The status of some Arctiinae (Erebidae) in Portugal

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Abstract

The status of three taxa of Arctiinae (Erebidae) in Portugal is re-examined. *Coscinia cribraria* f. *benderi* (Marten, 1957) is recognised as present in Portugal. *Arctia villica angelica* (Boisduval, 1829) is treated as a species separate from *A. villica* (Linnaeus, 1758); both species occur in the country. *Eilema predotae* (Schawerda, 1927) is deleted from the Portuguese list as all published records belong to *E. marcida* (Mann, 1859).
Key words: *Coscinia*, *Arctia*, *Eilema*, Iberian Peninsula.

Resumo

O estatuto de três táxones de Arctiinae (Erebidae) em Portugal é reavaliado. *Coscinia cribraria* f. *benderi* (Marten, 1957) é reconhecida como presente em Portugal. *Arctia villica angelica* (Boisduval, 1829) é tratada como uma espécie distinta de *A. villica* (Linnaeus, 1758); ambas ocorrem no país. *Eilema predotae* (Schawerda, 1927) é removida da lista portuguesa, uma vez que todos os registos publicados correspondem a *E. marcida* (Mann, 1859).
Palavras-chave: *Coscinia*, *Arctia*, *Eilema*, Península Ibérica.

Introduction

Recently various questions have arisen leading to the reconsideration of the status of some taxa in the Portuguese checklist (Corley, 2015). Questions relating to three taxa of Arctiinae (Erebidae), *Coscinia benderi* (Marten, 1957), *Arctia villica* (Linnaeus, 1758) and *Eilema predotae* (Schawerda, 1927) are discussed in detail below.

Methods

The assessment of status in Portugal of each discussed taxon considered the relevant literature and the re-examination of available specimens and records accessible to the authors. For the genera *Arctia* and *Eilema*, DNA barcode evidence was also considered. Details of the methods used to obtain barcodes of Portuguese material are given in Ferreira et al. (2024).

Acronyms: Alto Alentejo (AAL), Algarve (ALG), Beira Alta (BA), Baixo Alentejo (BAL), Beira Baixa (BB), Beira Litoral (BL), Douro Litoral (DL), Estremadura (E), Minho (M), Ribatejo (R), Trás-os-Montes (TM).

Taxa with change of status in Portuguese Checklist

***Coscinia cribraria* f. *benderi* (Marten, 1957)**
***Coscinia cribraria* f. *guidoi* (Cruz, 1978)**

Coscinia benderi was excluded from the Portuguese Lepidoptera list by Corley (2015) on the grounds that there was no convincing evidence of its presence in Portugal. Earlier Cruz (1978) had described and illustrated *Coscinia cribraria* subsp. *guidoi* Cruz, 1978, a form very similar to *benderi*, from Ribatejo. This was synonymised with *Coscinia benderi* by Gómez Bustillo & Arroyo Varela (1981) without any real basis. Even though her specimens were not located, the rejection of *benderi* was therefore not well justified. Disagreement among various authors regarding the taxonomic status of this form was also cited as a reason for its exclusion. The status problem remains unresolved.

The *Coscinia cribraria* complex includes a range of forms, many of them named, often showing marked differences in habitus, but not always clearly separable and mostly with similar genitalia. In the most recent treatment of the complex, Macià et al. (2019) recognised *C. mariaerosae* Expósito, 1991 from Mallorca and *C. chrysocephala* (Hübner, 1810) from the southern part of the Iberian Peninsula and North Africa at species level. They also treated three forms as subspecies: *C. cribraria benderi* (Marten, 1957) from south-west Spain, *C. cribraria rippertii* (Boisduval, 1834) from the Pyrenees and *C. cribraria ibicenca* Kobes, 1991 from Ibiza and Formentera. Even after these taxa are separated from *Coscinia cribraria cribraria* it remains polymorphic with several named forms. Among synonyms of *Coscinia cribraria cribraria* listed by Macià et al. (2019) is subspecies *guidoi* Cruz, 1978, described from Abrantes in Ribatejo. The subspecies is illustrated (Cruz, 1978) with black and white photos of male and female and with drawings of genitalia of each gender prepared by Teodoro Monteiro.

In Portugal forms of *cribraria* that can be assigned to *benderi* and *guidoi* occur in Algarve and *guidoi* has also been found in Ribatejo and Estremadura. There is much that remains unclear about the status of these forms, including whether they should be treated as a single taxon or separated. Because there is such a lack of clarity and consensus as to what taxonomic status they should be given, we prefer to treat them as forms, not subspecies.

In *Coscinia cribraria cribraria* and its other forms the forewings are white with grey to blackish markings, nearly always including some transverse markings, sometimes as a row of dots. In contrast forms *guidoi* and *benderi* are light brown, grey-brown or grey with two off-white streaks, one along the costa and the other in mid-wing, usually branching shortly along the veins; there may be one or two dark spots near the wing base or at the end of the cell. Figures 3–7 show some examples. These cannot all be ascribed to one form or the other, because the differences between *guidoi* and *benderi* are only clear in typical forms.

Further understanding of these forms can only come from study of more specimens. Collection of specimens is strongly encouraged. There is no available DNA barcode for f. *guidoi* and none from f. *benderi* in Portugal. Macià et al. (2019) mention differences in larval and pupal morphology between *cribraria cribraria* and *benderi*. It would be desirable to rear Portuguese examples to discover if such differences also occur in Portuguese populations.

Material examined:

Coscinia cribraria cribraria (Linnaeus, 1758)

In Corley (2015), *C. cribraria* was reported from all 11 provinces of mainland Portugal. Since then, the recognition of *C. chrysocephala* (Hübner, 1804) as a distinct species (Macià et al., 2019), has left several provinces without confirmed records of *C. cribraria cribraria*. There are reported confirmed records from ALG, E, BL, BA, DL, M, and TM:

ALG: Carrapateira, Aljezur, 6.x.1993, M. Corley, P1996.
ALG: Perna da Negra, Monchique, 11.x.2020, A. Valadares.
ALG: Rocha da Pena, Loulé, 11.x.2024, J. Nunes, J. Fabião & T. Valkenburg (Fig. 1).
E: Praia da Fincha Grande, Óbidos, 13.vii.2023, H. Cardoso (5949-1836) (Fig. 2).
BL: Vila Nova, Miranda do Corvo, 30.viii.2015, J. Rosete.
BA: Caldas de Manteigas, Manteigas, 3.ix.2001, M. Corley.
DL: Panchorra, Serra de Montemuro, Resende, 4.viii.2024, J. Rosete.
M: Vidoeiro, Gerês, 16.vi.2002, ex larva, ix.2001, M. Corley, P7284.
TM: Guadramil, Bragança, 17.viii.2019, J. Nunes, C. Silva and E. Jesus.

Figure 1. *Coscinia cribraria cribraria* (Linnaeus, 1758), Rocha da Pena, Loulé, 11.x.2024, J. Nunes, J.L. Fabião & T. Valkenburg.

Figure 2. *Coscinia cribraria cribraria* (Linnaeus, 1758), Praia da Fincha Grande, Óbidos, 13.vii.2023, H. Cardoso (5949-1836).

Coscinia cribraria f. *benderi* (Marten, 1957)

ALG: Praia de Monte Gordo, Vila Real de Santo António, 1.x.1995, J.L. Yela (Fig. 3).
Spain, Huelva: Laguna de las Madres, Moguer, 1.x.1979, M. Huertas (Fig. 4).

Figure 3. *Coscinia cribraria* f. *benderi* (Marten, 1957), ALG: Praia de Monte Gordo, Vila Real de Santo António, 1.x.1995, J.L. Yela.

Figure 4. *Coscinia cribraria* f. *benderi* (Marten, 1957), Laguna de las Madres, Moguer, Huelva, Spain, 1.x.1979, M. Huertas.

Coscinia cribraria f. *guidoi* (Cruz, 1978)

ALG: N. of Alportel, 11.ix.1996, M. Corley, P4180.
ALG: Praia da Amoreira, Aljezur, 15.vi.2021, A. Valadares. (Fig. 5.)
ALG: Fonte Benémola, Loulé, 6.vi.2024, J. Nunes (JN0370) (Fig. 6).
ALG: Fonte Benémola, Loulé, 11.x.2024, J. Nunes (JN0418).
R: Abrantes,v.1949, M.A. da Silva Cruz, gen prep. 1.075 male (Cruz, 1978).
E: Lagoa Pequena, Sesimbra, 14.x.2024, H. Batista.
E: Berlengas, Peniche, 15.vii.2021, H. Cardoso (3281-896) (Fig. 7).
E: Berlengas, Peniche, 9.viii.2023, H. Cardoso (6683-2014).

Figure 5. *Coscinia cribraria* f. *guidoi* (Cruz, 1978), Algarve, Aljezur, 15.vi.2021, A. Valadares.

Figure 6. *Coscinia cribraria* f. *guidoi* (Cruz, 1978), Fonte Benémola, Loulé, 6.vi.2024, J. Nunes (JN0370).

Figure 7. *Coscinia cribraria* f. *guidoi* Cruz, 1874, Berlengas, Peniche, 15.vii.2021, H. Cardoso (3281-896).

Arctia villica (Linnaeus, 1758) and *Arctia angelica* (Boisduval, 1828)

Corley (2015) treated all records of *A. villica* (Linnaeus, 1758) from mainland Portugal as belonging to the subspecies *angelica* (Boisduval, 1829), which was reported from all provinces. Ortiz et al. (2023) expanded on the earlier work of Freina & Nardelli (2007) concerning the *Arctia villica* species complex in the Iberian Peninsula. They recognised *A. villica* (Linnaeus, 1758) and *A. angelica* (Boisduval, 1828) as separate species, although they found no consistent differences in external genitalia. Their separation was based instead on wing pattern and a 2.4% divergence in DNA barcodes. Differences in internal genitalia remain to be tested.

In *A. villica* (Fig. 8), the forewing is black with seven or eight white or pale cream spots (sometimes accompanied by one or more small dots): a basal spot; a pair (pair 1) before mid-wing; a smaller pair (pair 2) just beyond mid-wing (occasionally with one spot absent); and a larger pair (pair 3), with one spot at three-quarters and the other in the tornus; plus a final spot near the termen. Freina & Witt (1987) illustrate a range of variation in both species (as subspecies).

In *A. angelica* (Fig. 9), the pale markings are cream to pale yellow, of more irregular shape: the basal spot is present; pair 1 is fused; pair 2 is small; pair 3 is highly variable, with the tornal spot often fused with the dorsal spot of pair 2, and frequently also fused with the three-quarters spot and sometimes even the terminal spot. The total number of pale areas on the wing therefore ranges from four to six, although very small additional pale markings may occur on or near the costa and tornus.

Figure 8. *Arctia villica* (Linnaeus, 1758), Berganzo, Álava, Spain, 12.vi.1999, Tx. Revilla.

Figure 9. *Arctia angelica* (Boisduval, 1828), North of Bensafrim, Algarve, Portugal, 11.iv.1994, M. Corley.

Ortiz et al. (2023) reported *A. villica* from northern Spain. DNA-barcoded specimens from northern Portugal confirm that *A. villica* sensu stricto is also present in this country (see below). In contrast, material from southern Portugal, attributed to *A. angelica*, has not yet been barcoded.

Specimens showing the habitus of *A. villica* from BL, BA, and TM are illustrated in Fig. 10. This species is also known from DL and M. Specimens showing the habitus of *A. angelica* from AAL, E, BL, R, BB and BA are figured in Fig. 11. This species is also known from ALG and BAL.

Preliminary evidence suggests that *A. villica* is largely restricted to northern Portugal, extending southwards perhaps as far as Coimbra, while *A. angelica* occurs mainly in the southern half of the country and possibly also in parts of the northern interior. Whether their distributions overlap remains uncertain. In Spain Ortiz et al. (2023) found some overlap of distribution areas and evidence from DNA barcodes of introgression, where moths of *A. angelica* phenotype had DNA barcode of *A. villica*. This indicates past hybridisation with persistence of the maternally inherited barcode fragment of DNA.

Material of *Arctia villica* (Linnaeus, 1758) confirmed by DNA barcode:
BA: Rio Agueda, Quinta da Chegão, Figueira de Castelo Rodrigo, 16.v.2018, M. Corley, S. Ferreira, L. Silva, D. Oliveira and R. Mateus (INV06303).
M: South of Salamonde, Serra da Cabreira, 31.v.2010, E.J. van Nieukerken (RMNH.INS27759).
TM: Sambade, Alfândega da Fé, 31.v.2016, M. Corley, V. Mata, R. Andrade and S. Ferreira (INV02428).

Additional material of *A. villica* examined:
DL: Ansiães, Amarante, 15.vi.2019, J. Nunes.
Records from BA, BL and TM in caption to figure 10, below.

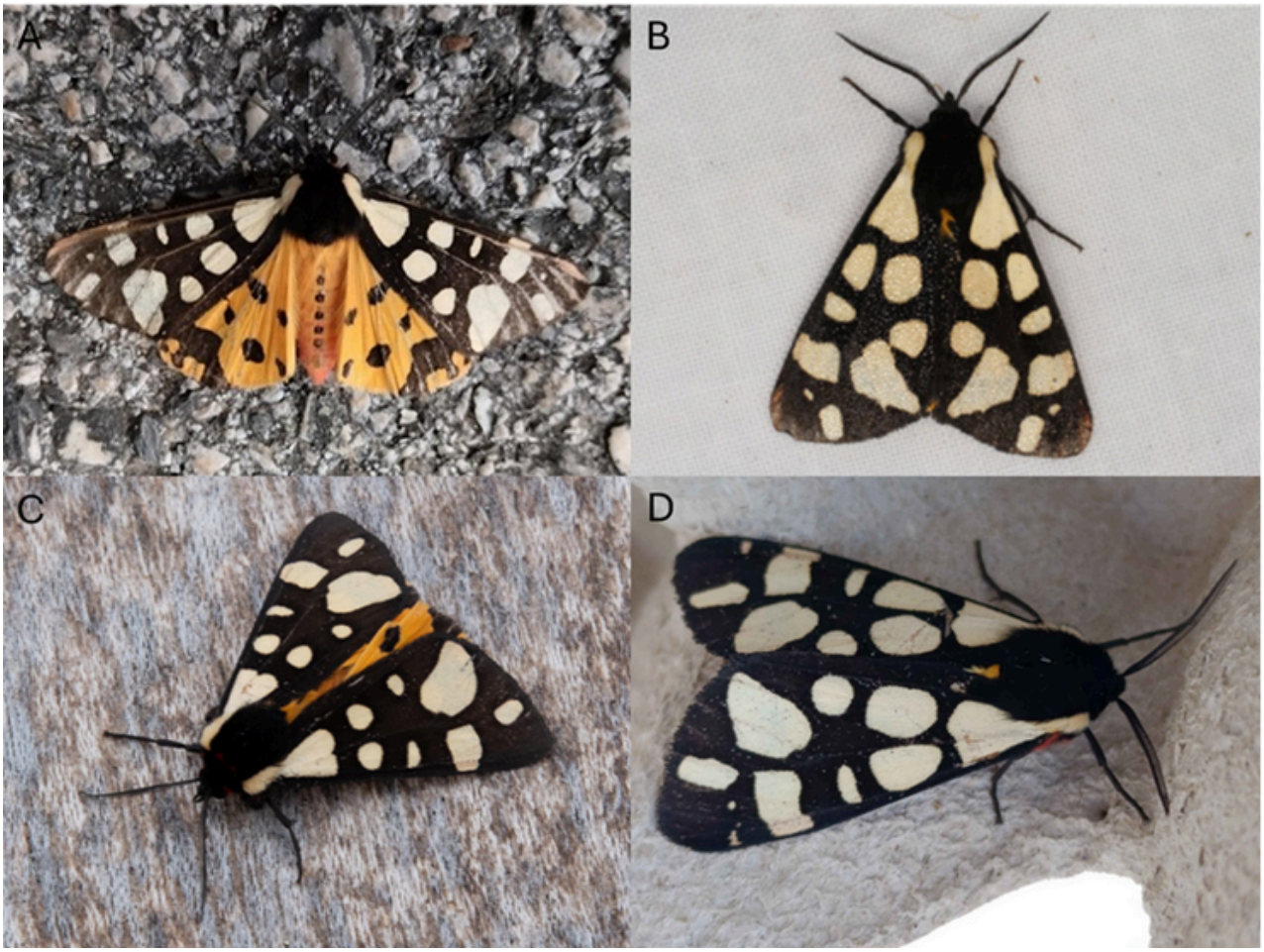

Figure 11. *Arctia villica* (Linnaeus, 1758) records from the Portuguese Moth Recording Scheme (Nunes et al., 2025). **A.** BL: Mata da Margaraça, Arganil, 5.vi.2025, P. Tenreiro. **B.** BA: Quinta dos Calhastros, Gouveia, 7.vi.2025, S. Duarte. **C.** BL: Podentes, Penela, 1.vi.2025, L. Cardoso. **D.** TM: Pedras Salgadas, Vila Pouca de Aguiar, 8.vi.2025, H. Magalhães.

Material of *A. angelica* (Boisduval, 1828) examined:
ALG: Vale da Fonte, W. of Bordeira, Aljezur, Algarve, 11.iv.1994, M. Corley specimen P2138.
AAL: South of Estremoz, Alto Alentejo, 11.iv.1997, M. Corley specimen P4211.
Records from AAL, R, E, BL, BB and BA in caption to figure 11, below.

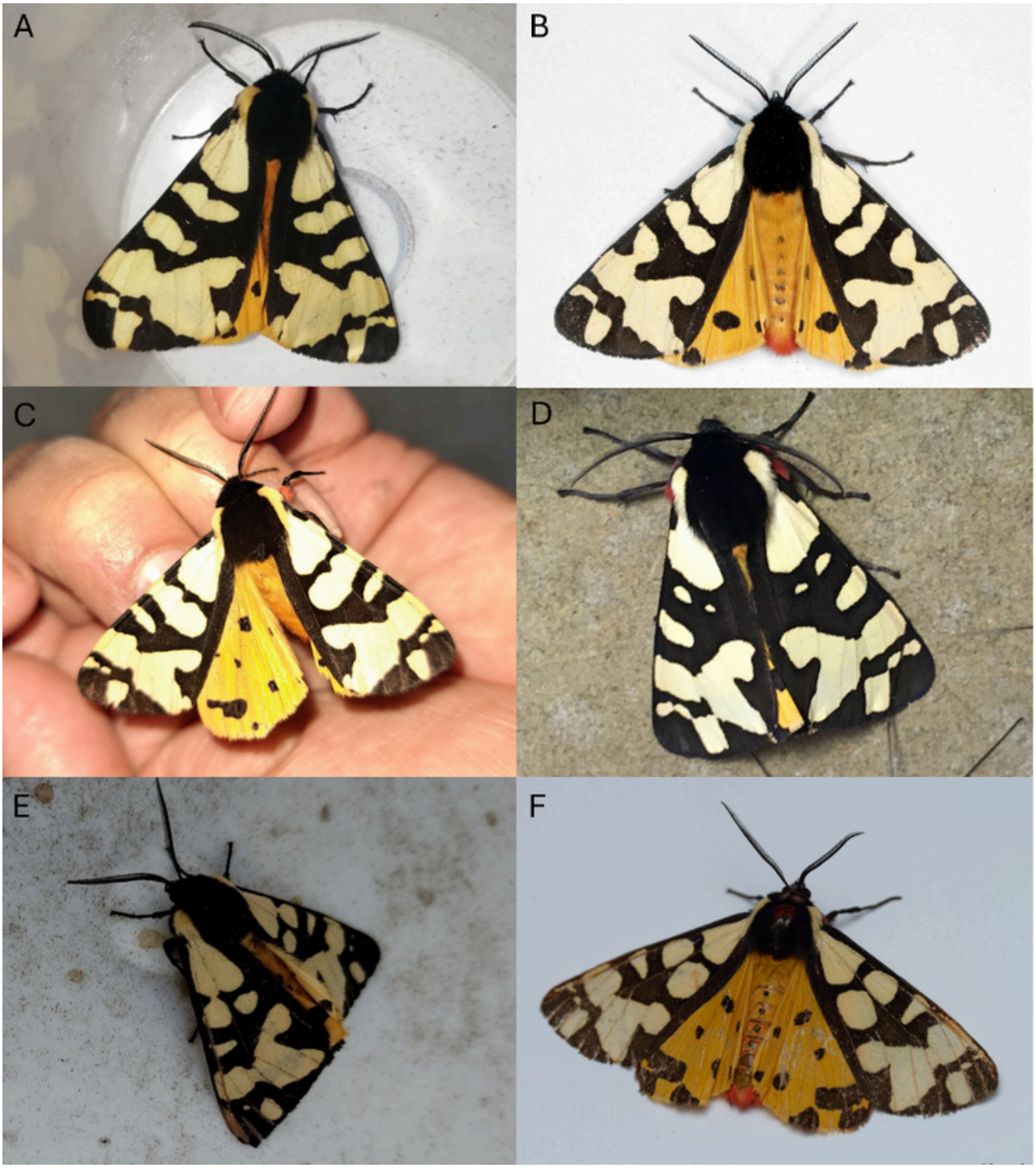

Figure 11. *Arctia angelica* (Boisduval, 1828) records from the Portuguese Moth Recording Scheme (Nunes et al., 2025). **A.** R: Areia de Cima, Alvega, Abrantes, 7.iv.2023, A. Santos. **B.** E: Trafaria, Almada, 23.iv.2025, J.L. Fabião. **C.** AAL: Évora, 13.iv.2024, S. Mateus. **D.** BL: Rio Seco, Batalha, 22.iii.2024, S. Mourão. **E.** BB: Castelo Novo, Fundão, 23.v.2025, P. Tenreiro. **F.** BA: Guarda, 6.ix.2023, E. Flor.

***Eilema predotae* (Schawerda, 1927)**

Eilema predotae was described by Schawerda from Albarracín in eastern Spain. The species was first recorded in Portugal by Teodoro Monteiro, who collected three specimens at Santana, Sesimbra (west of Setúbal) in August 1964. On 7 September 1969, he obtained two further specimens near Ribeira de Torgal, Vila Nova de Milfontes, Baixo Alentejo (Monteiro, 1975). His paper includes a drawing of the male genitalia. Monteiro reported that he had offered a specimen to Hervé de Toulgoët in Paris and had also shown him the drawing. De Toulgoët, at that time and for many years thereafter, was the leading authority on the Arctiidae.

In the Corley collection, there is a specimen of *E. predotae* collected by Barry Goater at Santiago de Cacém, Baixo Alentejo, in 1996. Other specimens in the same collection, confirmed by Goater, include one from Rio Maior, Ribatejo and another from Sesimbra, Estremadura (Fig. 12). These specimens appeared distinctive in habitus, with smoky-grey fore- and hindwings, a dull pale yellow forewing costa and usually slightly smaller than most *Eilema*, about the size of *E. uniola* (Rambur, 1866) but distinctly larger than *E. rungsi* Toulgoët, 1960. As further records accumulated, the species seemed to show a characteristic distribution, restricted to the western side of Portugal from Algarve to the Rio Mondego. Although not exclusively coastal, all records were from within 40 km of the shore, many from limestone sites.

More recently, questions have arisen concerning the occurrence of *E. predotae* in Portugal, suggesting that all records may in fact belong to *E. marcida* (Mann, 1859). This latter species was recorded from Barro, Torres Vedras, by Mendes (1910), although the identification cannot be confirmed because Mendes' collection lacks specimen labels. Gastón et al. (2007) recognised *E. marcida* as present in Spain, where it had previously been confused with *E. pygmaeola* (Doubleday, 1847). This led to confirmation of its occurrence in Portugal (Corley et al., 2009), with records from Algarve (Fig. 13) and Baixo Alentejo. At the time, these specimens were not confused with "E. predotae", being paler grey, without evident pale costa and slightly larger than the west coast form attributed to *predotae*.

A specimen collected at Chão de Couce, Pombal, Beira Litoral was originally identified as *E. predotae*, but DNA barcoding places it under *E. marcida* (INV03703). Examination of genitalia from several Portuguese specimens previously identified as either *predotae* or *marcida* indicates that only one species is present. However, the male external genitalia of these two taxa are very similar (e.g. Witt et al., 2011; Ylla et al., 2020.), which may explain the early misidentifications by de Toulgoët and Monteiro. *E. predotae* should therefore be removed from the Portuguese list, as there is currently no evidence of its occurrence in the country. All records are presumed to belong to *E. marcida*, although additional barcoding of specimens would be desirable to confirm this. *Eilema marcida* (Mann, 1859) is reported from all the southern provinces of Portugal, extending northwards to Beira Litoral and Beira Baixa.

Material examined:
ALG: São Romão, São Brás de Alportel, 11.ix.1991, M. Corley, P862.
AAL: Besteiros, Serra de São Mamede, Arronches, 1.ix.2001, M. Corley.
R: Marmeleira, Rio Maior, 12.ix.2002, M. Corley, P6730.
E: Sesimbra, 1.ix.2002, M. Corley, P6563.
BL: Chão de Couce, Pombal, 3.ix.2016, M. Corley and J. Rosete (INV03703).

Additional records:
BAL: Vila Nova de Milfontes, 7.ix.1969, T. Monteiro (Monteiro, 1975).
E: Santana, Sesimbra, viii.1964, T. Monteiro (Monteiro, 1975).
R: Areia de Baixo, Casa Branca, Abrantes, 5.vi.2023, P. Alves (Corley et al., 2024).
BB: Monte Barata, Idanha-a-Nova, 13.ix.2010, E. Marabuto (Marabuto et al., 2013).

Figure 12. *Eilema marcida* (Mann, 1859) previously determined as *E. predotae*, Sesimbra, Estremadura, 1.ix.2002, M. Corley, P6563.

Figure 13. *Eilema marcida* (Mann, 1859). São Romão, São Brás de Alportel, Algarve, 11.ix.1991, M. Corley, P862.

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