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Designation of lectotypes for some Spanish and other western European *Melitaea* taxa, some with mixed syntypic series of *M. phoebe* ([Denis & Schiffermüller], 1775) and *M. ornata* Christoph, 1893 (Lepidoptera: Nymphalidae)

P. J. C. Russell, L. Bartolozzi, R. L. Hawkins, W. J. Tennent & T. Léger

Abstract

Morphological characters of value in distinguishing *Melitaea phoebe* from *M. ornata* are exemplified from photographs of specimens from sympatric and partially synchronic populations in North Macedonia and Italy. Subspecies described as belonging to *M. phoebe* by several authors from specimens taken in Spain and other Western European countries are examined and their identities reviewed. Those which are shown to be subspecies of *M. ornata* are figured together with identification labels attached to the specimens. Where syntypes have been identified, lectotypes and paralectotypes are designated where appropriate. Some subspecies which are genuinely *M. phoebe* are commented upon. Eleven syntypes of *M. phoebe occitanica* are examined and found to comprise both *M. phoebe* and *M. ornata*; a *phoebe* lectotype is designated and its Type Locality is restricted to Barcelona, Spain. Lectotypes are also designated for the names *bethunebakeri*, *ornatiformis*, *emipunica* and *punicata*. Original identifications predate the separation of these two species and exemplify difficulties previous researchers had in separating them. *M. ornata pseudornata* is sunk in synomymy with *M. ornata bethunebakeri*. It is noted that some historic and often worn specimens are extremely difficult to identify with certainty.

KEY WORDS: Lepidoptera, Nymphalidae, *Melitaea*, *Melitaea phoebe*, *Melitaea ornata*, Spain, Europe.

Designación de lectotipos de *Melitaea* taxa de algunas españolas y otras del oeste europeo, algunas con series sintípicas mezcladas de *M. phoebe* ([Denis & Schiffermüller], 1775) y *M. ornata* Christoph, 1893 (Lepidoptera: Nymphalidae)

Resumen

Se proporcionan caracteres morfológicos de especímenes fotografiados para distinguir *Melitaea phoebe* de *M. ornata* a partir de poblaciones simpátricas y parcialmente sincrónica del norte de Macedonia y de Italia. Se examinan y se revisan sus identidades, las subespecies aceptadas descritas de *M. phoebe* sobre la base de ejemplares capturados en España y otros países de Europa occidental. Se presentan imágenes de aquellas que resultan ser subespecies de *M. ornata*, junto con las etiquetas de los ejemplares. Cuando los sintipos han sido identificados, se han designado los lectotipos y paralectotipos, cuando era necesario. Se comentan las subespecies que pueden adscribirse genuinamente a *M. phoebe*. Se han examinado once sintipos de *M. phoebe occitanica*, encontrándose que corresponden tanto a *M. phoebe* como a *M. ornata*; se designa un lectotipo de *phoebe* cuya localidad tipo es Barcelona, España. Se designan igualmente lectotipos para los nombres *bethunebakeri*, *ornatiformis*, *emipunica* y *punicata*. Las identificaciones originales preceden a la separación de estas dos especies y sirven para ejemplificar las dificultades que investigadores anteriores han tenido para separarlas. *M. ornata pseudornata* se designa como

sinonimia de *M. ornata bethunebakeri*. Se hace notar que algunos ejemplares históricos y frecuentemente en mal estado son extremadamente difíciles de identificar con seguridad.
PALABRAS CLAVE: Lepidoptera, Nymphalidae, *Melitaea*, *Melitaea phoebe*, *Melitaea ornata*, España, Europa.

Introduction

Melitaea ornata Christoph, 1893 [Type Locality (TL): *Circa* "Guberli", promontorium uralensium australium (near Guberlya, Orenburg Province, Russian Federation)] was convincingly separated from *Melitaea phoebe* ([Denis & Schiffermüller], 1775) [TL: environs of Vienna, Austria] simultaneously by RUSSELL *et al.* (2005) and VARGA *et al*. (2005), using the names *emipunica* and *ogygia*, respectively. Type material of *phoebe* was considered lost, and a neotype was designated from a specimen reared from ova laid by a female taken from the type locality (TENNENT & RUSSELL, 2010). Syntypes of taxa collected in Western Europe and named as subspecies of *M. phoebe* are present in various European museums; many of these have recently been properly associated with *M. ornata* (TÓTH & VARGA, 2011; RUSSELL & TENNENT, 2016), without formal designation of lectotypes where appropriate. This is remedied in this paper.

GARCÍA-BARROS *et al.* (2013) rejected subspecific divisions of *M. phoebe* in Spain because of its "seasonal variability"; however, this is re-examined in the light of the recent discovery of *M. ornata* in Spain by SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017a), who found it to be distributed in Granada, Jaén and Albacete. Some primary types of Spanish *Melitaea* subspecies, nominally of *M. phoebe*, are examined here in order to reassess their identity. The syntypic series of a number of *M. phoebe* subspecies have been assessed and found to contain both species. In general infrasubspecific names, quadrinomials and those of varieties and aberrations have not been investigated, except where there is a comment to be made about them. Synonymic names relating to *M. ornata* are in accordance with RUSSELL & TENNENT (2016).

Separation of *M. ornata* from *M. phoebe* based on adult morphology

The identification of these two species from museum material can be problematic, as full-proof identification ideally requires an examination of the late instar larvae (RUSSELL *et al*., 2007: 159 [figures]). However, forewing shape, detailed pattern of the submarginal markings of the ventral wing surfaces and the shape of the tips of the antenna usually provide a good indication (cf TÓTH & VARGA, 2011: appendix) particularly when there are several syntypes available from the same population. Details of the habitat where they were captured are also of value. *M. phoebe* prefers relatively moist mesophilous conditions, whereas *M. ornata* is usually found in hot dry biotopes (RUSSELL *et al*., 2007). Figures 1-4 illustrate the undersides of specimens from two sympatric and partially synchronic populations of *M. phoebe* and *M. ornata* from North Macedonia and Italy demonstrate the following differences: forewing apices of males tend to be acute in *M. phoebe* but more rounded in *M. ornata* (females of both species tend to be rounded); the black submarginal markings on the undersides of the wings tend to be linear arches touching the intervening veins in *M. phoebe* but more triangular in shape and not meeting these veins in *M. ornata*; tips of the antennae are club-shaped and more pointed in *M. phoebe* but foreshortened and spatulate in *M. ornata*.

Designations of lectotypes, in chronological order

Melitaea phoebe v. *occitanica* Staudinger, 1871; the Type Locality (TL) is disputed: originally Staudinger gave "It." (= Italy) but this was an error (recte "Iberia", HIGGINS, 1941: 336). The syntypic series present in the Zoologisches Museum der Humboldt Universität, Museum für Naturkunde, Berlin comprises 11 specimens (5 ♂♂ and 6 ♀♀) from three different localities. All specimens have the label "Origin" on their pins but Staudinger did not specify a holotype. The syntypes are from three widely spread Spanish collecting locations: "Barcelona" (3 ♂♂ and 3 ♀♀), "Granada" (1 ♂ and 2 ♀♀) and "San

Ildefonso", Segovia (1 ♂ and 1 ♀). This has resulted in two different authors suggesting limiting the Type Locality to two different locations: firstly, FRUHSTORFER (1916: 82 (A) (2):1) suggested it should be "Andalusia" and this was accepted by HIGGINS (1941: 336); secondly, VERITY (1928: 163) suggested "Barcelona" and this was accepted by VAN OORSCHOT & COUTSIS (2014: 60), who figured a specimen from Barcelona. The issue arises that the specimens from Barcelona are *M. phoebe* but those from Granada are *M. ornata*, and the female from San Ildefonso (specimen c2e3b8) is *M. ornata*, with foreshortened antenna and submarginal markings not touching the intervening veins, whilst the identity of the San Ildefonso male is questionable with specific characteristics not well defined. However, the locality at an altitude of c. 1200 m in the Sierra de Guadarrama, where it is hot and dry in the summer, is indicative of univoltine *M. ornata*.

The name *occitanica* has been in common use by lepidopterists for almost 150 years to represent the form of *M. phoebe* found in the Iberian Peninsula. Thus, in order to preserve this stability, a male specimen of *M. phoebe* from Barcelona is here designated as lectotype for *M. phoebe* v. *occitanica* Staudinger, 1871 (Figs 5a, b) and labelled accordingly (Fig. 5c). The labels on the pin of the lectotype are as follows: on pink paper with black surround "Origin"; on white paper handwritten in black "Barcelona"; on white paper printed in black "ex coll." and handwritten in black "3/11"/ printed "Staudinger"; on white paper printed in black: "http://coll.mfn-/berlin.de/u/ /c2e41c"; on purple-bordered white circle printed: "LECTO-/ TYPE"; on white paper printed in black: "LECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019".

Remaining syntypes from Barcelona are hereby designated as paralectotypes and have had the following labels added to their pins: on circular pale blue-bordered white paper printed in black: "PARA-/ LECTO-/ TYPE"; on white paper printed in black: "PARALECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019".

We hereby limit the Type Locality for *M. phoebe* v. *occitanica* to "Barcelona", Spain.

In order to demonstrate the different specific identifications we also here figure a male syntype from Granada (Figs 6a, b) and a female from San Ildefonso (Figs 7a, b), which clearly show the characteristic morphology of *M. ornata*. The three syntypes from Granada and the two from San Ildefonso are here designated as paralectotypes and have had the following labels added to their pins: pale blue-bordered on circular white paper printed in black: "PARA-/ LECTO-/ TYPE"; on white paper printed in black: "PARALECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019/ ("misident. Recte:/ *Melitaea ornata* Christoph, 1893") (Fig. 6c, 7c).

Melitaea phoebe ogygia Fruhstorfer, 1908 [TL: Greece, Poros Island]; name used by VARGA (1967) for Hungarian populations of what proved later to be *M. ornata*. According to BERNARDI & DE LESSE (1951: 140), a single female "holotype" is present in the Museum National d'Histoire Naturelle de Paris (MNHNP) (Figs 8a, b). Fruhstorfer did not routinely designate holotypes but since there is only one specimen it can be regarded as the holotype. From the photograph (Fig. 8b) of the underside of this specimen, it can be seen that it has centrally thickened triangular black submarginal markings not touching the intervening veins on both fore- and hindwings and also foreshortened tips to the antenna (spatulate). Thus *ogygia* is *M. ornata* and not *M. phoebe* as described originally by Fruhstorfer, a suitable label has been attached (Fig. 8c).

Melitaea phoebe ab. *totila* Stauder, 1914 [TL: Italy, Calabria, Cosenza, Mt. Cocuzzo] was described as an aberration ("Ich benenne diese Aberration Forma *totila*, ab. nov."), thus Stauder's 1914 name *totila*, although it has been given subspecific status by TÓTH & VARGA (2011) has no status in nomenclature. The whereabouts of the specimen is not known but its geographic source, south of the known distribution of *M. phoebe* in Italy, suggests it is an aberration of *M. ornata* (RUSSELL & TENNENT, 2016: note 92; RUSSELL, 2018: 258). VERITY (1938: 152 and Tav. 43: figs 68, 69) considered this to equate to *M. phoebe phoebina* Turati, 1921 (see below); however his illustrations appear significantly paler than Stauder's much darker melanic female (STAUDER, 1914: 373, fig. 1).

Melitaea phoebe narenta Fruhstorfer, 1917(a) [TL: Bosnia and Herzegovina, Herzegovina, Jablanica] was described from five females in the "Leonhard collection" (Leonhard does not appear to

be in any list of entomologists and thus was presumably an amateur butterfly collector) and a pair of "Types" in Fruhstorfer's collection (FRUHSTORFER, 1916: 1) in the MNHN, Paris (MNHNP). BERNARDI & DE LESSE (1951: 141) reported only a single male "holotype" in Fruhstorfer's collection but both a male and a female are present in the collection, thus there appear to be two syntypes. A further "paratype" (i.e. a syntype) was reported as being in the Natural History Museum, London (VAN OORSCHOT & COUTSIS (2014: 61).

Jablanica lies on the Neretva River at an elevation of c. 200 m; VAN OORSCHOT & COUTSIS (2014: 61) unfortunately misconstrued this as Mount Jablanica, which is on the North Macedonia/Albania border and mostly above 2000 m. The true locality, adjacent to both the Neretva River and Jablanica Lake, suggests a humid biotope typical of *M. phoebe*; however prior to the building of the dam in 1954, the habitat was more xerophilous. On close inspection of the photographs of the undersides of the two specimens it was concluded that they belonged to *M. phoebe* as described by Fruhstorfer and in agreement with VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: note 55).

Melitaea phoebe gerinia Fruhstorfer, 1917 [TL: Portugal, Lissabon {Lisbon}]; BERNARDI & DE LESSE (1951: 141) reported that there were no specimens of this subspecies in Fruhstorfer's collection in MNHNP. However, Rodolphe Rougeri found a male specimen there. From photographs of the underside it can be concluded that, despite the somewhat triangular shape of the submarginal black markings, they touched the intervening veins, the antennal tips were club shaped and not spatulate and the forewing apices appeared more acute than rounded. This specimen is correctly identified as *M. phoebe*, as described by Fruhstorfer and in agreement with VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: note 39).

Melitaea phoebe guevara Fruhstorfer, 1917 [TL: Spain, Castilien, (Cuenca mont.)] was described from three males in the "Leonhard collection". There is a significant statement in the description given by FRUHSTORFER (1917: 19), who said that this subspecies bore a close relationship to both subspecies *ogygia* from Greece and *telona* from "Palästina" (considered to be near Jerusalem, Israel [HIGGINS, 1941: 335]). Both are morphologically very similar and were considered to be *M. ornata* (RUSSELL & TENNENT, 2016: notes 59 and 91); however, TÓTH *et al*. (2014) suggested that *M. telona* may be a fourth species in this group. HIGGINS (1941: 349) suggested a similarity between *guevara* and subspecies *bethunebakeri* (see below). A "holotype" male and two male "paratypes" (i.e. three syntypes) were recognised by BERNARDI & DE LESSE (1951: 141). HESSELBARTH *et al*. (1995: 1030/1031 stated that they should be considered more correctly as lectotype and paralectotypes, with which the present authors agree. An inspection of the Fruhstorfer collection in MNHNP by RR revealed that there are three male specimens present, two of which have "PARATYPE" labels attached (presumably, since they were the first to mention "paratypes", by BERNARDI & DE LESSE, 1951: 141) but the third specimen has no "type" label. The question arose: was this third specimen one of the syntypes with the "HOLOTYPE" label missing? A close inspection of the wing and antenna morphology from high quality photographs (Figs 9a, b, 10a, b, 11a, b) indicated that the specimens all belong the same species, *M. ornata*, in contrast to VAN OORSCHOT & COUTSIS (2014: 61), based on studies of genitalia, and RUSSELL & TENNENT (2016: 48, note 41), who both considered, prior to the confirmation of the presence of *M. ornata* in Spain, that all Iberian subspecies were of *M. phoebe*.

Inspection of the labels (Figs 9c, 10c, 11c) revealed no indication that any of the specimens had originated from the Leonhard collection. The location labels were similar in all respects, being handwritten as follows: "Castilien [underlined with printed dots]/ Cuenca/ mont./ 1900 Korb". Conversely, the identification labels, also handwritten, were not all the same: the two specimens with "PARATYPE" labels were handwritten as follows: "*M. phoebe/ guevara* Fruhst.", whereas the label of the "non-type" specimen was written in a different hand as follows: "*Melitaea phoebe*/ ssp. *guevara* Frhst./ 1917 (*Soc. Ent.* p. 19)". Although it is possible that this is the specimen observed by BERNARDI & DE LESSE (1958), it cannot be assumed that this is their presumed 'holotype'. Since it is possible that the specimen with the "HOLOTYPE" label may turn up in the future, it was considered

unwise to designate a lectotype under these circumstances. We here formally identify the three available syntypes as *Melitaea ornata guevara* Fruhstorfer, 1917, **comb. n.**

Melitaea phoebe emipunica Verity 1919 [TL: Italy, Sicily, Palermo]: there are four male and one female specimens present in the Museo Zoologico de "La Specola" dell'Università, Firenza, Italy (cf. RUSSELL & BARTOLOZZI, 2019: Fig. 1). The male, which was figured by VERITY (1950: 152; Tav. 43: fig. 63) and given more accurate locality data: "San Martino della Scala m. 800 (Monreale Palermo); 5 V", is here designated as the lectotype of *Melitaea phoebe emipunica* (Figs 12a, b). The squat triangular submarginal black markings barely touching the black intervening veins (Fig. 12b) clearly place the taxon *emipunica* with *M. ornata*. *M. phoebe* has not so far been proven to occur in Sicily (RUSSELL, 2018: 258). The labels on the pin (Fig. 12c) are as follows: black print on yellow paper "Monreale (San Martino)m. 800/ PALERMO ISOLA di SICILIA/ 6 Maggio 1919 Querci"; black print on white paper "Ex coll. R. Verity"; black print on pink paper "Syntypus"; printed on yellow paper "FIGURATO DA/ R. VERITY FARF. D. IT./ TAV. 43 (hand-written)/ FIG. 63 (hand-written)"; Black print on red paper *"Melitaea ornata/ emipunica* Verity 1919/ LECTOTYPUS/ P. RUSSELL & L. BARTOLOZZI 2019". Both VAN OORSCHOT & COUTSIS (2014) and RUSSELL & TENNENT (2016) agreed with this determination.

Melitaea phoebe phoebina Turati, 1920 [TL: Italy, Calabria, Aspromonte, 1400 m]; this form was described on page 222 and the uppersides figured on tav. II figs 4 ♂♂ and 5 ♀♀, from which it appears to be a fairly heavily marked form, hence Verity's suggestion that the ab. *totila* of Stauder (see above) equated to this subspecies. The undersides were not figured by Turati but the forewing apices appear rounded as in *M. ornata*. According to CONCI & POGGI (1996) the collection of E. Turati is in the Museo Regionale di Scienze Naturali, Torino, Italy, (MRSN). NEKRUTENKO (1993: 129) listed the type material of Turati in this museum and referring to this subspecies stated that there were two female syntypes from the Aspromonte Mountains in the Province of Reggio Calabria, Italy and identified them as *Melitaea phoebe*, being unaware of the specific separation of *M. ornata*.

Unfortunately, the entomology collections in the Turin Museum are not currently accessible for administrative reasons and it has not been possible to inspect type material. However, it is possible to make a speculative identification, based on current knowledge of the distributions of the two species. Based on the collecting locality, this subspecies is almost certainly *M. ornata* as *M. phoebe* sensu strictu has not been recorded this far south in peninsular Italy; its limit appears to be Calabria, Cosenza, Monte Martinelli (RUSSELL & PATEMAN, 2011), where *M. ornata* also occurs. Six males and one female of this subspecies are present in the Rothschild collection in the Natural History Museum London (Russell and Tennent, pers obs.). This taxon was not considered by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 51, note 67) suggested it was *M. ornata* because of its location in southern peninsular Italy.

Melitaea phoebe rostagnoi Turati 1920 (223 and Tav. II, figs 10-12) [TL: Italy, Roma, Monte Autore]; from the figure 10, the male forewing apices appear distinctly acute as in *M. phoebe*. NEKRUTENKO (1993: 129) listed the Type material of Turati in the Museo Regionale di Scienze Naturali, Torino, Italy, (MRSN) and referring to this subspecies stated that there were two male and three female syntypes from Monte Autore, Province of Rome, Italy; he identified them as *Melitaea phoebe*, a conclusion with which we cannot argue.

In view of the current long-term closure of the museum we cannot be sure of their identity, but *M. phoebe* seems most likely. No specimen of *M. ornata* has been observed in peninsular Italy north of San Marco Catola, Foggia, Apulia, Italy (c. 41º 30' N.) (CAGNETTA 2016: 246). Similarly the aberration *sterlineata* Turati, 1921: (Fig. 12), with an almost unmarked discal area of the forewing and from the same locality, is most likely *M. phoebe*; VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: 52, note 75) agreed with this determination.

Melitaea phoebe punicata Ragusa, 1921 [TL: Italy, Sicily, Palermo District]. Apparently the Sicilian Macrolepidoptera collection of É. E. Ragusa was sold to Walter, Lord Rothschild (HORN *et al.*, 1990). There are nine males and five females in his collection at NHM, London, UK. (Russell and Tennent, pers. obs.); no indication that the material was syntypic was present on any of the data labels.

According to GREGORI (1926) another part of the butterfly collection of Énrico Ragusa was in the Instituto di Zoologia, Universita di Napoli, Portici, Italy (ZIUP); at our request Roberta Improta made a thorough search of the Naples Museum collections but was unable to find any of Ragusa's *M. phoebe* specimens (see Acknowledgements). From the NHM specimens, which are clearly *M. ornata*, a male captured by Ragusa in the District of Palermo is herewith designated as a lectotype. The specific characters of *ornata* are clearly visible in the photographs of the lectotype (Figs 13a, b). *M. phoebe* has not been reported from Sicily (RUSSELL, 2018). The labels on the pin of the lectotype (Fig. 13c) are as follows: on beige paper, part printed part handwritten "Prov. Palermo/ Local. V[all] Corta/ Data 10.5.[1]917/ Coll. E. Ragusa"; on beige paper, printed "Sicily,/ coll. E. Ragusa"; on purple-bordered circular white paper printed "LECTO-/TYPE"; on beige paper printed "Rothschild/ Bequest/ B.M. 1939-1."; on white paper printed "LECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019".

We here designate the remaining 13 syntypes as paralectotypes, of which six have the following labels: on beige paper, printed "Sicilien"/ hand written "Ficuzza/ 5"/ printed "Geo.C.Kr."; on beige paper printed "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019", 4 have the following labels: on beige paper with black surround handwritten: "M. Cuccio/ 30.4.[1]916"; on beige paper printed: "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019" and finally three have the following labels: on beige paper printed: "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019". We here formally identify all 14 specimens as *Melitaea ornata punicata* Ragusa, 1921.

M. phoebe bethunebakeri Sagarra, 1926 [TL: Spain: Andalucía, Granada, Sierra Nevada]. According to MACIÀ *et al*. (2017) there is a solitary male syntype in the Museo de Ciencias Naturales de Barcelona [MZB], Spain; there are three Syntypes in the Museum of Comparative Zoology, Harvard University. PR and RLH hereby designate one of these syntypes from Harvard as a lectotype (Figs 14a, b). All three specimens have the same data (Fig. 14c); from the high-quality photograph of the underside of this specimen (Fig. 14b) it can be seen that it exhibits the morphological traits of *M. ornata*, although some of the centrally thickened submarginal markings on the ventral surface touch the intervening veins. The remaining three syntypes are here designated as paralectotypes.

The labels (Fig. 14c) on the pin of the lectotype are as follows: on white paper printed: "ANDALUCIA 1600 m./ Sierra Nevada/21.6.25 Romei"; on red paper printed: "M.C.Z/ Paratype" /handwritten: "25800"; on white paper printed: "AG Weeks/ Collection"; on red paper handwritten: "*M. phoebe/ bethune-bakeri* Sag./ type series Querci"; on white paper printed: "MCZ-ENT/ 00112412"; on red paper printed: "LECTOTYPE/ *Melitaea phoebe*/ *bethunebakeri*/ Sagarra, 1926/ Designated Russell & Hawkins, 2019"; on white paper printed: "*Melitaea ornata bethunebakeri* Sagarra, 1926/ Determined Russell & Hawkins, 2019".

The labels on the paralectotype in Barcelona are as follows: on beige paper printed in black "ANDALUCIA 1600 m./ Sierra Nevada/ 21[handwritten].6.25 Romei; on white paper printed "73-4028/ MZB; on white paper printed "509"; on white paper handwritten *"Bethune/ bakeri*"; on white paper double edged in black, printed "*Melitaea phoebe Bethune-/bakeri* Sagarra, 1926/ black line/ *Melitaea phoebe* (Goeze,/ 1779)/ R. Macià rev. 2015"; on white paper with black surround, printed in red "PARALECTOTYPE"/ printed in black *"Melitaea phoebe*/ *bethunebakeri*/ Sagarra, 1926/ Designated Russell / & Hawkins"; on white paper with black surround printed in black *"Melitaea ornata/ bethunebakeri*/ Sagarra, 1926/ Determined Russell/ and Hawkins, 2019."

The labels on the two paralectotypes in Harvard are as follows: on white paper printed: "ANDALUCIA 1600 m./ Sierra Nevada/21 [handwritten].6.25 Romei"; on red paper printed: "M.C.Z/

Paratype"/handwritten: "25800"; on white paper printed: "AG Weeks/ Collection"; on white paper printed: *"Melitaea ornata bethunebakeri* Sagarra, 1926/ Determined Russell & Hawkins, 2019"; on red paper handwritten: *"M. phoebe/ bethune-bakeri* Sag./ type series Querci"; on red paper printed: "PARALECTOTYPE/ *Melitaea phoebe/ bethunebakeri/* Sagarra, 1926/ Designated Russell and Hawkins, 2019".

There is a pair of specimens in the Rothschild collection at the NHM in London (pers obs.) which may have been part of the syntype series, due to the similarity of their labels, and which can be identified clearly as *M. ornata*. Also MANLEY & ALLCARD (1970: plate 10, figs 1-4) figured two pairs of this subspecies from Sierra de Alfacar and Sierra Nevada, Granada, taken between 14 and 29 June 1959 at *circa* 1100-1650 m; the two figured undersides show the typical characters of *M. ornata*.

It has been brought to the first author's attention that a new subspecies for those *M. ornata* from various locations in Spain had been created - *Melitaea ornata baetica*, Muñoz-Sariot & Sánchez-Mesa, 2019. This name was changed later (cf MUÑOZ-SARIOT & SÁNCHEZ-MESA, 2019a and b) to *M. ornata pseudornata* Muñoz-Sariot & Sánchez-Mesa, 2019; the name *baetica* was preoccupied by *Melitaea baetica* Rambur, 1858, a synonym for what is now known as *Euphydryas desfontainii* (Godart, 1819). The holotype of *M. ornata pseudornata* [TL: Quéntar, Sierra Nevada, Granada, 1300 m, emerged 29-V-2018, from larva collected on 15-IV-2018] bears a remarkable resemblance to the lectotype of *bethunebakeri* designated above (Figs 14a, b), which also originated from the Sierra Nevada, 1600 m in 1925 (Fig. 14c): apart from the rather more acute forewing apices, which can be variable, of the taxon *pseudornata*, the antennal and wing morphology of both the holotype of *pseudornata* and the lectotype of *bethunebakeri* are almost identical. The subspecies *Melitaea ornata pseudornata* Muñoz-Sariot & Sánchez-Mesa, 2019 is hereby placed in synonymy with *M. ornata bethunebakeri* Sagarra, 1926, **comb. n.** and **syn. n.**

Melitaea phoebe galliaemontium Verity, 1928 [TL: Mont-Dore, Puy-de-Dôme, France]. This is a name given by Verity to an unnamed race described but not named by FRUHSTORFER (1918: 42). This was a small race with part of the forewings and all of hindwings covered in a greenish suffusion. HIGGINS (1941: 340) mistakenly gave the description of these specimens as being covered in black suffusion; this actually applied to the previous description of *crassenigra* Verity, 1928, given to specimens from Gironde, Lozère and Pyrénées Orientales (VERITY, 1928: 162). There were no specimens of this subspecies extant in Verity's collection in Florence in the early 1980's (KUDRNA, 1983) and thus no further comment can be made; the name was included here simply to correct the description given by Higgins and to confirm that the problem of identity is insoluble until further samples are collected from the Mont-Dore area. This taxon was not considered by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 47, note 38) considered it to be *M. phoebe*, based on its location.

Melitaea phoebe malvida Gaede, 1930 [TL: Bosnia & Herzegovina, Bosnia, Maklen (also spelt Makljen) Pass]; Gaede described (page 207) this subspecies and figured the upperside (Plate 13, d5). Gaede attributed this name to Fruhstorfer, but without a date; like HIGGINS (1941: 340) the present authors were unable to find any original description by Fruhstorfer. This subspecies was not mentioned by VAN OORSCHOT & COUTSIS (2014). The specimen figured and the description by Gaede indicated that the apices of the forewings were quite acute, indicating that this subspecies belongs to *M. phoebe*, as described. Gaede also indicated an association with the subspecies *narenta* Fruhstorfer, 1917, from Herzegovina (see above), also identified here as *M. phoebe*. No indication of the precise location or date of capture was provided, making for difficulties in finding this subspecies at the location given, which has a maximum elevation of 1123 m (Yugoslav Coast, Lascelles, scale 1:300,000, dated 1988/9). Until such time as further specimens become available, this identification requires confirmation.

Melitaea phoebe f. *ornatiformis* Sagarra, 1931 [TL: Spain, Castilla-La Mancha, Cuenca, Villacabras]; the only two known specimens of this subspecies, a male and a female, were considered to be "types" by SAGARRA (1931: 114), who stated that they were taken by Querci on 24 August 1928. These two specimens are housed in the Museo de Ciencias Naturales de Barcelona [now MZB],

Spain and were designated as "Holotype" male and "Paratype" female by MACIÀ *et al*. (2017: 175) but no labels were attached to the specimens indicating this action. From high quality photographs (Figs 15a, b) provided to the authors by Masó (see acknowledgements), both specimens were identified as *M. ornata*. A "holotype" label was added subsequently to the pin of the male and an "allotype" label to that of the female.

The data labels on the pins providing the location and date of capture (Fig. 15c) are old pre-printed labels (both specimens), with data reading: "? (obscured, if ever present). 8.1926" but this has been over-written, presumably by Querci himself, as "24 June 1928". The authors SAGARRA (1931: 114), MANLEY & ALLCARD (1970:40) and MACIÀ, CABALLERO-LÓPEZ, & MASÓ (2017: 175) considered that the original printed month, "8", (but not the printed year) indicated the date of capture. If the date on the printed label was correct, why would it have been over-written by Querci? The present authors consider that the date of capture was in fact the explicitly added, over-written date, "24 June 1928". This fits better with the usual univoltinity of *M. ornata*, both sexes of which would be expected to be on the wing at an elevation of 1200 m in June (RUSSELL & PATEMAN, 2011). The labels on the pin of the holotype (Fig. 15c) are as follows: on white paper with black surround printed in black "73-4026/ MZB"; on beige paper printed in black "NUEVA CASTILLA (Cuenca)/ Villacabras 1200 m./ [?].8.1926, [over-written by hand] 24 June 1928 Querci"; on white paper with double black surround printed *"Melitaea phoebe/ ornatiformis* Sagarra,/ 1930"/ black line/ "*Melitaea phoebe* (Goeze,/ 1779)/ R. Macià rev. 2015"; on red paper with black surround printed "MZB/ HOLOTYPE/ *Melitaea phoebe/ ornatiformis*/ Sagarra, 1931"; on white paper with black surround printed "*Melitaea ornata/ ornatiformis*/ Sagarra, 1931/ Determined Russell,/ 2019. We here formally identify the two specimens as *Melitaea ornata ornatiformis* Sagarra, 1931, **comb. n.**

It is of interest to note that there is a pair of *Melitaea* specimens in the Rothschild collection in the NHM in London with the same printed data labels. One is a female with a locality "Reillo 1000 m", similarly over-written, again presumably by the captor - Querci, with the same date, "24 June 1928". The other is a male, likewise captured by Querci, and is labelled "Huelamo 1200 m", with a date of "6. 8. 1928": the day "6" is handwritten, the month "8" printed and unaltered and the year has the printed "1926" with the "6" overwritten by an "8". It is probable that this specimen may be *M. phoebe* but it is acknowledged that it could represent a second brood *M. ornata*. This illustrates the difficulty in identifying museum material of these two species when dates of capture, which can be of significance, are unclear, being overwritten in faded ink on preprinted labels.

Melitaea phoebe ogygia postogygia Verity, 1938 [TL: uncertain - three syntypes from two different localities in Greece: Salonica (= Thessalonica), Macedonia @ 1000 ft. (= *circa* 300 m) and Olympus, bordering Thessaly/Macedonia @ 2500 ft. (= *circa* 750 m)]. Although the name *postogygia* has no formal nomenclatural standing as part of a quadrinomial, it is considered here because of its association with the names *ogygia* and *nigrogygia*, which are associated with *M. ornata* (cf above, and RUSSELL & BARTOLOZZI, 2019). Verity's description (1938: (16)) indicated that the name was proposed for a second generation of "*M. phoebe ogygia*". This is unusual: *M. ornata* is generally univoltine (RUSSELL & PATEMAN, 2011), although second generations occur when rearing the species in the U.K., if the larvae are exposed to very wet conditions (RUSSELL & PATEMAN, 2013).

Examination of the photographs of the three syntypes and their associated labels revealed that the two syntypic males from Salonica, taken 12 and 13 August 1936 are almost certainly *M. ornata* (Figs 16a, b, c); whereas a female from Olympus taken on "Aug[ust]. 17, 1935", is *M. phoebe* (Figs 17a, b & c). All three specimens were captured by Romei. These identifications, admittedly based only on antenna and wing morphology, were agreed by John Coutsis and Jim Pateman. (See Acknowledgements). The designation of a lectotype in this case is not relevant because the name *postogygia* is part of a quadrinomial (infrasubspecific) and thus not nomenclaturally significant.

Melitaea phoebe mod. *nimbula* Higgins, 1941 [TL: Asturian Mountains 4000 ft. (example illustrated by HIGGINS [Plate 14, fig. 12] from Espinama, Picos de Europa, Spain, June 30 '[19]35). In the NHM, London, there are 10 males and 2 females in the Lionel Higgins collection, captured on 30-VI-1935, the elevation is not given on the data labels but HIGGINS (1941: 337) stated that they were

taken at 4000 ft. (= *circa* 1225 m). The rather acute forewing apices, club shaped antenna and black submarginal markings in some but not all specimens touching the intervening veins suggest that they are *M. phoebe* and not *M. ornata* (Figs 18a, b). The labels on the pin of the holotype are shown in Fig. 18c. This name was overlooked by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 50, note 58) suggested it was *M. phoebe*. The subspecies is included here to demonstrate that submarginal markings can be confusing. We do not regard our identification as conclusive, since the holotype and some of the syntypes exhibit some characters of *M. ornata* and this population would benefit from further study.

Melitaea phoebe race *subtusca* Verity, 1952 [TL: France, Var, La Sainte Baume, Nans-les-Pins, 300 m], the syntypic series consists of seven specimens (4 ♂♂ and 3 ♀♀) from the Type Locality taken between 24 May 1926 and 24 May 1936 and held in the Museo Zoologico de "La Specola" dell'Università, Firenza, Italy. From an examination of the photographs of the undersides of all seven specimens, it would appear that they include both *M. phoebe* and *M. ornata*. A syntype of each species is illustrated for comparison: one male has morphological characters tending towards those of *M. ornata* (Figs 19a, b); another male has characters closely resembling *M. phoebe* (Figs 20a & b). Both are labelled as having been taken on the same day, 24 May 1926 (Figs 19c, 20c), but handwriting on the data labels suggests by different collectors; this raises the possibility that they were captured some distance apart. The only indication of who captured another of the specimens is a label "23-V-[19]33 Nans (Var) Foulquier leg.''; he must have been accompanied by another collector because there is another label dated 'Nans 23 Mai [19]33' again in a different hand! These two simultaneous captures by different collectors could suggest that the two specimens captured on each occasion (24 May 1926 and 23 May 1933) were taken some distance apart but with the nearest location reference for the data labels both being 'Nans'. It is unsurprising that Gédéon Foulquier (1855-1941) collected on the Massif de la St. Baume since he lived in Marseille, just to the south of the mountain ridge. Currently, it is not possible to reliably place *subtusca* with either species.

The following *Melitaea* subspecies described by Fruhstorfer from damp Alpine regions, based on photographs of the syntypes are all *M. phoebe*, as originally described: *koios* (1908b), *virgilia* (1917a), *sylleion* (1917a), *minoa* (1917a), and *rovia* (1919).

Additional subspecies described by Verity and present in the La Specola Museum in Florence, from France, Switzerland and Italy were all examined and confirmed to be *Melitaea phoebe*: *monilata* (1919), *tusca* (1919), *crassenigra* (1928), *subcorythallia* (1928), *suboccitanica* (1928), and *medioastricta* (1950). The following available names were not considered because of a lack of surviving specimens in what remains of Verity's collection in Florence: *monilataeformis* (1919), *aethereaeformis* (1919), *nigroalternans* (1919) and *postnarenta* (1939).

Conclusions and discussion

Close examination of type material is critical in establishing the distribution of both *Melitaea phoebe* and *M. ornata*. Prior to the recognition of *M. ornata* and the subsequent realisation that the species is quite widespread in Europe, all of the many subspecific taxa described in this group were routinely associated with *M. phoebe*.

Until recently all material from Spain was considered by all authors, including RUSSELL & TENNENT (2016), to be *Melitaea phoebe*. The presence of *M. ornata* in Spain was predicted by TÓTH *et al.* (2012: 249) but it was not until five years later, when SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017a) published the finding of larvae with red/brown head capsules, that the presence of this species in Spain was confirmed. Our examinations suggest that *M. ornata* was not in fact a recent arrival in Spain but had been recorded a century ago, unknowingly, by FRUHSTORFER (1917) as *M. phoebe guevara* and by SAGARRA (1926, 1931) as *M. phoebe bethunebakeri* and *M. phoebe ornatiformis* (respectively).

From a study of recent literature, it has been possible to identify tentatively some figured specimens. The pair of specimens figured by GÓMEZ-BUSTILLO & FERNÁNDEZ-RUBIO (1974, II:

197) appear to be *M. ornata*, but no indication of locality was given. GÓMEZ-BUSTILLO (1974: 188) recorded subspecies *guevara* (i.e. *M. ornata*) from the Province of Santander in northeast Spain. ROBERT *et al.* (1983: 62, Plate 9, figs (13)-(15)) made no mention of any subspecies occurring in the Province of Alicante but the underside of the specimen they figured from Bocairente-Alcoy (actually in Valencia Province) at 900 m appears to also be *M. ornata*. GÓMEZ DE AIZPÚRUA *et al*. (1983: 67), in their study of the butterflies of Madrid Province, mentioned that subspecies *guevara* occurred in the south and *ornatiformis* (i.e. *M. ornata*) in the east and north of the Province. Specimens figured by GARCÍA-BARROS *et al.* (2013: 1209, figs 143I, 143J), presumed to be *M. phoebe*, are in fact typical examples of *M. ornata*. García-Barros (pers comm.) provided details of the localities of the two specimens as follows: Spain, Madrid, San Sebastián de los Reyes, Dehesa de Viñuelas, 22-V-1980 (male) and Spain, Ávila, Candeleda (Sierra de Gredos), 1-VI-1986, J. Martín and J. L. Viejo leg. (female). These latter references together with the locations of the museum material given above indicate a far wider distribution of *M. ornata* in Spain, perhaps throughout most of the country, than that suggested by SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017).

Unfortunately VERITY (1950/51) did not provide many figures of the ventral surface of his Italian subspecies and more recently VILLA *et al*. (2009) recognised neither *M. ornata* nor any subspecies of *M. phoebe* in Italy. Subspecies described from Sicily (*punicata* Ragusa, 1921), and southern peninsular Italy (*phoebina* Turati, 1921) are *M. ornata* and, so far as the authors are aware, *M. phoebe* does not occur south of Monte Martinelli, San Fili, Cosenza, Calabria (RUSSELL *et al*., 2011). BALLETTO *et al*. (2014) were the first Italian authors to recognise the presence of *M. ornata* in Italy. The currently known distributions given for *M. phoebe* and *M. ornata* were correct (*M. phoebe* in the north and *M. ornata* in the south, including Sicily) but no subspecies of *M. phoebe* were mentioned and the only two Italian names related to *M. ornata* given were *emipunica* Verity, 1919 and ab. *totila* Stauder, 1914. However, having said this, caution needs to be taken as *M. phoebe* may yet be discovered in southern Calabria or even Sicily.

According to KUDRNA (1983) some of Verity's material in the Museo Zoologico de "La Specola" dell'Università, Firenze, Italy was lost to pests prior to his cataloguing of Verity's material and there are no specimens extant for two-thirds of names proposed by Verity. It has not been possible to examine and identify to which species many of his subspecific names, associated with *M. phoebe* by Verity, actually belong. Many of his names relate to 'sottorazza' (subraces), second generations of a race already named or aberrations (VERITY, 1950/51: 147-157), a status not covered by the ICZN Code, and even if specimens were present, most have not been considered in this study, unless there was some point to be made, for example the syntypic series of *"M. phoebe ogygia postogygia*" containing both species.

NEKRUTENKO (1993: 129) suggested that both taxa described by Turati (*phoebina* and *rostagnoi*) were "infrasubspecific" and referenced HIGGINS (1941: 341-342); however, the latter paper provides no evidence for this suggestion. The most recent distribution atlas of European butterflies (KUDRNA *et al.*, 2015) made no mention of *M. ornata*. Other recent books on European butterflies failed to recognise *M. ornata* as a separate species, for example LERAUT (2016: 992) treated *M. ornata* as synonymous with *M. phoebe*. For the record, Leraut also confusingly referred (p. 994) to both *M. phoebe* and *M. arduinna* (Esper, 1783) as "Freyer's Fritillary". The most recent checklist of European butterflies by WIEMERS *et al*. (2018), however, included *M. ornata* and gave an up to date European distribution.

Difficulties associated with separating historic material of *M. phoebe* and *M. ornata* has been pointed out previously (RUSSELL *et. al.*, 2007). Particular problems arise when the two species are sympatric and partially synchronic, as hybrids between the two species can occur (RUSSELL *et al.*, 2014; VAN OORSCHOT & COUTSIS, 2014), making positive identification of individual museum specimens extremely difficult and sometimes impossible. This was the situation with Verity's material from Nans-les-Pins, on the Massif de la Sainte Baume, and also Higgins' material from the Asturian Mountains; it appeared that both species were present within the syntype series, together with other specimens which were impossible to classify with any degree of certainty. It is of interest that both *M.*

ornata and *M. phoebe* have been recorded previously, but not simultaneously, from near Fayence, Var (RUSSELL *et al.*, 2007), which lies at approximately the same elevation (350m) and only some 80 km to the northeast of Nans-les-Pins. These two localities represent the only known sites for *M. ornata* in France. Those specimens whose identity is uncertain could be identified from molecular analysis although it is noted that the CO1 gene is the same in western populations of both *M. phoebe* and *M. ornata* (WAHLBERG & ZIMMERMANN, 2000; LENEVEU *et al*., 2009).

It is most unfortunate that the collections in the Museo Regionale di Scienze Naturali, Torino, Italy, are at the moment not available for inspection as they are the only source of the types of Turati's *Melitaea* material. Until they can be examined we assume that the currently reported Italian distributions of *M. phoebe* and *M. ornata* are correct. This will hopefully be resolved when the museum re-opens.

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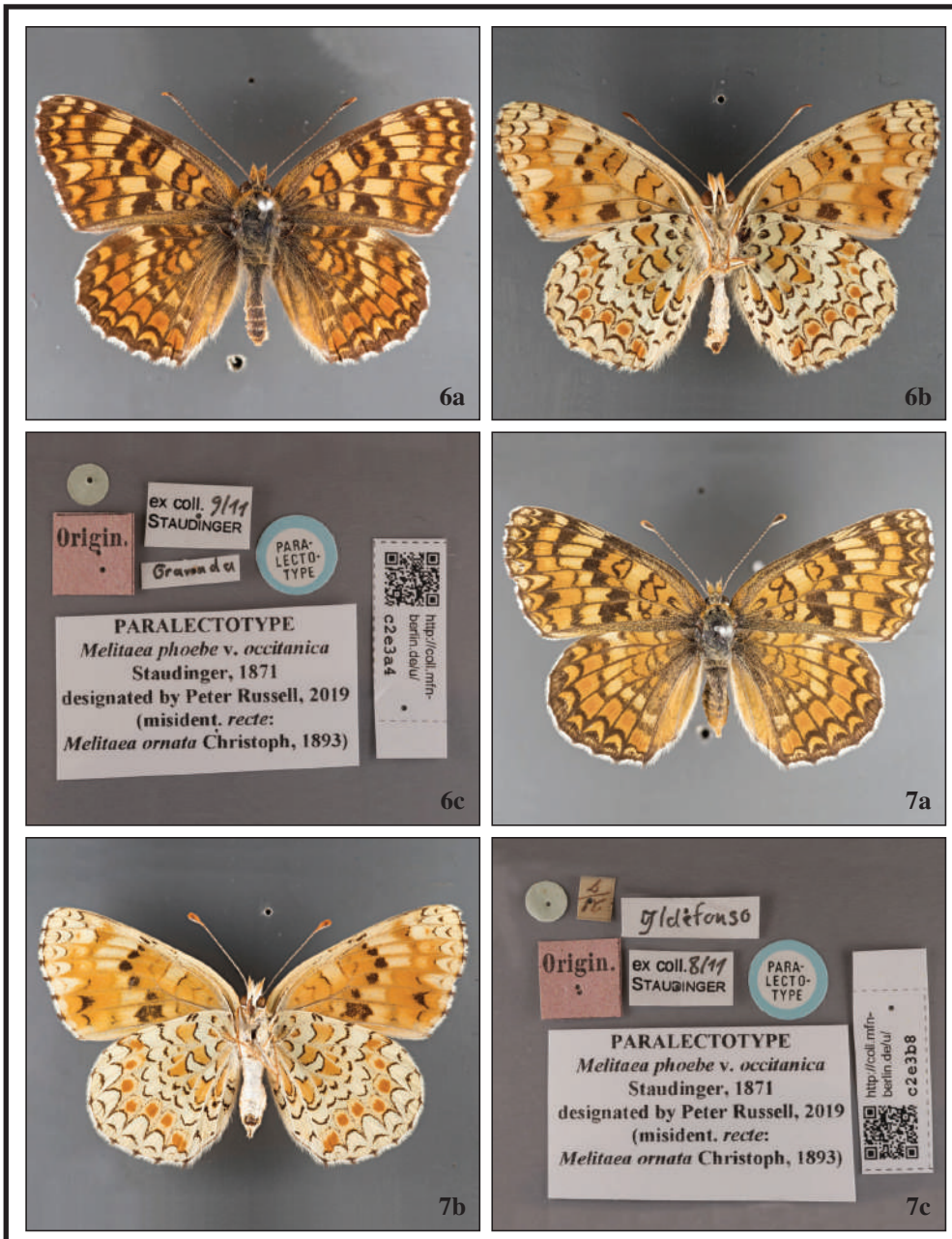
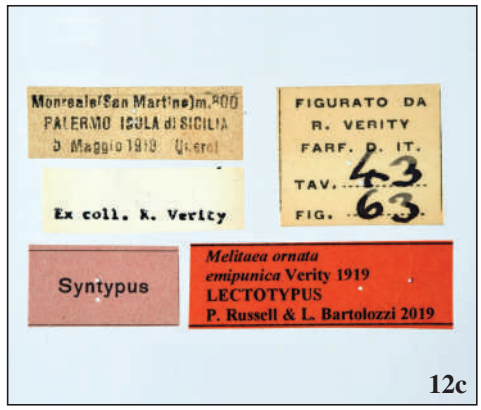
Figs 1-5.– 1. *Melitaea phoebe* male underside, Republic of North Macedonia, Skopje, Kriva Palanka, *c.* 650 m, 9 June 2013. © P. Russell. **2.** *Melitaea ornata* male underside, Republic of North Macedonia, Skopje, Suva Planina, *c.* 1000 m, 8 June 2013. © P. Russell. **3.** *Melitaea phoebe* female underside, Italy, Calabria, Cosenza, San Fili, Monte Martinelli, 880 m, 10 June 2007. © P. Russell. **4.** *Melitaea ornata* female underside, Italy, Calabria, Cosenza, San Fili, Monte Martinelli, 600 m, 3 June 1913 (Stauder Leg.) © W. J. Tennent. **5A, B & C.** *Melitaea phoebe occitanica* Staudinger, 1871, lectotype male Barcelona, Spain. © T. Léger. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

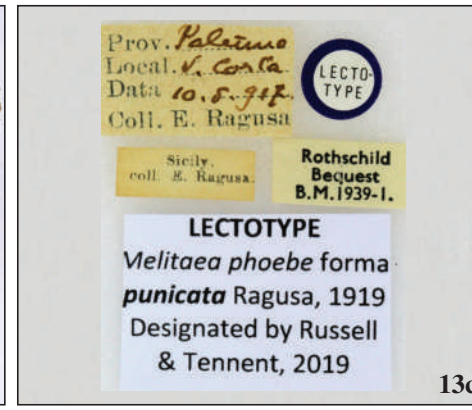


Figs 6-7.– 6A, B & C. *Melitaea phoebe occitanica* Staudinger, 1871, paralectotype male, Grenada, Spain, misidentified *Melitaea ornata*. © T. Léger. **7A, B & C.** *Melitaea phoebe occitanica* Staudinger, 1871, paralectotype female, San Ildefonso, Spain, misidentified *Melitaea ornata*. © T. Léger. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

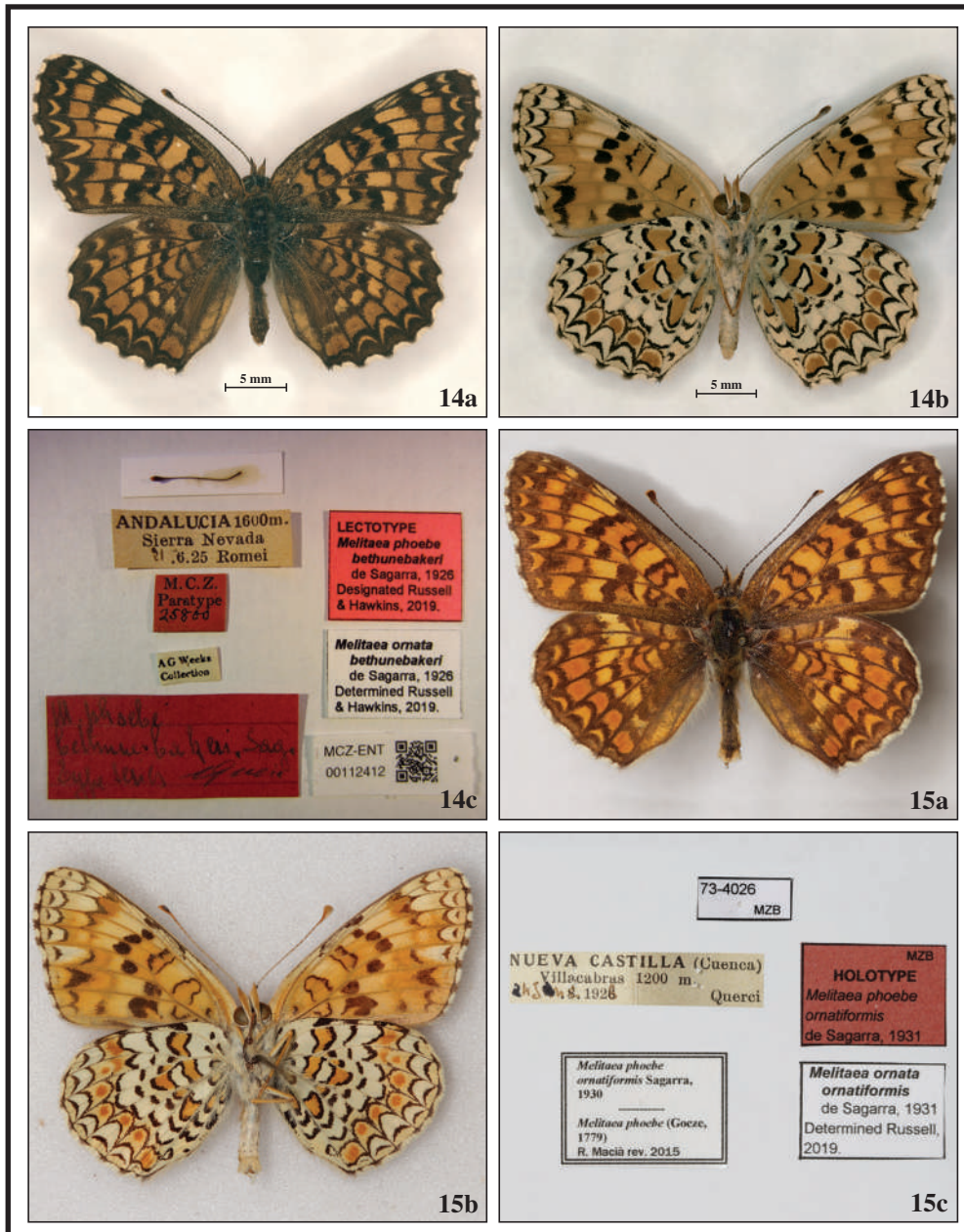
Figs 8-9.– 8A, B. & C. *Melitaea phoebe ogygia* Fruhstorfer, 1908, female lectotype, Greece, Poros, 14 June 1909, misidentified *M. ornata*. © R. Rougeri. **9A, B & C.** *Melitaea phoebe guevara* Fruhstorfer, 1917, male paralectotype, Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

Figs 10-11.– 10A, B & C. *Melitaea phoebe guevara* Fruhstorfer, 1917, male paralectotype, Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. **11A, B & C.** *Melitaea phoebe guevara* Fruhstorfer, 1917, male, 'non-type specimen' Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

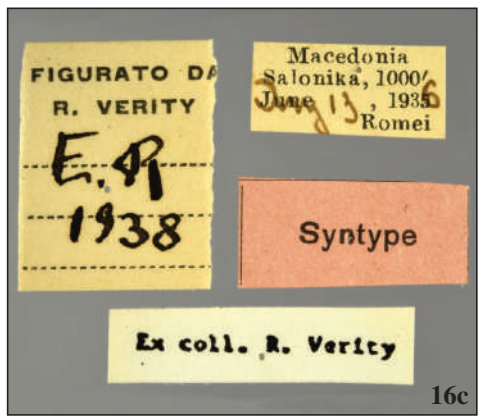




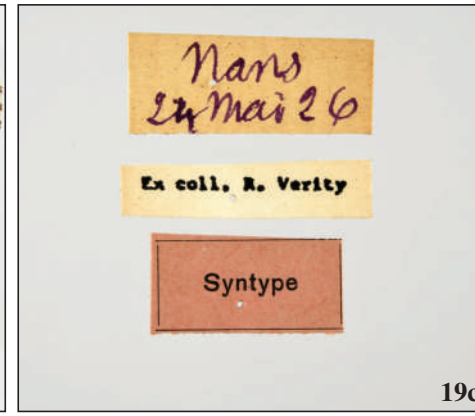
Figs 12-13.– 12A, B & C. *Melitaea phoebe emipunica* Verity, 1919, male lectotype, designated Russell & Bartolozzi, 2019, Italy, Sicily, Palermo, Monreale, 800 m, 6 May 1918, Querci leg., misidentified *M. ornata*. © S. Bambi. **13A, B & C.** *Melitaea phoebe punicata* Ragusa, 1921, male lectotype, designated Russell & Tennent, 2019, Italy, Palermo, Valle Corta, 10 May, [1]917, Ragusa leg., misidentified *M. ornata*. © W. J. Tennent. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs 14-15.– 14A, B & C. *Melitaea phoebe bethunebakeri* de Sagarra, 1926, male lectotype, designated Russell & Hawkins, 2019, Spain, Andalucia, Sierra Nevada, 1600m, 21 June 1925, Romei leg., misidentified *M. ornata*. © R. Hawkins. **15A, B & C.** *Melitaea phoebe ornatiformis* de Sagarra, 1931, male holotype, Cuenca, Spein, misidentified *M. ornata*. © G. Masó [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs 16-17.– 16A, B & C. *Melitaea phoebe ogygia postogygia* Verity, 1938, male syntype, Thessalonika, Greece, misidentified *M. ornata*. © S. Bambi. **17A, B & C.** *Melitaea phoebe ogygia postogygia* Verity, 1938, female syntype, Olymbos, Greece. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs– 18-19.– 18A, B & C. *Melitaea phoebe nimbula* Higgins, 1941, male holotype, Asturian Mountains, Spain. © W. J. Tennent. **19A, B & C.** *Melitaea phoebe subtusca* Verity, 1952, male syntype Nans les Pins, Var, France, 24 May 1926. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

Fig. 20A, B & C.– *Melitaea phoebe subtusca* Verity, 1952, male syntype Nans les Pins, Var, France, 24 May 1926, misidentified *M. ornata*. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].