

**Concerning the morphology of *Hyles tithymali* (BOISDUVAL, 1832) from La Palma island (W. Canary islands, Spain) and its formal ascription to *Hyles tithymali phaelipae* GIL-T. & GIL-UCEDA, 2007**

(Lepidoptera, Sphingidae)

by

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received 1.XII.2009

**Abstract:** The morphology of the larvae and the adults of *Hyles tithymali* (BOISDUVAL, 1832) from La Palma island are studied. This population is compared with *Hyles tithymali phaelipae* GIL-T. & GIL-UCEDA, 2007, described from El Hierro island.

The larvae, in the same way as those of El Hierro, show horizontally elongated subdorsal eye-spots (100% larvae of the sample), with the black border of each eye-spot reduced to a dorsal and a ventral black stripe, both horizontally separated. In the 100% of the grown larvae (L5), all the eye-spots are of a characteristic contrasted orange-ochreous colour [red, pink or white in the other subspecies of *H. tithymali* (BDV.)]. The dorso-lateral row of eye-spots is normally connected by a defined yellowish stripe, well visible in most of the larvae (over 90% of the sample).

Among the larvae of La Palma also an interesting morphotype can be found, unique for this island, existing in a very small percentage, but it is not uncommon, with a row of well developed supraspiracular spots [which is more typical in *H. euphorbiae* (LINNAEUS, 1758)].

The results of the comparison (larvae and imagos) indicate that the population of *H. tithymali* (BDV.) of La Palma island should be ascribed to *Hyles tithymali phaelipae* GIL-T. & GIL-UCEDA, 2007, because there is no constant character (in larvae or imagos) for distinguishing the populations of *H. tithymali* (BDV.) of both islands.

**Resumen:** Se estudia la morfología de las larvas e imagos de *Hyles tithymali* (BOISDUVAL, 1832) de la isla de La Palma. Se compara la anterior población con la *Hyles tithymali phaelipae* GIL-T. & GIL-UCEDA, 2007, descrita de la isla de El Hierro.

La larvas, del mismo modo que las de El Hierro, muestran ocelos subdorsales alargados horizontalmente (100% de las larvas de la muestra), con el borde negro de cada ocelo reducido a una raya negra dorsal y a otra ventral, ambas separadas horizontalmente. En el 100% de las larvas desarrolladas (L5), todos los ocelos son de un característico color contrastado naranja-ocre [rojo, rosa o blanco en las otras subespecies de *H. tithymali* (BDV.)]. La fila de ocelos dorso-lateral está normalmente conectada por una definida raya amarillenta bien visible en la mayoría de las larvas (en más del 90% de la muestra).

Entre las larvas de La Palma también aparece un interesante morfotipo, exclusivo de esta isla, existiendo en un muy pequeño porcentaje, pero no es raro, con una fila de manchas supraespiraculares bien desarrolladas [lo cual es más típico de *H. euphorbiae* (LINNAEUS, 1758)].

El resultado de esta comparación (larvas e imagos) indica que la población de *H. tithymali* (BDV.) de la isla de La Palma debe ser adscrita a la subespecie *Hyles tithymali phaelipae* GIL-T. & GIL-UCEDA, 2007, porque no hay caracteres constantes (en larvas o imagos) que permitan

distinguir las poblaciones de *H. tithymali* (BDV.) de ambas islas.

**Introduction:** The morphology of the larvae of *H. tithymali* (BDV.) in the Canary Islands is divided into two groups (figs. 1, col. pl. 12: 2):

- a) The first group belongs to the islands of El Hierro (type locality of *H. t. phaelipae* GIL-T. & GIL-UCEDA, 2007) and La Palma (fig. 1: La Palma indicated by an arrow; El Hierro below the previous), the two westernmost islands, showing strong elongate horizontal eye-spots, of orange-ochreous colour, with the black border of each spot reduced to a dorsal and a ventral horizontal black stripe; and the presence of a greenish-yellow stripe (col. pl. 12: 2, indicated by an arrow) that links all the dorso-lateral eye-spots.
- b) The second group belongs to the islands of Tenerife, Gran Canaria, Lanzarote and Fuerteventura [*H. t. tithymali* (BDV.), east and centre of the archipelago], showing round eye-spots of red, pink or white colour in grown larvae (L4, L5). This colour varies: it can be very intensely red or bright white, or various shades of pink in between. The morphology of the population of La Gomera island (fig. 1, indicated with a „?“) is discussed in GIL-T. (2010).

During the period between April 5th and 9st 2008, I was able to examine about 90 larvae of *H. tithymali* (BDV.) (from L2 to L5) in NE. of La Palma island, feeding on *Euphorbia lamarckii* SWEET (= *E. obtusifolia* POIR = *E. broussonetii* WILLD ex LINK) host plant of this hawkmoth in El Hierro and La Palma. All the grown larvae (L4, L5) showed strongly elongated horizontal subdorsal eye-spots (col. pl. 12: 2, top), well contrasted, of orange-ochreous colour, and the other main characters mentioned for the larvae of *H. t. phaelipae* GIL-T. & GIL-UCEDA.

It is considered in GIL-T. & GIL-UCEDA (2007) (final note in this paper) „that the population of *H. tithymali* (BDV.) from La Palma needs further investigation [...] complementary study to finally decide a different status or even for its possible adscription to *H. t. phaelipae* GIL-T. & GIL-UCEDA [...]“: The current work analyses the morphology of the offspring obtained from imagos (all ex larva) collected in La Palma, and compares it with *H. t. phaelipae* GIL-T. & GIL-UCEDA, studied in GIL-T. & GIL-UCEDA (2007), for clarifying if the previous population is undoubtedly ascribable to this subspecies.

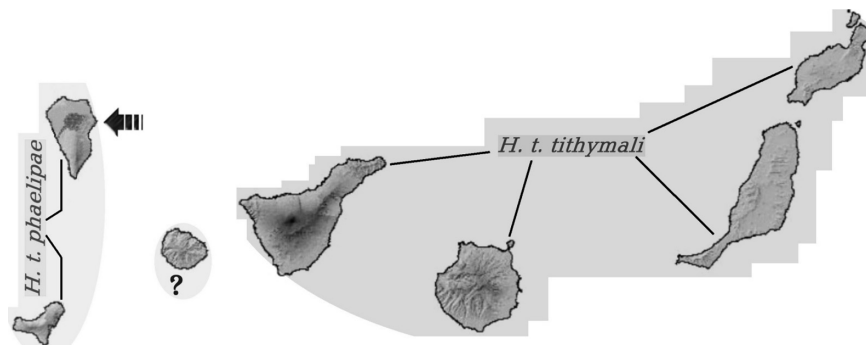


Fig. 1: Distribution of the two subspecies pf *Hyles tithymali* (BOISDUVAL, 1832) in the Canary islands.

**Material and Methods:** Around 90 larvae were examined in nature in La Palma. Some of these caterpillars were collected and reared in captivity until pupation. From their pupae and imagos,

a new generation (F1: 80 larvae) was obtained in captivity –in peninsular Spain-. Samples of larval varieties or forms obtained (all in L4-L5, with well defined morphology) were photographed laterally and compared with the available photographic material for the description of *H. t. phaelipae* GIL-T. & GIL-UCEDA, 2007. From the photos of the larvae most characteristic, representing their entire range of variability, several sections were selected to compose the figures 2-5 in col. pl. 12.

## Results

### Morphology of the larvae

L1 and L2 with the same characteristics as those in El Hierro.

In L3, right after the second moult, the larval pattern design starts to be noticeable and defined; some eye-spots can be seen showing some of their typical characteristics: elongate subdorsal spots, initially white; well defined a white stripe linking the eye-spots. In El Hierro, the eyes spots turn from white to ochre-orange some days after starting L3, - in La Palma they are normally white during L3.

In L4, all the larvae from El Hierro show their final colour pattern: strongly elongated horizontal subdorsal eye-spots of orange-ochreous colour (in 100% larvae); in La Palma the larvae does not show their final colour pattern yet: strongly elongated horizontal subdorsal eye-spots, but only some larvae showed the eye-spots of the colour slightly orange-white.

In La Palma, all the larvae were found to be linked by a well defined white-yellowish stripe, visible and delimited, connecting the eye-spots; in El Hierro the previous feature referred to, is yellowish (col. pl. 12: 2, top). In these two islands, in a very small percentage of larvae, on account to the fact that their lateral band was of a light yellow colour (no masking of this yellow colour by black), and the outline of the probable stripe linking the eye-spots was not clearly delimited within the ground colour (of the same colour) of the lateral band (El Hierro: col. pl. 12: 3, bottom row, left larva; La Palma: col. pl. 12: 4, bottom row, left larva)

In L5, the larvae of both islands are very similar, most of them indistinguishable [col. pl. 12: 3, 4; see also GIL-T. (2007)].

Between the larvae in La Palma, also an interesting morphotype (col. pl. 12: 5) occurs, exclusively in this island, existing in a very small percentage (3-4% of our sample), with a row of well developed supraspiracular spots, orange or white, giving to the larva the appearance of having two rows of eye-spots, like in *H. euphorbiae* (L.) and more typical for that species.

As we could see, the larvae from La Palma and El Hierro are the only ones within *H. tithymali* (Bdv.) (s. l.) that show to 100% strong elongated horizontal subdorsal eye-spots, with the black border of each spot reduced to a dorsal and a ventral horizontal black stripe.

### Morphology of the adults

Most of the imagos from La Palma are similar to those from El Hierro (col. pl. 13: 6), and most of them are indistinguishable: the median stripe in the forewing upperside is narrower; the ground colour of wings, fringes and body is clearly dark olive. See features of the morphology of the imagos of *H. t. phaelipae* GIL-T. & GIL-UCEDA in GIL-T. & GIL-UCEDA (2007). Although the above characters are constant in El Hierro, in La Palma some imagos (a small percentage) also have this middle stripe wider, similar to that shown by specimens of the nominotypical subspecies. The previous character is not important if we consider the great variability of the imagos of all subspecies of *H. tithymali* (Bdv.) (PITTAWAY, 1997)

**Conclusion:** As we could see, the population of *H. tithymali* (BDV.) in La Palma should be ascribed undoubtedly to *H. t. phaelipae* GIL-T. & GIL-UCEDA.

The interesting morphology of *H. tithymali* (BDV.) in La Gomera, apparently not known, is discussed before in GIL-T. (2010). With the results of the previous work, where a number of hypotheses on the origin of *H. t. phaelipae* GIL-T. & GIL-UCEDA is exposed, the knowledge of the morphology of *H. tithymali* (BDV.) in the three westernmost islands (fig. 1) of the Canary Islands is now completed.

**Acknowledgements:** I would like to express my sincere thanks to my friend RAFAEL ESTEVEZ RODRIGUEZ (Spain: Vigo, Pontevedra) for his help in revising the English text of this paper.

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Jahr/Year: 2010

Band/Volume: [41](#)

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

Artikel/Article: [Concerning the morphology of Hyles tithymali \(Boisduval, 1832\) from La Palma island \(W. Canary islands, Spain\) and its formal ascription to Hyles tithymali phaelipae Gil-T. & Gil-Uceda, 2007 253-256](#)