Atalanta **49** (1-4): 111-112, Marktleuthen (1. September 2018), ISSN 0171-0079

# About the distribution - updated and corrected - of *Erebia hispania* Butler, 1868, endemic in the Sierra Nevada (South Spain)

(Lepidoptera: Nymphalidae, Satyrinae)

by

Felipe Gil-T.

received 21.V .2018

**Abstract**: The distribution of *Erebia hispania* Butler, 1868, an endemism of the Sierra Nevada (south Iberian Peninsula), is reviewed. From the most current bibliography, two UTM 10x10 km grids mentioned are considered erroneously, being discarded. In the current paper its known distribution is extended with four new UTM 10 x10 km grids (equivalent to 36.36% of its total distribution): two of them located in the Province of Almería (eastern sector of Sierra Nevada), the Province not included in a reliable way for this species in the existing bibliography. The resulting final map indicates the existance of populations of this taxon within 11 UTM 10 x10 km grids. Also the correct altitude of its biotopes is discussed as in the existing references generally an incorrect minimum altitude is mentioned.

**Resumen**: Se revisa la distribución de *Erebia hispania* Butler, 1868 en Sierra Nevada (sur de la Península Ibérica), de donde es endémico. De la bibliografía más actual, se consideran erróneas dos cuadrículas UTM de 10 x10 km mencionadas, siendo descartadas. En el trabajo actual se amplía su distribución conocida en cuatro nuevas cuadrículas UTM de 10x10 km (equivalente al 36.36% de su distribución total): situándose dos de ellas en la provincia de Almería (sector oriental de Sierra Nevada), provincia no incluida, de manera fehaciente, para esta especie en la bibliografía existente. El mapa final resultante indica que existen poblaciones de este taxón dentro de 11 cuadrículas UTM de 10 x10 km. También, se discute sobre la altitud correcta de sus biotopos, ya que en las referencias existentes, generalmente, se menciona una altitud mínima incorrecta.

**Introduction**: The pyrenean endemism *Erebia rondoui* Oberthür, 1908 currently considered as a valid species, was regarded till the past decade as a subspecies of *E. hispania* Btl., an endemic taxon in the Sierra Nevada. Molecular studies made by Albre et al. (2008) proved that they are different species.
According to Dinca et al. (2015), *E. rondoui* Oberthür is more closely related (DNA barcoding) to *E. cassioides* (Reiner & Hochenwarth, 1792) and *E. tyndarus* (Esper, 1781) than with *E. hispania* Btl. (fig. 1), all of which belong to the so-called „*Erebia tyndarus* species-group".
Previously, de Lesse (1953) and Lattes et al. (1994), pointed out karyological and alo-enzymatic differences between *E. hispania* Btl. and *E. rondoui* Oberthür.

**Methodology and Results**: The existing bibliography that includes distribution data on *E. hispania* Btl. sensu stricto was reviwed. Special attention was taken on the more recent publications, theoretically thought to be more accurate and complete, as these should gather earlier records and supposedly a certain purge or the updated distribution data known till now. Based on the previous information, once this was revised and corrected, with the purpose of upgrading its chorology. I have added new UTM 10 x10 grids, which were not been mentioned before, with new populations of *E. hispania* Btl.
Google Earth and Google Maps applications were used to establish the limits of the UTM grids concerned as well as their altitude ranges. Completing and confirming the sampling results were obtained by own investigations in the Sierra Nevada during more than fifteen years in the past.

About the minimum altitude where *E. hispania* Btl. occurs: I have noticed that in several references the minimum altitude recorded for „*E. hispania*" is really applicable of the pyrenean endemism *E. rondoui* Oberthür, taxon previously considered as subspecies of *E. hispania* Btl. *Erebia rondoui* Oberthür in the Pyrenees flies at lower altitudes than *E. hispania* Btl. in Sierra Nevada.
The flight altitude where *E. rondoui* Oberthür appears is lower, being this a result of the diferent latitude and ecological requirements of each species. Higgins (1975) and Lafranchis (2007) quote 1500 m; Tolman & Lewington (1997), 1650 m; Viedma & Gómez-Bustillo (1985), Fernández-Rubio (1991), as well as other references, 1800 m. None of these altitudes are valid for *E. hispania* Btl.
Although in some references, for example in Viedma & Gómez-Bustillo (1985) and Fernández-Rubio (1991) 1800 m are mentioned generally as minimum altitude for „*E. hispania*", this should be corrected because the minimum flight altitude is really higher. My personal observations in western and central areas of the Sierra Nevada within Granada Province, which are the highest altitudes of the Sierra Nevada (above 3000 m), I have found that this butterfly usually appears from 2100-2200 m onwards. On the other hand, in the eastern part of Sierra Nevada, located in Almeria Pro-

vince (in the present work two UTM 10 x10 km grids are pointed out for this Province which have never been reliably referred) where the maximum alitude summits are lower, the species appear from 2000 m onwards. In Higgins & Hargreaves (1983), inspite of the 1500 m indicated in Higgins (1975), specify a minimum altitude of 2200 m; in Whalley (1981), Moreno (1991) and García-Barros et al. (2004b) the minimum altitude mentioned is 2000 m, altitudes more according to my observations.
In summary: It is concluded that the biotopes of *E. hispania* Btl. in the Sierra Nevada tend to be located above 2000 m. Consequently the altitude of certain localities will sustain the existence, according to my field samplings, of this butterfly or not in the UTM grids refered hereon. The method I used in other articles related to the distribution of other species, see Gil-T (2016a, 2016b).

Erroneous UTM grids found in bibliography: There are very few references in which the distribution of *E. hispania* Btl. is shown by means of UTM 10 x10 km grids. In the rest of references, when distribution maps are shown, only an unprecise coloured area or "stain" is given that supposedly covers its distribution, which is normally greater than the actual surface occupied by this butterfly. Examples in Viedma & Gómez-Bustillo (1985), Fernández-Rubio (1991) and Tolman & Lewington (1997). The more "recent" references, with the distribution showed by as UTM 10 x10 km grids, can be found in García-Barros et al. (2004a, 2004b), where they gather previous records and supposedly an update on the distribution data. The problem lies in the fact that for these two previous references have followed Moreno (1991), reference that shows erroneous and incomplete information both for *E. hispania* Btl. as well as for other species. As a result, in García-Barros et al. (2004a, 2004b have been included two incorrect UTM grids, and incomplete distribution. The two incorrect UTM grids are the following:
- UTM 10 x10 km grid 30SVG91: appears in fig. 2 crossed out in the northern zone of Sierra Nevada. The highest altitude in this area oscilates between 1600 m (mainly) and 1800-1880 m (in a very small surface). No records of the butterfly.
- UTM 10 x10 km grid 30SVF99: appears in fig. 2 crossed out in the southern part of Sierra Nevada. The maximum altitude here does not exceed 1840 m. No records of the butterfly.

Updated distribution with new UTM grids: After having discarded these two previous UTM grids, I have added four new UTM grids (36,6% of the total distribution) where this butterfly exist (obs. pers.). Localities not recorded in the actual bibliography. These are, from north to south and west to east, the following (see fig. 2):
- UTM 10x10 km grid 30SVG71: with a maximum height of 2700 m.
- UTM grids 30SWG00 and 30SWG10: it is important to outline that these two grids are clearly inside the Almeria Province limits. This province (UTM grids) has never been referred in literature for this taxa. For this reason, in none of the following references is mentioned: Viedma & Gómez-Bustillo (1985); Moreno (1991), García-Barros et al. (2004a, 2004b); Manley & Allcard (1970), who states that it is found „in the Sierra Nevada (Granada)" (sic); in the same manner, Fernández-Rubio (1991) states that *E. hispania* Btl. (sensu stricto) only exists in „Sierra Nevada (Granada)" (sic); etc. Significantly in Sabariego et al. (1995), monograph about the butterflies of Almeria, does not include to *E. hispania* Btl. in the butterfly fauna of this province.
It is necessary to clarify that the locality "Puerto de la Ragua", mentioned in some publications, like d'Hondt (1985) and Manley & Allcard (1970), is found in the geographical limit of Granada and Almeria. It is also important to clarify that „Almería: Puerto del Lobo" (sic) toponym mentioned in García-Barros et al. (2004a) is erroneous, as "Puerto del Lobo" belongs to Granada Province and not to Almeria Province [note: type locality of *Agriades zullichi* (Hemming, 1933)].
The highest altitudes of the eastern sector of Sierra Nevada (in Almería Province) are situated inside these two new grids (30SWG00, 30SWG10): Cerro del Almirez (2512 m) and Pico Buitre (2467 m). The UTM grid located farther east (30SWG10) is the new eastern limit known for this nevadense endemism.
- UTM grid 30SVF89: presents an altitude range between 2000 m (2200 m in its major part) and 2400 m and 2500 m (in its north-west end).

**Aknowledgement**: I would like to express my most sincere thanks to my friend Rafael Estévez Rodríguez (Vigo, Pontevedra, Spain) for his help in translating the text of this paper into English.

## References

Albre, J., Gers, C. & L. Legal (2008): Molecular phylogeny of the *Erebia tyndarus* (Lepidoptera, Rhopalocera Nymphalidae, Satyrinae) species group combining CoxII and ND5 mitochondrial genes: A case study of a recent radiation. - Molecular Phylogenetics and Evolution **47**: 196-210.

d'Hondt, J. P. (1985): Liste des lépidoptères rhopalocères capturés ou observés dans la Sierra Nevada (Espagne) (Fin juillet 1983 et pendant la premiére moitié de juillet 1985). Bulletin Cercle Lepidoptéristes de Belgique 14 (6): 107-111. Bruxelles.

De Lesse, H. (1953): Formules chromosomiques nouvelles du genre *Erebia* et séparation d'une espèce méconnue. - Comptes Rendus de l'Académie des Sciences. Série 3, Sciences de la Vie **236**: 630-632, Paris.

Fernández-Rubio, F. (1991): Guía de mariposas diurnas de la Península Ibérica, Baleares, Canarias, Azores y Madei-

ra. Ed. Pirámide, Madrid.
Dinca, V., Montagud, S., Talavera, G., Hernández-Roldán, J., Hebert, P. D. & R. Vila (2015): DNA barcode reference library for Iberian butterflies enables a continental-scale preview of potential cryptic diversity. - Scientific Reports **5**, article number: 12395. DOi: 10.1038/srep12395.
García-Barros, E., Chaves, P. & L. Wright (2004a): Distribución ibérica de once especies de satirinos (Lepidoptera, Nymphalidae, Satyrinae). - Shilap **32** (125): 57-79, Madrid.
García-Barros, E., Martín, J., Romo, H., Garcia-Pereira, P. & E. S. Maravalhas (2004b): Atlas de las mariposas diurnas de la Península Ibérica e islas Baleares (Lepidoptera: Papilionoidea & Hesperioidea). - Monografías Sociedad Entomológica Aragonesa **11**, Zaragoza.
Gil-T, F. (2016a): *Pseudochazara williamsi* (Romei, 1927): distribución actualizada, corregida, y ampliada con nuevas localidades (Lepidoptera, Nymphalidae, Satyrinae). - Rev. Gaditana Entomología **7** (1): 429-439, Cádiz.
Gil-T, F. (2016b): Distribución, actualizada y corregida, y estado de conservación de cuatro subespecies de *Parnassius apollo* (Linnaeus, 1758) (Lepidoptera, Papilionidae) en el tercio sur de la Península Ibérica (E Andalucía, S España). - Arquivos Entomolóxicos **16**: 203-210, La Coruña.
Higgins, L. G. (1975): The Classification of European Butterflies. Collins, London.
Higgins, L. G. & B. Hargreaves (1983): Las Mariposas de Europa. - Ed. Omega, Barcelona.
Lattes, A., Mensi, P., Cassulo, L. & E. Balletto (1994): Genotypic variability in western European members of the *Erebia tyndarus* species group (Lepidoptera, Satyridae). - Nota Lepidopterologica **5**: 93-104, Stuttgart.
Lafranchis, T. (2007): Papillons d'Europe. - Ed. Diatheo, Paris.
Manley, W. B. L. & H. G. Allcard (1970): A Field Guide to the butterflies and Burnets of Spain. - E. W. Classey, Hampton, London.
Moreno, M. D. (1991): Mariposas diurnas a proteger en Andalucía. - Junta Andalucía. Agencia de Medio Ambiente, Sevilla.
Sabariego, E., Martínez, J. & A. Aguirre (1995): Mariposas Diurnas de la provincia de Almería. - Instituto Estudios Almerienses, Diputación Almería, Cuadernos Monográficos **29**, Almería.
Tolman, T. & R. Lewington (1997): Butterflies of Britain & Europe. - Harper Collins Publishers, London.
Viedma, M. G. & M. R. Gómez-Bustillo (1985): Revisión del libro rojo de los lepidópteros ibéricos. - Ministerio de Agricultura, Pesca y Alimentación, ICONA, Monografías **42**, Madrid.
Whalley, P. (1981): The Pocket Guide to Butterflies. - Mitchell Beazley Publishers Ltd., London.

Address of the author

Felipe Gil-T.
C/ Corral del Veleta, 1, 2-A
E-18008 Granada (Spain)

Fig. 1: Imagos of *Erebia hispania* Butler, 1868 (Sierra Nevada, S. Spain).

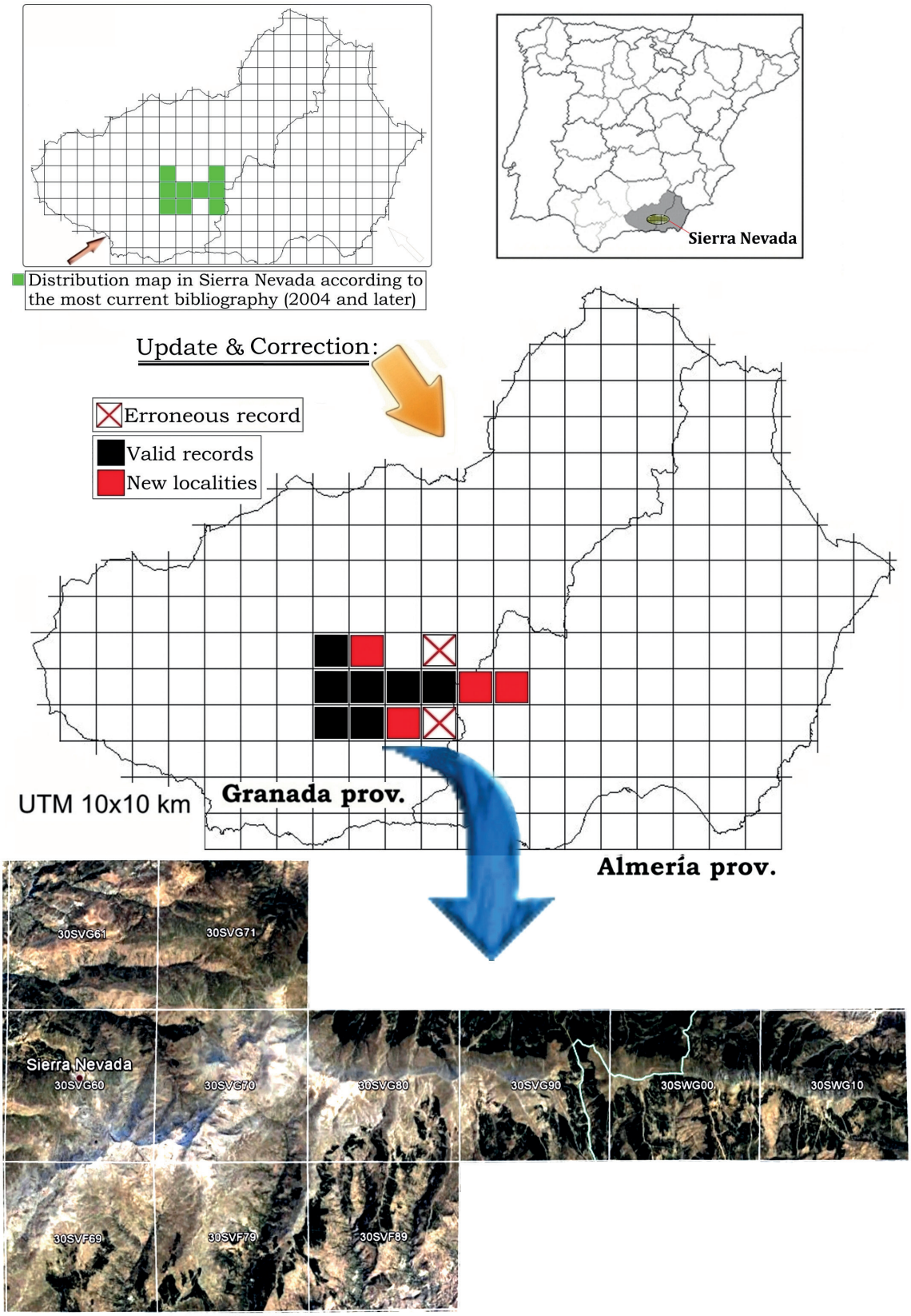


Fig. 2: Updated distribution of *Erebia hispania* Butler, 1868, with detail and numbering of the UTM grids 10x10 in the Sierra Nevada.