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***Maniola halicarnassus* - a new Satyrid from south-western Turkey (Lepidoptera : Nymphalidae : Satyrinae)**

George THOMSON

Abstract. *Maniola halicarnassus* - a new Satyrid from south-western Turkey (Lepidoptera : Nymphalidae : Satyrinae)

A new species belonging to the genus *Maniola* SCHRANK from south-western Turkey is described. The butterfly flies sympatrically with *M. telmessia*. Males can be identified by some external characters. The females of the new species are difficult to separate from *telmessia*. The ova have a distinctive number of longitudinal ribs and the larvae have a variable number of instars. One population includes hybrids between the new species and *telmessia*.

Samenvatting. *Maniola halicarnassus* - een nieuwe Satyride uit Zuidwest-Turkije (Lepidoptera : Nymphalidae : Satyrinae)

In het genus *Maniola* SCHRANK wordt een nieuwe soort beschreven uit Zuidwest-Turkije. De vlinder komt sympatrisch voor met *M. telmessia*. De mannetjes kunnen geïdentificeerd worden op basis van sommige uiterlijke kenmerken. De wijfjes van de nieuwe soort zijn moeilijk te onderscheiden van *telmessia*. De eieren hebben een karakteristiek aantal lengteribben en de larven hebben een variabel aantal stadia. Eén populatie bevat hybriden tussen de nieuwe soort en *telmessia*.

Résumé. *Maniola halicarnassus* - un nouveau satyridé du sud-ouest de la Turquie (Lepidoptera : Nymphalidae : Satyrinae)

Une nouvelle espèce du genre *Maniola* SCHRANK est décrite du sud-ouest de la Turquie. Le papillon cohabite avec *M. telmessia*. Les mâles peuvent être identifiés en se basant sur plusieurs caractères externes. Les femelles de la nouvelle espèce ne peuvent être que difficilement séparées par rapport à *telmessia*. Les oeufs ont un nombre caractéristique de côtes verticales et les larves ont un nombre variable de stades. Une population comprend des hybrides entre la nouvelle espèce et *telmessia*.

Keywords : *halicarnassus*, *Maniola*, Turkey, speciation, morphology.

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Introduction

Six species belonging to the genus *Maniola* SCHRANK have been described, *jurtina* (LINNAEUS, 1758), *megala* (OBERTHÜR, 1909), *chia* (THOMSON, 1987), *telmessia* (ZELLER, 1847), *cypricola* (GRAVES, 1928) and *nurag* (GHILIANI, 1852). Sympatry is known between *jurtina* and *nurag* in Sardinia (SIMMONDS 1930) and between *telmessia* and *megala* in southern Turkey (THOMSON 1987). *Maniola jurtina* and *telmessia* have been found flying together in a few localities in Turkey (VAN OORSCHOT & VAN DEN BRINK 1986). However, *jurtina* appears to prefer rather different biotopes from *telmessia* (VAN DEN BRINK pers. comm.) and the same preference for less dry habitats by *megala* has recently been identified by the author in south-western Turkey.

Among samples of *Maniola* collected in the Bodrum area of Turkey (Province of Muğla) in May 1987 were a number of males which superficially resembled the small *megala antalyana* TAUBER, 1970. However, the genitalia was not at all like that of *megala*, but was similar to that of *telmessia*. These butterflies were flying with the rather small *telmessia* males which are found in south-western Turkey. There also appeared to be a small, but significant number of intermediate forms. *Maniola telmessia* males were greatly outnumbered by the larger forms. Females of this mixed *Maniola* population were very variable in size and wing markings. Later examination confirmed that several wing marking characters are constant in these butterflies, distinguishing them clearly and consistently from *telmessia*.

Alain OLIVIER collected in the area in late May 1988 and supplied material for examination. He also noted that some males were of the intermediate form. A second visit to the Bodrum area by the author in early September 1988 enabled further examination of these butterflies. *Maniola telmessia* and *megala* were emerging from aestivation in south-western Turkey, as was the mixed population in the Bodrum Peninsula. Males represented about 10% of all flying *Maniola*, a higher proportion during the post-aestivation period than has been reported elsewhere. All males taken in the original Bodrum site were of the larger form. A new site for the butterfly was found, still in the Bodrum Peninsula, some distance from the original locality. This new site produced none of the intermediate individuals. Samples taken to the east of Bodrum comprised *telmessia* only.

A number of ova were laid by several females which were collected from the Bodrum population in 1987. The ova from all but one parent had 18 longitudinal ribs, the others had 15-16. Mortality was extremely high (greater than 90%) in the first larval instar stage, possibly due to overcrowding, but a number of F1 insects were successfully reared under a 24L:0D photoperiod regime at 22-24°C. Some of the progeny from the parent females pupated after five larval instars, but others pupated after six. The imagines from one parent were typical of the small form *telmessia* from that area, the rest corresponded with the larger, darker forms which had been sampled from the wild population, although they were not quite as large or dark as the wild individuals. This difference was probably due to the rearing conditions.

Extensive thermo-/photoperiod experiments have failed to induce extra

instars in *telmessia*, which normally has five. The Bodrum species, therefore, appears to have a variable number of larval instars, five or six, making it unique in the genus *Maniola* and distinguishing it quite clearly from *telmessia*. Interestingly, *jurtina* is the only other *Maniola* which has six larval instars. Further stock was obtained from four post-aestivation females collected in September 1988, but none survived beyond the third larval instar. Male genitalia differed from that of *telmessia*, but this character was not entirely diagnostic.

Description

Maniola halicarnassus, new species (Lepidoptera : Nymphalidae : Satyrinae)

Male

Wing length : mean 23.26 mm ($\pm 1.12SD$), largest 25.26 mm, smallest 21.62 mm.

Upperside forewing : Ground colour uniformly blackish sepia. Fulvous around ocellus usually indistinct, only occasionally extending as a clear submarginal band, rarely extending towards the cell as in most *telmessia*. Apical ocellus distinct, variable, usually rather small and with a single white pupil, rarely bipupilled. Androconial band very conspicuous, black, curved and tapering upwards, often extending beyond vein 3, always broader at its base and forming a distinct triangular shape, similar to that of *M. cypricola* and *M. chia*. Hindwing margin usually more dentate than in *telmessia*.

Upperside hindwing : Uniformly blackish sepia.

Underside forewing : Ground colour uniformly golden yellow/brown, or with submarginal area slightly lighter than the discal and basal areas. 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.

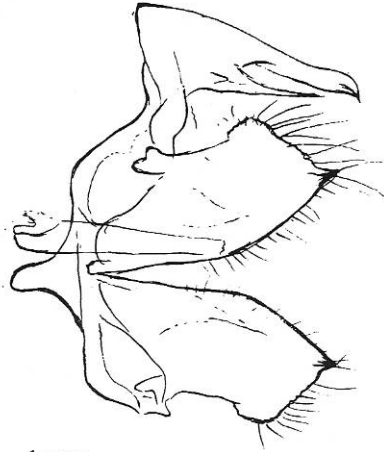
Underside hindwing : Mid grey/brown, occasionally reddish grey/brown, sometimes finely mottled pale grey, frequently pale grey inwardly. Submarginal band slightly paler. Ocelli very distinct, noticeably more so than in *telmessia*, sometimes large, 2 to 5, in intervenosa 2, 3, 4, 6 and 7, each surrounded by ochreous yellow, those in intervenosa 3 and 6 nearly always pupilled white, others frequently so. Striae variable, small, but often conspicuous.

Female

Superficially identical to *telmessia* and indistinguishable from that species in the field. It is identifiable at present only by rearing from wild caught parents, when the egg ribbing and male progeny should be distinctive.

Genitalia

Male (figure 1) : Uncus long, usually longer than that of *telmessia*. Gnathos extending to more than .75 of the uncus length, gnathos base slightly dilated. Valve variable as with other *Maniola* species, almost always broader and often larger than that of *telmessia*, distal process pointed, dorsal process (lobe)



1mm

Figure 1 : *Maniola halicarnassus* n. sp. - male genitalia.

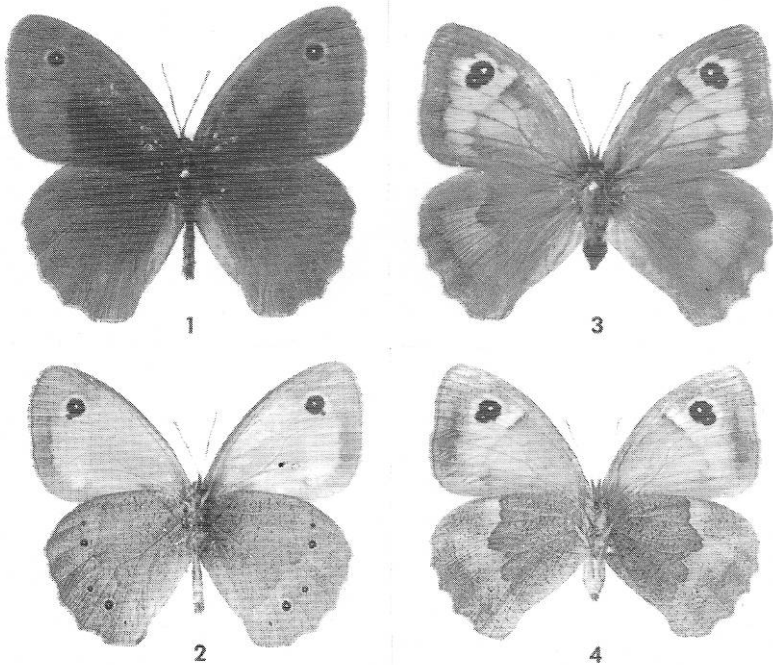


Figure 2 : *Maniola halicarnassus* n. sp. - 1. holotype male (upperside); 2. holotype male (underside); 3. allotype female (upperside); 4. allotype female (underside).

Table 1 : Main daily air temperatures (monthly averages) at seven sites in western Turkey and the eastern Greek islands - °C difference from mean of all stations.

	Lesbos	Chios	Izmir	Bodrum	Marmaris	Rhodes	Antalya
January	-0.3	+0.2	-1.7	+0.9	+0.4	+0.7	-0.2
February	0	-0.3	-1.7	+0.6	+0.3	+1.3	-0.1
March	-0.6	+0.2	-1.2	+0.7	+0.3	+0.7	+0.4
April	-0.8	+0.4	-0.4	+0.5	+0.1	+0.2	+0.5
May	-0.4	+0.1	+0.1	+0.2	+0.1	-0.1	+0.1
June	-0.5	-0.2	+0.3	+0.5	+0.4	-0.6	+0.4
July	-0.4	+0.3	+0.2	0	+0.4	-0.9	+0.8
August	-0.4	-0.8	+0.1	0	-0.2	+0.3	+0.9
September	-1.0	-0.4	-0.7	+0.4	+0.2	+0.7	+1.1
October	-0.7	+2.2	-1.0	+0.4	-0.2	+0.5	+0.8
November	-0.9	+0.4	-1.0	+0.7	-0.4	+1.2	+0.2
December	-0.5	+0.3	-1.4	+1.0	+0.2	+1.1	-0.1
year	-0.4	+0.1	-0.7	+0.5	+0.1	+0.3	+0.5
period (yrs)	11-13	12-14	?	29-30	26-27	11-13	?

Table 2 : Mean daily precipitation (monthly averages) at seven sites in western Turkey and the eastern Greek islands - mm difference from mean of all stations.

	Lesbos	Chios	Izmir	Bodrum	Marmaris	Rhodes	Antalya
January	-49	-52	-45	-14	+68	+26	+66
February	-27	-15	-15	0	+55	-27	+37
March	-11	-16	-12	-6	+39	+2	+5
April	+1	-4	+9	-2	+7	-14	+6
May	+3	-10	+13	-11	+4	-2	+7
June	+2	+3	0	-1	+6	-7	+3
July	+2	+2	+1	-1	-1	0	+1
August	+1	0	+1	-1	0	-1	+1
September	+1	-2	+5	0	+2	-3	+3
October	-2	-17	-11	+3	+32	+23	-8
November	+39	-30	-28	-24	+45	+12	-10
December	-53	-37	-53	-35	+83	+15	+82
year (total)	-102	-185	-137	-116	+333	+18	+189
period (yrs)	14	9	?	29-30	26-27	12-13	?

Table 3 : Wing lengths (mm) of male *Maniola telmessia* and *M. halicarnassus* from the Greek islands of Samos and Kos and south-western Turkey.

	<i>telmessia</i>			<i>halicarnassus</i>
	S.W.Turkey	Samos	Kos	Bodrum
min	17.30	18.24	19.82	21.62
max	23.32	23.54	22.72	25.18
mean	20.95	21.03	21.54	23.26
SD(of mean)	±1.29	±0.97	±0.91	±1.12

usually longer than that of *telmessia*. Julien Organ comprised of few rods, usually thinner than that of *telmessia*. Aedeagus broad and straight.

Female : Indistinguishable at present from that of *telmessia*.

Life cycle and immature stages

The ova have 18 ribs, compared with 14-16 in *telmessia*, 19-21 in *megala* and 18-21 in *jurtina* (THOMSON 1987). The species has a variable number of instars in the larval stage, five or six. The larvae and pupae are similar to those of *telmessia*.

Genetics

No significant difference between the new Bodrum species and *telmessia* was detected by electrophoresis.

Variation

Males vary markedly in size and, to some extent, in the degree of fulvous on the upperside forewing. The degree of pale grey mottling on the underside of the male hindwing varies considerably.

Distribution and range

Known only from the Bodrum Peninsula of south-western Turkey at 50-100m above sea level.

Habitat

Flies sympatrically with *telmessia* in rough bushy areas with many flowers. The type locality is overgrown derelict land.

Flight

Recorded only on 30 May and 5 September. The flight time of the species is almost certainly later than that of *telmessia*. The adults aestivate in the summer months like all southern *Maniola* species.

Types

Holotype male (figure 2, 1-2) : «30 May 1987/TURKEY/Muğla Province/ 3 km west of Bodrum/G. Thomson», deposited in the Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam.

Allotype female (figure 2, 3-4) : «14 October 1987/reared from ova/pupated after 6/larval instars/F1 reared/24L:0D photoperiod/at 22-24°C/P1/30 May 1987/TURKEY/Muğla Province/3 km west Bodrum», deposited in the Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam.

Paratypes : 11 males, data as holotype (author's collection).

Other material examined : 11 males, data as holotype; 4 males, 5 September 1988, 3 km west of Bodrum, 50 m, leg. G. THOMSON; 3 males, 5 September 1988, Dereköy, Bodrum Peninsula, 100 m, leg. G. THOMSON; laboratory material reared from females taken in the type locality (males and females).

Discussion

The discovery of another *Maniola* species flying sympatrically with *telmessia* in the Bodrum area is extremely interesting. The Bodrum Peninsula is partially isolated, separated from the rest of Turkey by a 6 km wide isthmus and a barren mountain ridge rising to almost 1000 m. Disjunction is not necessary total, as *telmessia* is found several kilometres to the east.

Climatically, the Bodrum Peninsula is a little warmer and drier than much of western Turkey (including the Datça Peninsula, Marmaris and Fethiye, the type locality for *telmessia*) and the adjacent Greek islands (tables 1 and 2). This, no doubt, affects the flight patterns of *Maniola* and there appears to be a difference of about two weeks between the emergence of *telmessia* and the new species. In 1987 Marmaris *telmessia* males were freshly emerging when they were worn in the Bodrum area. The flight time of *Maniola* species in Greece and Turkey was delayed by several weeks in 1987, so it is likely that the new species appears in mid-May, about two weeks later than *telmessia*. The climate could also have had some influence on the evolution of the species there.

The identifications of male *halicarnassus* in other areas should not be difficult. There is little overlap in the size of the male *halicarnassus* and *telmessia*: even the larger insular forms of *telmessia* from the islands of Kos and Samos do not often approach the dimensions of *halicarnassus* (table 3). This large size, distinctive androconial band and reduced fulvous on the upperside forewing should distinguish it from *telmessia*. The male genitalia is distinct from that of *megala*, *chia* and *jurtina*.

There are some aspects of this new species which are anomalous. The type locality appears to support a mixed population of *telmessia*, *halicarnassus* and intermediate forms. A simple explanation of these individuals would be that they are hybrids between *telmessia* and *halicarnassus* but, if they are, they are being maintained as a significant proportion of the population (estimated as greater than 10%). The species of *Maniola* in south-western Turkey probably are recent (THOMSON 1987) and it is suggested that *halicarnassus* has evolved in very recent times, so recent that its specific separation from *telmessia*, though real, is very tentative and the hybrid individuals are a consequence of secondary intergradation.

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