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Atalanta (August 2007) **38** (1/2): 199-202, Würzburg, ISSN 0171-0079

The correct hostplant of *Polyommatus golgus* (HÜBNER, 1813): *Anthyllis vulneraria pseudoarundana* H. LINDB.

(Lepidoptera, Lycaenidae)

by

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received April 16th 2007

Abstract: The intention of this work is to amend the identification given for the hostplant of *Polyommatus (Plebicula) golgus* (HÜBNER, 1813) in MUNGUIRA & MARTIN (1989), where it is incorrectly considered to be *Anthyllis vulneraria arundana* (BOISS. & REUT.) H. LINDB. (which occurs on limestone soils and dolomitic sands) - a plant which is absent where *P. golgus* (HBN.) occurs (in southern Spain, at Sierra Nevada, at an altitude of 2500-3000m). The error has been subsequently repeated in diverse references about this butterfly. Its correct hostplant is *Anthyllis vulneraria pseudoarundana*, a subspecies endemic to the Sierra Nevada at an altitude of 2200-3400m, and which has a distinctive ecology (on schists and siliciferous habitats). A synopsis of the differences between the two plants is included in order to differentiate between the subspecies.

Resumen: Este trabajo intenta corregir el error cometido en la identificación de la planta nutricia larval de *Polyommatus (Plebicula) golgus* (HÜBNER, 1813) realizada en MUNGUIRA & MARTIN (1989), donde se consideró incorrectamente a *Anthyllis vulneraria arundana* (BOISS. & REUT.) H. LINDB. (propia de terrenos calizos o arenas dolomíticas), planta inexistente en el hábitat de *P. golgus* (HBN.) (S. Spain, Sierra Nevada, 2500-3000m altitud). Este error ha sido recogido posteriormente por varios autores en diversas referencias sobre este lepidóptero. Siendo su correcta planta nutricia *Anthyllis vulneraria pseudoarundana*, subespecie endémica de Sierra Nevada, existente en un intervalo altitudinal de 2200-3400 m de altitud, y de ecología muy diferente (sobre esquistos, silicícola). Se incluye una sinopsis con el objetivo de diferenciar estas dos subespecies de *A. vulneraria*.

Zusammenfassung: In dieser Arbeit soll die Fehlbestimmung der Raupenfutterpflanze von *Polyommatus (Plebicula) golgus* (HÜBNER, 1813), durch MUNGUIRA & MARTIN (1989) als *Anthyllis vulneraria arundana* (BOISS. & REUT.) H. LINDB. (die auf Kalkböden und sandigem Dolomit wächst) angegeben, korrigiert werden. Diese fehlt dort, wo *P. golgus* (HBN.) vorkommt (in Südspanien, in der Sierra Nevada, in Höhen von 2500-3000 m). Diese Fehlbestimmung wurde seither in verschiedenen Publikationen wiederholt angegeben. Die korrekte Bestimmung für die Planze ist *Anthyllis vulneraria pseudoarundana*, die, mit unterschiedlichen ökologischen Ansprüchen (auf Schiefer- und kieselsauren Böden), in der Sierra Nevada zwischen 2200-2400 m endemisch wächst. Es wird eine Übersicht über die Unterscheidungsmerkmale beider Unterarten gegeben.

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Introduction: As previously mentioned in the abstract, as a result of the work by MUNGUIRA & MARTIN (1989), and in other related references by these two authors, the identification of the host plant of *P. golgus (Hbn.)* appears incorrectly in various other works where the biology of this species is dealt with, examples of which may be found in FERNANDEZ-RUBIO (1989), TOLMAN & LEWINGTON (1997), etc. This error has gone uncorrected despite the extensive bibliography available on the botany of the Iberian peninsula, as well as the endemic flora of the Sierra Nevada.

The study of diverse references has allowed us to verify that the sites of *Anthyllis vulneraria* existing within the biotopes where *P. golgus* (HBN.) flies corresponds to the subspecies *pseudoarundana*, a plant which, among other differences (for example in its morphology, which is described later), is distinguished from the subspecies *arundana* by its particular ecological requirements (a high altitude, its soil substrate, and endemism at Sierra Nevada).

Identification keys for *A. v . pseudoarundana* and *A. v. arundana*: In various references, for example in CASTROVIEJO et al. (2000:853-854; 2001:665-668) and in BENEDI (1998: 291-193), identification keys are provided for the differentiation of these two subspecies; their morphology is also described, together with their distribution - all of which is necessary for a correct determination. The main differences are given in Table 1. The plants are also described and illustrated in BLANCA et al. (2002: 351).

Of all of the characteristics pointed out in Table 1, it is considered that the most significant is the indument on the leaves (especially on their underside: thin upright hairs are present in *arundana*, these being thick and curved in *pseudoarundana*) and the size of the leaflet terminals, while the ecology of each subspecies (its altitude and soil substrate) is also relevant. *A. v. pseudoarundana* also presents altitudinal variation: at its highest level (3000-3400) the form is named var. *alpina* WILK., which has short stems measuring between 3 and 6 cm, with tight leaflets, while at lower elevations (2200-3000 m) var. *nivalis* WILLK. has longer stems which grow from 6 to 12 cm).

The subspecies *A. v. arundana* (colour plate 5A: 2 A, B) exists on calcareous soils in various Penibetica mountain ranges (in the south and south-east of the Iberian peninsula), in the provinces of Cadiz, Granada, Malaga and Almeria.

Nowadays, several authors accept that *A. v. pseudoarundana* is present not only in Sierra Nevada (S. Spain: S. Granada and S. Almeria provinces) but also at high elevations in the Moroccan Great Atlas (= ssp. *atlantis* EMBERGER & MAIRE), in spite of the large distance that separates these two localities. Accepting this, *P. golgus* (HBN.) and some high altitude populations of *Polyommatus atlantica* (ELWES, 1905) (they occur up to 3000 m) in the Moroccan Great Atlas (the type locality) could both feed on the same host plant, although this has yet to be confirmed. Nevertheless, on account of the habitat diversity and altitudinal range accepted for *P. atlantica* (ELWES), this species, in contrast to *P. golgus* (HBN.) (colour plate 5A: 1; monophagus at subspecific level), undoubtedly uses other subspecies of *A. vulneraria* as hostplants.

It is of interest to point out that TOLMAN (1994:27) erroneously believed that *Polyommatus sagratrox* (AISTLEITNER, 1986) and *P. golgus* (HBN.) fed on the same host plant (*A. v. arundana* sic!), this coincidental assumption appearing to be the basis of his statement that argued strongly against specificity for *sagratrox*, and which therefore considered *P. sagratrox* (AISTLEITNER) to be solely a subspecies of *P. golgus* (HBN.) (which is a controversial

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opinion). TOLMAN appears to ignore, among other features (ecological and morphological differentiations), that the relevant differences in sexual and flight behaviour (extensively accepted in taxonomy) between both species (as well as other differences), all of which have been described in GIL-T. (2003), prove their specific separation. To these dissimilarities we now add its evidently different larval host plant.

	A. v. arundana	*A. v. pseudoarundana*
N° of leaflets on basilar leaves	*Normally from 3 to 5*	*Normally from 5 to 7*
Shape of the leaflet terminal	*orbicular or broadly ovate*	*Eliptic-oblong*
Size of the terminal leaflet respect to the laterals	*Not more than double (Fig. 2, left)*	*Double or superior (Fig. 2, right))*
Indument on the top side of the leaves	*silky, formed by fine & upright hairs*	*None or very little*
Indument on underside of the leaves	*silky, formed by fine & upright hairs*	*Bristly, formed by thick and curved hairs*
Colour of indument of leaves	*Silvery or brownish-chestnutbrown*	*Brownish or chetnutbrown rarely silvery*
Diameter of the glomerules	*20-25 mm*	*20-30 mm*
Glomerule bracts	*around the same length of the calyx or somewhat shorter*	*More short than half of the calyx*
Length of the flowers	*16-18 mm*	*14-16 mm*
Length of the calyx	*10-13 mm*	*9-10 mm*
Length of the fruit body/stipit	*2-3 mm*	*1-1,5 mm*
Soil substrate, biotope	*Saxicole communities, calcareous soils or dolomitic sands*	*psicroxerophyle communities, siliceous soils (micaschists)*
Altitudinal interval	*1200-2100 m*	*2200-3400 m*

Table 1: Synopsis differences between *A. v. arundana* and *A. v. pseudoarundana*

Acknowledgement: I am very grateful to RAFAEL ESTEVEZ RODRIGUEZ (E-Vigo, Pontevedra) for his essential help in the translation of the text from Spanish into English.

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Colour plate 5A (page 311)
Fig. 1: ♀ of *Polyommatus golgus* (HÜBNER, 1813) on *Anthyllis vulneraria pseudoarundana.*
Fig. 2: Left: leaves of *A. v. arundana*; right: leaves of *A. v. pseudoarundana.*

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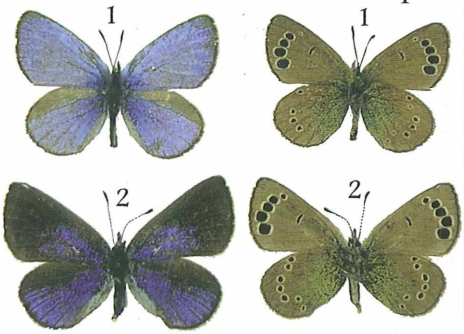
Colour plate 5/ Farbtafel 5



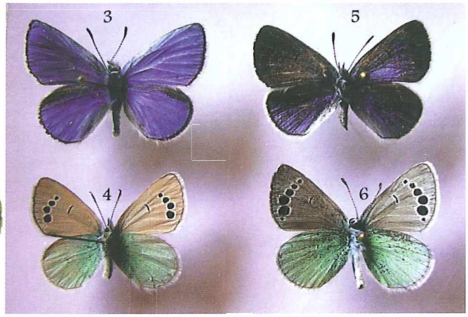


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Fig. 1, 2: *Glaucopsyche* ***hazeri*** **spec. nov.**, Holotypus ♂, Allotypus ♀, 280 km NW Kerman (Dehaj), 10 km W Dehaj, Medvar Mountain, 4.IV.2006, leg. et coll. KARBALAYE.

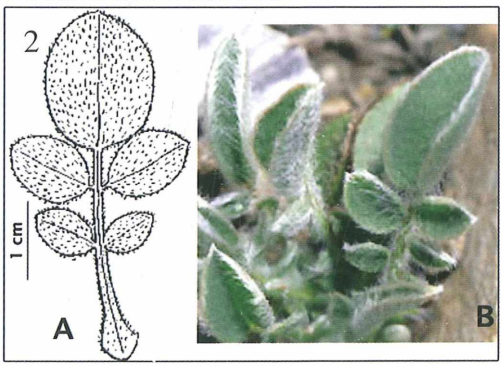
Fig. 3: *Glaucopsyche alexis* (PODA, 1760), ♂, Saveh, Khanak, 1700 m, 3.IV.2005, leg. et coll. KARBALAYE.

Fig. 4: *Glaucopsyche alexis* (PODA, 1760), ♂, N Tehran, Lavasan, Kound, 2000 m, 5.V.2005 , leg. et coll. KARBALAYE.

Fig. 5: *Glaucopsyche alexis* (PODA, 1760), ♀, Saveh, Khanak, 1700 m, 3.IV.2005, leg. et coll. KARBALAYE. **Fig. 6**: *Glaucopsyche alexis* (PODA, 1760), ♀, N Tehran, Lavasan, Kound, 2000 m, 5.V.2005 , leg. et coll. KARBALAYE.

Fig. 7: Type locality, 280 km NW Kerman (Dehaj), 10 km W Dehaj, Medvar Mountain, 4.IV.2006.

Colour plate 5A/ Farbtafel 5A



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Zeitschrift/Journal: Atalanta

Jahr/Year: 2007

Band/Volume: 38

Autor(en)/Author(s): Gil-T. Felipe

Artikel/Article: The correct hostplant of Polyommatus golgus (Hübner, 1813): Anthyllis vulnerariapseudoarundana H. Lindb 199-202