

The larval host-plant of *Pontia chloridice* (HÜBNER, [1813] in Greece (Lepidoptera : Pieridae)

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Abstract. The larval host-plant of *Pontia chloridice* in Evros, N.E. Greece has been established as *Cleome ornithopodioides*. A brief description of the pre-imaginal stadia is given. The pupa of *chloridice* is remarkable for mimicking a bird-dropping. Circumstantial evidence suggests that the species hibernates on stones within its biotope. It is further argued that the species hibernates as a pupa. Several widely-dispersed colonies of *chloridice* were found in Evros at altitudes of 50-250 m. The pupation strategies adopted by some members of the Pieridae and Papilionidae are compared and discussed briefly.

Samenvatting. De voedselplant van de rups van *Pontia chloridice* HÜBNER in Griekenland (Lepidoptera : Pieridae)

In Evros (Noordoost-Griekenland) werd de voedselplant van de rups van *Pontia chloridice* gedetermineerd als *Cleome ornithopodioides*. Een korte beschrijving van de pre-imaginale stadia wordt gegeven. De pop van *chloridice* mimeert de uitwerpselen van vogels. Er wordt verondersteld dat de soort verpopt op verspreid liggende stenen in het biotoop. Verder wordt aangegeven dat de soort als pop overwintert. Verscheidene ver van elkaar verspreide kolonies van *chloridice* werden aangetroffen in Evros tussen 50 en 250 m hoogte. De verpoppingsstrategieën van enkele soorten uit de families Pieridae en Papilionidae worden met elkaar vergeleken en kort besproken.

Résumé. La plante-hôte de la chenille de *Pontia chloridice* (HÜBNER) en Grèce (Lepidoptera : Pieridae)

La plante-hôte de la chenille de *Pontia chloridice* à Evros, dans le nord-est de la Grèce, a été déterminée comme appartenant à *Cleome ornithopodioides*. Une brève description des états pré-imaginaux est présentée. La chrysalide de *P. chloridice* est remarquable vu sa ressemblance frappante avec un excrément d'oiseau. L'évidence circonstancielle suggère que l'espèce se chrysalide sur des cailloux présents sur son biotope. De plus, il est suggéré que l'espèce hiberne à l'état de chrysalide. Plusieurs colonies largement dispersées de *chloridice* ont été trouvées à Evros à des altitudes allant de 50 à 250 m. Les stratégies de chrysalidation de plusieurs membres des Pieridae et Papilionidae sont comparées et brièvement traitées.

Key words : *Pontia - chloridice - Cleome - ornithopodioides - Pieridae - Papilionidae - ovum - larva - pupa - Greece.*

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The presence of an established colony of *Pontia chloridice* in Greece was noted by DACIE et al. (1979, 1982). In April 1989, my wife and I visited Evros in N.E. Greece to search for the butterfly and its larval host-plant. After some days, a small colony of the insects was located at an altitude of about 200 m in the hills to the north of Alexandroupoli. The biotope consisted of a small, barren landscape, liberally strewn with smooth, rounded stones, evidently fashioned by the action of water. The area was surrounded by scrub and small trees. The first few *chloridice* captured were males which had been flying slowly a few centimetres above the ground. They were seen to dip frequently in between the stones and as no flowering plants were in evidence - indeed, the

ground was almost entirely devoid of vegetation - it was concluded that these males were in search of emerging females rather than sources of nectar. The first female *chloridice* observed, flew exactly the same manner except that on one occasion, she disappeared amongst the stones for several seconds. Inspection of this site revealed a very small seedling, barely 1 cm high. It possessed only its primitive leaves and on the edge of one of these was a pale yellow Pierid ovum. A careful search of this otherwise uninviting biotope revealed many such plants, mostly hidden from casual view by the stones between which they grew. The time of year and the uniform state of development of the plants (evidently non-perennial) indicates, of course, that an earlier spring brood could not have been supported: this conclusion, in company with the behaviour of the males, argues strongly for the species having hibernated as pupae within the confines of its breeding-ground.

Upon returning to the site several days later, the plants had developed considerably, enabling specimens suitable for identification to be collected. The identity of the species was later established as *Cleome ornithopodioides* LINNAEUS (Capparidaceae). Many plants contained ova, mostly deposited on the flower buds and leaves.

Greatly assisted by the knowledge of the larval host-plant and biotope character, several, small, widely-dispersed colonies of *chloridice* were found in Evros at altitudes of 50-250 m.

The pre-imaginal stadia of *Pontia chloridice*

Freshly laid ova are pale yellow becoming dark orange in maturation. Hatching occurs after 7-10 days. The newly-emerged larva is dark olive-green with black tubercles on each segment from which arises a black spine. Unfortunately, circumstances did not permit the development of the larvae to be followed closely, but four, small larvae were reared on growing plants in an attempt to acquire the full-grown larva and pupa.

Prior to pupation, the larvae measured 26-29 mm in length, having taken 15-18 days to achieve this size from larvae measuring 5 mm. The ground colour is porcelain white. Each segment is studded with black, shiny tubercles, the more prominent of which comprise two rows of 3 situated obliquely and symmetrically about the dorsum, with a further 1 closer to and on each side of the dorsal line. There are other black tubercles and smaller dark spots, some arranged symmetrically, others not so. The arrangement of the tubercles on the head and tail segments depart somewhat from the general pattern. Each tubercle carries a fine spine which is dark nearest its base but white for the latter third of its length. The larvae is sparsely clothed with fine, white hairs of varying lengths: a higher density of shorter white hairs occurring on the head. The junction of each segment is marked by a bright, orange band which extends about half-way down the flank. The outer-facing, upper part of the feet are orange as are the head and tail segments. In the penultimate instar, the larvae are about 17 mm long and identical to the final instar in form but with yellow replacing the orange markings.

The pupa is quite remarkable for giving the immediate and striking impression of a bird-dropping - apparently unique in the European Pieridae. This, however, is not so surprising considering the character of the biotope in which the butterfly lives, if it is surmised that pupation occurs on the surface of the same, smooth and rounded stones which harbour its host-plant. This supposition is supported by the absence of alternative pupation sites (within the area containing its host-plant) and the observed behaviour of the males, which, of course, provide the clearest possible indication of the whereabouts of female pupae. It is evident that the host-plant itself is not a viable overwintering site for pupae: it is an annual of a rather delicate structure, the dead stems of which are very unlikely to survive the winter intact. As far as is known, other European Pieridae seeking protection in the pupal stage use camouflage as means of deceiving potential predators. This is possible because of the suitability of the sites available for pupation. However, if *chloridice* were to adopt the appropriate cryptic colouration in pupating on the smooth surface of a stone, it would still be detectable as an incongruous and therefore conspicuous lump. Evidently, *chloridice* has evolved the defensive strategy of rendering itself even more conspicuous but has compensated by exploiting an unusual variant in the art of deception. The only other European butterfly which appears to have adopted bird-dropping mimicry in the pupal stage as a defence against predation is *Strymonidia pruni* LINNAEUS.

In captivity, the rim of the pot containing the host-plant was selected as the site for pupation. The pupa is secured at the tail and by a silken girdle. The only pupa to survive produced a female after 19 days. Resemblance to the pupa of *Pontia daplidice* LINNAEUS is superficial in respect to shape as well as colouration. Regarding the latter, the head, thorax, dorsal area of the abdomen and margins of the wing-cases are various shades of olive-green or brown. Other dark patches, corresponding to the black tubercles on the larva, are evident along the thorax and abdomen. Whitish areas occur on all segments but the wing-cases are almost entirely white. Compared to *daplidice*, the *chloridice* pupa is very much rounder and smoother in its contours, having none of the sharp angles and points of its congener: indeed, it is as much the shape as the colouration which contributes to the impression of a bird-dropping.

Comparison with the pupae of Papilionidae

In the present context, it is perhaps of some interest and relevance to consider the Papilionidae which pupate on stones but use camouflage to evade detection. The Papilionidae, however, associate, as often as not, with craggy terrain where a greyish/brownish, rectilinear pupa would not seem out of place on a similarly coloured and compatibly structured surface of, for example, rugged limestone. Additionally, Papilionidae would appear to have the option, where suitable rock is not available, of pupating, to good effect, on the bark of trees or shrubs. As surmised earlier, neither of these options, both involving the use of camouflage, would appear to be available to, or

otherwise required by *chloridice*.

Acknowledgements

The author is greatly indebted to Professor D. FERGUSSON of the Rijks-universitair Centrum Antwerpen (RUCA) and Dr. Alfred HANSEN of the Botanical Museum, Copenhagen, for determining the identity of the larval host-plant, *Cleome ornithopodioides*. The author also extends his appreciation to Mr. Jos DILS and Mr. Ib KREUTZER for transporting, on his behalf, living plant material to the above institutions.

References

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Boekbespreking

Vives Moreno, A. : *Catálogo sistemático y sinonímico de los Lepidopteros de la Península Ibérica y Baleares (Insecta : Lepidoptera)*.

17 x 24 cm, 378 p., Ministerio de Agricultura, Pesca y Alimentación, gebonden in slappe kaft, 1992, Pesetas 5000,- (Ptas 3000,- voor Fellows of Shilap) (ISBN 84-7479-904-X).

Dit boek was oorspronkelijk bedoeld als het tweede deel van de «Catálogo Sistemático de los Lepidopteros Ibéricos. (I) Macrolepidoptera» door M.R. GOMEZ-BUSTILLO & M. ARROYO VARELA (1981), maar sinds die datum zijn er zoveel wijzigingen in de hogere systematiek doorgevoerd en zoveel nieuwe soort voor de Iberische fauna ontdekt, dat het een beter idee leek om een volledig nieuwe naamlijst te starten. In dit deel vinden we de zogenaamde Microlepidoptera terug, waaronder ook Hepialidae, Cossidae, Zygaenidae en Sesiidae. De superfamilies Geometroidea, Axioidea, Drepanoidea, Bombycoidea, Sphingoidea, Hesperioidea, Papilionoidea en Noctuoidea zullen binnenkort in een tweede deel verschijnen.

Het boek begint met een bespreking van het soortbegrip en zijn onderverdelingen en van de criteria die door diverse auteurs gehanteerd worden voor de classificatie van de Lepidoptera. Dit inleidend deel eindigt met een systematisch overzicht van de hogere categorieën tot op het tribus.

De kwaliteit van de soortenlijst zelf bereikt zeker die van de vermaarde Franse lijst door P. LERAUT en biedt meer ruimte voor aanvullingen en correcties omdat per pagina slechts één kolom is gedrukt. De lijst bevat erg veel synoniemen, en dat is heel praktisch voor wie ook oudere literatuur wenst te raadplegen. De typografie van de lijst is goed bestudeerd en de lijst is daardoor erg overzichtelijk in het gebruik. Geldige namen zijn vetjes gedrukt, synoniemen kursief en met een grote insprong. Een verbetering tegenover de Franse lijst is verder dat de auteursnamen tussen haakjes staan als de auteur de soort in een ander genus beschreef dan het genus waartoe ze nu behoort.

In de marge is met de letters E., P. en B. aangegeven of de soort in Spanje, Portugal of op de Balearen voorkomt. Staat er geen letter, dan is de soort uitsluitend bekend van het Spaanse vasteland. Bij 112 soort wordt verwezen naar bijkomend commentaar achteraan in het boek. Daar vindt men ook een uitgebreide literatuurlijst, en alfabetische registers van namen van hogere taxa, auteurs en soortnamen.

Het boek is gedrukt op kwaliteitspapier en erg verzorgd uitgegeven. De prijs is zeker niet te hoog voor de geboden informatie. Hopelijk moeten we niet te lang wachten op het tweede deel.

W.O. De Prins