

# Notes on the taxonomic status and supposed biogeographic affinity of the *Pseudochazara anthelea* (Hübner, [1824]) populations from Kípros (Cyprus) and from the Greek island of Kós (Lepidoptera: Nymphalidae Satyrinae)

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**Samenvatting.** Beschouwingen over de taxonomische status en veronderstelde biogeografische verwantschap van de *Pseudochazara anthelea* (Hübner, [1824]) populaties van Kípros (Cyprus) en die van het Griekse eiland Kós (Lepidoptera: Nymphalidae Satyrinae). Rebel beschreef in 1916 *Pseudochazara anthelea acamanthis* van het eiland Kípros (Cyprus) en somde een reeks kenmerken op welke de erkenning van dit taxon zouden rechtvaardigen. Dezelfde auteur vermeldde deze zelfde ondersoort voor de eerste maal van het Griekse eiland Kós in 1936, waarbij een bijzondere biogeografische affiniteit tussen de populaties van beide eilanden werd gesuggereerd. De diverse kenmerken van *P. anthelea acamanthis* worden kritisch getoetst en blijken, na vergelijking met uitgebreid materiaal uit Turkije en de Oostelijke Egeïsche eilanden, binnen de normale variatie van de nominaatvorm te vallen. Bijgevolg wordt *P. anthelea acamanthis* onder deze gesynonimiseerd en wordt bovenvermelde biogeografische affiniteit gëinvalideerd.

**Résumé.** Considérations à propos du statut taxonomique et de l'affinité biogéographique supposée des populations de *Pseudochazara anthelea* (Hübner, [1824]) de Kípros (Chypre) et de l'île grecque de Kós (Lepidoptera: Nymphalidae Satyrinae). Rebel décrit en 1916 *Pseudochazara anthelea acamanthis* de l'île de Kípros (Chypre) et énumérait une série de caractéristiques qui justifieraient la reconnaissance de ce taxon. Le même auteur rapporta cette même sous-espèce pour la première fois de l'île grecque de Kós en 1936, suggérant ainsi une affinité biogéographique particulière entre les populations de ces deux îles. Les divers caractères de *P. anthelea acamanthis* sont évalués de façon critique et, après comparaison avec un matériel nombreux de Turquie et des îles égéennes orientales, ceux-ci se révèlent faire partie de la variation normale de la forme nominative. Par conséquent, *P. anthelea acamanthis* est synonymisé sous celle-ci et l'affinité biogéographique postulée ci-dessus est invalidée par la même occasion.

**Key words:** *Pseudochazara - anthelea - acamanthis* - Kípros (Cyprus) - Kós - biogeographic affinity.

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## Introduction

In 1916, Rebel described a subspecies of *Pseudochazara anthelea* from the island of Kípros (Cyprus) as "*Satyrus anthelea* (Hb.) *acamanthis* n. subsp.". The differentiating characters, according to this author, are :

- the shorter wings [smaller size ?] ("der kurzen Flügelform")
- the sharply defined proximal border of the [forewing] postdiscal band in the female ("scharfen Begrenzung der Außenbinde (...). Beim Weibchen ist die tief ockergelbe Außenbinde basalwärts ebenso scharf und ununterbrochen begrenzt ...")
- the postdiscal band on upperside hindwing is reduced to a small orange patch in the females ("Auf den Hinterflügeln findet sich nur ein kleiner ockergelber Außenfleck")
- a narrow white postdiscal band in the males ("Beim Männchen ist die weiße Außenbinde ebenso schmal ...")
- in the males, the postdiscal [forewing] ocelli are larger than in nominotypical *anthelea* in the males ("die beiden Augenflecke der Vorderflügel sind (...) größer als bei *Anthelea*-Stammform) and the space in between is invaded by blackish brown ("Ihr Zwischenraum ist wie bei *Amalthea* schwarzbraun ausgefüllt")

Rebel (loc. cit.) further noted its resemblance with *P. anthelea amalthea* (Fridvaldszky, 1845) in its smaller size, the narrowness of the postdiscal band and the larger postdiscal ocelli in the male, the basally closed postdiscal band on forewing and the reduced postdiscal area on hindwing in the female. *P. anthelea amalthea* indeed shows these features to an extreme degree. This taxon, that occurs on Kríti (Crete) - its type-locality - and also in mainland Greece and the southern Balkans, further differs constantly from all the other described subspecies in the white colour of the postdiscal band in the female. Therefore it will not be considered further in the present discussion.

Subsequent authors have not questioned the validity of *P. anthelea acamanthis* until van Oorschot, van den Brink & van Oorschot (1987) studied its status again in a taxonomic revision of *P. anthelea*, whereby they designate a lectotype for *P. anthelea acamanthis*. These authors noted that the wingspan of the males in this subspecies cannot be used as a relevant difference with the subspecies *anthelea* and further found the postdiscal band on the forewing upperside in the females to be inwardly closed in 19 examined specimens, while they found an open condition in 14 specimens. Additionally, they noticed that the area between the apical ocellus and the apex of the forewing upperside is completely blackish brown in all but one of the 22 male specimens of *acamanthis* they examined. They conclude that "the absence of the white spot in the apical area and the narrow postdiscal band in the males give reason to agree reluctantly with Rebel in appointing subspecific rank to the Cyprus population".

Finally, Olivier (1993) expresses serious reservations about the validity of *P. anthelea acamanthis*.

In 1936, Rebel reported this species for the first time from the island of Kós, making the following remarkable statement: "Vier ♂ und ein frisches ♀ von der Insel Kos, Mt. Dikeo, 8.VI., lassen sich von der zyprischen Form *acamanthis* nicht trennen. (...). Zoogeographisch ist das Vorkommen der Art in der Form Zyperns auf dem koischen Gebirge sehr bemerkenswert".

Subsequently, both Hartig (1940) and Bernardi (1961) also admit the presence of *P. anthelea acamanthis* on Kós, while van Oorschot et al. (loc. cit.) state: "According to Rebel *acamanthis* is also present on the Greek island of Kos, but we were not able to verify this".

#### Aims of the present study

A particular biogeographic affinity between the faunas of the S.E. Aegean and Kípros has been suggested on several occasions. Beside the present example, other ones have been quoted for butterflies in the literature, all of these pertaining in peculiar to Kípros and Ródos (see Olivier op. cit. for a discussion and evaluation of all these cases). Recently, Olivier & Coutsis (1995) have discussed one possible example of such an affinity between *Maniola cypricola* (Graves, 1928) from Kípros and *M. halicarnassus* Thomson, 1990 from the Bodrum Peninsula (SW. Turkey) and Níssiros. More such situations have been reported for other animal groups, e.g. Tipulidae (Diptera) and land snails (Theowald & Oosterbroek 1990; Glaubrecht 1993, 1994).

Between 1986 and 1994, I had the opportunity to collect large series of *P. anthelea* from Kípros as well as from the Eastern Aegean islands and the Bodrum Peninsula (the bulk of this material is deposited in the VLCA collection) and to compare these to further material from the Turkish mainland (also in the VLCA collection).

In the present contribution, the validity of the taxonomic status of *P. anthelea*

## Plate 1

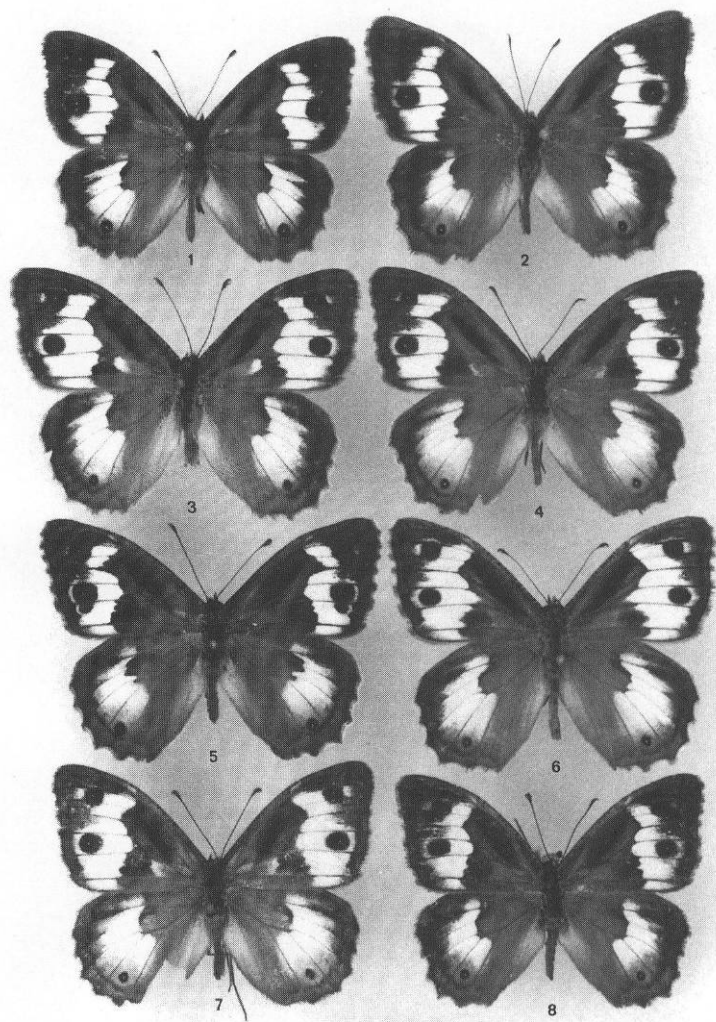


Plate 1: *Pseudochazara anthelea anthelea* (Hübner, [1824]): Males

1. Óros Karvoúni (Sámos, Greece) (1150m), 11.VI.1988, leg. A. Olivier, in coll. VLCA. 2. Óros Karvoúni (Sámos, Greece) (1150m), 13.VI.1988, leg. A. Olivier, in coll. VLCA. 3. Óros Karvoúni (Sámos, Greece) (1150m), 17.VI.1989, leg. A. Olivier, in coll. VLCA. 4-5. Óros Pelinéo (Hios, Greece) (1000-1297m), 22.VI.1990, leg. A. Olivier, in coll. VLCA. 6. Coruh valley, 12-25 km NE. Ispir, St. 1710 (Prov. Erzurum, Turkey) (1400m), 4-12.VII.1991, leg. W. De Prins, D. van der Poorten & A. Riemis, in coll. VLCA. 7-8. 2-3 km N. Ortakent (Bodrum Peninsula, Prov. Muğla, Turkey) (300-400m), 6.VI.1992, leg. A. Olivier, in coll. VLCA.

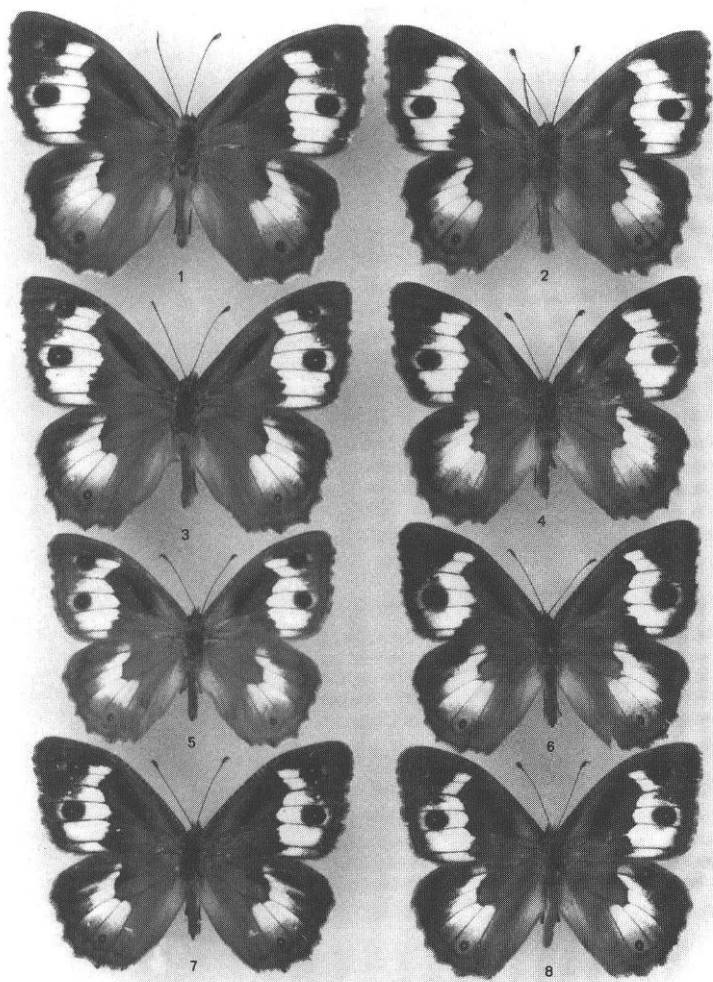


Plate 2: *Pseudochazara anthelea anthelea* (Hübner, [1824]): Males  
1-2. Óros Dikeos (Kós, Greece) (400-800m), 28.V.1988, leg. A. Olivier, in coll. VLCA.  
3-4. Óros Dikeos (Kós, Greece) (750-846m), 17.VI.1992, leg. A. Olivier, in coll. VLCA.  
5-7. Plátres (Kipros - Cyprus) (900-1000m), 7.VI.1991, leg. A. Olivier, in coll. VLCA.  
8. Lemithou (Kipros - Cyprus) (1200m), 16.VI.1991, leg. A. Olivier, in coll. VLCA.

Table 1: Expression of the white postdiscal band on upperside forewing in *Pseudochazara anthelea anthelea* (Hübner, [1824]) males

Area of origin	Number of specimens examined	Pd. band wide		Pd. band narrow	
		n	%	n	%
Turkey	37	36	97.30	1	2.70
Kıpros (Cyprus)	40	18	45.00	22	55.00
Rόδος	46	43	93.48	3	6.52
Kός	8	5	62.50	3	37.50
Σάμος	50	36	72.00	14	28.00
Ηίος	40	23	57.50	17	42.50

Table 2: Presence/absence of the white spot distally of the apical ocellus on upperside forewing in *Pseudochazara anthelea anthelea* (Hübner, [1824]) males

Area of origin	Number of specimens examined	Present		Absent	
		n	%	n	%
Turkey	37	36	97.30	1	2.70
Kıpros (Cyprus)	40	11	27.50	29	72.50
Rόδος	46	43	93.48	3	6.52
Kός	8	8	100.00	0	0
Σάμος	50	43	86.00	7	14.00
Ηίος	40	36	90.00	4	10.00

*acamanthis* will be examined critically and, as a corollary, the validity of the present case suggesting a special biogeographic affinity as just mentioned.

### Results and Discussion

*Shorter wings/smaller size.* Material from K ıpros in no way differs from Anatolian material (including the Eastern Aegean islands) in wing shape and van Oorschot et al. (loc. cit.) found the wingspan of males from K ıpros to fall within the range of variation of nominotypical *anthelea*.

*Females: condition of the postdiscal band on upperside forewing and extension of the postdiscal band on upperside hindwing.* In Turkish mainland material, a closed postdiscal band is found in roughly 10 % of the females from all over the country. A score of up to 30 % closed postdiscal band has been found in 49 specimens from the southern province of Antalya and up to 85 % in the east in the province of Elazığ (41 specimens) (data from van Oorschot et al. loc. cit.). Olivier (op. cit.: 140, table 5) has examined this condition in material from K ıpros, as well as from several Eastern Aegean islands including R odos, K os, S amos and H ios. The "closed" condition appeared to be the most common in all samples investigated, and even more common in all Greek island specimens (> 78 %) than in the K ıpros material. Extreme phenotypes in both directions ("open" vs. "closed") have been illustrated by Olivier (op. cit.: 67-68, Plate 2) and Hesselbarth, van Oorschot & Wagener (1995: Vol. 3, 238-239, Plate 67). It is clear that the feature "closed condition" cannot be used as a differentiating character of the K ıpros population.

The expression of the postdiscal band on upperside hindwing varies to a great extent within each population of *P. anthelea anthelea* (and *P. anthelea acamanthis*). It is apparently positively correlated to the condition of the upperside forewing postdiscal band.

*Males: expression of the white postdiscal band on upperside forewing.* The width of the postdiscal band in the males is a quite variable feature, both individually and geographically and, on many occasions, it appeared quite difficult to me to classify its condition as either wide or narrow. It rather seems to vary more or less continuously from narrow to wide. The resulting data on table 1 are therefore somewhat subjective, but nevertheless interesting and worth consideration. Material from K ıpros indeed reveals 55 % of the examined specimens of my own sample to have a narrow band (compare to 81.82 % of 22 specimens examined in this respect by van Oorschot et al. loc. cit.), which is a higher score than in any other sample I examined. The (small) sample from K os also scores very high indeed, though less than the H ios sample, that includes 42.50 % of "narrow-banded" specimens. At best one can say that the narrow-banded condition seems more frequent on K ıpros than in any examined Anatolian (including Eastern Aegean islands) population, but it certainly is not a constantly differentiating character. Narrow-banded specimens can indeed be met with, though in varying proportions, in any population (see plates 1 and 2 of the present study).

*Males: presence vs. absence of the white spot distally of the apical ocellus on upperside forewing.* As with the previous feature, the expression of this spot, when present, varies continuously from almost non-existent to well-marked. On table 2, it is scored as present even when barely visible. Even then, this spot is indeed absent in the majority of the K ıpros specimens (72.50 %), while the next highest absence score is only 14 % (S amos)! In the small K os sample (n = 8), however, this spot was always present

(on plates 1 and 2, mostly specimens that lack it or show it in its most vestigial expression are shown; compare to Olivier op. cit.: 67-68, Plate 2 and Hesselbarth et al. op. cit.: Vol. 3, 238-239, Plate 67). This is the feature that characterizes the Kípros population best, but here also the difference is only a quantitative one.

*Males: size of forewing postdiscal ocelli (and darkening of the area in between).* This feature was not studied quantitatively, but a look at the specimens shown on plates 1 and 2 reveals that the Kípros material is in no way peculiar in this respect.

It may be concluded that, although the Kípros material shows some features at higher frequencies than any of the remaining populations considered, none of these differentiates it constantly. As a result, *Satyrus anthelea acamanthis* Rebel, 1916 is newly sunk in synonymy under *Pseudochazara anthelea anthelea* (Hübner, [1824]).

Material from Kós is even less distinctive and falls in all respects within the range of variation of nominotypical *anthelea*. Hence the statement of a special biogeographic affinity between the populations of *P. anthelea* from Kípros and Kós is not supported at all by the facts and thus is completely invalidated.

The following synopsis mentions all known literature records applying to this species on both islands :

#### *Pseudochazara anthelea anthelea* (Hübner, [1824])

##### A. KÍPROS (CYPRUS)

- [*Satyrus*] *Anthelea* Hb.; Lederer 1855: 182.  
*Sat.[yrus]* *Anthelea* Hb.; Staudinger 1879: 283.  
*Sat.[yrus]* *anthelea* Hb.; Heyne 1895: 543-544.  
*Satyrus anthelea* (Hb.) *acamanthis* Rebel 1916a: 96, 99-100 n. syn.  
*Satyrus anthelea acamanthis* Rbl.; Rebel 1916b: 85, 87, 89, 110.  
*Hipparchia anthelea* Hbn.; Turner 1920: 172, 189-190.  
*S.[atyrus]* *anthelea* Hbn. ... *acamanthis* Rbl.; Gaede 1930: 165.  
[*Satyrus*] *anthelea* Hübner; Gaede 1931: 117.  
[[*Satyrus*] *anthelea* Hübner] ab. *acamanthis* Rebel; Gaede 1931: 118.  
*Satyrus anthelea acamanthis* Rbl.; Rebel 1936: 23-24.  
*Satyrus anthelea* (Hb.) *acamanthis* Rbl.; Rebel 1939: 498, 508.  
*Pseudochazara anthelea acamanthis* Rebel; Bretherton 1954: 209.  
*Pseudochazara anthelea acamanthis* Rebel; Bernardi 1961: 187, 189, 201, 207, 208.  
*Pseudochazara amalthea* Friv. (*anthelea* Hb.) ... Ssp. *acamanthis* Rebel; Bretherton 1966: 37.  
*P.[seudochazara]* *anthelea*; Bernardi 1971: 30.  
*Pseudochazara anthelea acamanthis* Rebel; Bretherton 1974: 2.  
*Satyrus antheleus* Hb.; Georghiou 1977: 214.  
*Pseudochazara anthelea acamanthis* Rebel, 1916; Parker 1983: 21, 22, 25, 34, 37, 50.  
*Pseudochazara anthelea acamanthis*; Brock 1987: 105, 107.  
*Pseudochazara anthelea acamanthis* Rebel; Hofmann & Rose 1987: 137, 138-139.  
*Pseudochazara anthelea acamanthis* (Rebel, 1914); van Oorschot, van den Brink & van Oorschot 1987: 91, 94-95.  
*Pseudochazara anthelea* (Hübner); Coutsis 1990: 12 [fig. 41], 14-15 [fig. 89].  
*Pseudochazara anthelea acamanthis* Rebel, 1916; Manil 1990: 325, 329, 331, 333, 334, 335, 340-341 [Plate 1], 352-353, 356-357 [Plate 4], 372, 384.  
*Pseudochazara anthelea acamanthis* (Rebel, 1916); Olivier 1993: 140, 141, 196, 202 [table 14], 204 [footnote (1) under table 15], 208, 221, 222.  
*Pseudochazara anthelea acamanthis* [(Rebel, 1916)]; Hesselbarth, van Oorschot & Wagener 1995: 134, 962, 1113 [table 27].

##### B. KÓS

- Satyrus anthelea acamanthis* Rbl.; Rebel 1936: 23-24.  
*Satyrus anthelea* (Hb.) *acamanthis* Rbl.; Rebel 1939: 508.  
*S.[atyrus]* *anthelea* Hb. *acamanthis* Rbl.; Hartig 1940: 226.  
*Pseudochazara anthelea acamanthis* Rebel; Bernardi 1961: 189, [190], 194 [fig. 4], 201, 207, [209].  
*Pseudochazara anthelea* Hübner; Bernardi 1971: 28.  
*Pseudochazara anthelea* (Hübner, [1824]); Olivier 1986: 113.



*Pseudochazara anthelea anthelea* (Hübner, [1824]); van Oorschot, van den Brink & van Oorschot 1987: 91, 94.  
*Pseudochazara anthelea anthelea* (Hübner, [1824]); Olivier 1993: 140, 141, 199 [table 12].  
*Pseudochazara anthelea anthelea* (Hübner, [1824]); Hesselbarth, van Oorschot & Wagener 1995: 962, 1113 [table 27].

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