The butterflies of the Greek island of Tílos (Lepidoptera : Hesperioidea & Papilionoidea)

Alain OLIVIER

Samenvatting. De dagvlinders van het Griekse eiland Tílos (Lepidoptera : Hesperioidea & Papilionoidea)

Na een korte inleiding over de geografische ligging en plantengroei van het Griekse eiland Tílos, alsook over de reeds bekende dagvlinderfauna (slechts 3 soorten waren bekend!), presenteert de auteur zijn gegevens, verzameld op 25, 26 en 27 mei 1992. 19 dagvlindersoorten zijn tot op heden waargenomen op Tílos en er wordt aangenomen dat 80% van de er voorkomende fauna nu bekend is. Er zijn geen endemische ondersoorten op Tílos : het betreft alle wijdverbreide taxa. Vermoedelijk is de belangrijkste, zoniet de enige bron van de dagvlinderfauna van Tílos het eiland Ródos. De dagvlinderfauna van Tílos verschilt sterk van deze van het nabijgelegen eiland Níssiros. Tílos heeft de meest verarmde dagvlinderfauna van alle tot op heden voldoende geëxploreerde eilanden van de Dodekannesos.

Résumé. Les papillons diurnes de l'île grecque de Tílos (Lepidoptera : Hesperioidea & Papilionoidea)

Après un bref exposé de la situation géographique et de la végétation de l'île grecque de Tílos, ainsi qu'un aperçu de la faune lépidoptérique diurne précédemment connue (seulement 3 espèces étaient connues!), l'auteur présente ses propres données, collectées les 25, 26 et 27 mai 1992. A présent, 19 espèces de papillons diurnes ont été observées à Tílos et il est supposé que cela représente probablement 80% de la faune de cette île. Il n'y a pas de sous-espèces endémiques à Tílos : il s'agit uniquement de taxa largement distribués. Il est supposé que l'île de Rhodes constitue la source principale, sinon unique, de la faune lépidoptérique actuelle de Tílos. Celle-ci diffère fortement de celle de l'île toute proche de Níssiros. Tílos a la faune lépidoptérique la plus appauvrie de toutes les îles du Dodécannèse suffisamment explorées à l'heure actuelle.

Key words : butterflies - biogeography - Tílos - Greece

Olivier, A. : Luitenant Lippenslaan 43 B 14, B-2140 Antwerpen-Borgerhout.

Introduction

The Greek island of Tílos lies in the SE. Aegean Sea, at about 37 km to the NW. of the island of Ródos, 37 km to the WSW. of the island of Símí, 19 km to the S. of the nearest point on the Reşadiye Yarımadası Peninsula (Prov. Muğla, Turkey), 13 km to the SE. of the island of Níssiros and 36 km to the SSE. of the island of Kós (Níssiros lies between both). The islands of Sariá and Kárpathos lie much further to the S. (at resp. 53 and 62 km). The geographic position of Tílos is shown on fig. 1.

Tílos has an area of 63 km^2 and is composed of hard Mesozoic limestone and young volcanics. The highest point is at 651 m. Its vegetation consists of dry treeless garrigue, with orchards surrounding the villages of Livádia, Eristós and Megálo Horió. The climate of this part of the Aegean and a detailed study of the flora and phytogeography of Tílos are treated in CARLSTRÖM (1987).

From 1912 till 1945, the island was under Italian administration and the only lepidopterological records available so far resulted from a short visit by Prof. Alessandro GHIGI in August 1926. Three butterfly taxa were collected

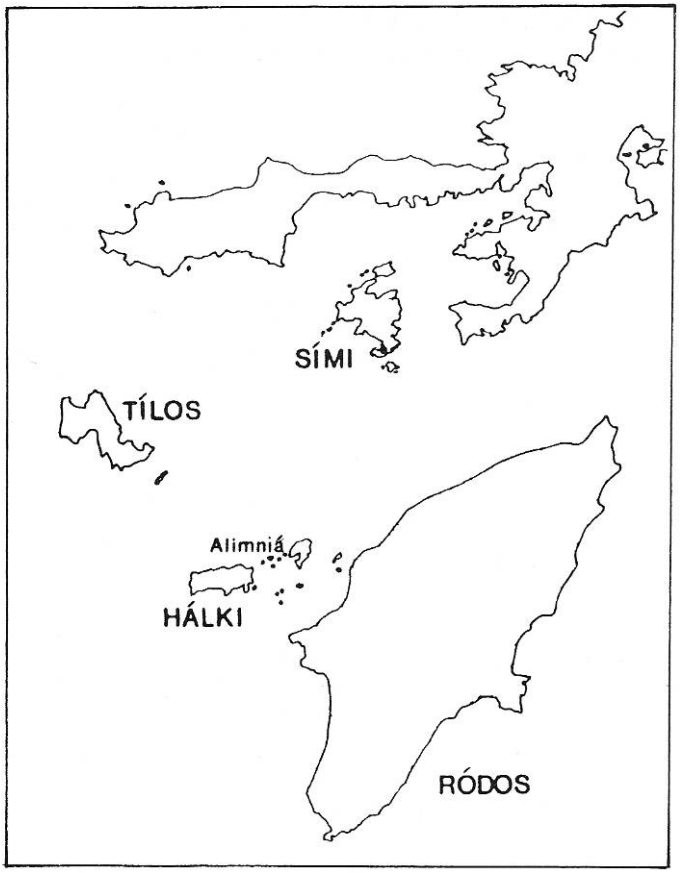

Fig. 1 : Geographical situation of the island of Tílos (Greece)

on Tílos at the time, viz. *Iphiclides podalirius podalirius* (LINNAEUS, 1758), *Hipparchia fatua fatua* (FREYER, [1845]) and *Maniola telmessia* (ZELLER, 1847). These records were published by TURATI (1929) and GHIGI (1929) from «Piscopi» (the Italian name for the island) and they are listed again by BERNARDI (1961, 1971) and OLIVIER (1993 : 198-199, table 12).

I had the privilege to visit this charming little island on 25, 26 and 27 May 1992 and to collect 17 butterfly species, 16 of which are new to the island. Altogether, 19 butterfly species are now known from Tílos. This probably amounts to 80% of its actual butterfly fauna, the remaining taxa to be discovered presumably being composed exclusively of ubiquitous and migratory butterflies.

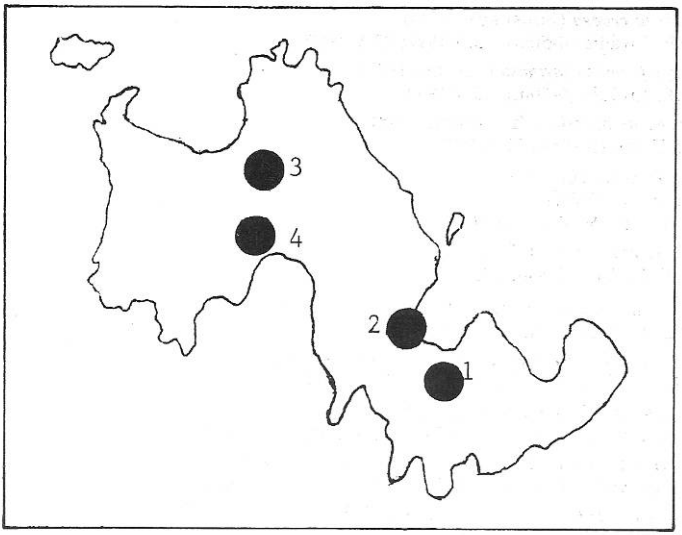

Fig. 2 : Localities on Tílos where collecting took place.
1. 1 km SE. Livádia (0-50m)
2. Livádia (0m)
3. Megálo Horió (0-50m)
4. 1 km NE. Eristós (0-50m)

Systematic Part

The following is a complete list of the 19 known butterfly taxa from Tílos. Taxonomy follows DE JONG (pers. comm.) for *Muschampia proto aragonensis* DE SAGARRA, 1924 and OLIVIER (1993) for the remaining taxa.

Collecting localities are shown on fig. 2. They are as follows :

1) 1 km SE. Livádia (0-50 m): dry gully and surrounding degraded treeless garrigue.
2) Livádia (0 m): abandoned cultivated area.
3) Megálo Horió (0-50 m): orchards and cultivated fields.
4) 1 km NE. Eristós (0-50 m): cultivated fields.

Carcharodus alceae alceae (ESPER, [1780])
- 1 km SE. Livádia (0-50m), 25.V.1992
- 1 km NE. Eristós (0-50m), 27.V.1992

Carcharodus stauderi ambiguus (VERITY, 1925)
- 1 km SE. Livádia (0-50m), 25.V.1992; 27.V.1992

Muschampia proto aragonensis DE SAGARRA, 1924
- 1 km SE. Livádia (0-50m), 27.V.1992

Papilio machaon syriacus ELLER, 1936
- 1 km SE. Livádia (0-50m), 25.V.1992

Iphiclides podalirius podalirius (LINNAEUS, 1758)
- Recorded by TURATI (1929 : 178) and GHIGI (1929 : 306). Not seen during my visit.

Colias crocea crocea (FOURCROY, 1785)
- 1 km SE. Livádia (0-50m), 25.V.1992; 27.V.1992

Gonepteryx farinosa farinosa (ZELLER, 1847)
- 1 km SE. Livádia (0-50m), 25.V.1992

Pieris brassicae brassicae (LINNAEUS, 1758)
- Megálo Horió (0-50m), 27.V.1992

Pieris rapae rapae (LINNAEUS, 1758)
- Livádia (0m), 26.V.1992
- 1 km NE. Eristós (0-50m), 27.V.1992

Euchloe ausonia taurica RÖBER, 1907
- 1 km SE. Livádia (0-50m), 25.V.1992

Lycaena phlaeas phlaeas (LINNAEUS, 1761)
- 1 km SE. Livádia 0-50m), 25.V.1992

Pseudophilotes vicrama schiffermuelleri (HEMMING, 1929)
- 1 km SE. Livádia (0-50m), 25.V.1992; 27.V.1992

Polyommatus loewii loewii (ZELLER, 1847)
- 1 km SE. Livádia (0-50m), 25.V.1992; 26.V.1992; 27.V.1992

Polyommatus agestis agestis ([DENIS & SCHIFFERMÜLLER], 1775)
- 1 km SE. Livádia (0-50m), 25.V.1992; 26.V.1992; 27.V.1992

Polyommatus icarus icarus (ROTTEMBURG, 1775)
- 1 km SE. Livádia (0-50m), 27.V.1992

Vanessa atalanta atalanta (LINNAEUS, 1758)
- 1 km SE. Livádia (0-50m), 26.V.1992 (only observed)
- 1 km NE. Eristós (0-50m), 27.V.1992

Vanessa cardui (LINNAEUS, 1758)
- 1 km SE. Livádia (0-50m), 25.V.1992; 26.V.1992

Hipparchia fatua fatua (FREYER, [1845])
- Recorded by TURATI (1929 : 180) and GHIGI (1929 : 306). The species had not yet emerged at the time of my visit.

Maniola telmessia (ZELLER, 1847)
- 1 km SE. Livádia (0-50m), 25.V.1992; 26.V.1992; 27.V.1992
- First mentioned by TURATI (1929 : 181) and GHIGI (1929 : 306).

Biogeography

1. Data

In order to reveal the biogeographical affinities of the butterfly fauna of Tílos, it is important to know its taxonomic differentiation (endemism) and its affinities with neighbouring areas at subspecies level, as well as to compare its species composition to that of neighbouring areas. The following observations are of relevance ([1]) :

([1]) OLIVIER (1993 : 198-201, tables 12 & 13) presents an exhaustive species list for the Eastern Aegean islands, Kárpathos, Kríti and Kíthira up to 1990. The present analysis also takes into account new records gathered in May-June 1992 on the islands of Tílos, Níssiros, Kós, Kálimnos and Léros.
The Dodekánissa as conceived here includes Kárpathos, Ródos, Sími, Tílos, Níssiros, Kós, Psérimos, Kálimnos, Télendos, Léros and Pátmos (with the exception of Psérimos, Télendos and Pátmos, it is believed that at least 80% of the actual butterfly fauna of these islands - and in several cases up to 90% or more - is now known).

1) all species recorded from Tílos are also known from the nearby Turkish mainland and they are represented there by the same subspecies. This is also the case, when present, with their representation on the Aegean islands and on the Greek mainland.

2) 16 taxa that have been recorded on Tílos (84,21%) do also occur on the Greek mainland, while 13 taxa (68,42%) are known to occur also on Kríti. On the other well-investigated islands of the Dodekánissa their representation is as follows : Ródos (18 = 94,74%), Kós (17 = 89,47%), Léros (15 = 78,95%), Níssiros (14 = 73,68%), Kálimnos (14 = 73,68%), Kárpathos (13 = 68,42%) and Símí (11 = 57,89%). Of the 19 butterfly taxa known from Tílos, 2 (10,53%) are known from 2 other islands of the Dodekánissa (*M. proto aragonensis*, *G. farinosa farinosa*), the remaining 17 (89,47%) have been recorded on at least 3 up to 9 other islands.

3) 40 out of the 59 species (67,80%) recorded from the totality of the islands of the Dodekánissa are absent from Tílos. Numbers of absent taxa on each of the other well-investigated individual islands are : Ródos (12 = 20,33%), Kós (13 = 22,03%), Kálimnos (34 = 57,62%), Níssiros (35 = 59,32%), Símí (37 = 62,71%), Kárpathos (37 = 62,71%) and Léros (38 = 64,41%).

2. Conclusions

The butterfly fauna of Tílos is very impoverished, most so of all well-investigated islands of the Dodekánissa so far, as a result of its small size, its relatively isolated geographic situation and its poor vegetation diversity. It consists of species that have not differentiated subspecifically and are well-represented not only on the nearby Turkish mainland, but also on the other islands of the Dodekánissa and even, to a large extent, on the Greek mainland. Three taxa, viz. *Carcharodus stauderi ambiguus*, *Polyommatus loewii loewii* and *Maniola telmessia*, are Anatolian elements and hence when an affinity can be discerned, it is with the butterfly fauna of the Turkish mainland and the Dodekánissa (the three forementioned taxa are known to occur on resp. six, five and nine other islands of this group).

The close geographical proximity of Tílos to the island of Níssiros could lead to the assumption that their faunae show the greatest similarity : this is obviously not the case, however. Only 58,33% of the butterfly taxa from Níssiros are also known from Tílos and on the former island one finds some taxa (*Carcharodus orientalis orientalis* REVERDIN, 1913, *Satyrium ilicis ilicis* (ESPER, [1799]), *Polygonia egea* (CRAMER, 1775) and *Maniola halicarnassus* THOMSON, 1990) that are also absent from Ródos, but that occur on Kós and/or in the Turkish province of Muğla.

All but one of the butterfly species recorded at present from Tílos are also known from Ródos. The remaining one, *Muschampia proto aragonensis*, is known from Kárpathos, Símí and the nearby Turkish mainland (I have seen specimens from Değirmenyanı and Marmaris). This suggests that the butterfly probably has reached Tílos and Kárpathos via Ródos. It may be

absent from Ródos nowadays, but I predict that it is present there but has not been recorded yet. In that case, both Ródos and Tílos would share 100% of the butterfly fauna of the latter island. Hence, the most parsimonious assumption is that Tílos probably got its present butterfly fauna entirely from Ródos and that that island is its only source area, despite the present-day distance of both islands. The *Maniola telmessia* population on Tílos, for instance, looks much more similar to that of Ródos than to that of Kós (on Nissiros, it is replaced by *Maniola halicarnassus*!). The islands of the South Aegean Island Arc (Kríti, Kárpathos and Ródos) as well as Símí, Tílos and Nissiros remained isolated during the entire Pleistocene (OLIVIER 1993 and references therein). There is, however, evidence for an intermittent Pleistocene land-connection between Tílos and Ródos (DERMITZAKIS & GOEDICKE 1977, DERMITZAKIS 1990). It would be tempting to go as far back in time to explain the current pattern observed. There is no evidence in support of such an assumption, however, as all the taxa concerned occur in the same subspecies on the Turkish mainland as well.

One other source area could be the Reşadiye Yarımadası Peninsula (Prov. Muğla, Turkey), that remains almost totally unexplored today (I paid a visit to it till as far west as Knidos on 7.VI.1992, but butterfly activity was extremely poor : only *Thymelicus hyrax* (LEDERER, 1861), *Polyommatus loewii loewii* and *Charaxes jasius jasius* (LINNAEUS, 1767) were observed about 5 km east of the latter locality).

Finally, the great similarity of the butterfly fauna of Tílos with that of both Ródos and Kós could be due to the much larger size of both latter islands and their much greater biodiversity, resulting in a much higher number of butterfly species, including (nearly) all taxa that are also known from Tílos.

Whatever it may be, there seems to have been gene exchange between the butterfly populations on Tílos and the adjacent one(s) much more recently than intermittently during the Pleistocene and this may even occasionally be the case now as there is no taxonomic differentiation at all in any of the Tílos butterfly species, while sea barriers of between 19 and 37 km are not insurmountable for butterflies. One of the most remarkable conclusions of the present study is that the butterfly faunae of Tílos and Nissiros are significantly different.

References

Bernardi, G., 1961. Biogéographie et spéciation des Lépidoptères Rhopalocères des îles méditerranéennes. - *Colloques int.Cent.natn.Rech.scient.* **94**: 181-215.

Bernardi, G., 1971. Biogéographie des Lépidoptères Rhopalocères des îles égéennes. - *C.r.somm. Séanc. Soc.Biogéogr.* **1971**: 21-32.

Carlström, A., 1987. A Survey of the Flora and Phytogeography of Rodhos, Simi, Tilos and the Marmaris Peninsula (SE Greece, SW Turkey). - Department of Systematic Botany. University of Lund, Lund.

Dermitzakis, M.D., 1990. The colonisation of Aegean islands in relation with the paleogeographic evolution. - *Biologia gallo-hell.* **17**: 99-130.

Dermitzakis, M.D. & Goedicke, T., 1977. Subsidence of inter island channels and faunal migration. - *VIth Colloquium on the Geology of the Aegean region* I: 535-536.

Ghigi, A., 1929. Ricerche faunistiche nelle isole italiane dell'Egeo. Risultati generali e conclusioni. - *Archo zool.ital.* **13** : 293-354.
Olivier, A., 1993. The butterflies of the Greek island of Ródos : taxonomy, faunistics, ecology and phenology with a tentative synthesis on the biogeography of the butterflies of Kríti (Crete), Kárpathos, Ródos, the Eastern Aegean islands and Kípros (Cyprus) (Lepidoptera : Hesperioidea & Papilionoidea). - Vlaamse Vereniging voor Entomologie, Antwerpen.
Turati, E., 1929. Lepidotteri. In : Ricerche faunistiche nelle isole italiane dell'Egeo. - *Archo zool. ital.* **13** : 177-186.

Boekbesprekingen

Svendsen, P. (Ed.) & Fibiger, M. : *The distribution of European Macrolepidoptera, Noctuidae volume 1, Noctuinae I.*
16,5 x 24 cm, 293 p., Faunistica Lepidopterorum Europaeorum, European Faunistical Press, Karavelvej 16, DK-4040 Jyllinge, Denmark, gebonden in slappe kaft, DKR 280,- (10% vermindering bij intekening op de hele reeks van 9 geplande delen) (ISBN 87-89414-00-4).

Eindelijk is dit lang verwachte deel verschenen! Doel van het projekt *Faunistica Lepidopterorum Europaeorum* is een monografische bewerking aan te bieden van de verspreiding van de Europese Macrolepidoptera, met een verspreidingskaart voor elke soort. Uiteraard kan een dergelijk ambitieus programma niet uitgewerkt worden door één persoon en daarom heeft de verantwoordelijke kontakt gezocht met niet minder dan 64 entomologen die alle landen van Europa vertegenwoordigen. In de inleiding verklaren deze medewerkers hoe ze in hun land zijn tewerk gegaan om de basisgegevens te verzamelen en welke bronnen ze daarvoor hebben gebruikt.

Het systematisch deel geeft taxonomische en faunistische informatie over de soorten uit de genera *Euxoa* tot *Standfussia* (Noctuidae, Noctuinae partim), in het totaal 134 soorten. Het meest opvallend is wellicht de verzameling kaarten waarop de verspreiding van alle behandelde soorten door middel van stippen wordt aangeduid. Daarbij is een onderscheid gemaakt tussen waarnemingen voor of na 1960. Voor de kaarten is gebruik gemaakt van het UTM-gridsysteem van 50 km^2. Het behandelde gebied bestrijkt heel Europa van de Atlantische Oceaan (met inbegrip van IJsland en de Azoren, maar zonder de Kanarische eilanden) tot en met de Oeral en van Noord-Skandinavië tot de Middellandse Zee. Noord-Afrika wordt niet behandeld, de Griekse eilanden en Europees Turkije wel. Het boek bevat ook een erg uitgebreide literatuurlijst gerangschikt volgens land.

Uiteraard is het jammer dat ook niet de fauna van de Kanarische eilanden en het gebied ten noorden van de Sahara zijn opgenomen, maar er waren reeds taxonomische (en andere) problemen genoeg voor de Europese fauna alleen! Een nadeel is verder dat de kaarten (1 kaart per pagina) steeds met de bovenrand naar de rug van het boek toe werden afgedrukt. Hierdoor moet men het boek steeds draaien om een kaart te kunnen bekijken. Het zou veel praktischer geweest zijn om de kaarten steeds in dezelfde richting te oriënteren, zeker als men de verspreiding van twee verwante soorten wil vergelijken.

Volgens de uitgever zouden de volgende delen in deze reeks veel sneller na elkaar gepubliceerd worden. Het is dus wachten op deel 2 in deze toch wel erg interessante reeks. Iedereen die nog iets wil publiceren over de verspreiding van Europese Noctuidae kan niet buiten dit werk.

W.O. De Prins