Maniola chia - a new Satyrid from the Greek island of Chios (Lepidoptera : Nymphalidae : Satyrinae)

George THOMSON

Samenvatting. Maniola chia - een nieuwe Zandoog van het Griekse eiland Hios (Lepidoptera : Nymphalidae : Satyrinae)
De auteur beschrijft een nieuwe soort uit het genus Maniola Schrank van Hios. De identificatie van het nieuwe taxon is gebaseerd op kenmerken van de uiterlijke morfologie, genitalia, morfologie van het ei, chaetotaxie van de rups en enzymeelektroforese. Verondersteld wordt dat deze soort voornamelijk evolueerde als een gevolg van het «founder effect».

Résumé. Maniola chia - un nouveau Satyride de l'île grecque de Chios (Lepidoptera : Nymphalidae : Satyrinae)
L'auteur décrit une nouvelle espèce dans le genre Maniola Schrank provenant de Chios. Pour l'identification du nouveau taxon la morphologie externe, les genitalia, la morphologie de l'oeuf, la chaetotaxie larvaire et l'électrophorèse enzymatique sont utilisés. Il est supposé que l'espèce a évolué principalement par la suite du «founder effect».

Abstract. Maniola chia - a new Satyrid from the Greek island of Chios (Lepidoptera : Nymphalidae : Satyrinae)
A new species of the genus Maniola Schrank from Chios is described. External morphology, genitalia, embryonic morphology, larval chaetotaxy and enzyme electrophoreses were used in an identification of the new taxon. It is suggested that the species evolved principally as a result of founder effect.

Keywords : chia, Maniola, Chios, Satyrinae, speciation, morphology, electrophoresis.

Thomson G. : Department of Biological Science, University of Stirling, Stirling, Scotland.
Correspondence address : 2 Ravenhill, Lochmaben, Lockerbie, Dumfriesshire, Scotland, DG11 1NR.

The butterfly fauna of the eastern Greek islands is poorly documented. The early works of REBEL (1916, 1924, 1935, 1936), TURATI (1929), TURATI & FIORI (1930), HARTIG (1940), REISSER (1946) and even the more recent papers by BENDER (1963) and BRETHERTON (1966) have been shown to be superficial in their coverage (THOMSON, 1985; RIEMIS, 1986; GASKIN & LITTLER, 1986; OLIVIER, 1986). The distribution of Maniola telmessia (Zeller, 1847) and jurtina (Linnaeus, 1758) in the eastern Aegean islands was known, until recently, only from some of the abovementioned lists together with the paper of TAUBER & TAUBER (1968). Maniola telmessia has been recorded from Karpathos, Rhodes, Symi, Kos, Kirykos, Samos and Lesbos. It was also reported from Chios by REBEL (1935) as ‘Epinephele telmessia Z. : Insel Chios, 10 und 11.VI und Insel Mytilene 13 bis 16.VI (W.W.), ein φ. fünf φ.’ On the other Greek islands from which there are records jurtina is found (COUTSIS, 1969, 1972), but there are many where the situation is not known.

In May 1986 a short series of Satyrid butterflies which had been collected on the Greek island of Chios (GASKIN & LITTLER, 1986) was received from Professor David GASKIN. These had been designated Maniola telmessia, but
there was some doubt about their true identity. The males resembled rather large *cypricola* Graves (1928) or *megalae* (Oberthür, 1909). The females were superficially indistinguishable from the large *jurtina* phenotypes which are found in some of the eastern Mediterranean, Ionian and Aegean islands, including Crete, Corfu (Thomson, 1969) and Zakynthos (Gaskin, pers. comm.). Dissection of both male and female genitalia revealed that the Chios butterflies were certainly not *telmessia* and, if they were to be assigned to an existing taxon, they would accord more appropriately with *Maniola jurtina*. While the form of the female genitalia suggested this affinity (Thomson, 1976), the anomalous structure of the male genitalia in relation to known geographical variation in southern and eastern Europe (Thomson, 1973), left considerable doubt.

Through the generous help of Mr Alain Olivier, 20 further individuals (10 males and 10 females) of this butterfly, collected in the Nea Moni Monastery area of the island, were received alive. Two females were subjected to photoperiod regulation in an attempt to induce oviposition. By July 12, 16 ova were laid from which 12 larvae hatched. These did not survive beyond the first instar. In preparation for enzyme electrophoresis 10 males and 9 females, including one of the laying females, were frozen.

On examination of this material it became clear that these butterflies represented an entirely new taxon. Both larval chaetotaxy and allele frequencies from electrophoretic analysis proved conclusive. Examination of a long series of Chios *Maniola* in the Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam, extended the morphological data and contributed to an overall picture of variation in the species.

Description

*Maniola chia*, new species (Lepidoptera : Nymphalidae : Satyrinae)

**Male**

Wing length : mean 23.84 mm (±1.172 SD), largest 26.86 mm, smallest 21.10 mm.

Upperside forewing : ground colour uniformly blackish sepia. Fulvous around ocellus usually distinct, occasionally extending as a clear submarginal band to vein 2. Apical ocellus distinct, usually moderately large or large, frequently with a single white pupil, occasionally bipupilled. Androconial brand conspicuous, black, curved and tapering upwards, frequently extending beyond vein 3.

Upperside hindwing : uniformly blackish sepia.

Underside forewing : ground colour uniformly golden yellow-brown. Medial line, when present, slightly darker than ground colour. Outer margin mid grey-brown, about .1 wing length, widening towards the wing apex. Costa narrowly edged grey-brown. Apical ocellus distinct, usually single pupilled, occasionally bipupilled and surrounded indistinctly by light yellow-fulvous.

Underside hindwing : almost uniformly mid grey-brown, occasionally reddish grey-brown. Submarginal band slightly paler or indistinct. Ocelli
often large and distinct, 2 to 5 in intervenosa 2, 3, 4, 6 and 7, each surrounded by ochreous yellow, frequently white pupilled. Striae small and inconspicuous.

Female
Wing length: mean 25.87 mm (±1.745 SD), largest 28.06 mm, smallest 20.52 mm.
Upperside forewing: ground colour uniformly dark sepia, lighter than the ground colour of the male. Fulvous area extensive, always present in discal area and as a distinct but variable marginal band extending from vein 2 to vein 8. Discal and submarginal areas usually separated by a distinct, broad, dark medial line of the ground colour. Fulvous around apical ocellus paler. Apical ocellus large, frequently very large, usually distinct and with 1 or 2 white pupils.
Upperside hindwing: ground colour as forewing. Submarginal fulvous band usually clear and extensive.
Underside forewing: ground colour golden yellow-brown. Discal area paler, yellowish. Medial line inconspicuous, darker than ground colour. Outer margin grey-brown, almost .15 wing length, widening towards wing apex. Apical ocellus large, sometimes very large, distinct with 1 or 2 white pupils. Area around apical ocellus paler than the submarginal band.
Underside hindwing: ground colour variable, uniformly light grey-brown to mid sepia. Submarginal area shaded light violet-grey to fulvous, especially adjacent to the medial line. Ocelli 0 to 3. Striae conspicuous.

Genitalia
Male (figure 1, 1-4, figure 2, 2): uncus long. Gnathos extending to more than .75 of the uncus length, gnathos base slightly dilated. Valve variable as with other Maniola species, significantly larger than telmessia, shaped differently from that of most telmessia but approximately similar to some individuals from Lesbos and Samos, distal process bluntly pointed, dorsal process (lobe) wide, less wide than in the eastern jurtina form (THOMSON, 1973) but wider than in western jurtina. Aedeagus broad and straight. Julien Organ thicker than that of telmessia, possibly slightly less so than in most eastern jurtina.
Female (figure 1, 5): lamella postvaginalis large and broad, similar to that of jurtina, considerably larger than that of telmessia. Lamella antevaginalis variable, usually heavily sclerotised. Bursa occasionally with two signs of a length greater than those of most telmessia but much shorter and lighter than those in cypricola.

Ovum
Similar to that of telmessia, but shorter (less tall) and greater in diameter than most telmessia ova so far examined. Rib number 13 to 14, compared with 14 to 16 for telmessia and more than 18 for jurtina. Form symmetrical, unlike some telmessia.
Figure 1: 1-4 Maniola chia n.sp., Nea Moni, Chios, 30 May 1986 - male genitalia; 5 Maniola chia n.
sp., female genitalia - data as male (magnification x10)
First instar larva
Superficially similar to *telmessia*. Position of spines and setae identical with *telmessia*, but spine lengths differ markedly between the species.

Genetics
Allele frequencies suggest a relationship distinct from other *Maniola* species. A single monomorphic locus is fixed for a mobility different from that of both *jurtina* and *telmessia*. This dimeric locus is diagnostic for the *jurtina* and *telmessia* groups.

Variation
The range of variation in wing markings is similar to that in other *Maniola* species. Variation occurs principally in the size of the apical ocellus, the extent of fulvous on the upperside, the degree of melanism on the underside and the number and position of the underside hindwing ocelli. Three males and one female of a form homologous with form *addenda Mousley* (*Thomson*, 1969) of *M. jurtina* and three males with an ocellus on the upperside hindwing are included in the material studied. The range of variation in size is considerable, particularly in the males (figure 3).

Distribution and range
Known only from the island of Chios where it is, apparently, widespread and common, flying to at least 500 m.

Habitat
Flies in similar situations to *jurtina* and *telmessia* in south-eastern Europe, garigue, cultivated areas and less open habitat where the adults can find shade
Figure 3: Wing lengths of male and female *Maniola telmessia* and *M. chia* n.sp. from the Greek islands of Karpathos (A), Rhodes (B), Symi (C), Kos (D), Samos (E), Chios (F) and Lesbos (G); the thin line represents the range, the thick line 1 standard deviation each side of the mean and the open box 2 standard errors on each side of the mean.
including small pine woods with undergrowth and in particular near bushes especially *Quercus ilex* and *Rubus* sp. (OLIVIER; pers. comm.).

**Flight**

Earliest 23 May, latest 20 September. The adults are presumed to aestivate in the summer months like all southern *Maniola* species.

**Types**


Paratypes: 11 males, 20 females deposited in the Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam, 28 males, 28 females (A. OLIVIER collection), 5 males, 5 females (author’s collection), 1 male, 1 female (D. VAN DER POORTEN collection), 1 male, 1 female (J. DILS collection), 1 male, 1 female (A. RIEMIS collection), 1 male, 1 female (W.O. DE PRINS collection).


**Discussion**

Chios is one of the large group of islands which lies a short distance from the Turkish mainland. On the other islands which have been studied, Karpathos, Rhodes, Symi, Kos, Samos and Lesbos, *telmessia* is the only *Maniola* which has been found. The wing length of male *Maniola chia* should distinguish it from most *telmessia* (figure 3). Female size overlaps with that of *telmessia* on the other islands in the eastern Aegean and dissection of genitalia is essential for identification.

Although the large size of *chia* contrasts greatly with the small *telmessia* on
the adjacent islands, especially Lesbos, neither morphological nor electrophoretic data indicate character displacement. The affinities which this species displays with both jurtina and telmessia in the form of the genital armature and immature stages could suggest hybrid origin. However, electrophoretic analysis do not support this. It is likely that Maniola chia, an insular endemic species, is the consequence of founder effect during a period of rapid postglacial colonization, subsequent genetic drift and later consolidation by stabilising selection.

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Author's note

The analysis leading to the conclusions detailed in this paper form part of a major study of Maniola and related genera. It is not appropriate that details of electrophoretic techniques and analysis or larval chaetotomy should be published here.

References


Boekbespreking

Blab, J. : Grundlagen des Biotopschutzes für Tiere

Dit is de tweede, sterk uitgebreide, uitgave van het boek dat voor het eerst in 1984 verscheen. Talrijke hoofdstukken werden bijgevoegd en de bestaande teksten werden alle sterk uitgebreid. Het boek vat uiteen in twee grote delen : het algemeen deel met gegevens over o.a. : indeling van biotopen, waardering van verschillende ecosystemen, en het gedetailleerde deel waarin achtereenvolgens de verschillende biotopen worden besproken waarin dieren leven, o.a. : binnenwaters, moeraslanden, bos, akker. Bij elk biotooptype worden karakteristieke soorten opgenomen en de eisen besproken die ze aan hun milieu stellen. Die voorbeeldsoorten worden vanaf vier gekozen bij de gewervelden, de vlinders, kevers, libellen, vleugeligen, sprinkhanen en slakken. Tevens worden bij elk biotooptype de factoren besproken die er de oorzaak van zijn dat het biotoop bevalt en de maatregelen die dienen genomen te worden om de achteruitgang te stoppen en de oorspronkelijke toestand te herstellen.

Het boek is zeer gedetailleerd onderverdeeld in hoofdstukken, paragrafen enz. Alleen hierdoor was het mogelijk om enige klaarheid te scheppen in deze onoverzichtelijke materie. Belangrijk is het besluit van de auteur dat het behouden van soorten (door b.v. vangverbot) alleen zin heeft als erst het voortbestaan van hun biotopen zekerheid is. Omdat het boek zo sterk onderverdeeld is en erg op de praktijk gericht, vindt eenieder in enkele ogenblikken de informatie die hij zoekt.

Het boek mag dan ook niet in de boekenkast ontbreken van diegenen die zich met natuurbescherming bezighouden, hetzij omwille van hun beroep of omwille van persoonlijke interesse. W.O. De Prins