in the central-western region, amidst a degraded ecological matrix. Through targeted Lepidoptera surveys, over two hundred observations were made between 2023 and 2026, with ninety-two selected observations documented photographically on iNaturalist (plemos, 2026), all in the presence of *Eupatorium cannabinum* subsp. *cannabinum* L., a tall hygrophilous herb whose national distribution becomes scarce towards the southern half. Monitoring followed a key network of host-plant locations, optimized by the author's contributions to the predictive vegetation mapping from the Red List of Mainland Portugal's Vascular Flora (Carapeto et al., 2020).



Figure 1 - Mating pair of *G. flavago* on *E. cannabinum*. Observation under red-spectrum light to minimize phototactic stress and ensure minimal light disturbance to the environment. Nadadouro; 10.ix.2026.

The principal study area comprises the Caldas da Rainha typhonic valley, the adjacent coastline, and the western part of the synclinal structures between the Caldas da Rainha diapiric anticline and Serra dos Candeeiros, extending northwards to the Alcobaça River basin. These formations offer a high degree of topographic sheltering, in a region characterized by a Mediterranean climate with strong Atlantic influence, mild temperatures, frequent fog, and relatively cool summers.

The territory's remarkable geological diversity provides the foundation for its renowned floristic importance (Farminhão, 2021), particularly within its riparian corridors and relict forest remnants. Such habitats serve as refugia (Keppel et al., 2012; Zhang et al., 2023), combining topography, hydrography and vegetation with proximity to the Atlantic to shield against the Mediterranean influence.

Notably, this region hosts the southernmost known disjunct populations with Eurosiberian affinities, encompassing both flora and microfauna at low elevations. This pattern is exemplified by species such as the oak bush-cricket *Meconema thalassinum* (De Geer, 1773), the locally abundant moth *Epione repandaria* (Hufnagel, 1767), the leaf beetle *Hydrothassa glabra* (Herbst, 1783), and others (GBIF.org, 2025).

This study aims to document the rediscovery of *Gortyna flavago* in Portugal, characterize its ecological niche in the central-western region, and assess the role of riparian habitats as bioclimatic refugia to better inform conservation strategies.

Materials and Methods

A direct visual census was applied in areas with varying accessibility to provide immediate taxonomic identification and an approximate quantification of population densities, phenological traits, and behavioural and reproductive aspects, thereby minimizing disturbance while maximizing the monitoring of nocturnal activity.



Figure 2 - Surveys extended simultaneously across several locations, with considerable effort devoted to monitoring adults and observing their behaviour, allowing less-known aspects of their ecology, such as adult feeding, to be documented. In the photograph, an adult male was observed hovering around a bramble thicket onto which aphid honeydew was dripping from an infested willow above. Nadadouro; 27.viii.2024.

Due to high environmental stochasticity and the structured yet adaptive survey design, the resulting data were inherently heterogeneous, reflecting an approach intended to maximize the quality and range of observations obtained during each field session rather than conform to a rigid quantitative protocol. Although concrete data were collected, their numerical representation did not always adequately reflect population abundance, relative density, spatial structure, and ecological patterns evident through direct observation, particularly at sites where numerous individuals made exact tracking impractical. Quantitative analysis was therefore avoided where it could be misleading. Instead, interpretation relied on ecological contextualization, integrating empirical observations with regional knowledge of habitat structure, host-plant distribution, analogous species, and historical trends. Maps use only a minimum selection of available data to represent distribution, and density on a relative basis.

In 2026, no additional localities were surveyed; fieldwork instead focused on the species' behaviour and on its responses to extreme climatic events and environmental degradation. In previous years, phenology and behavioural monitoring of the adults was conducted every other day at two selected sampling sites (Nadadouro and Quinta dos Bugalhos neighbourhood), complemented on alternate days by targeted surveys in additional locations. Effort was concentrated in September to capture the full flying period, with particular attention to its onset and termination (August-October).

Surveys targeted late-instar larvae and pupae across all *E. cannabinum* occurrence sites known, and were also intensively surveyed on other potential host-plant taxa, searching for characteristic signs of occurrence of this species. Monitoring and documentation impact was minimized, particularly of first instars to avoid host-plant alterations and vulnerability to predators.

Two distinct approaches were employed for detection and monitoring, based on *E. cannabinum* occurrence sites:

a) On-site trapping:

LepiLED Maxi Switch (customized LED configuration; Fig. 3), and a tripod-mounted 3x 10 W 365 nm (UVA) mini-projectors, with an additional vertical blue light LED strip, powered by small portable powerbanks, and UVA protection glasses.

b) Surveys with flashlights:

High-powered handheld LED flashlights were used for adult stage monitoring. Specifically, a deep red (660 nm) light was used to detect, track and observe the species with minimal disturbance; a 6500 K white light for general purposes; and a high-power UVA light (365 nm) to facilitate the occasional capture and identification of dispersing individuals, relying on temporary optical stunning rather than long-range attraction.



Figure 3 - Factory-customized LepiLED Maxi Switch. The device is equipped with high-efficiency Nichia LEDs, configured with four UVA LEDs, two blue LEDs, and two green LEDs. Additionally, a user-made upgrade: polished aluminium “mirrors” on the upper and lower inner faces.

Overcoming negative phototaxis:

Gortyna flavago adults frequently exhibited negative phototaxis toward white-light flashlights, slight sensitivity to red light at close distance, and a stunned response to direct strong UV light. Behavioural response to 630-660 nm illumination is not manifested through violent reactions, but still sufficient to interrupt activities such as oviposition or pheromone release. The species' weak affinity for illumination had already been reported as sporadic and occurring under intense light, making it easier to find during earlier stages (South, 1907). These traits made some observations difficult, necessitating attention under extremely low red-light intensity or brief, intermittent periods in total darkness.

Fixed light trapping was only effective near the host-plant stands with LepiLED, although moths were often observed keeping their distance from the lamp. Consequently, and also to minimize disturbance too close to the core populations, this method was used only occasionally. High-powered handheld LED flashlights provided the best results for adult monitoring.

Documentary photography:

Macro photography was performed using a Canon EOS 6D with a 100 mm macro lens, and photographs were edited to approximate natural perception. Imaging was essential for precise georeferencing and temporal data, as well as for the analysis and identification of specific individuals across distinct dates or localities.

Mapping:

The distribution maps for *G. flavago* were based on selected photographic records of the adult stage, only supplemented by larval records in locations where adults were absent or remained undetected.

Spatial analysis and mapping were conducted using QGIS (v3.36.3; QGIS Development Team, 2026). Topographic contextualization for the central-western Region (Oeste, Portugal) was established using the Esri World Hillshade three-dimensional terrain model. Urban settlement centroids (cities and towns) were extracted from OpenStreetMap (OpenStreetMap Contributors, 2026).

Night-time light (NTL) spatial distribution was evaluated using high-resolution multispectral observations from the SDGSAT-1 satellite via its Glimmer imager (GMI) night-light sensor. Orthorectified high-resolution product (10m/40m) with sensor noise removal. Final imagery was generated from the complete overlay of four GeoTIFF (TIF) provided by the SDGSAT-1 Team (CBAS/CAS, 2026).

National distribution maps for *E. cannabinum* are available on the Flora-On portal (Flora-On, 2005–2025), which aggregates reliable data from the author and multiple sources. The author's mapping contribution is currently being updated and prepared for a forthcoming independent publication.

Municipalities covered by surveys:

Alcobaça, Bombarral, Caldas da Rainha, Leiria*, Marinha Grande*, Nazaré, Óbidos, Pombal* (altitude ranged from 0 to 150 m).

Greater monitoring efforts were conducted along the Typhonic Valley and the western sector of the A-dos-Francos syncline, as opposed to the eastern strip, where visits were scaled back following the first negative results and a lower density of mapped host-plant locations.

Field surveys beyond this territory (*) were occasional, especially further north, in the coastal regions of Marinha Grande, Leiria, and Pombal, where extensive stands of *E. cannabinum* were previously known to the author at varying distances from the coastline. These lands were severely impacted by extreme wildfires in 2017, in several cases followed by inadequate habitat management.

Entomological collection:

A couple of wild specimens are kept in the author's private collection, and one male is deposited in the José Luis Yela collection (Spain).

Rearing trials:

To avoid damaging sensitive damp areas and maximize the probability of tracking adults from emergence onwards, a small number of larvae were collected at selected sites and meticulously relocated to nearby, more accessible plant stands. A few captive specimens were used in an attempt to compare behavioural aspects and biotic interactions with those observed in the field.

Results and Discussion

The rediscovery of *G. flavago* and known spatial distribution:

Extant populations of *G. flavago* were discovered in the Central West of Portugal (Fig. 4), occurring in several scattered and highly localized sites within the municipalities of Óbidos, Caldas da Rainha, and Alcobaça. Since the intensive monitoring efforts were conducted along the Typhonic Valley and the western sector of the A-dos-Francos syncline, the current regional distribution map (Fig. 4) may expand as future research progresses.

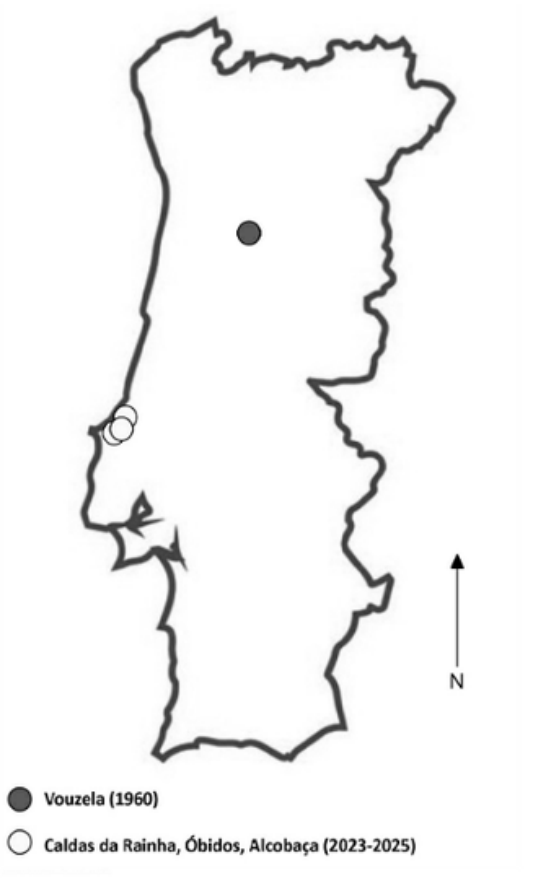

Figure 4 - Known distribution of *Gortyna flavago* in Portugal. The solid circle indicates the historical record from Vouzela (1960), while open circles indicate the recently documented populations in Caldas da Rainha, Óbidos and Alcobaça municipalities (2023–2025).

The *G. flavago* occurrence sites central to this study are the following:

- **Ribeira do Nadadouro** (upstream section) - The site features a water spring at Casais da Fonte and is part of the Lagoa de Óbidos catchment. The partially hydromorphic system extends across arenosols on broad, gently sloping terrain comprising smallholder agriculture and a marshy alder woodland upstream (*Alnus lusitanica* Vít, Douda & Mandák), shaped by highly diverse hydrological inputs that create a particularly favourable setting for megaforb vegetation. The first record for this location is a male, collected on 27.ix.2023 at UTM 29S MD3864 (Caldas da Rainha Municipality).

- **Vicinity of Águas Santas** - A former alder grove on hydromorphic arenosols still hosts *E. cannabinum* in catenal areas, presently consisting of a strip of mature willow woodland (*Salix atrocinerea* Brot.), in the alternation between slopes with *Quercus pseudococcifera* Desf. or *Quercus lusitanica* Lam., on a lentic section of a Rio da Cal tributary, within the Óbidos Lagoon catchment. The first record for this location is a male, recorded on 27.ix.2023 at UTM 29S MD4161 (Óbidos Municipality).

- **Vicinities of Formigal** (Salir de Matos Parish) - Several sections of hydromorphic arenosols with willow woodland (formerly Alder), including a larval record at Olhos de Água. A mating pair was recorded on 10.ix.2025 at UTM 29S MD9162 (Caldas da Rainha Municipality).

- **Vicinities of Quinta dos Bugalhos** (Vidais Parish) - This subpopulation thrives at a few sites along small upstream tributaries and catenal sequences of hydromorphic arenosols, as well as in interflow and runoff systems uphill, and along alluvial forest edges and ditches, forming a cluster of dispersed points. A significant core population occurs near Quinta dos Bugalhos that features scarce remnants of *Alnus lusitanica* marginal woodlands dominated by *Quercus* spp. The first regional finding and the second national record for the species was a female recorded on 23.ix.2023 at UTM 29S MC4663 (Caldas da Rainha Municipality).

- **Tornada - Barrantes** - Located on the eastern flank of the Caldas da Rainha Typhonic Valley, the habitat consists of runoff sections and micro-terrace borders associated with the Rio Tornada valley, overlooking forested slopes, hillside small permanent runoff or seepages and rural land. The first record for this location was a larva on *E. cannabinum*, recorded on 21.v.2024 at UTM 29S MD5168 (Caldas da Rainha Municipality).

- **Fonte Figueira** - Margin of an incised stream passing through a place named Fonte Figueira. Sloping banks dominated by *Quercus* spp.. The single record for this location was a larva on *E. cannabinum*, recorded on 14.vi.2025 at UTM 29S MD4623 (Alcobaça Municipality).

Upstream hydrographic sections of Ribeira do Nadadouro and the vicinities of Quinta dos Bugalhos are the most relevant core populations, possibly source populations (in a metapopulation context), exhibiting the highest recorded densities of larval traces and adult activity.

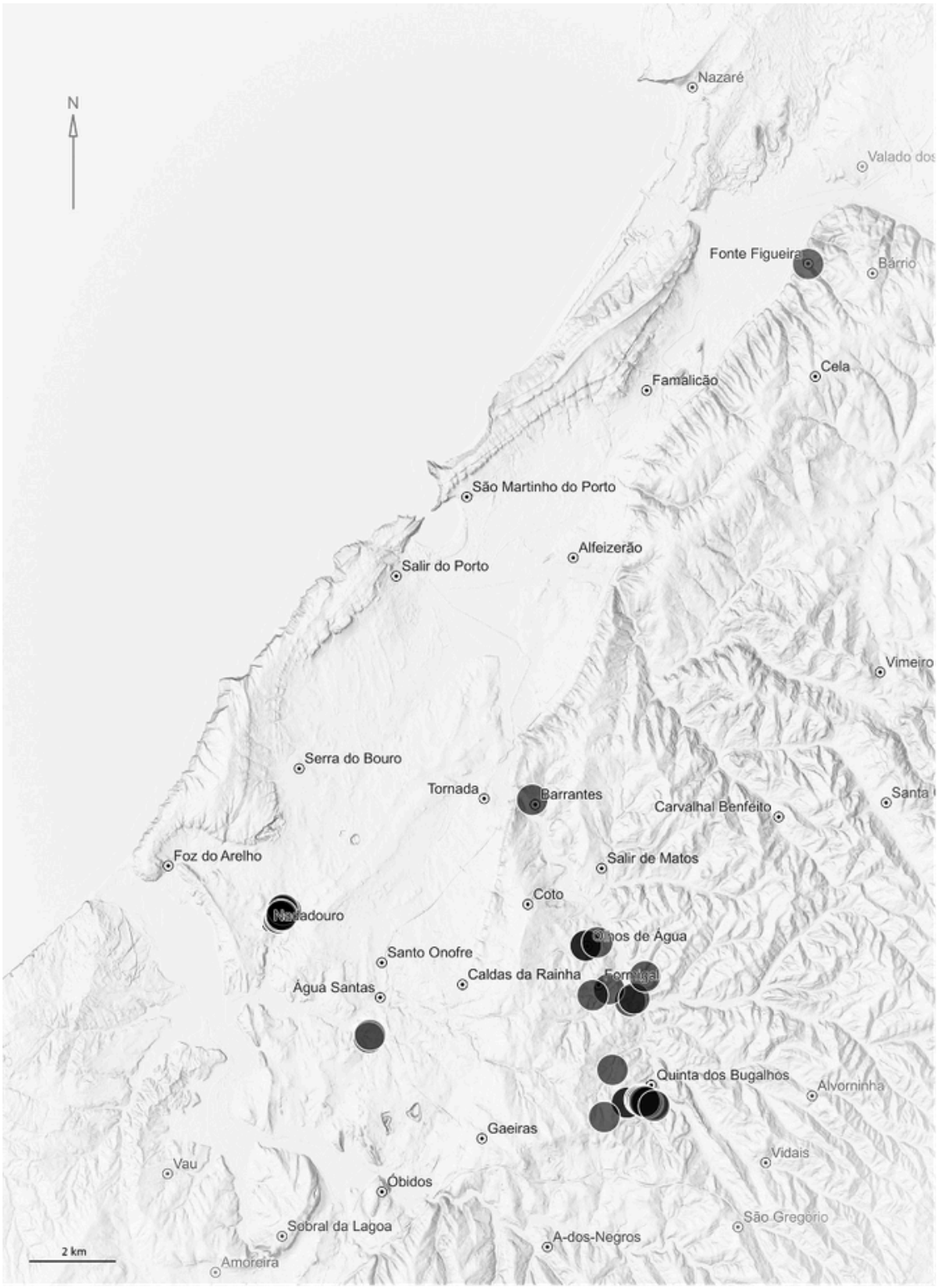

Figure 5 - Distribution of *Gortyna flavago* and urban settlements in the main study area of the Western Region (Oeste, Portugal), showing a low-precision density effect at coincident points by solid black circular markers representing documented occurrence. Light gray shading represents the topographic relief and three-dimensional terrain morphology (Esri World Hillshade; Esri, 2026). Settlement and geographic features derived from OpenStreetMap.

I. Habitat ecology

Southern range context:

At a broad scale across Europe, *Gortyna flavago* is described as an ecological generalist. According to Zilli et al. (2005), the species is widespread across most habitats in its western range, though populations are typically characterized by low density. This broad habitat tolerance is further supported by authors like Waring & Townsend (2017), Ebert (1997), and Skinner (2009), who note its presence in diverse environments ranging from gardens and woodland rides to waste ground. However, while assuming this generalist framework, Ebert (1997) and Skinner (2009) highlight a marked affinity for increased moisture, specifically pointing to ditch margins, riparian edges, and marshes as favoured sites.

The recent findings in Portugal align with these observations of moisture affinity but suggest a much narrower ecological breadth at the southern edge of the species' distribution. In the surveyed region, the moth has only been detected in two Portuguese biogeographic regions (Figs. 4 and 5), with Vouzela marked by mountain and continental influences, and the central-western region mainly representing a lowland region with a strong Atlantic influence.

Towards other southern parts of its European range, *Gortyna flavago* is very scarce and highly localized, with isolated and scattered records in the Iberian Peninsula and rare, localised occurrences in mountainous areas of southern Italy (Calle, 1982; Parenzan & Scalercio, 1996).

Host-plant specialization:

In north-western Europe *G. flavago* may show high ecological plasticity (Fibiger, 1990; Skinner, 2009) and utilizes a wide range of host-plants. Thistles (*Carduus*, *Cirsium*) and burdocks (*Arctium*) are frequently cited as primary hosts, while foxglove (*Digitalis*) is also mentioned. Other reported host-plants include *Jacobaea vulgaris* Gaertn., *Eupatorium, Verbascum* L., *Scrophularia* Tourn. ex L., *Artemisia vulgaris* L., *Pulicaria dysenterica* (L.) Bernh., *Achillea millefolium* L., *Angelica* L., *Aegopodium* L. and *Urtica* L. (Bretherton et al., 1983); *Petasites* Mill. and *Valeriana* L. (Zilli et al., 2005); and *Centaurea* L. (Henwood & Sterling, 2020).

The published accounts differ in the number and selection of host-plants listed. Henwood & Sterling (2020) distinguish six main host-plants, including *Eupatorium*, and seven others used less commonly. Ebert (1998), mentions *Eupatorium* in a list of four. Leraut (2019) lists eleven plant genera but does not include *Eupatorium*. Additional host-plant records for *G. flavago* are available in the HOSTS database (Robinson et al., 2023).



Figure 6 - Well-developed, flowering stands of *Eupatorium cannabinum* subsp. *cannabinum*, the host plant of studied populations of *Gortyna flavago*.

Thus, although *Eupatorium* appears in several accounts, none of these descriptions identifies it as the most frequently used host plant.

In contrast, the recently studied Portuguese populations appear to rely exclusively on *E. cannabinum* (Figs. 6 and 7), despite intensive surveys of other plants. No evidence of *G. flavago* was found on *Cirsium palustre* (L.) Scop., a close associate of *Eupatorium* in central-western Portugal, nor on *Cirsium arvense* (L.) Scop., a long-established agricultural weed that is common near three of the recorded occurrence sites, and also not in *Cirsium vulgare* (Savi) Ten., a common plant in forest edges. No signs of larvae or adult activity were detected on other thistles, nor on *Digitalis purpurea* L., *Arctium minus* (Hill) Bernh., *Jacobaea vulgaris* Gaertn., *Pulicaria dysenterica*, *Cheirolophus uliginosus* (Brot.) Dostál or the regional endemic *Leucanthemum lacustre* Brot., even when they occur together with *Eupatorium* stands affected by *G. flavago*.

Host-plant specialization at regional scales is well documented in Lepidoptera (Bernays & Graham, 1988). This marked contrast between Portuguese and north-western European populations may be related to the peripheral position of western Portugal populations within the species' range. Host-plant use may become more restricted toward species' range margins, as observed in *Lycaena dispar* (Haworth,1802), whose northern marginal populations show greater host-plant specialization than populations closer to the core of its European distribution (Martin & Pullin, 2004).

Hydrological niche:

The habitat of *G. flavago* regionally depends on the hydrological niche of its host plant, which requires a regular seasonal hydrological regime despite topohydrological variations. The fundamental baseline consists of constant, well drained soil moisture levels throughout the seasons combined with stable margins during flood events. At specific sites within the study area, a stable soil-moisture profile was maintained even during the severe flooding after Storm Kristin in early 2026. This stability is critical for the host-plant, which, under the regional mild winter temperatures, does not tolerate prolonged flooding or stagnant water containing suspended and decomposing debris. Concurrently, these precise soil moisture tolerances and drainage dynamics are possibly equally vital for the vulnerable life stages of the moth.

Long-term studies of northern European fen vegetation have likewise demonstrated the importance of hydrological integrity for the persistence of hygrophilous plant communities, including tall-herb formations associated with *Eupatorium cannabinum* (Fojt & Harding, 1995).



Figure 7 - Stands of *Eupatorium cannabinum* still erect in a herbaceous meadow in the height of autumn. The associated *C. palustre* usually exhibits senescence after fruiting well before that of *E. cannabinum*, with many plants presenting dry stems by September; furthermore, they collapse, and their structures degrade more rapidly and completely over the following months, contrasting with *E. cannabinum*.

Vegetation Framework:

E. cannabinum depends on a narrow window of ecological conditions to thrive under a Mediterranean climate. In central-western Portugal, it can be found across a range of riverine and humid habitats, including runoff areas on coastal cliffs, where it may occur among rush communities. It also occurs in hygrophilous scrublands within semi-open woodland, in runoff or interflow sections, sometimes associated with pioneer mire formations and catenal boggy habitats, where it may be constrained by local chemical conditions. Even when occurring in dune slacks and intersection zones between drier and hygrophilous scrub, the vegetation always exhibits an Atlantic affinity, including Ericaceae, and generally features some nearby canopy cover.

G. flavago occurs in abundance mainly corresponding to the priority habitat 91E0* (*Alluvial forests with Alnus glutinosa and Fraxinus excelsior*, Annex I of Directive 92/43/EEC; European Commission, 1992), which is locally represented by subtypes 91E0pt1, 91E0pt2 and 91E0pt3 according to the Portuguese Sectoral Plan (ALFA, 2004). While these subtypes vary in hydrological stability, in the studied region 91E0pt3 is usually structurally more stable and less prone to disruptive flooding. Highly resilient humid perennial megaforb communities (6430pt2), particularly those featuring *E. cannabinum*, are regionally closely associated with these habitats. Structurally similar hygrophilus vegetation is described in Northern Europe as riparian tall-herb communities, tall-herb fens, alder carr margins, or tall helophyte fringes.

Microclimatic Constraints:

Beyond the soil and water parameters, the dense, tall megaforb stands and the structural canopy of riparian woodland may provide microclimatic protection. The moth's flying period does not differ greatly across Europe, being concentrated in September, a month that can be remarkably warm under the Atlantic–Mediterranean climate of central-western Portugal. Areas lacking a minimum amount of tree-canopy cover and humid air may therefore be unfavourable. On the other hand, shading cannot be extensive as to preclude woodland edges and clearings in edaphically suitable positions, where *E. cannabinum* can develop under minimum adequate light conditions.

This localized microclimatic buffering is crucial in the Mediterranean-Atlantic bioclimatic transition, where structured riparian fringes decouple the understory from regional thermal extremes (Rivas-Martínez et al., 2011; De Frenne et al., 2019).

Main topohydrological settings:

The Caldas da Rainha typhonic valley is a unique diapiric depression characterized by differential erosion and Holocene alluvial plains (Zêzere, 2005). According to Zêzere, this geomorphological structure promotes significant water retention and creates a network of humid floodplains, surrounded by limestone ridges. Consequently, these dynamics create a microclimatic matrix and a microhabitat network.

The survey results indicate that the ecological niche of *G. flavago* is not confined to a single humid habitat type or ecotone, but emerges from the convergence of persistent moisture, adequate drainage, sufficient illumination, presence of arboreal cover, hydrological stability, and vigorous *E. cannabinum* growth. The different configurations described below represent distinct topographic and hydrological expressions of its ecological niche, ranging from marshy alder systems and larger riverine landscapes to narrow incised valleys and catenal hillslope runoff systems (surface runoff or subsurface flow).

a) Marshy woodland ecotones

The most favourable ecological setting identified for *G. flavago* is associated with marshy forests of *Alnus lusitanica* (Habitat 91E0pt3), particularly their riparian forest-edge ecotones and clearings. This habitat is currently very rare, confined and highly isolated regionally, with many sites retaining only secondary regeneration dominated by *Salix atrocinerea* Brot. (Fig. 8), which more readily colonizes transformed humid soils through wind-dispersed seeds, and sometimes with remnant *Frangula alnus* Mill..

The preferred habitat typically develops along a catenary sequence transitioning into hydromorphic arenosols (also argillaceous sands), often associated with deep, stable baseflow or shallow, gently sloping aquicludes. Hardwater flow, multi-directional lateral infiltration and lateral runoff extend suitable hydrological conditions across the system, particularly upstream of the Nadadouro stream, which stands out as an ecological hotspot for megaforb communities and *G. flavago*. Despite its limited spatial extent and being highly threatened, the Nadadouro site is a reference point also for other riparian Lepidoptera, revealing poorly known species towards their southern range limits, especially *A. lusitanica*-associated such as *Caloptilia elongella* (Linnaeus, 1761), *Acleris notana* (Donovan, 1806) and *Idaea dromikos* Hausmann, 2004 (see Appendix for more details), with similarly few confirmed Portuguese records, in some cases also known from a single locality. This is particularly noteworthy for a habitat increasingly constrained by urban encroachment (Fig. 22).



Figure 8 - Rare view of a hidden inner clearing of a mature willow grove with *Frangula alnus* (probably a former alder grove) in a lentic run-off area fed by a hard-water baseflow within hydromorphic arenosols, partially surrounded by sandstone reliefs. *Quercus* spp. and strawberry trees form a peripheral forest. Such sites are not uncommon, despite being altered, but some preserve dozens of medium-to-large-sized *E. cannabinum* stands. Formigal (Caldas da Rainha); 2021.

Marshy alder forests are also particularly favourable through their unique edaphic characteristics: organic matter and alder-associated mycorrhizae contribute to balanced nitrogen availability which, combined with the water characteristics, is readily taken up by plants, favouring extensive stands of *E. cannabinum* capable of vigorous regeneration even after disturbance.

The waterlogged woodland core of this habitat may support *Magnocaricion* helophytes, especially *Carex paniculata* subsp. *lusitanica* (Willd.) Maire, or *Phragmition* species such as *Iris pseudacorus* L. and *Sparganium erectum* L.; in disturbed areas these more readily mix with megaforbs, with *Eupatorium cannabinum* L. typically occurring peripherally.

b) Fluvial ecotones



Figure 9 - Typical scenario of controversial management in regional riverbanks and water channels of central-western Portugal: current interventions focus on drainage and mechanical clearing, while neglecting ecological integrity. *Eupatorium* populations have virtually disappeared from the agricultural landscapes of the modified rivers west of Óbidos. Rio Real (river valley). Óbidos; 2025.

Broad alluvial fluvisols in lowlands, regularly subject to flooding and other unstable conditions, and with a history of intensive land use, have generally shown to be less suitable for this moth or the maintenance of permanent nuclei of *E. cannabinum*, despite some featuring sparse stands of this plant and wooded patches. These areas are generally occupied mainly by tall, annual or nitrophilous ruderal species. In a few sections where agricultural pressure is lower, this plant is still associated with fragmented or degraded alder woodlands dominated by *Salix atrocinerea* Brot., frequently on micro-terraces (habitat 91E0pt1) occasionally occupied by hybrid poplar plantations, a feature that can also be found in habitat 91E0pt3. These habitats frequently include ditches within traditional agricultural parcels, which only support sporadic occurrences of *Eupatorium* where stable moisture and minimal chemical applications persist.

Currently, alluvial micro-terraces are more suitable when associated with interflow or runoff areas from adjacent hillsides or small tributaries. These zones tend to transition toward other habitat types (such as 91E0pt3), as occurs in the vicinity of Quinta dos Bugalhos, or toward the specific conditions described below.

c) Incised valley ecotones

Eupatorium cannabinum also occurs confined to the naturally narrow wet margins of incised valleys, along sandstone and marl reliefs, where relict habitats featuring hazelnut (*Corylus avellana* L.) groves (9160pt2) and *Laurus nobilis* L. (5230pt1) are particularly valuable for conservation. These watercourses frequently include alder formations comprising habitat 91E0pt1. Generally surrounded by mixed forest with oak dominance (*Quercus* spp.) and *Phillyrea* L. groves (5230), these distinct riparian communities are very well represented along the eastern border of the Diapir, facing the Typhonic Valley (Fig. 10).

G. flavago is scarce or possibly occasional in these habitats, potentially owing to the narrow strips of permanently moist, stable soils along the margins that escape both winter flows and summer drought, their degradation, or excessive shade that limits the growth of the host-plant. An exception occurs in edges where wider riparian shelves support wet meadow patches; however, as a result of rural abandonment, these are almost permanently clogged with dense brambles. The scarce records of the moth in such situations possibly result today from dispersal from colonies under different topohydrological circumstances and undetermined distances, where *E. cannabinum* is more abundant and vigorous.



Figure 10 - Typical riparian section of a well-preserved incised valley: canopy dominated by *Alnus lusitanica* and *Corylus avellana* with *Clematis vitalba*. The humid, steep banks feature *Eupatorium cannabinum*, *Hypericum androsaemum* L., the southernmost known population of *Melittis melissophyllum* L. of western Europe, *Carex pendula*, and Dryopteridaceae. Caldas da Rainha Municipality; 2025.

d) Hygrophilous shrublands in catenal contacts

Oligotrophic acidic surfaces on gentle hillslopes with a significant influence of a baseflow allow small patches of hygro-minerotrophic vegetation and may also form a suitable habitat for *G. flavago*. This biotope does not necessarily correspond to a defined forest, stream or watercourse; it is often open and flanked by dry heath and gorse shrublands characterized by understory communities, giving way in damp patches to homologous hygrophilous shrublands. A localised grey dune profile combining wet heath and megaforbs occasionally extends, along with its characteristic species, into sandy inland surfaces further into the typhonic valley. Not uncommonly, *Erica erigena* R. Ross, *Genista ancistrocarpa* Spach and *Carex hispida* Willd. ex Schkuhr are observed alongside *Eupatorium cannabinum*, and may extend into small patches of oligotrophic mire formations.

These biotope types are not rare but somewhat degraded, although remnants still occur contiguously and interact with those previously described. Although lacking host-plants with robust stems in abundance, a few stands remain suitable, and the observation of larvae and small-sized *G. flavago* individuals may indicate a functional niche.

This is part of the landscape found very well represented in the coastal areas from Leiria to Pombal, and also somewhat far from the coast in contact with swamp forests, sometimes featuring abundant nuclei of *E. cannabinum*.

II. Life history of *Gortyna flavago* in central-western Portugal

Larval and Pupal Stages:

The life cycle stages of *Gortyna flavago* have been widely recorded in classical and modern European entomological literature. The species overwinters in the egg stage, with hatching probably occurring in February or early March in central-western Portugal, where a few almost mid-instar larvae can already be detected by April in young plant shoots (Fig. 11).

Although larvae may naturally relocate on or between stems, the traces left during the early stages are often subtle, appearing to be predominantly sedentary.



Figure 11 - Early instar larva on *Eupatorium cannabinum*. Nadadouro; 10.iv.2024.



Figure 12 - Recently emerged male specimen expanding its wings below mid-height of an *Eupatorium cannabinum* stem, in an area where high larval abundance had been previously recorded. This is the earliest record for the region, made very close to a newly installed street light near which three large stands of this host-plant occur, constituting an unusual occurrence. Nadadouro; 7.viii.2024.

Larval growth is slow throughout summer. Feeding apparently slows markedly during the final instar for over a month while the larva enlarges a pupal chamber at the base of the host stem. Unless dislodged, full grown larvae remain sedentary, showing little evidence of activity. Upon relocation, they may rapidly re-bore and excavate a new space at the base of another stem, becoming stationary again. Moreover, after three years of observations, the flying period was consistently centred around the same period (September), irrespective of interannual meteorological variation and differences in host-plant development, habitat and location, which may point to the possibility of a mechanism synchronizing the transition to the adult stage. The only exception involving early adult emergence was recorded during the first week of August (Fig. 12).

The interior of the stem consistently contains high levels of moisture or plant fluids. The increasingly sap-rich environment within *Eupatorium* stems may explain specific feeding requirements, in what deserves further study. Feeding efficiency appears high throughout larval development, possibly owing to additional nutrient uptake from flowing sap. The relationship between the larva and its host-plant appears to be highly balanced. *E. cannabinum* produces multiple stems from perennial rhizomes, and a couple of isolated vigorous plants can harbour several larvae from March/April through to August/September, as observed at the Nadadouro site. In August 2024, an isolated vigorous plant was found to contain seven pupal chambers among 21 erect stems; seven additional stems showed no traces of occupation, while another seven contained empty galleries. The stems, characterized by hard, strong walls, are excavated internally only within their lower quarter, with galleries extending slightly below the rhizome block while leaving substantial vascular tissue intact. Consequently, stems are rarely destroyed and generally continue to flower and set seed successfully. Generally, only thinner, secondary stems, or growing in shaded conditions, succumb to the activity of final-instar larvae. In such cases, larvae may move to a new stem to complete feeding or pupate within the existing senescent stem (*Eupatorium* stems do not break easily, even after senescence).

Monitoring the duration of the pupal stage is not feasible due to poor visibility on plants and potential behavioural changes in captivity, and because exact start dates were unknown. In August, larval fresh boring signs are minimal, and few open and resealed galleries with non-parasitized individuals were followed until emergence, roughly indicating that this phase may last between two and three weeks.

The exit hole is prepared slightly above the pupal chamber and remains barely concealed beneath the plant epidermis (Fig. 13). Even enlargement of the chamber does not appear to impede sap circulation and exudation. Construction of the pupal chamber may increase basal fragility and occasionally cause stems to lean, particularly in shaded areas, although complete breakage is uncommon, as already has a natural tendency to lodge, with the distal portion subsequently curving upwards and proceeding to flower. Since the *E. cannabinum* typically grows in dense communities, leaning stems may remain supported by neighbouring plants of similar height. Overall damage is therefore limited. Moreover, the slopes and marginal areas where it thrives are generally subject to little trampling by larger mammals, which tend to follow established tracks.

Stems bearing larval traces and an open exit hole dry naturally during winter and may remain erect until the following season.

A potential advantage of *E. cannabinum* as a host-plant under these biogeographic conditions is its perennial rhizomatous growth, allowing vigorous annual resprouting and persistence at the same site over successive years. This may provide greater spatial continuity of larval resources than annual stems of plants such as *Cirsium palustre*, particularly where suitable habitats are fragmented and host-plants are often confined to small, isolated patches.

This remains a hypothesis, but observations over three years and the author's experience with the plant, activity of *Gortyna flavago* may stimulate basal stem multiplication and resprouting from peripheral sections, potentially enhancing the plant's capacity to remain an optimal host. In the absence of another apparent comparable cause, plants occupied annually appear broader and produce a greater number of stems than unaffected plants, although they do not develop the excessive abundance of thin regrowth observed following mechanical mowing.



Figure 13 - Pupal chamber with a closed exit hole (in the centre) and a false exit hole above, possibly a failed entrance attempt. Nadadouro; 4.viii.2024.

Under non-mined conditions, new shoots emerge from the rhizome, initially growing downwards or horizontally before turning towards the surface as they develop. However, when stems are mined by larvae whose galleries extend into their lower sections during summer, natural winter senescence appears to penetrate to greater depth. As spring approaches, living tissue is therefore situated farther below the rhizome block, potentially forcing regrowth from deeper zones and causing new shoots to emerge more peripherally. This process appears to increase the peripheral width of the rhizome block and may induce a slight increase in stem production while maintaining a relatively robust stem diameter, and a balanced number of stems.

Mating season:

Adult emergence typically occurs from dusk into the night, beginning in late August (rare earlier), peaking in September, and becoming infrequent in early October with only worn-out individuals observed by both methods described. The peak mating period occurs when the host-plant is already fruiting and its inflorescences are withered (ceasing to attract nocturnal pollinators that abound in riparian zones, which in turn attract more predators).

Following wing expansion, adults exhibit low mobility; they typically ascend the stem and remain stationary for several hours, sometimes repositioning without taking flight. This behaviour mirrors that of *Luperina testacea* (Denis & Schiffermüller, 1775), where evening female flyers are also composed of individuals that emerged on previous nights. However, unlike

the latter which mates hours later during a secondary flight period at dawn, *G. flavago* barely flies away and hides in the leaf litter at daybreak.

Both males and females become highly active at twilight the following night, flying around *Eupatorium* patches along woodland edges and in clearings, but also penetrating densely wooded habitats and bramble thickets where some host-plants persist. Females select a low perch and release pheromones, often from the host-plants or very close (Fig. 14). Males meticulously patrol these clusters along edges from dusk onwards for about an hour, then remain perched near the host-plants if not mating successfully, however keeping their antennae raised. Mating (Fig. 1) was recorded between 20:45 and 23:30 (first week of September, western Portugal; UTC+1), in many cases involving females previously observed on preceding nights.

The slow, mid-height (0.5–1.5m), and inquisitive patrolling behaviour of males among the stems and dense vegetation at twilight suggests a potential narrow window of pheromone release by newly emerged females; however, mating involving fresh females (located and monitored at fifteen-minute intervals) was never observed during overnight monitoring. It seems likely that the use of red light did not inhibit the females, especially since older females were successfully tracked and observed mating under similar light conditions.

Activity becomes rare overnight, and finally both sexes find a low position to hide at dawn.

Dispersal and Oviposition:

Despite limited observations of adult feeding (a single instance involving aphid honeydew; Fig. 2), the relative longevity of a captured mated female could indicate a high dispersal potential over at least a week and a half, with very gradual oviposition, although these results may have been influenced by feeding and *ex-situ* protection. Conversely, the recapture of a female at the same site on two consecutive nights (freshly emerged and then mated the following night), and again after a seven-day interval despite cold intervening nights, indicates that at least some individuals may exhibit site fidelity, or returning, maintaining a localized home range within isolated patches or area (Fig. 14). Both sexes were frequently observed at the same locations over consecutive nights, often within the same forest edge.

However, the occasional observation of 1-2 larvae in isolated sites with very limited host-plants, kilometers away from the main colonies, may suggest dispersal behaviour that likely maintains gene flow between subpopulations.

Field observations at Nadadouro and in the vicinity of Quinta dos Bugalhos suggest that oviposition occurs on the first withered leaves near the base of thicker stems (Fig. 15). However, due to the proximity required for observation amidst dense vegetation, and since the species easily interrupts certain behavioural routines when exposed to light, the presence of wild eggs was not observed. Adults observed active after midnight were exclusively females.

Behaviour in limited controlled environments (*ex situ*) offering diverse plant structures, showed a consistent preference for broad, desiccated (brown) leaves on the middle section of the stem, with the eggs concealed in small clutches in a manner typical of the Apameini tribe, with the plant tissues acting as a partial sheath. The female tested exhibited intermittent periods of activity throughout the night, with peak activity at dusk, ending at 3 AM.

In nature, the mid-height hanging *E. cannabinum* leaves often persist through late autumn and fall during winter, potentially leaving egg clutches dependent on undisturbed soil conditions.

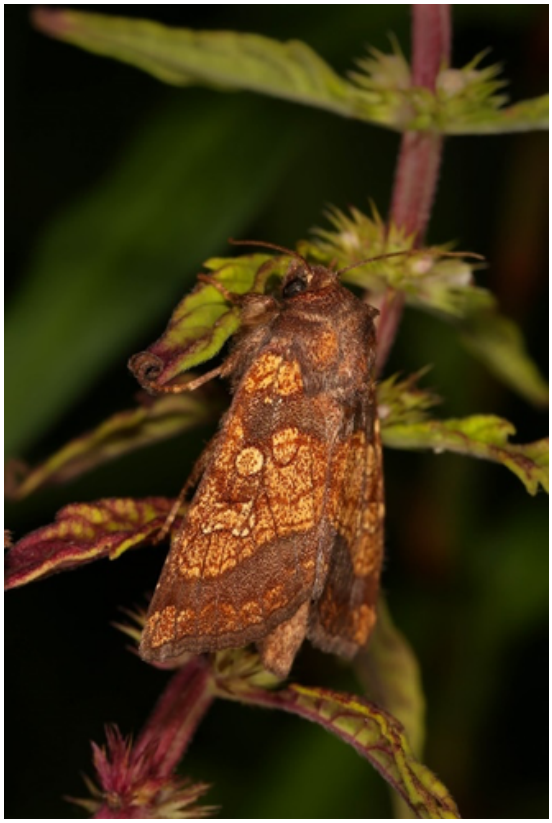

Figure 14 - Female interrupting her calling behaviour on *Lycopus europaeus* L. after being disturbed by a camera flash. A mating pair was located a short distance away. Likely due to the disturbance and the late hour, she was found mating the following night less than 100 m away. A third observation of the same individual was made nearly a week later at the same location, where she appeared partially worn (apparently almost empty of eggs). The identity match was confirmed through image analysis. Nadadouro; 2.ix.2024.



Figure 15 - Oviposition behaviour on a bent stem of *Eupatorium cannabinum*, under *Alnus lusitanica* canopy. Nadadouro; 30.viii.2026.

Inconclusive rearing trials:

Captive breeding at a small scale has not yielded reliable results, despite some outcomes being subject to results and discussion.

Eggs laid by a captive female, kept under urban micro-climate outdoors, hatched between late February and early March. However, these dates may not accurately reflect the natural phenology in the wild. The young larvae were released at the Nadadouro stream (in 2025), in a plot where larvae had not been found in previous years, and developed according to the species' normal phenology.

Four captured larvae were reared, fed with detached cultivated stem parts of *E. cannabinum*, but with unsatisfactory results, this reinforces the hypothesis that the species is highly dependent on fresh plant sap. Furthermore, the resulting abnormally small adults possibly exhibited altered behaviour: emerging randomly during a 24-hour period, both males and females struggling violently to escape their cages and refusing to mate, even in outdoor cages placed near cultivated host-plants. This necessitated their release into the wild (lost out of sight), rendering the observations null and unrepresentative of natural behaviour. Such a reaction is common among captive specimens and should not be interpreted as dispersal.

Predation and parasitoids:

Very few cases of predation on *G. flavago* have been witnessed. Nevertheless, bats were occasionally identified hunting just after the twilight period, precisely when the moth peaks its activity: *Myotis escalerai* (Cabrera, 1904) and *Plecotus austriacus* (Fischer, 1829), together with a medium-sized brown-orange-colored horseshoe bat (*Rhinolophus* cf. *mehelyi*), were easily identified at very close range at Nadadouro site.

However, The repeated recaptures of adults during the breeding season suggest that *G. flavago* can exhibit considerable longevity in its natural habitat.

Two malformed pupae from Nadadouro were retained for the identification of a lethal endoparasitoid: *Nemoraea pellucida* (Meigen, 1824), a tachinid inhabiting forest areas, raising the possibility that it may be a common situation.

Despite the presence of fissures exposing the larval and pupal chambers, often caused by plant tissue folding or wrinkling, no predatory interest from *Myrmica* sp. was observed affecting *G. flavago*. This lack of interaction persists even when ant colonies occupy the rhizome block, and despite *Myrmica* sp. being very common and abundant in these humid habitats.

III. Habitat and population dynamics

Negative surveys and vegetation succession:

The presence of *E. cannabinum* alone was not sufficient to predict the occurrence of *G. flavago*. Surveys of apparently suitable host-plant stands, including some comprising several tens of vigorous plants, frequently produced no evidence of larvae and adults. Negative surveys included *E. cannabinum* stands approximately 300 m from Ribeira do Nadadouro, with abundant plants in an area of gentle hillslope runoff, and also sites at Mata das Mestras and Mata do Vimeiro (east of the Caldas da Rainha Typhonic Valley), at woodland edges influenced by hillslope interflow. All had been subjected to vegetation cutting, though not necessarily annually, and yielded no evidence of *G. flavago*. The species was also undetected in other scattered *E. cannabinum* occurrence sites and incised valleys east of the Typhonic Valley, where no visible signs of vegetation cutting were observed.

While some negative results coincided with evident threats or habitat limitations, others had no obvious explanation, suggesting that unknown behavioural preferences or dispersal limitation factors, previous disturbance or less readily detectable environmental pressures may influence occupancy.

The consistent lack of detections in cut stands, regardless of intervention timing or frequency, is compatible with the species' prolonged use of persistent host-plants for endophytic larval development, pupation and possibly oviposition on senescent foliage, requiring structural continuity through winter. For instance, roadside *E. cannabinum* stands (Fig. 16) may retain abundant host-plants while recurrent management prevents moth attraction or completion of its annual cycle, turning these habitats into possible ecological traps, unless specific evolutionary response allow the moth to avoid them.

Conversely, *E. cannabinum* stands colonized fallow or abandoned ground near established populations and were subsequently occupied by *G. flavago* (Fig. 17), indicating that new occupied habitat can develop where neighbouring populations provide sources of both seeds and dispersing females.



Figure 16 - Roadside verge intersecting a "native" runoff line with water accumulation, with hundreds of thin *Eupatorium* stands along a 70 meter stretch. Vegetation management even promotes their multiplication, but surveys for *G. flavago* at this location resulted totally null. Alfeizerão (Alcobaça); 2024.



Figure 17 - Smallholder agriculture fallow along the Ribeira do Nadadouro upstream section, easily evolving into a wet meadow and megaforb vegetation. This site experiences a significant *Eupatorium cannabinum* colonization in fallow and abandoned wet fields. Note upstream one of the groups of *Alnus lusitanica* woodland. This regeneration originates from seedlings of more consolidated plants in nearby undisturbed uncultivated soils; 2026.

New habitat opportunities and regeneration may be temporary, as prolonged abandonment favours succession by *Rubus*, dense scrub and invasive vegetation, eventually increasing shade, suppressing megaforb communities and, particularly where grazing and smallholder agriculture has declined, even promoting woody herb fuel accumulation that may increase the local intensity of wildfires. Traditional low-intensity land use may have helped maintain these habitats at an intermediate successional stage. In particular, sheep grazing tends to maintain the margins of wet meadows while avoiding *E. cannabinum* and other inherently peripheral, unpalatable megaforbs. Habitat persistence therefore appears incompatible with both recurrent indiscriminate clearance and unrestricted vegetation succession.

Negative surveys further north:

Along the Nazaré-Pombal coast (National Pine Forests), extending slightly inland into more rugged and consolidated terrain, *E. cannabinum* was known from several apparently suitable habitats, including riparian galleries in dune depressions and small streams and seepage along hygrophilous scrublands. Although some stands recovered after the 2017 severe fires, others were subsequently destroyed by land-management interventions, and recent surveys across coastal and adjacent inland habitats yielded *no G. flavago*, with many Eupatorium populations destroyed. However, historical occurrence or persistence of undetected populations cannot be excluded.

Habitat resilience under disturbance regimes:

The topohydrological settings occupied by *G. flavago* also differ in their response to episodic disturbance. Lowland larger riverine systems are more exposed to flooding (Fig. 18), whereas open hillside habitats with a mix of megaforbs and hygrophilous scrub may be more vulnerable to summer wildfire. Marshy alder and stable interflow systems on slightly elevated terrain with luxuriant summer succulent foliage vegetation have proven to be comparatively buffered from these extremes, as well as riparian galleries embedded in broader sections of steep-sided humid valleys. During the severe fires of 2017, humid riparian and nemoral vegetation remained unburnt at some of both types of site, whereas more open coastal scrubby humid ecotones burned severely; *E. cannabinum* nevertheless regenerated rapidly in the latter and was sometimes among the first species to resprout. The survival of *G. flavago* during fire remains unknown; any protection afforded to larvae by their basal, partly subterranean position in moist stems and soil remains hypothetical.



Figure 18 - Active alluvial systems and floodplains, characterized by fluctuating flood regimes, high sediment loads, and variable water levels, rarely meet the conditions required for the permanent proliferation of *Eupatorium cannabinum*, which prefers moist yet well-drained soils in more hydrologically stable catenal contacts. Instead, these dynamic environments naturally favour other plants and specialized endophytic marsh lepidopterans better adapted to hydrological fluctuations. Poças do Vau, Óbidos; 2026.

Conversely, during the extreme flooding in early 2026 after Storm Kristin, the Nadadouro upstream hydromorphic system maintained essentially unchanged water levels, while extensive areas upstream the Rio Tornada valley were strongly affected, including lowlands in the vicinity of Quinta dos Bugalhos, where, due to partial rural abandonment and vegetation management, *Eupatorium* was not well represented in the hygrophilous niche most suitable for escaping floods. Following the storms throughout the entire 2026 season, no records were made in these areas of the Vidais parish. In the worst-case scenario, this localized collapse coincided with relatively recent, extensive, and profound deforestation extending over kilometers along the surrounding slopes due to modern eucalyptus rotation practices. A couple of years ago, these practices disrupted water runoff pathways and hygrophilous shrublands that intermingled with megaforbs. Furthermore, machinery-induced erosion and subsequent bank collapses have also severely affected the margins of the lower riparian zones (Fig. 19b).

The intrinsic relationship between the ecology of different topohydrological settings typically reduces the probability of synchronous extreme events through habitat diversity, thereby allowing for recolonization. Moreover, the contrasting responses suggest that more stable habitats may provide long-term refugial conditions, especially under rising anthropogenic pressure, while more disturbance-prone habitats contribute periodically to habitat availability and spatial continuity.



Figure 19 a/b - Earthworks effects after a forest monoculture rotation: a) upland runoff/interflow formerly supported semi-open hygrophilous scrublands and megaforbs in relative abundance; b) a slightly lower zone a few hundred meters away, where erosion and landslides impact an ecologically outstanding marshy area characterized by rare and protected megaforb vegetation. Both sites are located upstream of a degraded woodland whose edges hosted significant numbers of *G. flavago*; The first *G. flavago* regional record in 2023 (2º national record) originates halfway between sites, prior to the main interventions. Freguesia de Vidais (Caldas da Rainha); 2025(a)/2026(b).

Population persistence under changing landscapes:

Riparian tall-herb (megaforb) communities often persist as remnants of natural river-valley vegetation and refugia for hygrophilous plants in heavily modified landscapes (Rodwell, 1995; van der Maarel, 2005). However, in Portugal's west region this applies to a limited range of species, especially considering that, under a Mediterranean climate, the edaphic moisture ecotone can be very narrow.

Contemporary pressures include intensive forestry, agriculture, orchard management and far-reaching effects of agrochemical exposure, hydrological overexploitation, invasive vegetation and urban expansion, and stands lagging behind any functional or sustainable criteria (Fig. 21).

Historically, before such extensive landscape transformations, marshy ground, springs and narrow riparian margins with heliophilic edge habitats often escaped intensive cultivation, with traditional agricultural practices also preserving small riparian fragments and culturally recognized sites, particularly springs associated with interflow zones. Increasing mechanization and disregard or lack of legal restrictions now facilitates intervention within many of these formerly marginal habitats, leaving only ruderal plants and some nitrophilous helophytes on deep ditches. This process has been accelerating: several *E. cannabinum* sites known from earlier floristic surveys were substantially altered or destroyed between 2019 and 2023 (example in Fig. 20).



Figure 20 - One of many instances of direct, severe destruction of marshy woodlands with hydrologically stable margins, previously regenerating from an earlier harvest. Regionally, traditional smallholder subsistence farming and low human population density restricted land-use conversion in these difficult-to-manage topohydrographic features, long-term preserving core and marginal vegetation. Neighborhood of Formigal (Imaginário; Caldas da Rainha); 2026.



Figure 21 - Inappropriate land use in riparian ecosystems: Drainage and Umbrella Pine (*Pinus pinea* L.) planting in naturally saturated soils, with the application of herbicides. Concelho de Óbidos.

These changes acquire greater significance in the context of the fragmented regional distribution and the persistence of *G. flavago*. Sites supporting the highest recorded densities may have functioned as source populations, while larvae were also found in small, apparently isolated patches and newly established *E. cannabinum* stands near existing populations became occupied. Although no individuals were recorded at more than one location, these observations, together with the spatial proximity of several occupied sites, are consistent with a metapopulation structure at the local scale. Regional persistence may therefore depend on a heterogeneous network of core population and smaller, sometimes transient habitats that may facilitate dispersal and recolonization. This spatial complementarity may be particularly important where suitable humid ecotones are naturally restricted and increasingly fragmented by land-use change.

Light pollution:

The study area where *G. flavago* was rediscovered is largely urbanized, with locally high levels of street lighting and extensive diffuse artificial light particularly under the frequent cloudy conditions of summer.

The most relevant core population of this moth (Nadadouro) occurs where high-quality habitat patches persist amid ongoing urban development, including housing, gardens and associated street infrastructure. Artificial illumination is only locally attenuated by dense riparian tree cover within the wooded core and edge areas. Although the species appears tolerant of current urban light levels at Nadadouro under these conditions, the behavioural responses observed throughout this study suggest that this may have its limits, with stronger illumination potentially increasing light avoidance.

Night-time light distribution was therefore mapped across the study area (Fig. 22a/b), with the Nadadouro site highlighted at a more detailed scale (Fig. 22b). This issue may become particularly relevant to planned riparian restoration near urban centres, welcome actions given habitat loss elsewhere through agricultural intensification or excessive abandonment; wavelength-adapting or limiting artificial lighting in these restored habitats may favour biodiversity.

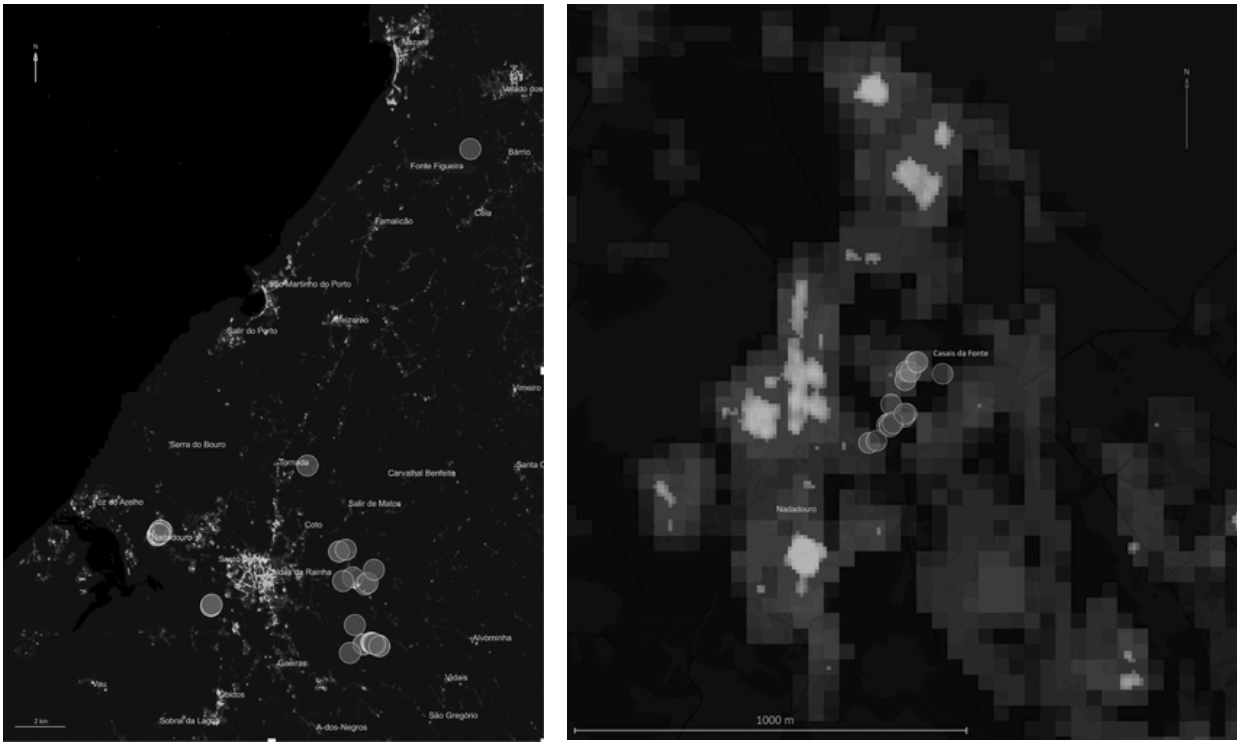

Figure 22a/b - a) Night-time light satellite observation on 11.xii.2024. The overlay combines the 10m spatial definition of light sources with the 40m band to capture atmospheric radiance diffusion. b) observation of artificial light in the upstream area of the Nadadouro stream. The shallow valley features peripheral and diffused lighting (especially under cloud cover, not here represented), partially attenuated by dense tree canopies reducing upward light propagation.
The dark circles represent *G. flavago* documented records (imagery) between 2023 and 2025.
SDGSAT-1 imagery courtesy of the Sustainable Development Goals Big Data International Research Center (CBAS) and the Chinese Academy of Sciences (CAS).

Conservation

The apparent restriction of *G. flavago* to a small number of localized populations and its dependence on a spatially restricted network of humid habitats warrant targeted conservation measures in central-western Portugal. Priority should be given to maintaining the known core populations, together with smaller occupied patches and intervening habitat that may contribute to dispersal and recolonization.

Protection should therefore extend beyond individual host-plant stands to the hydrological and vegetation processes that maintain suitable riparian and interflow ecotones. Management of *E. cannabinum* stands should preserve their structural continuity throughout the year. Recurrent mowing or clearance of occupied and potentially suitable stands should be avoided, while excessive succession by *Rubus*, scrub and invasive vegetation may require selective control where it causes substantial shading or displacement of megaforb vegetation. Such intervention should be spatially limited or carried out rotationally across micro-sites. Where low-intensity grazing maintains open wet-meadow margins without substantial consumption or damage of *E. cannabinum*, its continuation may be compatible with habitat maintenance.

Conservation of the underlying hydrology is equally important. Drainage, water abstraction (boreholes), soil sealing and other modifications capable of altering groundwater, lateral interflow or riparian flow should be avoided in and around *G. flavago* habitat. Appropriate separation from intensive forestry and orchards would also reduce direct habitat alteration and potential exposure to agrochemical drift, while invasive vegetation should be controlled where it compromises native riparian and megaforb communities. In urbanized sites, unnecessary artificial illumination immediately adjacent to breeding patches should be minimized or adapted where practicable.

Formal recognition of the most important population nuclei, potentially through small protected areas or site-specific management agreements, would facilitate their long-term conservation. Where connectivity has been lost, restoration should favour natural regeneration of *E. cannabinum* and associated native vegetation, supplemented where necessary by locally sourced material, rather than isolated planting without suitable hydrological conditions and provision for appropriate long-term maintenance. Monitoring should remain minimally invasive and include both established populations and apparently suitable unoccupied stands, allowing changes in occupancy, habitat condition and connectivity to be detected while the species' Portuguese distribution remains incompletely known.

Conclusions

The rediscovery of *Gortyna flavago* after more than six decades without records in Portugal reveals a species that may have been historically overlooked, but appears to be rare and highly localised in the study region. In central-western Portugal, its strong fidelity to *Eupatorium cannabinum* and dependence on a restricted combination of persistent soil moisture, adequate drainage, vegetation structure and microclimatic conditions contrast with the broader ecological plasticity reported elsewhere in Europe.

The fragmented distribution of occupied sites, some separated by only a few kilometres within networks of humid habitats, notably across Óbidos Lagoon and Rio Tornada system, together with the occurrence of small, newly colonized host-plant patches within a few hundred metres of core populations, suggests potential connectivity among local population nuclei. The observed adult longevity, behavioural characteristics and flight capability further support the likelihood of medium-distance dispersal, possibly facilitated by olfactory detection of *Eupatorium cannabinum*. Collectively, these spatial and biological characteristics are consistent with a local metapopulation structure, although no individuals were recorded at more than one site during the survey period.

At this Atlanto-Mediterranean range margin, humid riparian and associated ecotones may act as bioclimatic refugia for moisture-dependent biodiversity, warranting conservation under increasing anthropogenic pressure (Keppel et al., 2012; Zhang et al., 2023). The Portuguese distribution of *G. flavago* nevertheless remains incompletely known. The localized nature of the populations documented here, together with negative surveys in apparently suitable habitats across Beira Litoral, means that historical occurrence or the persistence of additional undetected populations cannot be excluded. Further studies are therefore essential to establish its full distribution and to determine whether the ecological patterns identified here remain consistent under different environmental conditions across its range.

Acknowledgments

My first sincere gratitude goes to the anonymous contributors to the data collection for this paper. Once more, a special thanks goes to Martin Corley for challenging me to publish years ago. I am also grateful to the reviewers and the editorial team for their dedication to processing such a lengthy manuscript. Finally, I wish to thank everyone who has contributed to ensuring that effective conservation solutions are already being planned and implemented to prevent the decline of this species.

Appendix

Field records obtained at Nadadouro (Casais da Fonte), through direct nocturnal searches using handheld flashlights include *Acleris notana* (Donovan, 1806) on 16.v.2026; *Caloptilia elongella* (Linnaeus, 1761) at Nadadouro on 29.vii.2025, 13.viii.2025 and 9.vii.2026 (two records); and *Idaea dromikos* Hausmann, 2004 at Quinta dos Bugalhos on 10.viii.2025 (two records), with a substantial number of additional observations at Nadadouro in 2025 and 2026, mainly between July and August. Approximately six records on 8 and 14 October suggest a possible partial second generation, coinciding with an exceptionally warm early autumn. At Nadadouro, adults were observed in abundance directly beneath alder trees (*Alnus glutinosa*), with oviposition and larval feeding observed exclusively on fallen alder leaf litter. Larvae were detected within this leaf-litter substrate from August to July of the following year. Similar observations of the feeding niche of *I. dromikos*, associated with fallen alder leaf litter, were made near Mosteiro de Folques, Arganil (40.22612° N, 7.99447° W), with the first record of the species on 6.viii.2023. For consistency, observations made after midnight are assigned to the preceding calendar date, corresponding to the beginning of the nocturnal survey.

References

ALFA. 2004. *Tipos de Habitat Naturais e Semi-Naturais do Anexo I da Directiva 92/43/CEE (Portugal continental): Fichas de Caracterização Ecológica e de Gestão para o Plano Sectorial da Rede Natura 2000*. Associação Lusitana de Fitossociologia, Lisboa.

Bernays, E. & Graham, M. 1988. On the evolution of host specificity in phytophagous arthropods. *Ecology* **69** (4): 886-892.

Bretherton, R. F., Goater, B. & Lorimer, R. I. 1983. In: Heath, J. & Emmet, A. M. (eds.) *The Moths and Butterflies of Great Britain and Ireland* **10** (Noctuidae, part 2): 1-459. Harley Books, Colchester.

Calle, J. A. 1982. *Noctuidos españoles. Boletín del Servicio contra Plagas e Inspección Fitopatológica*, Fuera de Serie **1**: 1-430. Ministerio de Agricultura, Pesca y Alimentación, Madrid.

Carapeto, A., Francisco, A., Pereira, P. & Porto, M. (eds.) 2020. L*ista Vermelha da Flora Vascular de Portugal Continental*. Coleção Botânica em Português **7**: 1-374. Imprensa Nacional-Casa da Moeda, Lisboa.

CBAS/CAS. 2026. SDGSAT-1 *Satellite Imagery*. Sustainable Development Goals Big Data International Research Center & Chinese Academy of Sciences (consultado em outubro de 2026).

Corley, M. F. V. 2015. *Lepidoptera of Continental Portugal. A fully revised list*. Martin Corley, Faringdon. 288 pp.

De Frenne, P., Zellweger, F., Rodríguez-Sánchez, F., Scheffers, B. R., Hylander, K., Luoto, M., Vellend, M., Verheyen, K. & Lenoir, J. 2019. Global buffering of temperatures under forest canopies. *Nature Ecology & Evolution* **3** (5): 744-749. DOI: 10.1038/s41559-019-0842-1.

Ebert, G. (ed.) 1998. *Die Schmetterlinge Baden-Württembergs* **7**: Nachtfalter V. 582 pp. Eugen Ulmer, Stuttgart.

Esri. 2026. *World Hillshade Map Server Elevation Tiles*. Environmental Systems Research Institute. [consultado em outubro de 2026].

European Commission. 1992. *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Communities* L 206.

Farminhão, J. (coord.) 2021. *Sítios de Interesse Botânico de Portugal Continental*. Tomo II. Coleção Botânica em Português **5** (2). Imprensa Nacional-Casa da Moeda, Lisboa.

Fibiger, M. 1990. *Noctuidae Europaeae* **1**: *Noctuinae I*. 208 pp. Entomological Press, Sorø.

Flora-On. 2005-2025. *Flora de Portugal Interativa*. https://flora-on.pt/ (accessed October 2026).

Fojt, W. & Harding, M. 1995. Thirty years of change in the vegetation communities of three valley mires in Suffolk, England. *Journal of Applied Ecology* **32** (3): 561-577. DOI: 10.2307/2404653.

GBIF.org. 2025. GBIF *Occurrence Search*. https://www.gbif.org/occurrence/search (accessed October 2026).

Heath, J. & Emmet, A. M. (eds.) 1983. *The Moths and Butterflies of Great Britain and Ireland.* Vol. **10**. *Noctuidae (Part II) and Agaristidae*. Harley Books, Colchester.

Henwood, B. & Sterling, P. 2020. *Field Guide to the Caterpillars of Great Britain and Ireland.* 448 pp. Bloomsbury Wildlife.

iNaturalist. 2008-2025. *iNaturalist Network*. iNaturalist (accessed October 2026).

Keppel, G., Van Niel, K. P., Wardell-Johnson, G. W., Yates, C. J., Byrne, M., Mucina, L., Schut, A. G. T., Hopper, S. D. & Franklin, S. E. 2012. Refugia: identifying and understanding safe havens for biodiversity under climate change. *Global Ecology and Biogeography* **21** (4): 393-404. DOI: 10.1111/j.1466-8238.2011.00686.x.

Leraut, P. 2019. *Moths of Europe* **4**: *Noctuidae II*. 575 pp. N.A.P. Editions, Verrières-le-Buisson.

Martin, L. A. & Pullin, A. S. 2004. Host-plant specialisation and habitat restriction in an endangered insect, *Lycaena dispar batavus* (Lepidoptera: Lycaenidae) I. Larval feeding and oviposition preferences. *European Journal of Entomology* **101** (1): 51-56.

OpenStreetMap Contributors. 2026. *Planet dump* [Portugal spatial data]. OpenStreetMap Foundation. OpenStreetMap (accessed October 2026).

Parenzan, P. & Scalercio, S. 1996. Nuove segnalazioni di nottuidi (Lepidoptera) per l'Italia meridionale (Contributi alla conoscenza della lepidotterofauna dell'Italia meridionale. XIX). *Entomologica* **30**: 105-133.

plemos. 2026. *iNaturalist observations of Gortyna flavago on/between 2023 and 2026* [data set]. iNaturalist. Available from: iNaturalist dataset (accessed September 2026).

QGIS Development Team. 2026. *QGIS Geographic Information System*. QGIS Association. QGIS (accessed October 2026).

Rivas-Martínez, S., Rivas-Sáenz, S. & Penas, A. 2011. Worldwide bioclimatic classification system. *Global Geobotany* **1**: 1-634.

Robinson, G. S., Ackery, P. R., Kitching, I. J., Beccaloni, G. W. & Hernández, L. M. 2023. *HOSTS - a Database of the World's Lepidopteran Hostplants*. Natural History Museum, London. Available at: HOSTS database (accessed 2025).

Rodwell, J. S. 1995. *British Plant Communities* **4**: *Aquatic Communities, Swamps and Tall-Herb Fens*. Cambridge University Press, Cambridge.

Silva Cruz, M. A. & Gonçalves, T. 1961. Notas Lepidopterológicas IV. Uma nova contribuição para o inventário dos heteróceros portugueses. *Memórias e Estudos do Museu Zoológico da Universidade de Coimbra* **269**: 75.

Skinner, B. 2009. *Colour Identification Guide to Moths of the British Isles*. 325 pp. Apollo Books, Stenstrup.

South, R. 1907. *The Moths of the British Isles*. Frederick Warne & Co., London & New York.

van der Maarel, E. (ed.) 2005. *Vegetation Ecology*. Blackwell Publishing, Oxford.

Waring, P. & Townsend, M. 2017. *Field Guide to the Moths of Great Britain and Ireland*. Bloomsbury Wildlife.

Zêzere, J. L. 2005. A geomorfologia da região das Caldas da Rainha. In: Aires-Barros, L. (coord.), *Caldas da Rainha: Património das Águas*: 57-65. Assírio & Alvim, Lisboa.

Zhang, X., Ci, X., Hu, J., Bai, Y., Thornhill, A. H., Conran, J. G. & Li, J. 2023. Riparian areas as a conservation priority under climate change. *Science of the Total Environment* **858** (2): 159879. DOI: 10.1016/j.scitotenv.2022.159879.

Zilli, A., Ronkay, L. & Fibiger, M. 2005. *Noctuidae Europaeae* **8**: *Apameini*. 323 pp. Entomological Press, Sorø.

Una contribución al estudio de los geométridos de los alrededores de Valencia capital y su provincia (Insecta: Lepidoptera) con observaciones sobre su biología

Gareth Edward King

c/. Gerardo Rueda, 2-bajo, 7, 28038 Madrid. e-mail: sterrhinae@gmail.com;
https://orcid.org/0000-0003-0804-5353

Resumen

Se citan 32 taxones de la familia Geometridae recogidos en los alrededores de la capital y de la provincia de Valencia desde enero de 2025 hasta marzo de 2026. Se emplearon dos métodos en la búsqueda de ejemplares: la búsqueda de larvas, sobre todo en los meses iniciales del año, y el uso de la trampa de luz desde mayo hasta marzo. La representación mayoritaria se da en la subfamilia Ennominae, con 13 (40,6 %) taxones documentados. También se incluyeron datos de su biología y de los estados inmaduros obtenidos *ex* hembra.
Palabras clave: Geometridae, estudio faunístico, biología, Valencia.

Abstract

Thirty-two taxa in the family Geometridae are documented from the outskirts of Valencia and from within its province between January 2025 and March 2026. Two methods were used to obtain specimens: a search for larvae, especially earlier in the year, and the use of a light trap from mid-May until March. The subfamily Ennominae was the most important faunistically, with 13 (40.6 %) taxa documented. Also included were data on their biology and on the early stages of taxa obtained *ex* female.
Key words: Geometridae, faunistics, biology, Valencia.

Introducción

Los trabajos que tratan de los geométridos de la Comunidad Valenciana, con un énfasis en la provincia de Valencia, incluyen a Bolland (1978), Baixeras (1987), Domínguez & Baixeras (1989, 1992, 1993) y a Huemer & Wieser (2006, 2010). Los dos últimos artículos son los más exhaustivos, con más de 70 especies en cuatro subfamilias citadas a través de las tres provincias (Castellón, Valencia, Alicante), con una representación faunística abrumadora de las Sterrhinae Meyrick, 1892, con 38 taxones documentados. Hausmann (2004) cita la importancia de este taxón en las altitudes y latitudes más bajas. Los geométridos que más se destacan de Valencia incluyen a los dos endémicos: *Idaea saleri* Domínguez & Baixeras, 1992, además de *Aplocera bohatschi* (Püngeler, 1914), cuya biología se desconoce (Domínguez & Baixeras, 1993; Hausmann, 2004).

El objetivo de este trabajo es mejorar los conocimientos de esta familia lepidopterológica debido a una serie de prospecciones en el campo valenciano a lo largo de catorce meses.

Metodología

- Entre los meses de enero y mayo de 2025 se batieron o se inspeccionaron arbustos o plantas bajas con motivo de hallar los estados inmaduros (King & Viejo Montesinos, 2010), plantas como *Bituminaria bituminosa* (L.) C.H. Stirt., *Dorycnium gracile* Jord., *Dorycnium pentaphyllum* Scop., *Erica scoparia* L., *Euphorbia medicaginea* Boiss., *Helianthemum canum* (L.) Hornem., *Helianthemum hirtum* (L.) Mill., *Thymus zygis* L., *Rhamnus lycioides* L. C.H. Stirt., *Ulex parviflorus* Pourr.
- Los imagos se recogieron en situación de reposo en los muros, sobre todo en los primeros meses del año.
- Se ubicó una trampa de luz (LED, 24 vatios, 12 voltios) colocada a nivel del suelo por encima de una sábana blanca a partir de la 2ª quincena del mes de mayo de 2025 hasta bien entrado el mes de marzo de 2026. Se encendió a partir del atardecer hasta las 23:30 horas solamente (por razones logísticas).
- Se montaron las preparaciones de la genitalia de las Sterrhinae Meyrick, 1892 por si hubiesen problemas con la taxonomía.
- La **Tabla I** indica las características de la vegetación de los lugares incluidos en el estudio.

Abreviaturas:

Col. GEK=colección personal de GEK
GEK=Gareth Edward King
leg. et det. = *legit et determinavit* (recolector, él que determinó el ejemplar)
MRS=Mark R. Shaw
NMS=National Museum of Scotland
t. m.= término municipal

Tabla I: Las localidades muestreadas en los alrededores de Valencia y provincia.

Localidad	**Altitud**	**Características**
Cullera, macizo de calizas (ciudad: N 39°09'50.46; W 00°14'46.81) UTM 10 km² YJ33	32 m	Zona por detrás del pueblo con suelos calizos; arbustos de *Rhamnus lycioides* L. subsp. *lycioides*, matas de *Thymus zygis* L., p. ej.
El Plantio, área forestal, t. m. de Paterna N 39°53'92.0; W 00°49'86.1 UTM 10 km² YJ17	121 m	Bosque de *Pinus halepensis* Miller con grandes claros, con arbustos de *Rhamnus lycioides* L. subsp. *lycioides*, *Pistacia* y *Juniperus*, además de *Thymus*, *Dorycnium* y otras plantas. Suelos arenosos.
Santa Rita, t. m. de Paterna N 39°32'11.10; W 00°29'16.02 UTM 10 km² YJ17	45 m	Suelos de pH muy alto con señales de un huerto abandonado con ejemplares aislados de *Citrus*; matas de *Stipa* y matas extensivas de *Salsola vermiculata* L.
Alboroya, Valencia N 39°29'46.18; W 00°19'48.31 UTM 10 km² YJ37	a.n.d.m.	Zona de litoral degradada con ejemplares aislados de *Atriplex halimus* L.

Resultados

Orden taxonómica según Hausmann & Sihvonen (2019). Los términos botánicos según Herbari Virtual del Mediterrani Occidental (https://herbarivirtual.uib.es/es/illes-balears).

Geometrinae Stephens, 1829
Eucrostes indigenata (De Villers, 1789):
VALENCIA: El Plantio, área forestal, t. m. de Paterna, 115 m: 2♀ 6.vii.2025; ♂, ♀ 7.vii.2025; 2♂, ♀ 16.vii.2025; ♂ 23.vii.2025 todos atraídos a la trampa de luz (LED) GEKING *leg. et det*. Col. GEK.

Hemithea aestivaria (Hübner, 1789):
VALENCIA: Cullera, 38 m, macizo de calizas: larva L4, 22.iii.2025, en *Thymus zygis* Loefl. ex L. (Lamiaceae); *ex* capullo 3.iv.2025, emergió 10.iv.2025 ♂ *Meteorus versicolor* (Wesmael) (Hymenoptera: Braconidae) (MRS det., NMS dep.).

Ennominae Duponchel, 1845

Isturgia catalaunaria (Guenée, [1858]):

VALENCIA: El Plantio, área forestal: ♀ 12.x.2025; ♂ 15.x.2025, atraídos a la trampa de luz (LED) GEKING, *leg. et det.*Col. GEK.

Isturgia miniosaria (Duponchel, 1829):

VALENCIA: El Plantio, área forestal: ♂ 12.x.2025; ♀ 18.x.2025 (LED); GEKING, *leg. et det.* Col. GEK.

Ex ♀ 18.x.2025: huevos puestos individualmente en un bote; larvas eclosionadas 30.x.2025 en *Lygos sphaerocarpa* L.

Itame vincularia (Hübner, 1813):

VALENCIA: Cullera, macizo de calizas: ♀ 12.iv.2025*; El Plantio, área forestal: ♂, 2 ♀ 5.iv.2025*; ♀ 12.iv.2025*; 2 ♀ 20.iv.2025*; ♀ 26.iv.2025*; ♀ 4.v.2025*; ♀ 12.v.2025*; ♀ 6.vii.2025; ♂ 12.vii.2025; ♀ 14.vii.2025; 2 ♂, ♀ 16.vii.2025; 4 ♂, 2 ♀ 23.vii.2025; 2 ♀ 6.viii.2025; imago entre *Rhamnus* 9.viii.2025*;* 3 ♀ , ♂ 19.viii.2025; (5) 25.viii.2025; (7) 2.ix.2025; (5) 10.ix.2025; (7) ♀ 23.ix.2025; (9) 27.ix.2025; (2) 30.ix.2025; (2) 7.x.2025; (4) 9.x.2025; (4) 12.x.2025; (2) 15.x.2025; (3) 18.x.2025; ♂ 26.ii.2026; ♂ 8.iii.2026; ♂ 12.iii.2026, GEKING, *leg. et det.* Col. GEK. Todos atraídos a la trampa de luz (LED), salvo los indicados con *; las cifras entre paréntesis se refieren a los ejemplares no recogidos.

Ex ♀ 5.iv.2025: siete huevos puestos individualmente, con el eje paralelo al sustrato, en ramas de *Rhamnus lycioides* L.; huevos eclosionados 14.iv.2025, con dos larvas en fase de prepupa 6.v.2025; dos emergencias: 20.v.2025 y 23.vi.2025 (desarrollo asincrónico). *Ex* ♀ 12.v.2025: huevos puestos individualmente (siempre en ramas de *Rhamnus*); eclosionados el 18–19.v.2025; primeras pupas 17.vi.2025; dos imagos emergieron 26.vi.2025 y 27.vi.2025 (*exuviae*, imagos Col. GEK). *Ex* ♀ 23.ix.2025: huevos puestos individualmente en *Rhamnus*. L2 5.x.2025.

Pachycnemia hippocastanaria (Hübner, 1799):

VALENCIA: El Plantio, área forestal: ♀ 7.x.2025; ♀ 12.x.2025; ♀ 21.x.2025; ♂ 1.i.2026; ♂ 8.iii.2026, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Pachycnemia tibiaria (Rambur, 1829):

VALENCIA: Cullera, macizo de calizas: ♀ 12.iv.2025; El Plantio, área forestal: ♂ 7.x.2025; ♀ 9.x.2025, atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Perigune narbonea (Linnaeus, 1767):

VALENCIA: El Plantio, área forestal: ♂ 10.ix.2025; 3 ♂ 30.ix.2025; (6) 7.x.2025; (2) 9.x.2025; (4) 12.x.2025; (9) 15.x.2025; (7) ♂ 18.x.2025; (6) 7 ♂ 26.xii.2025; 2 ♂ 29.xii.2025; (8) 3 ♂ 1.i.2026; ♂ 12.i.2026; ♂ 22.i.2026; 2 ♂ 10.ii.2026; 6 ♂ 22.ii.2026; 2 ♂ 26.ii.2026; ♂ 8.iii.2026; 2 ♂ 12.iii.2026, GEKING, *leg. et det.* Todos atraídos a la trampa de luz (LED). Las cifras entre paréntesis se refieren a la totalidad de ejemplares, no todos recogidos. La trampa se puso el 21.iii.2026, sin que acudiesen ejemplares.

Aspitates ochrearia (Rossi, 1794):
VALENCIA: El Plantio, área forestal: ♂ 20.iv.2025; ♀ 9.x.2025 (LED); GEKING, *leg. et det.* Col. GEK.
Ex ♀ 9.x.2025: huevos puestos en fila en rama de *Rhamnus*; eclosionados el 17.x.2025; las larvas se alimentaron de *Polygonum aviculare*.

Dyscia penulataria (Hübner, 1819):
VALENCIA: El Plantio, área forestal: ♂ 1.v.2025; ♀ 27.ix.2025; ♀ 15.x.2025 (LED), GEKING, *leg. et det.* Col. GEK.

Calamodes occitanaria (Duponchel, 1829):
VALENCIA: El Plantio, área forestal: ♂ 15.x.2025 (LED), GEKING, *leg. et det.* Col. GEK.

Chemerina caliginearia (Rambur, 1833):
VALENCIA: El Plantio, área forestal: ♂ 8.iv.2026 (LED), GEKING, *leg. et det.* Col. GEK.

Peribatodes ilicaria (Geyer, [1833]):
VALENCIA: El Plantio, área forestal: ♀ 9.x.2025 (LED), GEKING, *leg. et det.* Col. GEK.

Tephronia lhommaria (Cleu, 1928):
VALENCIA: El Plantio, área forestal: ♀ 23.v.2025 (preparación código: 2026.24); ♀ 27.ix.2025 (código: 2026.28); 2 ♀ 7.x.2025 (código: 2026.26); 2 ♀ 9.x.26; ♀ 12.x.2025, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Rhoptria asperaria (Hübner, 1817):
VALENCIA: El Plantio, área forestal: 2 ♀ 18.x.2025; ♀ 10.ii.2026; 2 ♀ 8.iii.2026, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Sterrhinae Meyrick, 1892
Idaea ochrata albida (Zerny, 1936):
VALENCIA: Santa Rita, t. m. de Paterna, 38 m: 2 ♂ 6.vi.2025; ♀ 13.vi.2025, GEKING, *leg. et det.* Col. GEK.

Idaea filicata (Hübner, 1799):
VALENCIA: El Plantio, área forestal: ♀ 6.vii.2025; ♀ 7.vii.2025 (LED); 3 ♀ 23.vii.2025; ♀ 19.viii.2025, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.
Ex ♀ 19.viii.2025: la noche del 22.viii.2025, huevos (siete) puestos al azar en un bote con raíces y flores de gramíneas, sin ningún huevo adherido al sustrato. Las larvas eclosionaron el 27.viii.2025. Se alimentaron de flores de *Medicago sativa* L. y de otras papilionáceas. L2 2.ix.2025. Pupas: 22.ix.2025. 3 ♀ emergieron el 2.x.2025.

Idaea minuscularia (Ribbe, 1912):
VALENCIA: Cullera, macizo de calizas: ♀ 15.v.2025 (prep. 2026-04), GEKING, *leg. et det.* Col. GEK.
Ex ♀ 15.v.2025: huevos puestos aglutinados en una gramínea (*Stipa*), eclosionados el 21.v.2025; se alimentaron de hojas de *Chenopodium album* L. y flores de *Medicago*, con las primeras pupas a finales de junio y la emergencia de 2 ♀ el 25.vi.2025.

Idaea cervantaria (Millière, 1869):
VALENCIA: Cullera, a.n.d.m. (El Raval, casco urbano): ♀ , ♂ 22.ii.2025 (prep. 2026-08); ♂ 22.iii.2025, GEKING, *leg. et det.* Col. GEK.
Ex ♀ 22.ii.2025: varios huevos puestos en pequeños grupos (KING & VIEJO MONTESINOS, 2016); larvas eclosionaron el 4.iii.2025, alimentándose de hojas marchitas, p. ej., *Polygonum aviculare* L., con las larvas en L5 el 3.iv.2025 y las primeras en fase de prepupa el 13.iv.2025; emergencias a partir del 20.iv.2025 (25.iv.2025, 28.iv.2025, 27.v.2025) (desarrollo asincrónico).

Idaea ostrinaria (Hübner, 1813):
VALENCIA: El Plantio, área forestal: ♂ 23.v.2025; ♂ 3.vi.2025, GEKING, *leg. et det.* Col. GEK.

Idaea eugeniata (Millière, 1870):
VALENCIA: Cullera, macizo de calizas: ♂ 15.v.2025 (prep. 2026-06), GEKING, *leg. et det.* Col. GEK.

Brachyglossina hispanaria (Püngeler, 1913):
VALENCIA: El Plantio, área forestal: 2 ♀ 7.vii.2025 (prep. 2026-02); ♀ 16.vii.2025 (prep. 2026-01), todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.
Ex ♀ 7.vii.2025: c. doce huevos puestos individualmente o en pequeños grupos el 9.vii.2025 en una rama seca de *Dorycnium* sp. Son de tono cremoso-rojizo. No eclosionaron por razones no aclaradas.

Scopula submutata nivellearia (Oberthür, 1922):
VALENCIA: El Plantio, área forestal: ♀ 6.vii.2025; ♀ 12.vii.2025; ♀ 2.ix.2025; ♂ 10.ix.2025 (prep. 2026-03); ♀ 27.ix.2025, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Scopula imitaria (Hübner, 1799):
VALENCIA: El Plantio, área forestal: ♀ 12.v.2025 *en visu*; (1) 23.ix.2025 *en visu*, GEKING, *leg. et det.* Col. GEK.

Scopula marginepunctata (Goeze, 1781):
VALENCIA: La Cañada (casco urbano), 115 m: ♀ 26.ii.2025; El Plantio, área forestal: ♀ 17.v.2025; ♂ 7.x.2025; Santa Rita, t. m. de Paterna, 38 m: ♀ 14.vi.2025, todos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Scopula minorata (Boisduval, 1833):
VALENCIA: Cullera, 38 m, macizo de calizas: ♂ 12.iv.2025 (prep. 2026-11); ♂ 3.x.2025; Santa Rita, t. m. de Paterna, 38 m: ♀, ♂ 6.vi.2025 (prep. 2026-10), ambos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Rhodometra sacraria (Linnaeus, 1767):
VALENCIA: Cullera (casco urbano, terreno baldío), 2,5 m: ♂ 17.iv.2025; (2) *en visu* 3.x.2025; El Plantio, área forestal: ♂ 20.iv.2025*; ♀ 29.v.2025*; ♀ 19.viii.2025; (2) 25.viii.2025; (1) 2.ix.2025; (2) 10.ix.2025; (3) 23.ix.2025; (1) 27.ix.2025; (2) 30.ix.2025 (en la estación La Vallesa); (2) 7.x.2025; (2) 7.x.2025; Els Orriols, Valencia capital: 13.viii.2025; Santa Rita, t. m. de Paterna, 38 m: (2) 25.ix.2025; (6) 6.x.2025; (2) 12.x.2025, GEKING, *leg. et det.* Col. GEK. Todos atraídos a la trampa de luz salvo los indicados con * que se vieron en el campo anteriormente.

Larentiinae Duponchel, 1845
Scotopteryx peribolata (Hübner, [1817]):
VALENCIA: El Plantio, área forestal: ♂ 15.x.2025; ♀ 18.x.2025 (LED), GEKING, *leg. et det.* Col. GEK.

Orthonama obstipata (Fabricius, 1794):
VALENCIA: Alboraya, Playa Patagona, a. n. d. m.: ♂ 25.v.2025 (LED), GEKING, *leg. et det.* Col. GEK.

Gymnoscelis rufifasciata (Haworth, 1809):
VALENCIA: Cullera (casco urbano, terreno baldío), 38 m: ♀ *ex* larva, 22.iii.2025, en las hojas unidas por un hilo de seda de *Mespilus germanica* (L.) K. Koch (Rosaceae), fase de prepupa a principios de abril; emergió 7.iv.2025; El Plantio, área forestal: ♀ 2.vi.2025; ♂ 1.i.2026 (LED), GEKING, *leg. et det.* Col. GEK.

Eupithecia rosmarinata Millière, 1865:
VALENCIA: El Plantio, área forestal: ♀, ♂ 8.iii.2026, ambos atraídos a la trampa de luz (LED), GEKING, *leg. et det.* Col. GEK.

Eupithecia centaureata (Denis & Schiffermüller, 1775):
VALENCIA: Alboraya, Valencia capital: ♀ 29.v.2025; Els Orriols, Valencia capital: 12.viii.2025 en visu, GEKING, *leg. et det.* Col. GEK.

Discusión y conclusiones

Se analizan a continuación los 32 taxones que se han documentado en los alrededores de Valencia capital o en la provincia, con la mayor parte del material recogido en la trampa de luz montada en la zona de estudio (**Tabla I**), desde mayo de 2025 hasta marzo de 2026.

Eucrostes indigenata: Es una especie termófila distribuida por la costa mediterránea (Hausmann, 2001), citada de Valencia (Baixeras, 1987; Huemer & Wieser, 2010).

Hemithea aestivaria: Se destaca la naturaleza meridional de la cita de una especie no documentada de Valencia ni de la costa mediterránea ibérica, aunque sí de Italia (Baixeras, 1987; Redondo et al., 2009; Huemer & Wieser, 2006, 2010; Raineri & Zilli, 2014), así como el hecho de que *Thymus zygis* L. (Lamiaceae) no se encuentra entre sus plantas huéspedes conocidas (Carter & Hargreaves, 1987). El bracónido que atacó la larva, del género *Meteorus Haliday*, se caracteriza, como los parasitoides que eligen huéspedes (larvas) expuestos en la planta nutricia, como son normalmente los geométridos, es decir, las larvas no unen las hojas con hilos de seda (Shaw & Huddleston, 1991).

Itame vincularia: Es una especie común, por lo menos en El Plantio, o atraída a la trampa o recogida a la luz del día entre los arbustos de *Rhamnus*. Baixeras (1987) también la documentó como «muy abundante». En cuanto a su fenología en la zona de estudio, vuela casi todo el año, desde febrero hasta octubre, con ausencia de ejemplares únicamente en el mes de junio. Por esta razón, es muy posible que sea trivoltina en Valencia. Cabe destacar que, como planta nutricia, no pierde sus hojas a lo largo del invierno. Gómez de Aizpúrua et al. (2003) mencionan una única generación desde junio hasta septiembre, mientras Redondo et al. (2009) indicaron dos generaciones desde marzo hasta septiembre, con una pausa en el mes de julio.
Se ha podido criar este taxón hasta en tres ocasiones en condiciones de cautividad, y las observaciones relativas a la oviposición son inéditas.

Pachycnemia hippocastanaria: Baixeras (1987) indicó este taxón como «abundantísimo» y señaló que el material se capturó en los meses más «cálidos». Lo que más se destaca con los pocos datos disponibles es que sea un insecto que aprovecha los meses más fríos, desde octubre hasta marzo, con el hallazgo de un ejemplar incluso en enero. Redondo et al. (2009) indicaron el período de vuelo entre febrero y noviembre. Su planta nutricia, *Erica scoparia* ssp. *scoparia*, es característica de la zona del estudio (Cullera, El Plantio).

Pachycnemia tibiaria: Huemer & Wieser (2010) la citaron de la Sierra de Espadán (Castellón), pero no parece frecuente en la zona de estudio y, además, es de distribución por lo general septentrional según Redondo et al. (2009). Estos mismos autores indican una generación a finales del verano-otoño; sin embargo, uno de los ejemplares se recogió en el mes de abril, o sea, debe de ser bivoltina más al sur.

Perigune narbonea: En Valencia se ha documentado en vuelo desde la segunda semana de septiembre hasta la segunda semana de marzo, o sea, es un insecto cuya actividad como imago se circunscribe al otoño-invierno. Redondo et al. (2009) la indican como un geométrido bivoltino, desde finales de febrero hasta finales de abril, y luego desde mediados de agosto hasta finales de octubre. En Madrid, durante los meses invernales, se desarrolla como oruga en *Teucrium polium* L. (King & Viejo Montesinos, 2010). Garre et al. (2016), con sus pocos ejemplares recogidos de *P. narbonea* en Almería, también indicaron el mes de febrero.

Rhoptria asperaria: Con los pocos ejemplares atraídos a la luz (todos hembras), se observa una actividad otoñal-invernal, con un ejemplar incluso en febrero. Garre et al. (2016) también documentaron ejemplares a finales de febrero.

Idaea filicata: Los ejemplares atraídos a la luz (todos hembras) mostraron una actividad fenológica veraniega; Hausmann (2004), sin embargo, indicó hasta tres generaciones desde mayo hasta septiembre-octubre. Las observaciones relativas a la oviposición son inéditas y los huevos puestos al azar reflejan lo que hace otro componente del grupo *rusticata* Sterneck, 1940: *I. figuraria* (Bang-Haas, 1907); aunque *I. laevigata* (Scopoli, 1763) e *I. rusticata* (Denis & Schiffermüller, 1775) sí ovipositan en el sustrato (King, en preparación).

Idaea cervantaria: Nuestro material recogido en Cullera refleja una fenología invernal, con los primeros imagos hallados en febrero y luego en marzo. Hausmann (2004) indica la primera generación a principios de abril; en Madrid hay datos de principios de marzo (Col. GEK), mientras Garre et al. (2016) documentan la naturaleza polivoltina del taxón en Almería.

Brachyglossina hispanaria: Es un taxón endémico citado de Valencia (Redondo et al., 2009), aunque ni Baixeras (1987) ni Huemer & Wieser (2006, 2010) lo documentaron. Las observaciones relativas a la oviposición son inéditas. Hausmann (2004) comenta que no se conocen bien sus preferencias de hábitat. Nuestro material se recogió en una zona de matorral descrita en la **Tabla I**.

Scopula marginepunctata: La fenología del material recogido abarca desde febrero hasta octubre, o sea, puede que sea polivoltina en Valencia, una estrategia reconocida en altitudes bajas del sur de Europa (Hausmann, 2004).

Rhodometra sacraria: Un divagante reconocido (Hausmann, 2004). En Valencia se ve en vuelo desde abril hasta octubre. Es de suponer que mantiene poblaciones estables en la región, aunque nunca se ha visto la larva.

Gymnoscelis rufifasciata: Se reconoce como muy polífaga en más de 20 familias botánicas (Mironov, 2003), aunque *Crataegus germanica* (L.) K. Koch constituye la primera cita en esta rosácea, con otras especies de la misma familia documentadas por Degtjareva (1973).

A pesar de una campaña llevada a cabo para buscar las larvas desde enero hasta mayo de 2025, siguiendo la metodología de King & Viejo Montesinos (2010), no se localizaron más de dos larvas de dos especies.

Agradecimiento

A Joaquín Baixeras Almela, del *Institut Cavanilles de Biodiversitat i Biologia Evolutiva* de la Universidad de Valencia, Paterna, por su amabilidad al ayudar en la obtención del permiso por parte de la Comunidad Valenciana (2025–2026).

Bibliografía

Baixeras, J. 1987. Lepidoptera, capítulo 5 en: Docavo Alberti, I. (coordinador), *La Entomofauna del Monte de Porta-Coeli*, Ediciones Alfons el Magnànim, Institució Valenciana d'Estudis i Investigació, 119–156.

Bolland, F. 1978. Heterocèrés de Torres-Torres (provincia de Valencia). *SHILAP Revista de lepidopterología*, **6** (23): 207–213.

Carter, D. J. & Hargreaves, B. 1987. *Raupen und Schmetterlinge Europas und ihre Futterpflanzen*, Verlag Paul Parey, Hamburgo-Berlín.

Degtjareva, V. I. 1973. Dendrophilnye cheshuekrylye Hissarskogo khrebta i Hissarskyo doliny. Dushanbe, Donish, 194 pp. (en ruso).

Domínguez, M. & Baixeras, J. 1989. Aportació al millor coneixement dels Drepanidae Comstock, 1893 i Geometridae Leach, 1815, valencians (Lepidoptera). *Treballs de la Societat Catalana de Lepidopterologia*, **9**: 59–67.

Domínguez, M. & Baixeras, J. 1992. *Idaea saleri* sp. nova (Lepidoptera: Geometridae). *Nota lepidopterologica*, **15** (2): 102–105.

Domínguez, M. & Baixeras, J. 1993. Sobre la identidad de tres Larentiinae de la Península Ibérica. *Boletín de la Asociación Española de Entomología*, **17** (2): 323–332.

Garre, M., Rubio, R. M., Guerrero, J. J. & Ortiz, A. S. 2016. Análisis faunístico de los Geometridae Leach, 1815 del Parque Natural Sierra María-Los Vélez (Almería, España) (Lepidoptera: Geometridae). *SHILAP Revista de Lepidopterología*, **44** (174): 211–236.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2003. *Mariposas y sus biotopos*, Reserva Natural El Regajal-Mar de Ontígola, Lepidoptera I memoria 2002, Comunidad de Madrid, 207 pp.

Herbari Virtual del Mediterrani Occidental (https://herbarivirtual.uib.es/es/illes-balears). Área de Botánica, Departamento de Biología, Universidad de las Islas Baleares (consultado el 1 de julio del 2026).

Hausmann, A. 2001. Introduction. Archiearinae, Orthostixinae, Desmobathrinae, Alsophilinae, Geometrinae. In: Hausmann, A. (ed.) *The Geometrid Moths of Europe* **1**: 1–282. Apollo Books, Stenstrup, Dinamarca.

Hausmann, A. 2004. Sterrhinae. In: Hausmann, A. (ed.) *The Geometrid Moths of Europe* **2**: 1–600. Apollo Books, Dinamarca.

Hausmann, A. & Sihvonen, P. 2019. Revised, annotated systematic checklist of the Geometridae of Europe and adjacent areas, Vols 1–6. In: *The Geometrid Moths of Europe*, **6**: part 2, 568–906. Brill, Leiden (Holanda), Boston (EEUU).

Huemer, P. & Wieser, C. 2006. Additions to the faunistics of Lepidoptera in the Comunidad Valenciana (Spain), Part **I**. *Boletín Sociedad Entomológica Aragonesa*, **39** (1): 271–283.

Huemer, P. & Wieser, C. 2010. Beitrag zur Faunistik der Schmetterlinge (Lepidoptera) in der Region Valencia (Spanien), Teil **II**. *Denisia*, **29**: 139–164.

King, G. E. & Viejo Montesinos, J. L. 2010. Geometrid larvae and their food-plants in the south of Madrid (Central Spain) (Geometridae). *Nota lepidopterologica*, **33** (1): 45–61.

Mironov, V. 2003. Larentiinae II (Perizomini and Eupitheciini). In: Hausmann, A. (ed.) *The Geometrid Moths of Europe* **4**: 1–464. Apollo Books, Dinamarca.

Raineri, V. & Zilli, A. 2014. Appendix. Geometridae from the site of Macchiagrande, pp. 222–224. In: *Lepidoptera Research in Areas with High Biodiversity Potential in Italy*. Vol. **1**, Zilli, A. (ed.), Natura Edizioni Scientifiche, 373 pp.

Redondo, V. M., Gastón, F. J. & Gimeno, R. 2009. *Geometridae Ibericae*. Apollo Books, Stenstrup, Dinamarca, 361 pp.

Shaw, M. R. & Huddleston, T. 1991. *Classification and Biology of Braconid Wasps*. Handbooks for the Identification of British Insects, **7** (11): 1–126.

The genus *Hellinsia* Tutt, 1905 (Pterophoridae) in Portugal

Martin Corley[1], Sónia Ferreira[2,3] and José Luís Fabião[4]

[1]*Pucketty Farm Cottage, Faringdon, Oxfordshire, SN7 8JP, U.K. email: martin.corley@btinternet.com;* https://orcid.org/0000-0003-4240-8007
[2]*CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Campus de Vairão, Universidade do Porto, 4485-661 Vairão, Vila do Conde, Portugal.*
[3]*BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, 4485-661 Vairão, Vila do Conde, Portugal; E-mail: hiporame@gmail.com;* https://orcid.org/0000-0002-6884-3966
[4]*Rua Fausto Guedes Teixeira 3, 3ºD, P-1700-185 Lisboa, Portugal; E-mail: jlfab@hotmail.com;* https://orcid.org/0009-0000-7768-711X

Abstract

Re-examination of Portuguese records of the genus *Hellinsia* results in the conclusion that records of *H. inulae* (Zeller, 1852) and of *H. carphodactyla* (Hübner, 1813) belong to *H. coniodactylus* (Staudinger, 1859). The only record of *H. osteodactylus* (Zeller, 1841) belongs to *H. pectodactylus* (Staudinger, 1859).
Key words: Revision, *inulae*,*coniodactylus*, *carphodactyla*, *osteodactylus*, *pectodactylus*.

Resumo

A reapreciação de registos para Portugal do género *Hellinsia* levam a concluir que os registos de *H. inulae* (Zeller, 1852) e de *H. carphodactyla* (Hübner, 1813) pertencem a *H. coniodactylus* (Staudinger, 1859). O único registo de *H. osteodactylus* (Zeller, 1841) pertence a *H. pectodactylus* (Staudinger, 1859).
Palavras-chave: Revisão, *inulae*, *coniodactylus*, *carphodactyla*, *osteodactylus*, *pectodactylus*.

Introduction

The Portuguese checklist (Corley, 2015) is currently 11 years old. Numerous species have been added and a small number deleted over those 11 years. There have also been changes in the concept of certain species, usually resulting from DNA barcoding examination or due to the correction of morphological misidentifications, as in a few genera of Pyralidae, Noctuidae and Erebidae (Corley, 2025b; Corley, 2025c; Corley et al., 2025).

Following the realisation that the treatment of the genus *Merrifieldia* Tutt, 1905 was unsatisfactory, which led to changes and additions to the Portuguese list (Nel et al., 2025; Corley, 2026a), it became apparent that there were also problems in other genera of Pterophoridae.

During the 1980s and 1990s various French authors described a number of new species of Pterophoridae, based on small differences in genitalia, larval morphology and host-plants. The family was monographed by Arenberger (1995) and by Gielis (1996). In the preparation of the checklist (Corley, 2015), these works were followed on the assumption that they were the most authoritative at the time. Both authors had a wider species concept than the French authors and many of the newly described French species were synonymised (Arenberger, 1995; Gielis, 1996). More recently these species described from France have been subject to DNA barcoding analysis (e.g. Nel & Huemer, 2023) with the result that many have been found to be valid species. From

this, it is now clear that the treatment in the Portuguese checklist of several genera is unsatisfactory and needs revision.

In this paper Portuguese records of the genus *Hellinsia* Tutt, 1905 are re-evaluated, resulting in the removal of *H. osteodactyla* (Zeller, 1841) and *H. carphodactyla* (Hübner, 1813) from the Portuguese fauna and the transfer of all records of *H. inulae* (Zeller, 1852) to *H. coniodactylus* (Staudinger, 1859).

Materials and Methods

Material examined is listed under the individual species. Permanent genitalia preparations were made following the methods of Robinson (1976).

Genitalia preparations by Martin Corley are mostly in RCMC.

Differences between species depend on details of the valvae and associated structures, as figured in Nel (2003).

DNA barcodes were obtained as described in Ferreira et al. (2024) within the IBI – InBIO Barcoding Initiative and Sample ID are indicated with the code INVXXXX to each specimen DNA barcoded. The associated voucher information, including locality metadata, is publicly accessible through the BOLD dataset - DS-IBILP12 - The genus *Hellinsia* Tutt, 1905 in Portugal (Pterophoridae) (dx.doi.org/10.5883/DS- IBILP12).

Abbreviations

AAL Alto Alentejo
ALG Algarve
BA Beira Alta
BAL Baixo Alentejo
BB Beira Baixa
BL Beira Litoral
DL Douro Litoral
E Estremadura
f female
Gen. prep., GP genitalia preparation
m male
MNHNC Museu Nacional de História Natural e da Ciência, Universidade de Lisboa
RCAR Research Collection of A Rocha, Mexilhoeira Grande
RCEM Research collection of Eduardo Marabuto
RCJF Research collection of José Fabião
RCJN Research collection of João Nunes
RCJR Research collection of Jorge Rosete
RCMC Research collection of Martin Corley
RCMD Research collection of Michael Dale
RCPP Research collection of Pedro Pires
TM Trás-os-Montes

***Hellinsia* Tutt, 1905**

Species to be removed from the Portuguese list are preceded by †
Species to be added to the Portuguese list is preceded by *

† *Hellinsia carphodactyla* (Hübner, 1813)

There are only four published records of this species in Portugal:
BB: Monte Barata, Monforte da Beira, 1.vii.2005, P. Pires, det. Corley (Corley GP 2455 f) (RCPP) (Corley et al., 2007; Marabuto et al., 2013).
AAL: Ribeira de Seda, Alter do Chão, 4.vi.2007, E. Marabuto, det. Corley (Corley GP 3106 m) (RCEM) (Corley et al., 2009).
BAL: Sobral da Adiça, 5.vi.2008, M. Corley, E. Marabuto and I. Rodrigues, det. Corley (RCMC) (Corley et al., 2009).
BL: Castelo do Germanelo, 30.iv.2022, Rosete, gen. det. Rosete (JR452 m) (RCJR) (Corley et al., 2024).

These have been re-examined and the genitalia agree fully with others originally determined as *H. inulae* and therefore for the reasons given under *H. coniodactlus* must be transferred to that species. *H. carphodactyla* should therefore be deleted from the Portuguese list.

The main known host-plant of *H. carphodactyla* is *Inula conyza* DC. which is locally distributed in Portugal north of Rio Tejo (Flora-on, 2026), so the presence of this species in Portugal remains a possibility.

*** *Hellinsia coniodactylus* (Staudinger, 1859)**

Listed for Portugal by Karsholt & Razowski (1996) without data. Both Arenberger (1995) and Gielis (1996) treated *H. coniodactylus* as a synonym of *H. inulae*. Corley (2015) did not accept the species based on the absence of a record with data coupled with the published synonymy.

Nel (2003) treated *H. coniodactylus* as distinct from *H. inulae* and this distinctiveness has been recently confirmed by DNA barcode analysis (Nel & Huemer, 2023). All available genitalia preparations of *H. inulae* from Portugal have been re-examined. They appeared to belong to a single species, which was not *H. inulae* as figured by Nel (2003) and Nel & Huemer (2023). The distinction from *H. carphodactyla* as illustrated by the same authors was less clear.

From this it is concluded that all records of *H. inulae* from Portugal are likely to belong to *H. coniodactylus*. This is reinforced by the distribution of *H. inulae* given in Nel & Huemer (2023), which indicates it to be a species of the middle latitudes of Europe. Furthermore, the main known host-plants of *H. coniodactlus* listed by Nel & Huemer (2023) (from outside Portugal) are *Dittrichia viscosa* (L.) Greuter and *Pallenis spinosa* (L.) Cass., both common species in Portugal, while *H. inulae* feeds on *Inula britannica* L. and *I. salicina* L., Central European species that are not present in Portugal.

In the list of records below, apart from two indicated as new records, all were previously referred to *H. inulae* and are here transferred to *H. coniodactylus*.
ALG: São Romão, 10.vi.1976, J. Passos de Carvalho, det. Bigot (MNHNC) (Bigot & Carvalho, 1983); Tavira, iv.1979, J. Passos de Carvalho (MNHNC) (Monteiro & Carvalho, 1984); Praia Verde, 20.iv.1992, M. Corley (GP287 m) (RCMC) (Carvalho & Corley, 1995); N.W. of Sagres, 15.x.1996, A.J. Gardiner, det. Corley (Corley GP AJG79) (RCAR) (Corley et al., 2000). Additional records: Ludo,

20.iv.1994, M. Corley, (GP 541 f) (RCMC); Alportel,16.vi.1997, M. Corley (GP 1152 f) (RCMC) (both in Corley & Afonso, 2021); Cruzinha, Mexilhoeira Grande, 9.x.1997, A.J. Gardiner, det. Corley (Corley GP AJG123) (RCAR) (previously unpublished); Monchique, Faro, 7.x.2018, M. Corley) (Barcoded INV07667) (new record); Zavial, Vila do Bispo, 10.iv.2026, J. Fabião, GP 101-7827 m (RCJF) (new record). (Figs 1, 2).

BAL: Zambujeira do Mar, 18.viii.2011, P. Pires, det. Corley (Corley GP3972 m) (RCPP) (Corley et al., 2015); BAL: Porto de Alcaçer, Ribeira de Oeiras, Mértola, 7.iv.2021, J. Nunes and S. Ferreira (RCJN) (Nunes et al., 2025).

E: Trafaria, Almada, 13.vi.2026, J. Fabião, GP 101-9305 m (RCJF) (new record). (Figs 3, 4).

BL: Monte Santa Olaia, 30.vii.2003, P. Pires, det. Corley (RCPP); Madriz, 29.iv.2004, P. Pires, det. Corley (RCPP) (Pires & Corley, 2007); Poço, Condeixa-a-Nova, 7.iv.2017, J. Rosete, det. Corley (Corley GP 5359 m) (Barcoded INV05605) (RCJR); Abiúl, 22.vi.2019, J. Rosete, det. Corley (Corley GP 5829 m) (Barcoded INV09959) (RCJR).

BB: Lentiscais, 15.vii.2007, M. Corley and P. Pires (Corley GP 2937 m) (RCMC) (Marabuto et al., 2013).

DL: Valongo, 23.viii.2014, J. Nunes, det. Corley (RCMC) (Corley et al., 2015).

† *Hellinsia inulae* (Zeller, 1852)

First recorded from Portugal by Bigot & Carvalho (1983): Corley (2015) lists ALG, BAL, BL, BB and DL.

All records of *H. inulae* must be transferred to *H. coniodactylus* for the reasons given under that species (see above).

† *Hellinsia osteodactylus* (Zeller, 1841)

Recorded from Algarve, Silves by A.E. Eaton (Ragonot, 1881) and from Estremadura, Setúbal by P. Vieilledent (1905). Neither of these records has been confirmed as specimens could not be found (Corley, 2008).

The only recent record is from TM: Amieiro, Tua Valley, 6.v.2007, M. Corley (GP2808 f) (RCMC) (Corley et al., 2008; Corley, 2025a). Re-examination of the genitalia preparation shows it to be *H. pectodactyla*.

The known host-plant of *H. osteodactylus* is *Solidago virgaurea* L., which is not recorded from the Tua Valley, nor from Algarve (Flora-on, 2026), although it also feeds on some *Senecio* species (Gielis, 1996). The historic records are unconfirmed. In view of the difficulties in the identification of species in this genus, there is no reason to suppose that they would have been correct, therefore *H. osteodactylus* should be deleted from the Portuguese fauna.

***Hellinsia pectodactylus* (Staudinger, 1859)**

Recorded from Algarve: Lagoa da Nave, 15.iv.1994, M. Corley (Corley GP 573 f) (RCMC); Sargaçal, 12.iv.1995, A.J. Gardiner, det. Corley (Corley GP AJG95 m) (RCAR); Cruzinha, Mexilhoeira Grande, 16.iv.1996, P. Wallis, det. Corley (RCAR) (all in Corley et al., 2000). There are additional Algarve records from Boliqueime, 18.iv.2011 and 31.iii.2012, M. Dale (RCMD) (pers. comm., latter with male gen. prep. on Moth Dissection UK).

TM: Amieiro, Tua Valley, 6.v.2007, M. Corley (GP2808 f) (RCMC). Previously published as *H. osteodactylus* (Corley et al., 2008; Corley, 2025a).

Known host-plants of *H. pectodactylus* according to Gielis (1996) are *Solidago virgaurea* L. and *Gallatella linosyris* (L.) Rchb. f. The latter species is absent from Portugal. *Solidago* is not known from the localities where *H. pectodactylus* occurs (Flora-on, 2026), so it is likely to have a different host-plant.

Final results

Province distributions:

H. coniodactylus. ALG, BAL, AAL, E, BL, BB, DL.

H. pectodactylus. ALG, TM.

There are no accepted Portuguese records of *Hellinsia inulae*, *Hellinsia carphodactyla* or *Hellinsia osteodactylus*, so these three species must be deleted from the Portuguese list.

Acknowledgements

We are most grateful to all those who allowed MC to dissect their specimens and to Mike Dale for providing us with his records. We also thank João Nunes who suggested improvements to an earlier version of this article. SF was funded by the FCT through the program 'Stimulus of Scientific Employment, Individual Support—3rd Edition' (https://doi.org/10.54499/2020.03526.CEECIND/CP1601/CP1649/CT0007).

References

Arenberger, E. 1995. Pterophoridae I. - In H. G. Amsel (ed.): *Microlepidoptera Palaearctica* **9**: 1–258. 153 pls.

Bigot, L. & Carvalho, J. Passos de, 1983. Contribution a la connaissance des Lepidopteres *Pterophoridae* du Portugal. *Alexanor*, **13**: 133–137.

Carvalho, J. Passos de & Corley, M.F.V. 1995. Additions to the Lepidoptera of Algarve, Portugal. *SHILAP Revista de lepidopterología*, **23** (91), 191–230.

Corley, M.F.V. 2008. The Lepidoptera collections of deceased Portuguese entomologists. *Entomologist's Gazette*, **59**: 145-171.

Corley, M.F.V. 2015. *Lepidoptera of Continental Portugal. A fully revised list*. 288 pp. Martin Corley, Faringdon.

Corley, M. 2025a. The Lepidoptera of the Tua Valley, Portugal 2006–2014. *Artimelia – Lepidoptera Ibérica*, **1**(1): 4–42.

Corley, M. 2025b. A revision of Portuguese records of the genus Gymnancyla Zeller, 1848 (Pyralidae: Phycitinae). *Artimelia – Lepidoptera Ibérica*, **1**(1): 57–60.

Corley, M. 2025c. Two corrections to the Noctuidae fauna of Portugal. *Artimelia – Lepidoptera Ibérica*, **1**(1): 71–72.

Corley, M. 2026a. *Merrifieldia menthae* (Chrétien, 1925) (Lepidoptera: Pterophoridae) in Portugal. *Artimelia – Lepidoptera Ibérica*, **2**: 36–40.

Corley, M. 2026b. A revision of Portuguese records of the genus *Psorosa* Zeller, 1846 (Pyralidae: Phycitinae). *Artimelia – Lepidoptera Ibérica*, **2**: 41–46.

Corley, M. & Afonso, B. 2021. Portuguese Lepidoptera records compiled by Martin Corley's database. CIBIO (Research Center in Biodiversity and Genetic Resources) Portugal. Occurrence dataset https://doi.org/10.15468/ca4xt8; https://www.gbif.org/dataset/0f7c7942-c5d2-435e-afba-97df549dbc19

Corley, M.F.V., Gardiner, A.J., Cleere, N. & Wallis, P.D. 2000. Further additions to the Lepidoptera of Algarve, Portugal (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **28** (111), 245–319.

Corley, M.F.V., Marabuto, E. & Pires, P. 2007. New Lepidoptera for the fauna of Portugal (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **35** (139):321–334.

Corley, M.F.V., Marabuto, E., Maravalhas, E., Pires, P. & Cardoso, J.P. 2008. New and interesting Portuguese Lepidoptera records from 2007. S*HILAP Revista de lepidopterología*, **36** (143): 283–300.

Corley, M.F.V., Marabuto, E., Maravalhas, E., Pires, P. & Cardoso, J.P. 2009. New and interesting Portuguese Lepidoptera records from 2008. *SHILAP Revista de lepidopterología*, **37** (148): 463–484.

Corley, M., Nunes, J. & Yela, J.L. 2025. The status of some Arctiinae (Erebidae) in Portugal. *Artimelia – Lepidoptera Ibérica*, **1**: 102–113.

Corley, M.F.V., Rosete, J., Romão, F., Dale, M. J., Marabuto, E., Maravalhas, E., & Pires, P. 2015. New and interesting Portuguese Lepidoptera records from 2014. (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **43** (172): 583–613.

Corley, M.F.V., Fabião, J.L., Lemos, P., Nunes, J., & Rosete, J. 2024. New and interesting Portuguese Lepidoptera records from 2023 (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **52** (208): 761–786. https://doi.org/10.57065/shilap.1018

Ferreira, S., Corley, M.F.V., Nunes, J., Rosete, J., Vasconcelos, S., Mata, V.A., Veríssimo, J., Silva, T., Sousa, P., Andrade, R., Grosso-Silva, J.M., Pinho, C.J., Chaves, C, Martins, F.M., Pinto, J., Puppo, P., Muñoz-Mérida, A., Archer, J., Pauperio, J. & Beja, P. 2024. The InBIO Barcoding Initiative Database: DNA barcodes of Portuguese moths. *Biodiversity Data Journal*, **12**: e117169. https://doi.org/10.3897/BDJ.12.e117169

Flora-On. 2026. Flora de Portugal Interativa. Sociedade Portuguesa de Botânica. Available at: https://flora-on.pt/ Accessed 12 June 2026.

Gielis, C. 1996. Pterophoridae. In Huemer, P., Karsholt, O. & L. Lyneborg |(Eds.). *Microlepidoptera of Europe* **1**: 1–222. Stenstrup (Apollo Books).

Karsholt, O. & Razowski, J. 1996. *The Lepidoptera of Europe*. Apollo Books, Stenstrup. 380 pp.

Marabuto, E., Pires, P. & Corley, M.F.V. 2013. The Lepidoptera of Parque Natural do Tejo Internacional, Portugal (Insecta: Lepidoptera). *SHILAP Revista lepidopterologica* **41** (161): 5–42.

Monteiro, T. & Carvalho, J. Passos de, 1984. Lepidópteros do Algarve. *Anais da Faculdade de Ciências de Porto*, **64**: 95–219.

Moth Dissection UK. 2026. https://mothdissection.uk.com/ Accessed 15 September 2026.

Nel, J. 2003. Atlas des Lépidoptères Pterophoridae de France, genitalia mâles et femelles, iconographie couleur. *Supplément au Tome XII de la Revue de l'Association Roussillonnaise d'Entomologie*, 1–61, 118 pp.

Nel, J., Corley, M., Varenne, Th. & Ferreira, S. 2025. Description de *Merrifieldia thibaulti* sp. n., découverte en France et au Portugal (Lepidoptera, Pterophoridae). *Revue de l'Association Roussillonnaise d'Entomologie*, **118**: 247–251.

Nel, J. & Huemer, P. 2023. New data in the *carphodactyla* section of the genus *Hellinsia* Tutt, 1905: a bona species and a new synonymy (Lepidoptera, Pterophoridae). *Revue de l'Association Roussillonnaise d'Entomologie*, **32**: 27–33.

Nunes, J., Corley, M.F.V., Grundy, D., & Ferreira, S. 2025. The Heterocera of Mértola (Alentejo, Portugal) (Insecta: Lepidoptera). *SHILAP Revista De lepidopterología*, **53** (209): 101–120. https://doi.org/10.57065/shilap.1028

Pires, P. & Corley, M.F.V. 2007. The Lepidoptera of Baixo Mondego (Beira Litoral, Portugal) (Insecta: Lepidoptera). *SHILAP Revista lepidopterologica*, **35** (138):187–230.

Ragonot, E.L. 1881. Notes on the entomology of Portugal. IV. Lepidoptera (continued). Micro-lepidoptera (except Tineina) collected by the Rev. A.E. Eaton in 1880 with descriptions of new species. *Entomologist's Monthly Magazine*, **17**: 229–233.

Robinson, G.S. (1976) The preparation of slides of Lepidoptera genitalia with special reference to the Microlepidoptera. *Entomologist´s Gazette*, **2**: 127–132.

Vieilledent, P., 1905. Lepidópteros da Região de Setúbal. *Brotéria*, **4**: 185–206.



Figure 1. *Hellinsia coniodactylus* (Staudinger, 1859). Algarve, Vila do Bispo, Zavial, 10.iv.2026, J. Fabião 101-7827.

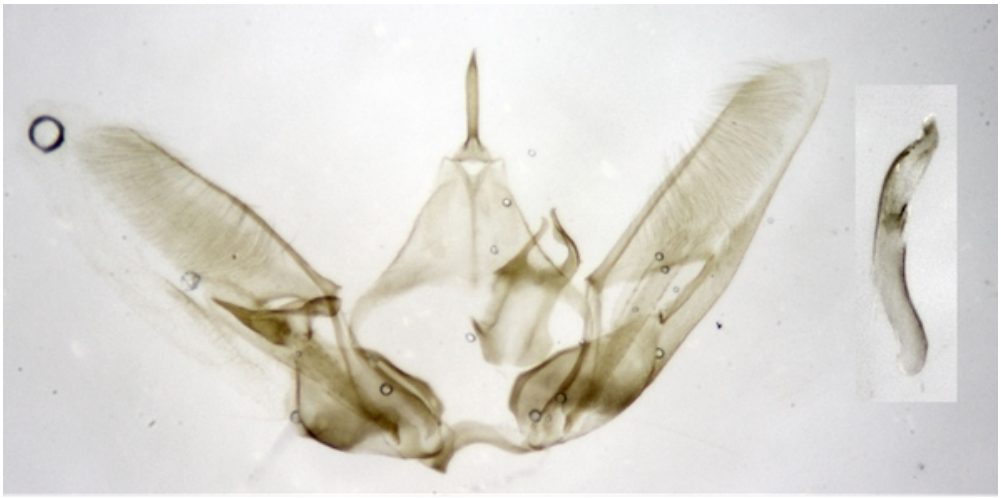

Figure 2. *Hellinsia coniodactylus* (Staudinger, 1859). Algarve, Vila do Bispo, Zavial, 10.iv.2026, J. Fabião GP 101-7827m, male genitalia.



Figure 3. *Hellinsia coniodactylus* (Staudinger, 1859). Setúbal, Almada, Trafaria, 13.vi.2026, J. Fabião 101-9305.



Figure 4. *Hellinsia coniodactylus* (Staudinger, 1859). Setúbal, Almada, Trafaria, 13.vi.2026, J. Fabião GP 101-9305m male genitalia.

Overlooked for 29 years: natural history and conservation of *Globia sparganii* (Esper, 1790) (Noctuidae) at Lagoa de Óbidos, West-Central Portugal

Paulo Lemos [1,2]

[1] *Independent Researcher, Caldas da Rainha, Portugal.*
[2] *Escola Superior de Turismo e Tecnologia do Mar; Politécnico de Leiria, Campus 4; Rua do Conhecimento 4; P-2520-614 Peniche; Portugal. email: paulolemos@live.com.pt;* https://orcid.org/0000-0002-3917-0520

Abstract

A population of *Globia sparganii* (Esper, 1790) (Lepidoptera: Noctuidae) was discovered at Lagoa de Óbidos during targeted surveys of other wetland moths following the early 2026 severe flooding. Together with the retrospective identification of a specimen collected in 2024 at the same site, this discovery marks the first confirmation of the species in Portugal since 1997. Observations of immature stages, adult behaviour, and reproductive activity revealed a strong local association with *Sparganium erectum* L. Adults exhibited limited attraction to light traps, whereas direct searches with flashlights revealed the species to be highly localised, despite the wider regional distribution of *S. erectum*. Classified as Endangered in the Portuguese Red List of Invertebrates, this moth faces conservation threats in Lagoa de Óbidos associated with habitat degradation and local environmental pressures.
Keywords: Lepidoptera, Noctuidae, wetland conservation, Lagoa de Óbidos.

Resumo

Uma população de *Globia sparganii* (Esper, 1790) (Lepidoptera: Noctuidae) foi encontrada na Lagoa de Óbidos durante prospecções direcionadas a lepidópteros palustres após as cheias severas do início de 2026. A par da retrospectiva identificação de um espécime recolhido em 2024 no mesmo local, esta descoberta representa a primeira confirmação da espécie em Portugal desde 1997. Observações dos estádios imaturos, comportamento dos adultos e atividade reprodutiva revelaram uma forte associação local com *Sparganium erectum* L. Os adultos demonstraram baixa responsividade a armadilhas luminosas, mas pesquisas diretas com lanternas indicaram que a ocorrência da espécie é altamente localizada, apesar da ampla distribuição regional da planta hospedeira identificada. Classificada como Em Perigo (EN) na Lista Vermelha dos Invertebrados de Portugal, a *G. sparganii* enfrenta críticas ameaças à sua conservação na Lagoa de Óbidos, relacionadas com a degradação do habitat e crescentes pressões ambientais locais.
Palavras-chave: Lepidoptera, Noctuidae, conservação de zonas húmidas, Lagoa de Óbidos.

Introduction

Globia sparganii (Esper, 1790) remains widely distributed and classified as Least Concern (LC) across Europe according to the recent European Red List of Moths (Phelan et al., 2026), while its Iberian populations are prone to geographic isolation at the southwestern limit of its range. As highlighted by Farino et al. (2024), both *Globia* species belong to a highly localised group of marsh lepidoptera whose sparse Ibero-Balearic records may carry significant biogeographical and conservation weight. In Portugal, *G. sparganii* is classified as Endangered (EN) (Boieiro et al., 2023).



Figure 1 - Mating pair of *Globia sparganii* on *Sparganium erectum* L. leaves near Pequena Poça do Vau, during the night of 21–22.vi.2026 at 12:06 AM.

Following a succession of severe floods in early 2026, a core population of *Globia sparganii* was found at Lagoa de Óbidos (Poças do Vau) under a very similar threatened context to that identified for *Globia algae* (Esper, 1789), a congeneric species recently documented for the national fauna (Lemos, 2026). *G. sparganii* was previously known in the country from a single published record from Lagoa de Santo André in 1997 (Corley, 2004). Following the June 2026 discovery, a specimen collected on a spiderweb, at Lagoa de Óbidos in 2024, was retrospectively identified as *G. sparganii*.

Despite being documented as oligophagous in Central and Northern Europe, with immature stages known to feed on various aquatic host-plants, the observations of the newly discovered core population suggest a more restricted host-plant association.

This report documents the newly discovered population of *G. sparganii* and the retrospective identification of a 2024 occurrence, at Lagoa de Óbidos, recently designated as a Ramsar site, and presents new data on its natural history and conservation in a landscape under increasing pressures.

Material and methods

Systematic field visits targeting adult and larval stages of *Globia sparganii* were carried out from June 2026, following the initial detection of the species on 21 June, and extended until October to monitor habitat condition and host-plant phenology. Fieldwork was centred at Poças do Vau (Lagoa de Óbidos), with additional surveys conducted across the central western region of Portugal to search for further populations. Two complementary survey methodologies were implemented.

Direct observation: Diurnal monitoring was conducted by close visual inspection of the vegetation to locate endophytic larvae, pupal chambers and resting adults. Nocturnal and crepuscular surveys used high-powered white-light torches (Fig. 2) to locate individuals, alongside long-wavelength emitters (deep red light — 660 nm) during behavioural close range observations to minimise disturbance.



Figure 2 - Customised equipment used for nocturnal direct observation surveys in 2026. Convoy S16 high-power flashlights (SFT70 white light and deep red light LEDs). Both devices feature adjustable output levels.

Attended light trapping: A custom factory-made LepiLED light trap was initially deployed at the southernmost periphery of the Pequena Poça do Vau (Fig. 3 - B), with limited results.

During nocturnal surveys, an effort was made to rotate rapidly between survey sites while retaining survey coverage until the end of the flying season at Lagoa de Óbidos. Photographic comparisons were used to identify individuals across consecutive survey dates. An effort was made to minimise damage to plants when searching for larvae, by not pulling them or detaching structures. Selected adults and two pupae were retained for identification and collection, and comparisons of behavioural observations, including long-term oviposition observations, and eggs from two females were kept as an ex-situ reserve

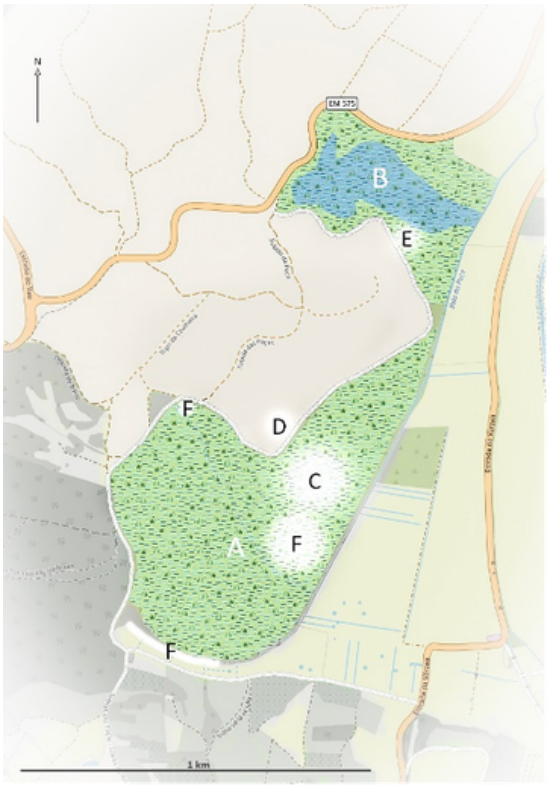

Figure 3 - Spatial view of the floodplain depressions of Poças do Vau, Lagoa de Óbidos. The area represented with a green background and a dashed, herbaceous pattern corresponds to the extensive zone that typically floods during winter, where the darker blue zone represents more or less permanent flooding. A: Area roughly corresponding to the central sector of Grande Poça do Vau. B: Pequena Poça do Vau. C: A more restricted area dominated by *Schoenoplectus lacustris* (L.) Palla and *Typha angustifolia* L. D: Small pond dominated by *Schoenoplectus lacustris*, with scarce *Sparganium erectum*, and the recently extirpated *Typha* sp. E: Area south of Pequena Poça do Vau featuring 2 small nuclei of *Sparganium erectum*. F: Marginal or central areas permanently dominated by *Typha angustifolia*. Base map source: OpenTopoMap (Data from © OpenStreetMap and NASA SRTM); adapted by the author.

Geographical coverage (municipalities and sites):

Surveys were supported by the author's database regarding host-plant locations, especially in the Caldas da Rainha Typhonic Valley. The fieldwork focused on the drainage basin of Lagoa de Óbidos, in the municipality of Óbidos (Poças do Vau, Rio Real and Rio Arnóia margins, Bom Sucesso, Amoreira, Pó, and Olho Marinho), Bombarral, and Caldas da Rainha (Nadadouro, banks and floodplains/tributaries of the Rio Tornada, Águas Santas, and Campo), as well as Alcobaça and Nazaré (S. Martinho do Porto, Vale do Paraíso, and the agricultural plains of the Rio Alcoa).

To investigate the regional occurrence of *G. sparganii*, all known host-plant stands within the surveyed area were revisited from June to August, targeting adults and searching for larval or pupal chamber traces.

Entomological collection

Wild-collected specimens of *Globia sparganii* are kept in the author's private collection.

Óbidos (Poças do Vau); Male 29.vi.2024; Male 21.vi.2026; Two pairs 26.vi.2026 (nearly empty females pinned); Coll. Lemos.

Results and discussion

I - The rediscovery of *Globia sparganii*

Circumstances of previous non-detection:



Figure 4 - *Globia sparganii* is a "reflective" light-colored moth characterised by a distinct behaviour and more conspicuous flight pattern above the herbaceous canopy than other local endophytic wetland macromoths. Morphologically larger than *Globia algae* and *Lenisa geminipuncta* (Haworth, 1809), from a distance its perching posture resembles a few common wet meadow species that rest prominently within the riparian vegetation along the shores of Lagoa de Óbidos; 22.vi.2026; 12:16 AM.

Globia sparganii was detected on the night of 21.vi.2026 during attended light trapping and direct searching near a large lagoon locally known as Pequena Poça do Vau (Fig. 3 – E), next to an unpaved path, where two isolated stands of *Sparganium erectum* L. occur close to the trapping point. This area of Lagoa de Óbidos had been intensively monitored; nevertheless, fixed light traps operated from May to July repeatedly detected *G. algae* for two years without a single record of *G. sparganii*. These surveys were primarily intended to detect *G. algae* dispersing into an area without *Schoenoplectus lacustris* (L.) Palla. Nearby willows support abundant aphid honeydew, providing a feeding resource for many Lepidoptera.

Moth activity around the trapping area was generally high in previous years. Several medium-sized wet meadow or reedbed species, particularly *Mythimna* spp. and *Thysanoplusia orichalcea* (Fabricius, 1775), commonly fly above riparian vegetation (higher than *G. algae*) or settle around the outer perimeter of faint illumination, often conspicuously perched on the vegetation for short periods. Under such conditions, routine examination of every moth with a hand-held white torch is impractical.

In 2026, common species usually conspicuous during these observations were noticeably scarcer. Against this reduced background activity, a moth flying out of a *S. erectum* stand crossed the beam of the hand-held white torch and was captured after directed high-output illumination disturbed its flight. Its identification as *G. sparganii* prompted an immediate directed search, revealing numerous adults concentrated within and immediately around the two nearby *S. erectum* stands.

This species showed little apparent affinity for the light trap. Some individuals negatively reacted to strong direct white light, but most remained within or immediately around the *S. erectum* stands, and mating behaviour continued even with the LED UV equipment placed close by. The occupied stands lay just near the poorly illuminated outer limit of the trapping area. The weak apparent "attraction" of adults to light and the high background moth activity may together

explain how a locally confined but numerous population remained undetected despite substantial previous survey effort. However, attended light trapping was subsequently discontinued there during behavioural observations, which were conducted using only deep red light.

Sparganium erectum stands had also been inspected regionally for endophytic moths since 2014, including precisely those stands near the small pond in April 2024 and 2025. *Orthotelia sparganella* (Thunberg, 1788) was the only endophytic moth detected during those earlier inspections. In retrospect, searches conducted in April 2026 may have been too early to detect the conspicuous larval and pupal evidence subsequently found in late June, while abundant traces of *O. sparganella* complicate recognition of evidence from other early-instar endophytic species. Searches were consequently repeated at several regional *S. erectum* stands, specifically targeting the same characteristic larval and pupal evidence found at the occupied site (Fig. 5), which remains visible on the plants for several months. But no comparable evidence of *G. sparganii* was found in other locations.

Adult behaviour, reproduction and immature stages:

Activity of adult males and previously mated females began at dusk. Individuals were concentrated within and around *Sparganium erectum*, frequently changing position through short flights, remaining very conspicuous on the upper parts of the plants (Figs. 4; 6; 7). Some temporarily left the stands out of sight and returned within moments or later. In several observations, individuals flew towards the eucalyptus plantation on the opposite side of the road and later returned, raising the possibility of attraction to aphid colonies on young shoots uphill.



Figure 5 - High levels of *Globia sparganii* occupancy on *Sparganium erectum*, with some unsuccessful pupae due to parasitoids and pathogens visible. Leaf bases at the plant core were slightly deflected to expose the remains. The infestation appears to impact only flowering, without compromising patch persistence. 27.vi.2026

Photographic comparisons allowed some individuals to be recognised on a successive survey dates (example in Fig. 6), indicating that at least some adults remained associated with the site for several days.

Mating pairs were observed on *Sparganium erectum*, generally in intermediate or elevated positions (Fig. 1), after females had moved towards the upper parts of the plants and begun calling. It was not confirmed whether they were females that had emerged earlier that night. Mating was always recorded between approximately 11:30 PM and 2:00 AM (reaching the latter hour only once), while conspicuous male activity declined at around 1:30 AM.

Both sexes were observed from the initial detection on 21.vi.2026 until 29.vi.2026, and males were particularly numerous, consistent with the high level of larval infestation within such a restricted space.

Despite the lack of species-specific monitoring before June, the inconspicuous larval traces in late April, combined with the empirically observed relationship between the high number of active, newly emerged adults and the infestation level relative to the number of plant shoots available, suggests that this core population experienced a relatively short flight period that effectively concluded well before that of *G. algae*. The last recorded *G. sparganii* was a worn male that had been photographed at the site four days previously (Fig. 6).



Figure 6 - A *Globia sparganii* worn male detected over a five-day period around the *Sparganium erectum* patch. Left picture on 25.vi.2026 and right on 29.vi.2026.

In captivity, one female exhibited several oviposition bouts per night, with the eggs laid on the edge of a toilet paper sheet, and activity increased towards dawn and was interrupted by periods of inactivity. When provided with nutrition, she continued laying eggs intermittently for more than a week. In the wild, some females subsequently disappeared from observation while still carrying eggs, suggesting some dispersal capacity, although predation provides an alternative explanation.

Eggs are deposited along the margins of *S. erectum* leaf blades, rolling the leaves with the ovipositor apparatus in a manner similar to *Rhizedra lutosa* (Hübner, [1803]) (Fig. 7). Egg adhesion was examined in four clusters in the wild and in captivity, all adhering only weakly and readily detached from the “glue” when the rolled leaves were handled after drying. This could have ecological significance if eggs remain unprotected among litter or decaying vegetation (Fig. 8), potentially exposing them to predation and directly to local substrate and hydrological conditions. Alternatively, the weak adhesion could conceivably represent an aberrant trait of the population concerned.



Figure 7 - *Globia sparganii* oviposition on the leaf blades of *Sparganium erectum*; 27.vi.2026.



Figure 8 - Structural composition of the litter layer beneath *Sparganium erectum* patches hosting *Globia sparganii*, displaying multi-year accumulation inclusive of dead biomass from previous seasons. The orientation of the leaves is mainly a consequence of winter and springtime inundation; 31.vii.2026.

Careful inspection from accessible paths revealed high prevalence of larval traces and pupal chambers distributed individually per shoot. The numbers of empty larval galleries and occupied pupal chambers was roughly equivalent, suggesting each larva damages an average of 1–2 shoots during this stage. Many pupal chambers contained empty puparia or dead pupae and larvae affected by parasitoids or disease (Fig. 5). Evidence of occupancy was found in approximately 70–80% of mature shoots (peripheral count, 1m inward from edge), without evidence of regression of the *S. erectum* patches.

By the time of this discovery, the site had already been without standing water for approximately one month with the occupied plants flowering and fruiting on dry soil. The aerial parts of the plants senesced through summer. Decaying leaves remain upright through the summer (Fig. 9) and may persist on the substrate into the following dry season; this is evidenced by the presence of older semi-rotten material from the previous year on the substrate in July (Fig. 8). Because the eggs sink in water, such accumulation could provide a plausible safe substrate for deposited eggs, although it does not explain their premature weak adhesion to the leaves. Even during flooding, this site does not experience significant currents, which are further impeded by the surrounding dense rush vegetation. Litter and plant material are therefore not normally swept far away or uprooted during winter.



Figure 9 - Monitored progression of the *Sparganium erectum* patch occupied by *Globia sparganii* following a high-precipitation winter and spring, subsequent aestival drought, and successive heatwaves atypical for the region. Plants exhibited typical annual senescence, with basal structures remaining intact in partially damp soil. Upper photo: 31.vii.2026; lower photo: 20.ix.2026.

Predation:

The bat *Myotis escalerai* Cabrera, 1904 and, particularly, nightjar species were directly observed preying on moths above the *S. erectum* stands. On arrival at the site around dusk, two to four nightjars were regularly present, either actively flying over the *Sparganium erectum* stand occupied by *Globia sparganii* or perched along the adjacent roadside, which borders the occupied stand. During these observations, the *S. erectum* stand lay directly against the moonlit background from the nightjars' line of sight. The presence of the observer appeared to discourage their approach during subsequent surveys.

Two male *G. sparganii* were found in a *Larinioides* sp. web at this location.

Rallids that could potentially prey on larvae and pupae were virtually absent from the immediate occupied area.

Ecological context:

The known occurrence area of *Globia sparganii* comprises two stands of *S. erectum*, covering approximately 280 m² (220 m² + 60 m²; Fig. 10), and lies within the Lagoa de Óbidos drainage basin, west of the Rio Real in the floodplain system of the Poças do Vau. The occupied area (Fig. 3 – E) lies beside an unpaved road that overlies a former catenal transition between sandstone-derived soils, formerly supporting heath-gorse vegetation and cork oak (currently eucalyptus plantations), and marshy vegetation on sediments from former lagoon mudflats formed when the brackish waters of Lagoa de Óbidos extended farther upstream. The flooded area still retains some salinity, with waters ranging from slightly brackish to hypersaline, reflecting its former inclusion within the coastal lagoon and subsequent hydrographic regression. The substrate is somewhat similar to that of the corresponding marginal areas of Grande Poça do Vau, where on the opposite road verge *Sparganium erectum* also occurs (Fig. 3 – D), this although in less saline water and affected by stunted growth and inverted phenology that currently may not be suited to the larval stage. Hillside water flow is seasonally variable along the verge from the opposite side of the large road.



Figure 10 - Spatial configuration of two neighboring *Sparganium erectum* patches near Pequena Poça do Vau colonised by *Globia sparganii*, taken by daylight near the end of the adult flying season; 27.vi.2026.

G. sparganii occupies seasonally inundated area that drains considerably faster than the deeper depressions of the Poças do Vau (colonised by other tall helophytes), and it is not a marginal detached depression like the pond of Fig. 3 – D. In February 2026, the "Fig. 3 – E" location was temporarily but deeply affected by severe flooding with the adjacent road submerged; however, by the *G. sparganii* flying period it was already dry.

The vegetation variation at the site is identical to that found in the vast area of Poças do Vau, which is predominantly composed of saline wet grasslands (pastures) and rush beds featuring *Bolboschoenus maritimus* (L.) Palla and *Juncus maritimus* Lam., together with a widespread invasion by *Spartina patens* (Aiton) Muhl. and expanding stands of *Phragmites australis* (Cav.) Trin. ex Steud. The dominance or presence of other helophytes is more localised, with *S. erectum* being the rarest of the potential known European host-plants for *G. sparganii* (Fig. 3).

Regional ecology and distribution of *Sparganium erectum*:

In the central western region of Portugal, the distribution of *S. erectum* is regionally fragmented, mirroring its habitat, but still locally abundant in a variety of semi-natural and transformed landscapes, including open or forested lagoon margins, riverbanks and runoff channels, river valleys and tributaries, irrigation and orchard ditches, and semi-open fields associated with remnants of hydromorphic podzolic soils and riparian galleries. Although less conspicuous than *Typha* species, it is regionally more widely distributed and abundant than those, even though it lacks their high wind-dispersal capacity. This distribution pattern and the associated plants identified might demonstrate that *S. erectum* populations persist in their historical locations (Fig. 11), despite most of the sites being degraded. However, this plant is particularly rare on slightly saline substrates of former large coastal lagoon systems, such as the drainage basins of the Óbidos Lagoon, São Martinho do Porto and the downstream floodplains of the Alcoa River, with a tendency to become restricted to the surrounding deep or heavily managed drainage ditches.

Sparganium erectum is characteristically associated with shallow-water and marginal wetland habitats, which are the most affected by human activities, and generally occupies shallower positions than *S. lacustris* and *Typha angustifolia* L. Several stands of *S. erectum* persisted in the Poças do Vau area in the 1990s, particularly around Pequena Poça do Vau,



Figure 11 - Example of a relict *Sparganium erectum* patch in permanently damp soil within the context of a marginal zone adjacent to abandoned small-scale farming, upstream of a tributary of Lagoa de Óbidos in the Municipality of Caldas da Rainha; 9.viii.2026.



Figure 12 - Male *Globia sparganii* trapped in a *Larinioides* sp. spiderweb over a small stand of verdant *Sparganium erectum*; 29.vi.2024.

peripherally in all directions (Fig. 3 – B). Parts of the wider floodplain have since been, and continue to be, affected by smallholder agriculture and pastoral abandonment, with the floodplains being subject to ditch excavation and other earthworks, as well as chemical constraints associated with agricultural and forestry use. The currently occupied *S. erectum* stands and the localised *G. sparganii* population are therefore remnants of similar wetland conditions that were more extensive until relatively recently.

Within the Poças do Vau, *S. erectum* is facing regression across the extensive still seasonally flooded surfaces, while being more frequent along tributaries and in upstream palustrine areas, especially on sandy soils. These landscapes are increasingly affected either by intensive agriculture where pesticides are used, or by abandonment without grazing (which replaces the lower riparian vegetation), which, however, does not seem to prevent a widespread (almost omnipresent) occurrence of *Nonagria typhae* (Thunberg, 1784).

Small livestock animals still move along the road and partially affect the *S. erectum* stands beside the passage, mainly through light grazing, browsing and trampling, with apparently limited overall effects. The nearby expansion of *S. patens* and *P. australis* represents the most evident long-term habitat pressure, while additional potential threats include repeated road-widening works immediately beside the occupied area and forestry harvesting adjacent to the site (Fig. 14).

Earlier occurrence and host-plant phenology:

An earlier occurrence of *G. sparganii* was documented on 29.vi.2024 in a *Sparganium* stand that was then more developed in the small pond supporting the high-density *G. algae* core population (Fig. 3 – D). The specimen, a medium-sized yellowish moth found trapped in *Larinioides* sp. spiderweb (Araneae: Araneidae), was collected at the time but provisionally considered to be an oversized *Plusia festucae* (Linnaeus, 1758), and stored in a refrigerator (Fig. 12). Following

the discovery of *G. sparganii* in 2026, the preserved specimen was re-examined and identified as *G. sparganii*. The circumstances closely match those documented twice in the newly discovered population in 2026, where male *G. sparganii* were found trapped in *Larinioides* sp. webs above *Sparganium* stands. The collection date coincides with that of the last confirmed adult observation in 2026.



Figure 13 - Poor regeneration and/or inverted phenology of the five main helophytes in the previously highest density *G. algae* site at Lagoa de Óbidos, where *Globia sparganii* also occurred in 2024. *Bolboschoenus maritimus* apparently better adapted to continue fruiting and thriving under this regime. From left to right: *Schoenoplectus lacustris*, *Sparganium erectum*, *Iris pseudacorus* L., *Typha latifolia* L. (as only standing litter from the previous season) and *B. maritimus*; end of summer, 20.ix.2026.

This confirmed earlier record demonstrates that *G. sparganii* occurred at this site while the local *Sparganium* was exhibiting a small stand (despite the inverted phenology already). The *Sparganium* stand at this location had been well developed six years earlier. In recent years, however, it exhibited delayed resprout that became more pronounced during the last two years. In 2025, the plants were still active, emerging during summer after water levels receded despite occasional livestock pressure (Lemos, 2026, Fig. 7). Following the February 2026 flooding, the stand declined markedly in extent, with only small shoots found in late August/September (Fig. 13). This phenological condition would appear poorly suited to normal local larval development, although the late-emerging plants could still have attracted adults and received eggs during recent years.

Host-plant association results:

The concentration of adults strongly attracted to *S. erectum* while resting, flying and mating, alongside oviposition on its leaves and the subsequent abundance of larval and pupal evidence, supports a strong regional association of *G. sparganii* with this plant, from which its specific epithet is derived. The international literature (Henwood & Sterling, 2020) mentions a diversity of helophyte hosts, such as *Typha* spp., *Sparganium erectum*, and also *Schoenoplectus lacustris*, *S. tabernaemontani* (C.C.Gmel.) Palla, *Iris pseudacorus* L.; however, this contrasts with the observations of the present study in western Portugal.

From May to July in both 2024 and 2025, large *Typha* stands at the Poças do Vau (Fig. 3) and associated ditches were repeatedly visited during monitoring of *G. algae* and other wetland moths, and the negative observations of *G. sparganii* from *Typha* are supported by substantial survey effort in 2026.

The observed activity patterns and biotic interactions of helophyte-associated endophytic moths within Poças do Vau, and further afield, provide additional context for these observations, with abundant *Typha* spp. occurring under diverse hydrological regimes, including at Grande Poça do Vau where it is embedded or interspersed with *S. lacustris* (Fig. 3 – C). The currently occupied *S. erectum* stands (Fig. 3 – E) are only approximately 500 m from Grande Poça do Vau. This distance is covered by *G. algae*, and *G. sparganii* was itself recorded in 2024 (Fig. 12) in the former *Sparganium* stand at the small peripheral high-density *G. algae* pond (Fig. 3 – D), only approximately 100 m from Grande Poça do Vau.

Contrasting with *G. sparganii* swarming adults around *S. erectum* at site "E" (Fig. 3), this moth was not detected within Grande Poça do Vau or in association with any more peripheral *Typha* stands, nor with scattered *Iris pseudacorus* or *S. lacustris* stands in surrounding areas. Furthermore, the endophytic macromoths found in *Typha* stands (larvae and adults) were repeatedly *Nonagria typhae* and *Sesamia nonagrioides* (Lefebvre, 1827), reinforcing previous regional observations in which *Typha* was not found to be regionally used as an oviposition host by *G. algae* (Lemos, 2026).

Subsequent regional surveys detected only *Orthotelia sparganella* among the endophytic moths associated with *S. erectum*, while *G. sparganii* remained undetected outside the known occupied site. The continued absence of *G. sparganii* detections at numerous surveyed locations of its locally associated host remains unexplained.

Whether *G. sparganii* larvae hatching from eggs laid on *S. erectum* may subsequently move to alternative host-plants mentioned in the European literature remains unknown, as such plants do not coexist at the known occupied site.

One possibility requiring experimental investigation is that adult host affinity and selection are influenced not only by host-plant identity or presence but also by plant and habitat condition. Furthermore, the high level of larval infestation observed in the occupied *S. erectum* stands could modify chemical cues, for example through plant damage or larval activity, including herbivore-induced plant volatiles (HIPVs), potentially influencing adult aggregation or oviposition (Zakir et al., 2013; El-Sayed et al., 2016; Hussain et al., 2020).

Syntopy with *G. algae*:

At the wetland-system scale, the occurrences of *G. sparganii* and *G. algae* at Poças do Vau partially overlap. This co-occurrence is not restricted to Lagoa de Óbidos. *G. algae* has also been recorded at Lagoa de Santo André, the locality of the previously published Portuguese record of *G. sparganii* from 1997, while Bergmann (1954) likewise reported that the two species may occasionally coexist.

The distribution of their respective host-plants might, however, suggest some differentiation of the two *Globia* species in relation to water depth. This should not be interpreted simply as *G. sparganii* being a shallow-water species and *G. algae* a deeper-water species. The largest known concentration of *G. algae* occurred until 2025 in a peripheral pond (Fig. 3 – D) where *S. erectum* also occurred within the same helophyte community. Neither *G. algae* nor *Nonagria typhae* is

particularly abundant in deeper-water areas of Grande Poça do Vau. This may partly reflect differences in offspring survival, as more *N. typhae* females are observed ovipositing at these sites when water levels recede, than the number of larvae subsequently found the following year.

N. typhae may not be comparable to *Globia* species, because it is found widely dispersed across the region in various wet or damp habitats, regardless of habitat type or the local availability of its host-plants (*Typha* spp.). It appears to establish itself in small numbers (even as isolated larval individuals) within very scattered sites with very few plants each, suggesting a high dispersal and colonization capacity within a metapopulation framework.

This pattern is difficult to compare with that of *Globia algae* because of the limited number of locations supporting its host-plant. The regional pattern nevertheless differs markedly between the two *Globia* species in relation to the availability of their principal regional host-plants: *S. erectum* persists in diverse and numerous natural or transformed habitats, despite *G. sparganii* having so far been detected only locally within the Poças do Vau wetland system. In contrast, the regional stands of the principal host-plants of *G. algae* are themselves increasingly rare, fragmented and undergoing a more severe decline (however, several scattered, well-preserved stands without apparent pressures, such as cutting, seem to support the species).

II - Conservation implications

The restricted known occurrence of *Globia sparganii* at Lagoa de Óbidos raises particular conservation concerns, especially given its Endangered status in Portugal. Although *Sparganium erectum* remains relatively widespread in western Portugal, the moth has so far been detected at Poças do Vau, suggesting that the presence of its locally confirmed host-plant is not sufficient to explain its distribution. The preservation of suitable hydrological conditions, vegetation structure and host-plant phenology, as well as other as yet unidentified factors, may therefore be important to the persistence of the species itself.

The regional conservation context differs from that documented for *G. algae*, particularly regarding host-plant availability, as the local main host-plant of *G. algae* is increasingly rare and fragmented (Lemos, 2026). Both species nevertheless occur in wetland habitats affected by vegetation changes, altered land use and direct human disturbance.

At Poças do Vau, the immediate threat is particularly evident. Track-widening works in October 2026 directly affected both *S. erectum* stands occupied by *G. sparganii*, through soil deposition and the accumulation of cut eucalyptus branches (Fig. 14). These disturbances add to the longer-term pressures associated with the expansion of *Spartina patens* and *Phragmites australis*, forestry operations and changes in wetland management. Preventing further damage to the occupied stands, maintaining the surrounding habitat conditions and monitoring the population should therefore be immediate priorities.

Continued surveys of other regional and national *S. erectum* stands are also necessary to establish whether the species occurs elsewhere and to assess its conservation needs more reliably.



Figure 14 - Habitat disturbance associated with track-widening works at Poças do Vau (Óbidos, Portugal) during the first week of October 2026. The works extended along the track surrounding Poças do Vau and other areas subject to forestry operations, and caused substantial disturbance to both stands of *Sparganium erectum* occupied by *Globia sparganii*. a) Deposition of soil onto the northernmost nucleus. b) Southern nucleus, with large eucalyptus branches deposited directly over *S. erectum*. c) Clearance of vegetation along the opposite verge adjacent to the eucalyptus plantation. d) View of the southern nucleus. e, f) Views from a lower position than shown in Fig. 8 published in Lemos (2026), documenting an area previously undergoing land preparation now occupied by a new plantation extending to the edge of the widened Poças do Vau track; the works also resulted in the destruction of several willows (*Salix* spp.) and rush-dominated vegetation along the opposite verge, bordering the Poça do Vau wetland. Freguesia do Vau (Óbidos); 12.x.2026.

Acknowledgments

I extend my deepest appreciation to the anonymous peer reviewers for their comprehensive scientific review, and take this opportunity to congratulate Martin Corley for his initiative and dedication to this journal, while also commending the editorial team for their efficiency and professional support.

References

Bergmann, A. 1954. *Die Grossschmetterlinge Mitteldeutschlands. Band 4/2: Eulen. Verbreitung, Formen und Lebensgemeinschaften*. Urania-Verlag, Jena.

Boieiro, M., Ceia, H., Caramujo, M. J., Cardoso, P., Garcia Pereira, P., Pires, D., Reis, J. & Rego, C. (eds.) 2023. *Livro Vermelho dos Invertebrados de Portugal Continental*. 468 pp. FCiências.ID & ICNF, I.P., Lisboa. https://doi.org/10.5281/zenodo.10519545

Corley, M. F. V. 2004. Provisional list of the Lepidoptera of Lagoa de Santo André, Baixo Alentejo, Portugal (Insecta: Lepidoptera). *SHILAP Revista de Lepidopterología*, **32** (126): 105-138.

El-Sayed, A. M., Knight, A. L., Byers, J. A., Judd, G. J. R. & Suckling, D. M. 2016. Caterpillar-induced plant volatiles ttract conspecific adults in nature. *Scientific Reports*, **6**: 37555. https://doi.org/10.1038/srep37555

Farino, T., Ortiz, A. S. & Yela, J. L. 2024. Segundo registro ibérico de *Archanara neurica* (Hübner, 1808) (Lepidoptera: Noctuidae: Noctuinae: Xylenini: Apameina): implicaciones biogeográficas. *Arquivos Entomolóxicos*, **30**: 153-158.

Henwood, B. & Sterling, P. 2020. *Field Guide to the Caterpillars of Great Britain and Ireland*. Bloomsbury, London.

Hussain, M., Gao, J., Bano, S., Wang, L., Lin, Y., Arthurs, S., Qasim, M. & Mao, R. 2020. Diamondback moth larvae trigger host plant volatiles that lure its adult females for oviposition. *Insects*, **11** (11): 725. https://doi.org/10.3390/insects11110725

Lemos, P. 2026. Two wetland-specific Lepidoptera new to Portugal, with notes on ecology, life history and conservation. *Artimelia–Lepidoptera Iberica*, **2**: 4-30.

OpenStreetMap Contributors. 2026. *Planet dump* [Portugal spatial data]. OpenStreetMap Foundation. openstreetmap.org (accessed October 2026).

Phelan, N., van Deijk, J., Allen, D., Bellotto, V., Böhm, M., Clay, J., Gallego-Zamorano, J., Parsons, M., Shirkhorshidi, M., Sterling, P., Trottet, A. & Winter, E. 2026. *European Red List of Moths: Status Assessment of European Moths*. Publications Office of the European Union, Luxembourg. https://doi.org/10.2779/6590787

Zakir, A., Bengtsson, M., Sadek, M. M., Hansson, B. S., Witzgall, P. & Anderson, P. 2013. Specific response to herbivore-induced de novo synthesized plant volatiles provides reliable information for host plant selection in a moth. *Journal of Experimental Biology*, **216** (17): 3257-3263. https://doi.org/10.1242/jeb.083188

Una contribución breve a los conocimientos de la biología de los geométridos recogidos en varias localidades de Madrid (Geometrinae, Sterrhinae)

Gareth Edward King

c/. Gerardo Rueda, 2-bajo, 7, 28038 Madrid. e-mail: sterrhinae@gmail.com;
https://orcid.org/0000-0003-0804-5353

Resumen

Se presentan datos adicionales de nueve taxones que tratan de las larvas halladas en las subfamilias Geometrinae y Sterrhinae y sus plantas huéspedes, junto con otros datos de su biología p. ej. sus parasitoides debido a los estudios de campo llevados a cabo en Madrid. Se recogieron 270 larvas de varias localidades madrileñas en la fosa del Tajo, zona de transición, además de la rampa (Sierra de Guadarrama).
Palabras clave: Lepidoptera, Geometridae, Geometrinae, Sterrhinae, biología, estados inmaduros, España.

Abstract

Additional data are presented for nine taxa obtained ex larvae in the subfamilies Geometrinae and Sterrhinae including their host plants together with other data on their biology e.g. parasitoids, due to field work undertaken in Madrid. 270 larvae were collected from various localities in the Tagus basin, transition zone as well as the foothills of the Sierra de Guadarrama.
Key words: Lepidoptera, Geometridae, Geometrinae, Sterrhinae, biology, early stages, central Spain.

Introducción

Soria (1987) fue probablemente el autor del primer libro que trató de llenar el hueco que quedó con tal de comprender los ciclos biológicos de los lepidópteros en el estado silvestre en la Península Ibérica, seguido por Gómez de Aizpúrua (1987, 1989) que trató específicamente de la familia Geometridae. En 2003, salió el primer tomo, en el que se indagó específicamente en los lepidópteros y sus estados inmaduros de El Regajal (Aranjuez, Madrid) (Gómez de Aizpúrua, et al. 2003, 2005, 2006, 2010, 2011). Sin embargo, Hausmann & Scalercio (2016) indicaron que los datos relativos a las plantas nutricias y demás detalles acerca de la biología de los lepidópteros aún escasean en el sur de Europa. En los últimos años ha habido una serie de trabajos publicados sobre las Geometridae que han intentado corregir esta anomalía (King, 2017, 2022, 2023, 2024; King & González Estébanez, 2015; King & Viejo Montesinos, 2010, 2012, 2016, 2020, 2021, entre otros). Covell (1983) mencionó la gran dificultad de encontrar larvas en el estado silvestre sobre todo entre las Sterrhinae Meyrick.

Este trabajo se entiende como una continuación de King & Viejo Montesinos (2010, 2012) con datos nuevos pertinentes a los geométridos y sus estados inmaduros. El siguiente artículo (II) se tratará de las subfamilias Ennominae y Larentiinae.

Abreviaturas:

Col. GEK=colección personal de GEK
GEK=Gareth Edward King
leg. et det. = *legit et determinavit* (recolector, él que determinó el ejemplar)
MRS=Mark R. Shaw
NMS=National Museum of Scotland
t. m.= término municipal

Material y método

Los métodos empleados en la búsqueda de larvas se han descrito (King & Viejo Montesinos, 2010; King & González Estébanez, 2015). En resumen, se buscaron a las larvas por debajo de varias plantas bajas, también entre la hojarasca, además de dentro del suelo o levantando piedras expuestas o debajo de las mismas plantas. En este trabajo se ha seguido esta metodología en otras zonas de Madrid fuera del valle del Tajo (Izco, 1984) a partir del 2006 en adelante. **Tabla I** describe las características de los lugares de muestreo. **Figura 1** ilustra una zona de muestreo en el valle del Tajo con suelos de yeso. Con las larvas recogidas en recipientes de plástico en el campo se siguió adelante con su crianza en condiciones de cautividad según las pautas establecidas (Friedrich, 1986; King & Viejo Montesinos, 2010). Normalmente, se añadió la planta nutricia según la cual se halló el ejemplar en el estado silvestre, en el género *Idaea* Treitschke las larvas suelen posar encima de las plantas no necesariamente asociadas con su alimentación (King & Viejo Montesinos, 2010, 2012) o incluso a nivel del suelo entre la hojarasca una indicación de que se aceptaran las hojas o las flores marchitas de plantas bajas. La próxima fase de pasar al estado de la pupa se efectuó en el mismo recipiente y así hasta el avivamiento de los adultos.

Tabla I: Características de las localidades del muestreo de Madrid.
Ferrandis et al. (2005).

Madrid	Coordinados	Características florísticas y del suelo	Fechas
Cerros de Palomera, Ciempozuelos, Chinchón (La Ponderosa), Valdemoro (590 m) (**Figura 1**)	N 40º09'09.1 O 003º36'27.1	De yeso; orientación del sur; abierto; soleado; orden botánico Gypsophiletalia: (Bellot, 1952) *Thymo-Teucrion verticillati* Ferrandis et al. (2005).	2000 en adelante
El Barrancón, Tres Cantos (720 m)	N 40º35'49.7 O 003º43'11.3	Arenas de las facies de Madrid (*Izco, 1984): orden botánico Quercetea ilicis: Artemisio-Santolinetum rosmarinifoliae*) (Bellot, 1952).	2002-2003 en adelante
Término municipal de Madrid capital; Los Perales, El Goloso (747 m), estación de Cantoblanco (720 m), Casa de Campo (649 m), Sanchinarro (735 m) etc.	N 40º33'39.3 O 003º42'51.9	Arenas de las facies de Madrid (Izco, 1984); matorral degradado con dominancia de *Artemisia campestris glutinosa* J. Gay ex Besser según la zona.	2002-2003 en adelante
Canteras, Alpedrete (950 m)	N 40º40’10.24 O 004º01’07.18	Sierra de Guadarrama vertiente meridional; *Rubo ulmifolii-Rosetum corymbiferae*) (Izco, 1984) en un bosque caducifolio con grandes claros.	2014



Figura 1: suelos de yeso: Ciempozuelos, 600 m, Madrid (imagen: abril 2013; autor: José Luis Viejo Montesinos).

Resultados

Geometrinae Stephens, 1829
Pseudoterpna coronillaria (Hübner, 1817):
MADRID: Tres Cantos (El Barrancón, 720 m): 16.iv.2019: ♀ *ex* larva L5 en *Cytisus scoparius* L. (**Figura 2**), emergió 12.v.2019 (Col. GEK).

Phaiogramma etruscaria (Zeller, 1849):
MADRID: Los Perales, El Goloso, 720 m: 11.vi.2017: tres larvas L3; 18.vi.2017: larva L4; parasitada (**Tabla II**) 13.vi.2020: L3 larva; 1.viii.2021: larva L4, pupa 8.viii.21, emergió ♀; El Barrancón, Tres Cantos, 720 m: 20.vi.2020 (**Figura 3**): tres larvas L3, L5 (2); dos larvas fase de prepupa 25.vi.2020; emergencias: 2 ♀ 3.vii.2020, ♂ 10.vii.2020. Todas las larvas se hallaron en las flores de *Ruta montana* L. (Rutaceae).

Microloxia herbaria (Hübner, 1813):
MADRID: Ciempozuelos (Cerros de Palomera, 600 m): 17.vii.2011 L2 larva; 13.viii.2011: L5 larva (**Figura 4**) en flores de *Limonium dichotomum* (Cav.) Kuntze; 26.xi.2016: larva L2 por debajo de *Teucrium polium* L. subesp. *capitatum* Briq. (Labiatae).

Sterrhinae Meyrick, 1892
Idaea sericeata calvaria Wehrli, 1927:
MADRID: L5 larva: El Barrancón, Tres Cantos, 720 m 16.iv.2019 en *Lavandula stoechas* L. ♀ emergió el 24.v.2019.

Idaea macilentaria (Herrich-Schäffer, 1847):
MADRID: El Barrancón, Tres Cantos: L5 18.v.2008 larva parasitada (**Tabla II**); Los Canteros, Alpedrete, 950 m: 19.iv.2014, 4.v.2014: L5 (28 larvas) entre *Rumex acetosa* L., gramíneas, además de *Dipsacus fullonum* L. (Dipsacaceae) subidas a las plantas o a nivel del suelo: 1 pupa 9.v.2014 con la primera emergencia 8.v.2014: 2♂, 9♀. Se documentaron tres parasitoides (**Tabla II**).

Idaea ochrata albida (Zerny, 1936) (**Figura 5**):
MADRID: Los Canteros, Alpedrete, 950 m: 19.iv.2014; 4.v.2014: dos larvas entre *Rumex acetosa*, gramíneas y *Dipsacus fullonum* subidas a las plantas o a nivel del suelo; 1 pupa 25.v.2014; emergencias: 22.v.2014, 9.vi.2014. Los Perales, El Goloso, 720 m: 18.v.2013 (2 L5); 25.v.2013 (2 L5); 9.iii.2014 (1 L3); 29.iii.2014 (5 L4); 30.iii.2014 (1 L4); 5.iv.2014 (1 L4 larva); 6.iv.2014 (1 L4); 11.iv.2014 (2 L4); 19.iii.2015 (2 L4); 19.iv.2015 (1 L5); 25.iv.2015 (2 L5); 16.iv.2016 (1 L5); 29.iv.2018 (1 L4 larva). Todas las larvas halladas por debajo matas de *Artemisia campestris* glutinosa (J. Gay ex Besser) con *Rumex acetosa* en la proximidad; en varias ocasiones con las larvas en el suelo. Los adultos emergiendo a finales del mes de mayo o en junio en los años respectivos de la recogida de las larvas. Las larvas parasitadas se detallan en **Tabla II**.

Scopula marginepunctata (Goeze, 1781):
MADRID: Los Perales, El Goloso: 23.v.2009; L5 en *Thymus mastichina* L. siendo depredada por una araña Pisauridae.

Scopula (Glossotrophia) asellaria dentatolineata (Wehrli, 1926):
MADRID: Cerros de Palomera, Ciempozuelos, 600 m: 26.xi.2016 (5 L3, L5); 10.xii.2016 (3 L4, L5); 11.ii.2017 (2 L4, L5); 10.i.2018 (3 L4, L5) (**Tabla II**: parasitoides) 10.iii.2019 L5 larva: pupa 20.iii.2019; ♂ emergió 13.iv.2019. Todas las larvas halladas en las proximidades de *Antirrhinum majus* L. y con frecuencia en los cortados de yeso un poco alejadas de esta planta (King & Viejo Montesinos, 2021).

Rhodometra sacraria (Linnaeus, 1767) (**Figuras 6, 7**):
MADRID: La Vega, Ciempozuelos, 600 m: 17.viii.2006: 14 larvas (L2, L3, L5 [11]) por debajo de *Polygonum aviculare* L. o *Atriplex prostrata* Boucher ex DC.: dos larvas L5; 24.viii.2006: 23 larvas (L1-L5; L3 [7]); Colmenar Viejo (alrededores de la estación, 826 m): 17.ix.2023: tres larvas en los primeros estadios en *Atriplex* sp. ♀ emergió 30.ix.2023; El Barrancón, Tres Cantos, 720 m: 16.ix.2006: seis larvas (L1 (4), L2); 1.x.2006: 16 larvas (L1-L5, L4 [6]); 12.x.2006: siete larvas L1, L5 (5); 5.xi.2006: por debajo de *Rumex acetosa**; cinco larvas que puparon 13.xii.2006 sin que sobreviviesen; 9.xi.2006: dos larvas L4, L5*; 19.xi.2006: dos larvas L5*; puparon 22.xi.2006 sin que sobreviviesen (3.xii.2006); 21.xi.2009: L5* larva; Madrid capital (Parque de San Blas, 644 m): 24.x.2006: tres larvas (L4, L5 [2]); 26.x.2006: L5 larva; 31.x.2006: dos L5 larvas; 2.xi.2006: L5 larva pupó 11.xi.2006; ♂ emergió 5.i.2007; Madrid capital, Casa de Campo (649 m): 7.x.2013; L5 en *Rumex acetosa*; Los Santos de la Humosa (alrededores), 600 m: 26.viii.2007: siete L5 larvas halladas con las primeras emergencias 7.ix.2007 F^1 larvas eclosionadas 12.ix.2007 con las primeras larvas en fase de prepupa 3,6.x.2007 emergencias: 20.x.2007 (5 imagos); Los Perales, El Goloso: 30.ix.2007: 32 larvas (L1-L5; L3 [10]); fase de prepupa: 3.x.2007; tres pupas 21.x.2007; emergencias a partir del 19.x.2007; 24.viii.2008: siete larvas al ras del suelo; 24.ix.2008: L5 larva; 28.ix.2008: 15 larvas L1-L5 (casi todas L5); 4.x.2008: 14 larvas (L2-L5) al ras del suelo; 11.x.2008: ocho larvas L5; cuatro larvas en fase prepupal 13.x.2008; emergencias 29.x.2008-3.xi.2008 otra (L5) por debajo de *Rumex crispus* L. que emergió 17.xi.2008. 9.xi.2008: Dos L2 larvas por debajo de *Rumex crispus*; pupas: 11.xi.2008; emergencias: 28.xi.2008; 10.x.2009: 16 larvas L4, L5 (12) al ras del suelo por debajo matas finas de *Polygonum aviculare*; 12.ix.2010: L5 ♂ emergió 23.ix.2010; 17.ix.2010: cinco larvas (L5) emergencias: ♂ ♀ emergieron 24.ix.2010; ♂ emergió 28-29.ix.2010. Todas las larvas se encontraron por debajo de *Polygonum aviculare* si no se documenta otra planta expresamente. Se documentaron dos parasitoides (Hymenoptera) *ex* larvas de *R. sacraria* (**Tabla II**).

Table II: Parasitoides *ex* larvas de Geometrinae y Sterrhinae (Hymenoptera: Ichneumonidae, Braconidae) (Shaw, 2010; King & Viejo Montesinos, 2012; 2021).

Huésped: taxón	**Lugar, planta huésped, fechas (formación de las pupas; emergencias; ataque de parasitoides sobre un lote etcétera)**	**Parasitoides: taxón**
ex Phaiogramma etruscaria	18.vi.17 larva L4; emergió; 25.vi.2017 en *Ruta montana*.	*Cotesia* sp. (Braconidae: Macrogastrinae) (MRS det. Col. NMS)
ex Idaea macilentaria	18.v.2008: entre la hojarasca por debajo de *Artemisia campestris*; emergió 5.vi.2008 (MRS det., NMS dep.); *ex* L5 19.iv.2014: emergieron a partir del 30.iv.2014.	*Microplitis* sp. (Braconidae: Microgastrinae) (MRS det. Col. NMS); *Cotesia* sp. (Microgastrinae)
ex Idaea ochrata albida	Larvas en el suelo por debajo de *Artemisia campestris* entre *Rumex acetosa*: *ex* dos larvas 18.v.2008; hojarasca; capullo 1.vi.2008; (emergieron 5, 12.vi.2008); *ex* larva: 1.vi.08; (emergió 16.vi.2008); *ex* cuatro larvas 18.iv.2009; capullo 9.v.2009; (emergió v.2009); *ex* dos larvas 9.v.2009; capullos sin que emergiesen las avispas; *ex* larva 23.v.2009; hojarasca (emergió 7.vi.2009).	*Microplitis* sp. (MRS det. Col. NMS)
ex Rhodometra sacraria	*Polygonum aviculare*: Ciempozuelos: 17.viii.2006 (16 larvas recogidas)=larva; 22.viii.2006 (capullo), avispa 30.viii.2006; Tres Cantos: 16.ix.2006 (6 larvas recogidas)=larva; 18.x.2006 (capullo); 1.x.2006 (16 larvas recogidas)=2 larvas 9.x.2006 (capullos) avispa: 24.x.2006; 12.x.2006 (7 larvas recogidas)= 2 larvas 20,21.x.2006 y 25,26.x.2006 (capullos); 9.xi.2006 (2 larvas recogidas)=larva (capullo) 29.xii.2006; Los Santos de la Humosa: 26.viii.2007 (7 larvas recogidas)=larva *ex* prepupa (sin fecha); El Goloso: 30.ix.2007 (32 larvas recogidas)=2 larvas (capullo) 21.x.2007; 24.ix.2008 (larva recogida)=larva (capullo) 21.x.2008; 28.ix.2008 (15 larvas recogidas)=larva (avispa) 7.x.2008; 4.x.2008 (14 larvas recogidas)=3 larvas (capullos) 7, 15.x.2008 (capullos) avispas em. 18-25.x.2008; 11.x.2008 (9 larvas recogidas, una en *Rumex crispus*)=larva (capullo) 15.x.2008.	*Homolobus truncator* (MRS det. Col. NMS).
ex Rhodometra sacraria	*ex* larva (16 larvas recogidas), 17.viii.2006; Ciempozuelos; emerged 27.viii.2006.	*Alcima orbitale* Gravenhorst, 1829
ex Scopula asellaria dentatolineata	10.i.2018: *ex* larva ii.2018; pupa 17.ii.2018; 2 emergieron 4.iii.2018.	*Homolobus truncator*



Figura 2: *Pseudoterpna coronillaria* (Hübner, 1817): L5 larva 16.iv.2019, Tres Cantos, Madrid.



Figura 3: *Phaiogramma etruscaria* (Zeller, 1849): L5 larva 20.iv.2020, El Goloso, Madrid.



Figura 4: *Microloxia herbaria* (Hübner, 1813): L2 larva 17.vii.2011, Ciempozuelos, Madrid.



Figura 5: *Idaea ochrata albida* (Zerny, 1936): L5 larva 10.iv.2011, El Goloso, Madrid.



Figura 6: *Rhodometra sacraria* (Linnaeus, 1767): pupa con el adulto pharate, ix.2007, El Goloso, Madrid.

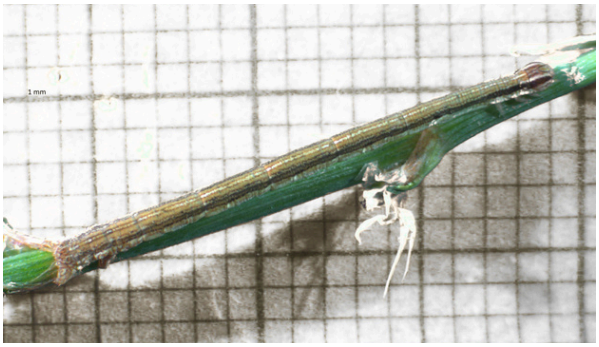

Figura 7: *Rhodometra sacraria* (Linnaeus, 1767): L5 larva, El Goloso, Madrid, ix.2007.

Discusión y conclusiones

Pseudoterpna coronillaria: Gómez de Aizpúrua (1989) la cita genéricamente en *Lygos* y *Ulex*, mientras Hausmann (2001) menciona *Cytisus scoparius* específicamente como planta nutricia.

Phaiogramma etruscaria: King & Montesinos (2010) citaron hasta cuatro plantas nutricias, con *Ruta montana* utilizada con frecuencia, mientras que Gómez de Aizpúrua et al. (2003) documenta *Lygos sphaerocarpa* (L.). Hausmann (2001) describe la larva como polífaga además de florícola, con una preferencia por las apiáceas.

Idaea sericeata calvaria: Gómez de Aizpúrua et al. (2011) citaron a *Lithospermum fruticosum* (L.) (Boraginaceae) como una planta nutricia no documentada en las hojas de esta familia botánica tóxica. Se considera un taxón polífago en las hojas marchitas (Hausmann, 2001). King & Viejo Montesinos (2012) incluyeron el hallazgo de larvas a nivel del suelo por debajo de *Artemisia campestris*. La larva hallada con motivo del estudio actual se encontró posada en las ramas de *Lavandula stoechas* (L.), con las flores ofrecidas exitosamente como fuente de alimentación en condiciones de cautividad.

Idaea macilentaria: Gómez de Aizpúrua (1987) citó genéricamente *Rumex* como planta nutricia, mientras que King & Viejo Montesinos (2012) documentaron una larva encontrada a nivel del suelo por debajo de *Artemisia campestris*, que se alimentó de flores y hojas de *Rumex acetosella* en cautividad. Las larvas halladas en cantidad, citadas en este trabajo, entre plantas individuales de *Rumex acetosa*, y el hecho de que se alimentaron de esta misma planta en condiciones de cautividad indican que la especie es oligófaga entre las poligonáceas.

Idaea ochrata albida: King & Viejo Montesinos (2012) documentaron el hallazgo de larvas por debajo de *Rumex acetosa* o en la proximidad de otras plantas bajas sin que necesariamente formen parte de su rango de plantas atacadas. En las mismas circunstancias se encontró la especie anterior.

Rhodometra sacraria: Según los datos, la larva se documenta asociada con poligonáceas (tres especies), además de chenopodiáceas (dos especies en el mismo género), con datos en otras poligonáceas recabados en King & González Estébanez (2015). Se la reconoce como oligófaga. No se mantienen poblaciones estables en el centro peninsular, con la llegada de los primeros adultos en mayo en Madrid y las larvas encontradas entre agosto y noviembre (Hausmann, 2004; King & Viejo Montesinos, 2014).

Parasitoides:

Tabla II recopila los parasitoides obtenidos de cinco especies *ex* larva. Son siete especies de Hymenoptera entre los ichneumónidos y bracónidos, aunque ni *Cotesia* Cameron, 1891 ni *Microplitis* Foerster, 1862 se habían identificado más que hasta el nivel del género. Shaw (2010) y King & Viejo Montesinos (2021) documentaron *Homolobus truncator* Say, 1828 como parasitoide

bracónido frecuente entre los geométridos que hacen el papel de larva-huésped de estos himenópteros que se alimentan expuestos en sus plantas nutricias a pesar de esconderse por debajo de ellas a nivel del suelo, o se alejan de las mismas en los cortados de yeso, p. ej. (Shaw & Huddleston, 1991; King & Viejo Montesinos, 2021). Entre agosto del 2006 y octubre del 2008 los datos obtenidos *ex R. sacraria* fueron constantes hasta en cuatro lugares distintos en Madrid (**Tabla II**). Proporcionalmente, con 14 larvas halladas el 4.x.2008 tres resultaron parasitadas (=21,5%), siendo el ataque más 'mortífero' en contraste con el lote de 32 larvas encontradas el 30.ix.2007 con dos larvas atacadas por *H. truncator* (=6,25%).

Agradecimiento

A Mark Shaw, del National Museum of Scotland (Edimburgo) (ya jubilado), por su ayuda constante a lo largo de muchos años en la identificación de los parasitoides resultantes. A José Luis Viejo Montesinos, de la Universidad Autónoma de Madrid (ya jubilado), por la concesión del uso del aparato de Leica en momentos dados en los últimos años en la preparación de la tesis doctoral y en ocasiones posteriores a 2013. A la Comunidad Autónoma de Madrid, por los permisos concedidos a lo largo de los años, con el último en vigor para cubrir 2026.

Bibliografía

Covell, C. V. 1983. The state of our knowledge of the Neotropical Sterrhinae (Geometridae). *Second Symposium on Neotropical Lepidoptera*, Arequipa, Peru, 1983: **1**: 1-23.

Ferrandis, P., Herranz, J. M.ª & Copete, M. A. 2005. Caracterización florística y edáfica de las estepas yesosas de Castilla-La Mancha. *Investigación Agraria: Sistemas y Recursos Forestales*, **14** (2): 195-216.

Friedrich, E. 1986. *Breeding Butterflies and Moths. A practical handbook for British and European species*; traducción del alemán al inglés: Steven Whitebread; edición inglesa con material adicional editado por A. Maitland Emmet, Harley Books, Essex, Reino Unido.

Gómez de Aizpúrua, C. 1987. *Biología y morfología de las orugas*, Tomo III, Geometridae, *Boletín de la Sanidad Vegetal*, **8** (15), Ministerio de Agricultura, Pesca y Alimentación, Madrid. 238 pp.

Gómez de Aizpúrua, C. 1989. *Biología y morfología de las orugas*, Tomo VII, Geometridae, *Boletín de la Sanidad Vegetal*, **7** (15), Ministerio de Agricultura, Pesca y Alimentación, Madrid. 224 pp.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2003. *Mariposas y sus biotopos*, Reserva Natural El Regajal-Mar de Ontígola, Lepidoptera I memoria 2002, Comunidad de Madrid, 207 pp.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2005. *Mariposas y sus biotopos*, Reserva Natural El Regajal-Mar de Ontígola, Lepidoptera II memoria 2003. Comunidad de Madrid, 259 pp.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2006. *Mariposas y sus biotopos*, Reserva Natural El Regajal-mar de Ontígola, Lepidoptera III memoria 2004, Comunidad de Madrid, 299 pp.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2010. *Mariposas y sus biotopos*, Reserva Natural El Regajal-Mar de Ontígola, Lepidoptera IV memoria 2005-2008, Comunidad de Madrid, 688 pp.

Gómez de Aizpúrua, C., González Granados, J. & Viejo Montesinos, J. L. 2011. *Mariposas y sus biotopos*, Reserva Natural El Regajal-Mar de Ontígola, Lepidoptera V memoria 2009-10, Comunidad de Madrid, 310 pp.

Hausmann, A. 2001. Introduction. Archiearinae, Orthostixinae, Desmobathrinae, Alsophilinae, Geometrinae. In: Hausmann, A. (ed.) *The Geometrid Moths of Europe* **1**: 1–282. Apollo Books, Stenstrup, Dinamarca.

Hausmann, A. 2004. Sterrhinae. In: Hausmann, A. (ed.) *The Geometrid Moths of Europe* **2**: 1–600. Apollo Books, Dinamarca.

Hausmann, A. & Scalercio, S. 2016. Host-plant associations of 29 Mediterranean Lepidoptera species in forested ecosystems unveiled by DNA barcoding (Insecta: Lepidoptera). *SHILAP Revista de lepidopterología*, **44** (175): 463–471.

Izco, J. 1984. *Madrid Verde*, Ministerio de Agricultura, Pesca y Alimentación, Madrid, 517 pp.

King, G.E. 2017. *Rhodostrophia vibicaria* (Clerck, 1759) (Geometridae: Sterrhinae): recent larval data from the Maritime Alps (province Cuneo, Italy). *Newsletter of the Societas Europaea Lepidopterologica*, **59**: 38.

King, G.E. 2022. *Dasypteroma thaumasia* Staudinger, 1892: further details on its biology in Madrid (Spain) and a brief description of its larva (Lepidoptera: Geometridae: Ennominae). *Boletín de la Sociedad Andaluza de Entomología*, **32**: 81-87.

King, G. E. 2023. *Boudinotiana touranginii* (Berce, 1870) (Lepidoptera: Geometridae: Archiearinae): observaciones en Madrid con la confirmación de su planta huésped en España. *Boletín de la Sociedad Andaluza de Entomología*, **33**: 166-171.

King, G.E. 2024. Contribution to the knowledge of *Synopsia sociaria* (Hübner, 1799) and its immature stages (Lepidoptera: Geometridae: Ennominae). *Boletín de la Sociedad Andaluza de Entomología*, **34**: 1-10.

King, G. E. & González-Estébanez, F. J. 2015. Geometrid larvae of the Alpi Marittime Natural Park (district of Valdieri, Cuneo, Italy), with descriptions of the larvae of two Gnophini Pierce, 1914 (Insecta: Lepidoptera: Geometridae). *Zoosystema*, **37** (4): 621–631.

King, G. E. & Viejo Montesinos, J. L. 2010. Geometrid larvae and their food-plants in the South of Madrid (Central Spain) (Geometridae). *Nota lepidopterologica*, **33** (1): 155–171.

King, G. E. & Viejo Montesinos, J. L. 2012. Las larvas del género *Idaea* Treitschke, 1825 (Insecta: Lepidoptera: Geometridae): nuevos datos sobre su morfología y biología. *Graellsia*, **68** (2): 249–262.

King, G. E. & Viejo Montesinos, J. L. 2014. *Rhodometra sacraria* (Linnaeus), a cosmopolitan sterrhine confirmed from Chile (Lepidoptera, Geometridae). *Revista Brasileira de Entomologia*, **58** (2): 103–106. https://doi.org/10.1590/S0085-56262014000200002

King, G. E. & Viejo Montesinos, J. L. 2016. Description of the ova and ovipositional strategies of six sterrhine taxa from Madrid, including comparative data with other species of this subfamily (Lepidoptera: Geometridae: Sterrhinae). *Graellsia*, **72** (1): 1-11.

King, G. E. & Viejo Montesinos, J. L. 2020. The Spanish endemic *Eupithecia gypsophilata* Skou, Mironov & Rietz, 2017 (Lepidoptera: Geometridae, Larentiinae): a contribution to an understanding of its early stages. *Entomologist's Gazette*, **71** (2): 93–97.

King, G. E. & Viejo Montesinos, J. L. 2021. Contribution to an understanding of the biology and larval morphology of two taxa in the genus *Scopula* Schrank, 1802, subgenus *Glossotrophia* Prout, 1913 (Lepidoptera: Geometridae). *SHILAP Revista de lepidopterología*, **49** (194): 259–271.

Soria, S. 1987. *Lepidópteros defoliadores de Quercus pyrenaica* Willdenow, 1805. Fuera de Serie, n.º 7, Ministerio de Agricultura, Pesca y Alimentación, Madrid, 302 pp.

Shaw, M. R. 2010. Palaearctic Homolobinae (Hymenoptera: Braconidae) in the National Museums of Scotland, with host and distribution records and a key to British species. *Entomologist's Gazette*, **61**: 43–51.

Shaw, M. R. & Huddleston, T. 1991. *Classification and Biology of Braconid Wasps* (Hymenoptera: Braconidae). Handbooks for the Identification of British Insects, **7** (11): 1–126. Royal Entomological Society of London, London.

Mothing in the rain

Martin Corley

Pucketty Farm Cottage, Faringdon, Oxfordshire, SN7 8JP, U.K. email: martin.corley@btinternet.com;
https://orcid.org/0000-0003-4240-8007

Not every night chosen for a mothing session stays warm and dry. Inevitably there are times when it rains, even in the Portuguese summer. If you are putting a light or light trap out in the garden for checking in the morning, it is not too troublesome. You may have drowned moths in the water in the trap or egg boxes filled with water, or at worst a broken light bulb. But there is always another night.

If, like me, you only have a few nights available for fieldwork during a week-long visit, there is pressure to put out lights every night, but sometimes this has to be aborted. Occasionally I have spent an hour or more surveying a site for the best spots to place two or three lights, putting all the equipment in place, then having a quick bite to eat before the night's activity begins, only to have a thunderstorm arrive at dusk, so that all the equipment must be gathered in before it gets too wet.

In spring and summer rain in late afternoon or at dusk rarely results in many moths flying, even if the rain stops. But in the autumn it is different. Many Noctuidae species emerge in October and November or even later. Often these species will come to light in heavy rain. This may be because clear dry nights can be significantly colder than wet nights and perhaps heavy rain presents more problems for bats than for moths.

When out in the field away from the place where I am staying, I run two or three lights from a generator, each light on a stand over a white sheet with egg boxes below the light. Long wires allow the lights to be quite far apart and in different microhabitats. During the night I progress from light to light noting what species arrive and collecting moths that cannot be immediately identified or are unfamiliar.

I remember occasions on visits to Portugal in October and November when it was evident that the rain falling during the day was unlikely to stop at night. My equipment had to be deployed in the rain and later collected up thoroughly wet.

In October 1997 my wife and I planned three nights out of our week in Algarve to go north to Serra de São Mamede. We had been making an inventory of the moths of the Parque Natural on short visits since September 1995, but this was the latest date chosen. Long before reaching Portalegre on the afternoon of 19 October, we could see there was rain over the mountains. On our arrival at our usual place of stay in Escusa, between Castelo de Vide and Marvão, I set up a light under a back porch which provided a little shelter, then, leaving my wife in the dry, I took lights to Galegos, a site east of Marvão, with Cork Oaks (*Quercus suber*). Among the moths I recorded, *Aporophyla chioleuca* (Fig. 1(a)) and *Agrochola meridionalis* (Fig. 1(b)) were new to me. Besides moths, I was rewarded with seeing a Salamander for the first time. On my return to Escusa I checked the light under the porch which had attracted *Cymatophorina diluta*.

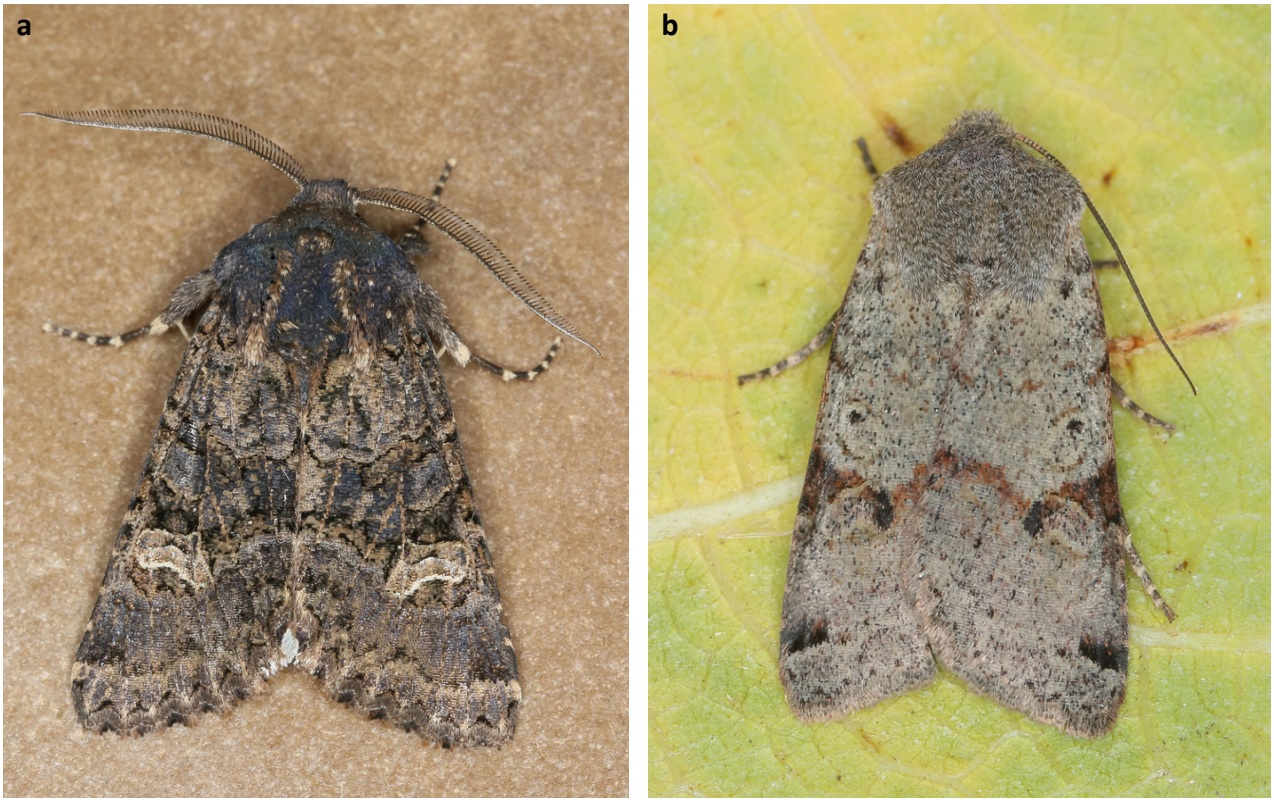

Figure 1. (a) *Aporophyla chioleuca*; (b) *Agrochola meridionalis.*
Species recorded in the municipality of Marvão.
(Photos: © Ana Valadares)



Figure 2. Marvão Castle and the surrounding landscape. The Minhota trapping site is located near the centre-left of the photograph, close to the small side road visible in the image.
(Photo: © Ana Valadares)

The following day there was no let up in the rain, but I took a light to the southernmost part of the Parque Natural at Hortas de Baixo, thinking that at the lower altitude it might not be raining. I was wrong. Nothing of great interest appeared, so I did not stay long. We had planned to stay for three nights, but after incessant rain all the next day we decided to pack up and return to Algarve. However, I decided that before leaving there was time to run a single light for a short time at Minhota, an area with Pyrenean Oak (*Quercus pyrenaica*) below the castle of Marvão (Fig. 2). This proved successful as I saw species not seen on previous nights including *Dryobotodes tenebrosa* (Fig. 3(a)) that was new to me as well as *Griposia aprilina* (Fig. 3(b)), a familiar species in England, but my first Portuguese record. Moths had to be boxed as soon as they arrived on the very wet sheet, because they mostly buzzed around on their backs, rapidly losing scales. After two hours, I returned to Escusa and we left for the Algarve. As soon as we were away from the mountains, the rain stopped. In total the trip produced 74 species of Macrolepidoptera, many of them new records for the Parque Natural.

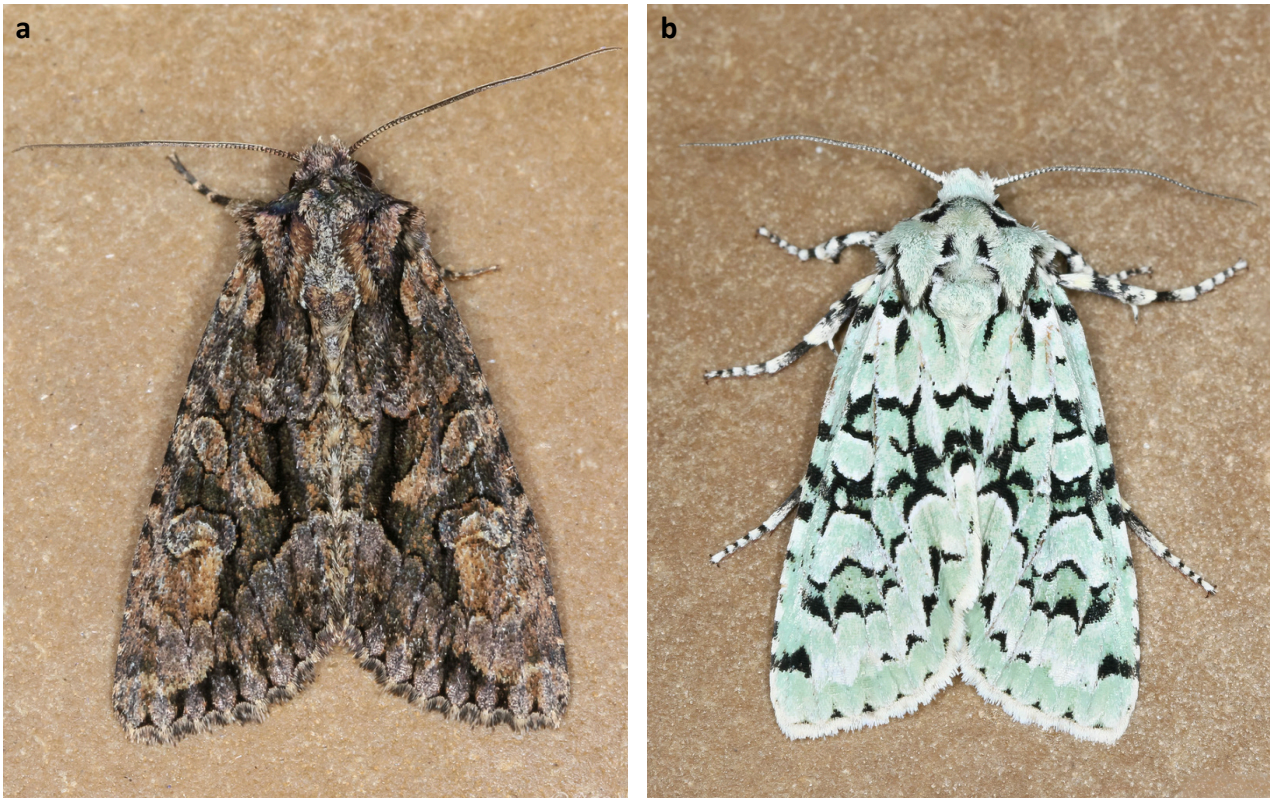

Figure 3. (a) *Dryobotodes tenebrosa*; (b) *Griposia aprilina*. Species recorded in the municipality of Marvão. (Photos: © Ana Valadares)

On 15 and 16 November 2009 I had two nights' fieldwork in the Tua valley where I was joined by Pedro Sousa, a colleague from CIBIO specialising in spiders. Rain set in during the second afternoon, so we decided we would not return to our accommodation in Carrazeda de Ansiães, but leave for Porto after a fairly brief field session at Amieiro (Fig. 4), which was always the most rewarding site in the Tua Valley. 33 species of Macrolepidoptera appeared, with *Agrochola blidaensis* new to me. After two hours in heavy rain with fair numbers of moths coming to the lights, the rain stopped. We soon realised that no more moths were flying, so we were glad to pack up.



Figure 4. Amieiro in the Tua Valley, the most productive trapping site visited during the November 2009 field trip. (Photo: © Martin Corley)

Among the many problems of trying to record moths in very wet conditions (being wet to the skin with cold fingers, trying to write in a wet notebook with a pen that doesn't write when wet, egg boxes full of water and liable to disintegrate) is that a generator running in heavy rain can sometimes become live, giving electric shocks when touched. The same problem has occurred with one of the long wires I use. After once receiving shocks when winding up the wire in rain, I was always careful to unplug this wire before winding it up.

Uma viagem às Flores

Ana Valadares

Casa da Amendoeira, Sargaçal, 8600-316 Lagos, Portugal; email: ana.valadares@gmail.com;
https://orcid.org/0000-0001-6970-7301

Tenho ligações aos Açores. A família do meu pai era açoriana e vivi na ilha Terceira até aos oito anos. Gosto muito das ilhas, embora ainda não conheça todas.

Tinha decidido que a minha próxima visita aos Açores seria à ilha das Flores, de que tantas pessoas me falavam como sendo a mais bonita do arquipélago. A viagem foi programada para decorrer entre 8 e 14 de julho, na companhia do meu marido, irmão e cunhada.

As Flores corresponderam plenamente às expectativas. É uma ilha lindíssima, de um verde luxuriante, com inúmeras cascatas, lagoas e escarpas cobertas de vegetação. Os trilhos permitem explorar a ilha a pé, sempre rodeados de paisagens impressionantes, onde a água e o verde parecem estar presentes em todo o lado (Fig. 1).



Figura 1. Ribeira Grande na ilha das Flores
(Fotografia: © João Sequeira)

No entanto, as Flores também têm fama de ser uma ilha de difícil acesso devido às condições meteorológicas, especialmente durante o inverno. Embora a viagem tenha decorrido em julho, o tempo acabou por influenciar significativamente os nossos planos.

A viagem de Lisboa às Flores demorou cerca de 36 horas mais do que o previsto. Depois de partir de Lisboa com escala em Ponta Delgada, o avião chegou a sobrevoar a ilha das Flores durante cerca de uma hora, sem conseguir aterrar devido às condições meteorológicas, acabando por regressar a São Miguel. Seguiram-se atrasos e cancelamentos de voos, que nos obrigaram a passar uma noite nessa ilha.

Foi uma verdadeira festa de despachar bagagem e recolher bagagem, à medida que os voos eram alterados ou cancelados.

O resultado foi a perda de quase dois dias da nossa estadia nas Flores. O regresso foi menos atribulado, mas também não escapámos a atrasos e a um cancelamento. Ir às Flores não é fácil!

Quando planeei a viagem, pensei imediatamente em realizar várias sessões de armadilhagem de borboletas noturnas, idealmente uma em cada noite da estadia. Surgiu então um problema: que armadilha levar? Precisava de ser leve, ocupar pouco espaço e caber numa mala de cabine.

Foi então que me lembrei de uma sugestão antiga de Helder Cardoso, um verdadeiro engenhocas, que me tinha oferecido um balde retrátil e um colar isabelino para cães, sugerindo que poderiam vir a ser utilizados na construção de uma armadilha portátil. Na altura, a ideia não me pareceu muito promissora, mas, perante as limitações impostas pela viagem, resolvi experimentar.

Com a ajuda de algumas braçadeiras, fitas LED alimentadas por um powerbank e outros materiais simples, construí uma armadilha que acabou por cumprir eficazmente o seu objetivo (Fig. 2).

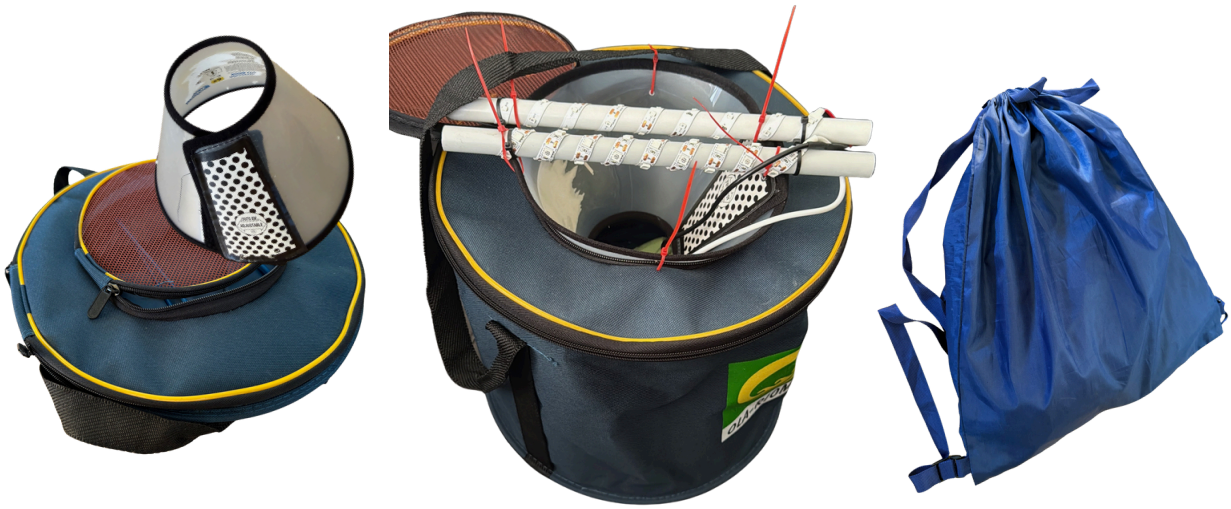

Figura 2. Balde retrátil, colar isabelino, armadilha montada e saco com todo o material (Fotografia: © Ana Valadares)

Infelizmente, a chuva persistente dos primeiros dias deitou por terra os planos de realizar várias sessões de armadilhagem. Só na última noite que passámos na ilha foi possível utilizar a armadilha.

Ficámos alojados na Fajã Grande, numa pequena casa com vista para o mar e para as escarpas cobertas de vegetação, de onde caem inúmeras cascatas. A paisagem é de tal forma impressionante que, por vezes, parece saída de um livro de histórias (Fig.3).



Figura 3. Fajã Grande nas Flores
(Fotografia: © João Sequeira)

Como um dos meus principais objetivos era realizar armadilhagem luminosa, procurei nas imediações um local sem luz artificial, com vegetação abundante e suficientemente acessível. Acabei por encontrar um local que reunia essas condições a cerca de dois quilómetros do alojamento.

A armadilha foi instalada nesse local na tarde de 13 de julho. Como a partida da ilha estava prevista para a manhã seguinte, tive de me levantar às 5h30 para percorrer os dois quilómetros a pé e recolher o equipamento antes de seguirmos para o aeroporto. Felizmente, a armadilha era suficientemente leve para ser transportada sem grande esforço, mesmo a essa hora da manhã.

Quando abri o balde, algumas borboletas fugiram antes de as conseguir registar, mas ainda ficaram algumas. Vá lá!

Apesar de ter conseguido realizar apenas uma sessão de armadilhagem durante toda a estadia, foi possível registar nove espécies: *Epiphyas postvittana* (4 indivíduos), *Gymnoscelis rufifasciata* (3), *Noctua carvalhoi* (4), *Noctua pronuba* (1), *Orthonama obstipata* (1), *Palpita vitrealis* (2), *Peridroma saucia* (1), *Thysanoplusia orichalcea* (1) e *Xestia c-nigrum* (2).

Destes registos, fiquei particularmente satisfeita por observar quatro exemplares de *Noctua carvalhoi* (Fig. 4), uma espécie endémica dos Açores que já tinha observado anteriormente na ilha de São Jorge.



Figura 4. Dois dos quatro exemplares de *Noctua Carvalhoi* observados
(Fotografia: © Ana Valadares)

Durante uma visita ao Poço da Ribeira do Ferreiro, um dos locais mais emblemáticos da ilha (Fig. 5), encontrei uma lagarta de Geometridae (Fig. 6) sobre *Laurus azorica* (Fig. 7). Como não consegui identificá-la no local, decidi tentar criá-la.



Figura 5. Poço da Ribeira do Ferreiro nas Flores
(Fotografia: © João Sequeira)



Figura 6. *Laurus azorica*
(Fotografia: © Ana Valadares)



Figura 7. Larva coletada em *Laurus azorica*
*(*Fotografia: © Ana Valadares)

Colhi vários ramos da planta hospedeira, acondicionei-os cuidadosamente para a viagem e regressei ao continente com a intenção de acompanhar o seu desenvolvimento. Só mais tarde me apercebi de que tinha trazido a lagarta, mas deixado as folhas nos Açores.

O que havia eu de lhe dar para comer?

Sem folhas de *Laurus azorica* disponíveis, tentei substituí-las por folhas de louro (*Laurus nobilis*), que a lagarta aceitou surpreendentemente bem, completando o seu desenvolvimento até à fase de pupa.

Ainda aguardo a emergência do adulto, mas as observações efetuadas durante a criação e a comparação com a informação disponível levam-me a suspeitar que possa tratar-se de *Ascotis fortunata azorica*, uma subespécie endémica dos Açores.

Apesar de todos os contratempos e de ter conseguido realizar apenas uma sessão de armadilhagem, a visita às Flores deixou-me com vontade de regressar, não só para continuar a explorar a fauna de Lepidoptera da ilha, mas também para voltar a desfrutar da beleza das paisagens e da tranquilidade que ali se encontra.

Algumas viagens terminam quando regressamos a casa. Esta ficou apenas adiada.

Guidance for authors

Articles should be submitted to the editor as Word files. They must be original work not published elsewhere.

Longer articles should be written in English, with a Portuguese or Spanish abstract. These papers will be peer-reviewed by one or more referees.

Short articles may be in English, Spanish or Portuguese, but English is preferred. They may be reviewed by a referee or not at the discretion of the editor.

Longer articles should have this format:

- Title
- Author(s)
- Address and e-mail address of author(s)
- Orcid number of author(s) (if available not obligatory).
- Abstract
- Key words
- Resumo or Resumen
- Key words
- Introduction
- Materials and Methods
- Abbreviations
- Results
- Discussion
- Acknowledgements
- References

Dates should appear in the format 6.vii.2024 (day.month.year).
The date of a record should be the actual date for daytime records, but records from overnight work should be the date on which the light was set, not the date when trap contents were examined.

References in the text should be given in the form (Vivaldi, 2014), or for two authors (Vivaldi & Beethoven, 2024), for more than two authors (Vivaldi *et al*., 2024).

In the References papers should be cited in the form:
Vivaldi, A. 2024. A quartet of new moths from eastern Portugal. *Lepidoptera fantastica*, **25** (2): 100–105.

Vivaldi, A. & Beethoven, L. 2024. Moonlight moth records. *Lepidoptera fantastica*, **25** (3): 180–197.

Vivaldi, A., Liszt, F. & Boccherini, L. 2024. Evidence that moths respond to classical music. *Lepidoptera fantastica*, **25** (3): 200–206.

Books should be cited:
Corley, M.F.V. 2015. *Lepidoptera of Continental Portugal. A fully revised list*. 288 pp. Martin Corley, Faringdon.

Book that is part of a series:
Huemer, P. & Karsholt, O. 1999. Gelechiidae I (Gelechiinae: Teleiodini. Gelechiini). In P. Huemer, O. Karsholt & L. Lyneborg (eds): *Microlepidoptera of Europe* **3**: 1–356.

Internet sites:
BOLD. 2007–2026. The Barcode of Life Data System.
http://www. v4.boldsystems.org/index.php

Lepiforum e.V. 2006–2026.
https://lepiforum.org/wiki/page/Lymantria_dispar

If available doi numbers should be included at the end of the reference:
Zlatkov, B., & Huemer, P. 2023. *Eucosma subvittana* (Staudinger 1892) stat. rev., a Mediterranean species resurrected by DNA barcodes and morphology (Lepidoptera, Tortricidae), *Zootaxa*, **5361** (4): 451-462.
https://doi.org/10.11646/zootaxa.5361.4.1

Index of papers published in *Artimelia – Lepidoptera Iberica* (Volumes 1–2)

Cardoso, H. 2025. First confirmed record of *Niphonympha dealbatella* (Zeller, 1847) (Lepidoptera: Yponomeutidae) in Portugal: a new genus and species for the national fauna. *Artimelia – Lepidoptera Ibérica* **1** (2): 98–101.

Conde, J., Figueiredo, H., Rodrigues, A. & Boieiro, M. 2025. *Daphnis nerii* (Linnaeus, 1758): registo de um esfingídeo raro em Portugal. *Artimelia – Lepidoptera Ibérica* **2** (1): 31–32.

Corley, M. 2025. A revision of Portuguese records of the genus *Gymnancyla* Zeller, 1848 (Pyralidae: Phycitinae). *Artimelia – Lepidoptera Ibérica* **1** (1): 57–60.

Corley, M. 2025. A revision of Portuguese records of the genus *Psorosa* Zeller, 1846 (Pyralidae: Phycitinae). *Artimelia – Lepidoptera Ibérica* **2** (1): 41–46.

Corley, M. 2025. Book review. Pyraloidea de la España Peninsular e Islas Baleares. Tx. Revilla, 2025. *Artimelia – Lepidoptera Ibérica* **1** (2): 119–120.

Corley, M. 2025. *Depressaria discipunctella* Herrich-Schäffer, 1854 in Portugal. *Artimelia – Lepidoptera Ibérica* **2** (1): 59–60.

Corley, M. 2025. How it all started. My first visit to Portugal in March 1989. *Artimelia – Lepidoptera Ibérica* **1** (2): 114–118.

Corley, M. 2025. *Merrifieldia menthae* (Chrétien, 1925) (Lepidoptera: Pterophoridae) in Portugal. *Artimelia – Lepidoptera Ibérica* **2** (1): 36–40.

Corley, M. 2025. Mothing in the rain. *Artimelia – Lepidoptera Ibérica* **2** (2): 144–147.

Corley, M. 2025. *Phyllonorycter berberidella* Nunes, Laštůvka & Laštůvka, 2026 (Gracillariidae) in Alto Alentejo. *Artimelia – Lepidoptera Ibérica* **2** (1): 56–58.

Corley, M. 2025. Preliminary studies on the genus *Apatema* Walsingham, 1900 (Autostichidae) in Portugal. *Artimelia – Lepidoptera Ibérica* **1** (2): 88–97.

Corley, M. 2025. The Lepidoptera of the Tua Valley, Portugal 2006–2014. *Artimelia – Lepidoptera Ibérica* **1** (1): 4–42.

Corley, M. 2025. Two corrections to the Noctuidae fauna of Portugal. *Artimelia – Lepidoptera Ibérica* **1** (1): 71–72.

Corley, M., Ferreira, S. & Fabião, J. L. 2025. The genus *Hellinsia* Tutt, 1905 (Pterophoridae) in Portugal. *Artimelia – Lepidoptera Ibérica* **2** (2): 111–118.

Corley, M., Nunes, J. & Yela, J. L. 2025. The status of some Arctiinae (Erebidae) in Portugal. *Artimelia – Lepidoptera Ibérica* **1** (2): 102–113.

Green, T. 2025. Lepidoptera recorded during a visit to Montechoro, Algarve, Portugal in June 2024. *Eupithecia minusculata* Alphéraky, 1883 (Geometridae, Larentiinae) is reported from Portugal for the first time. *Artimelia – Lepidoptera Ibérica* **1** (1): 61–70.

King, G. E. 2025. Una contribución al estudio de los geométridos de los alrededores de Valencia capital y su provincia (Insecta: Lepidoptera) con observaciones sobre su biología. *Artimelia – Lepidoptera Ibérica* **2** (2): 101–110.

King, G. E. 2025. Una contribución breve a los conocimientos de la biología de los geométridos recogidos en varias localidades de Madrid (Geometrinae, Sterrhinae). *Artimelia – Lepidoptera Ibérica* **2** (2): 134–143.

Lemos, P. 2025. Overlooked for 29 years: natural history and conservation of *Globia sparganii* (Esper, 1790) (Noctuidae) at Lagoa de Óbidos, West-Central Portugal. *Artimelia – Lepidoptera Ibérica* **2** (2): 119–133.

Lemos, P. 2025. Rediscovering *Gortyna flavago* (Denis & Schiffermüller, 1775) (Noctuidae) in Portugal after six decades: host-plant fidelity at the Atlanto-Mediterranean interface. *Artimelia – Lepidoptera Ibérica* **2** (2): 69–100.

Lemos, P. 2025. Two wetland-specific Lepidoptera new to Portugal, with notes on ecology, life history and conservation. *Artimelia – Lepidoptera Ibérica* **2** (1): 4–30.

Nunes, J. 2025. *Earias roseifera* Butler, 1881 (Nolidae: Chloephorinae), a new adventive species in mainland Portugal. *Artimelia – Lepidoptera Ibérica* **1** (2): 85–87.

Oliver Ruiz, F. E. & Oliver García, D. 2025. *Borkhausenia crimnodes* Meyrick, 1912 (Lepidoptera, Oecophoridae), a new species for Cantabria and Spain. *Artimelia – Lepidoptera Ibérica* **1** (1): 50–54.

Oliver Ruiz, F. E. & Oliver García, D. 2025. *Opogona omoscopa* (Meyrick, 1893) (Lepidoptera, Tineidae), a new species for Cantabria and new records of *Borkhausenia crimnodes* Meyrick, 1912 (Lepidoptera, Oecophoridae). *Artimelia – Lepidoptera Ibérica* **2** (1): 47–55.

Revilla, Tx., Morente, F. & de Juana, F. 2025. Presencia en España de *Willibaldiana culatrae* Trematerra, 2014 (Lepidoptera: Tortricidae). *Artimelia – Lepidoptera Ibérica* **2** (1): 33–35.

Rosete, J. & Nunes, J. 2025. Resumo Crítico de Microlepidoptera of Europe, Volume 10: Depressariidae, P. Buchner & M. Corley, 2024. *Artimelia – Lepidoptera Ibérica* **1** (1): 55–56.

Valadares, A. 2025. *Cerura erminea* (Esper, 1783) (Lepidoptera: Notodontidae): primeiro registo para Portugal. *Artimelia – Lepidoptera Ibérica* **2** (2): 65–68.

Valadares, A. 2025. Uma viagem às Flores. *Artimelia – Lepidoptera Ibérica* **2** (2): 148–152.

Valadares, A. & Cardoso, H. 2025. Primeiros registos de *Idaea trigeminata* (Haworth, 1809) e *Trisateles emortualis* (Denis & Schiffermüller, 1775) para Portugal e outros registos notáveis de Lepidópteros noturnos em Montalegre e Castro Laboreiro. *Artimelia – Lepidoptera Ibérica* **1** (2): 78–84.

Wilton, D. 2025. Algarve holiday produces a new moth species for Portugal. *Artimelia – Lepidoptera Ibérica* **1** (1): 43–49.