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Some butterfly observations in the Karaganda Oblast of Kazakstan

(Lepidoptera, Rhopalocera)

by

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Abstract: Unlike the Ural Mountains, the Altai, and the Tien Shan, the steppe region of Central Asia has been poorly investigated with respect to butterflies - distribution maps of the region's species (1994) show only a handful occurring within a 300 km radius of Karaganda in Central Kazakstan. It is therefore not surprising that approaching 100 additional species were discovered in the Karaganda Oblast during collecting in 1997, 2001 and 2002. During two days of collecting west of the Balkash Lake in May 1997, nine species were identified. On the steppes in the Kazakh Highland, 30 to 130 km south of Karaganda, about 50 butterflies were identified in 2001 and 2002, while in the Karkaralinsk forest, 200 km east of Karaganda, about 70 were encountered. Many of these insects are also to be found in western Europe and almost all of those noted at Karkaralinsk and on the steppes occur in South-Western Siberia. Observations revealed *Zegris eupheme* to be penetrating the area from the west and *Chazara heydenreichi* from the south. However, on the western side of Balkash Lake the picture appeared to change. Many of the butterflies found here in 1997 - *Parnassius apollonius*, *Zegris pyrothoe*, *Polyommatus miris*, *Plebeius christophi* and *Lyela myops* - mainly came from the south, these belonging to the semi-desert and steppe fauna of Southern Kazakstan.

Introduction

As an engineer working on the design and supervision of road construction, I have the opportunity to travel to many exotic countries around the world. Much of my spare time in these places is spent on butterfly collecting. In 1997, 2001, and 2002, I visited Kazakstan. Most of my observations in 1997 were made around Almaty but hunting trips further afield were also undertaken. Base of works was from 2001 Karaganda, although systematic recording did not commence until 2002.

West of the Balkhash Lake, 1997

Two days of entomological observations were made in May from a districts situated 25 km north of Saryshagan in the Karaganda Oblast and to the south-west of the Balkhash Lake at Burybaital in the Zhambylsk Oblast. Very few butterflies were seen. Sometimes I walked around for 15 minutes without spotting a single butterfly - collecting on the dry steppes in May is sometimes not very productive. Nevertheless some interesting species that were new to me were caught, together with the expected *Pontia daplidicae*, *Pontia cloridice* and *Colias erate*. *Parnassius apollonius* was quite common, especially in the southern part of the Balkhash lake, and *Zegris pyrothoe*, *Polyommatus miris*, *Lyela myops*, *Celastrina argiolus*, and *Plebeius christophi* were also identified.

The Karaganda Oblast, 2001 and 2002

Aksu Aiuli is situated on dry steppes, and the habitat certainly does not look like a butterfly collector's happy hunting ground. The most promising district seemed to be some small hills situated 10 km north of Aksu Aiuly (km 907), this area being referred to under that name in the following paragraphs. An examination of a map of the area shows that there is only one forest in the whole of this enormous Oblast (almost of the size of France in Western Europe), this being Karkaralinsk, a hilly area covering almost 50×20 square kilometres situated approximately 200 km east of Karaganda city. The most interesting district worthy of investigation was situated 45 km west of Aksu Aiuli, the habitat being composed of scattered patches of trees and bushes, and in the following text is called Zharyk.

The winter of 2000/2001 was rather cold with a lot of snow. Spring came suddenly in the middle of April, although some cold spells returned at the end of the month. June and July were somewhat rainy and the summer was cooler than normal, with only a few days when temperatures exceeded 30 degrees Centigrade. However, as a whole, the 2001 season must be considered typical. The following winter was very mild with above freezing temperatures recorded even in January, with only moderate precipitation. The months April, May, and June 2002, were rather rainy and much cooler than normal. Spring only arrived in mid May, the cold weather delaying the appearance of many butterflies. July and August were warm and almost without rain.

The first butterfly observed in Karaganda was a *Nymphalis antiopa* during a short hot spell at the end of March 2001, even though there was half a metre of snow still laying in the streets. In early April a *Nymphalis vau-album* was spotted in the city park and a couple of weeks later a casual walk in the same area produced numbers of *Vanessa cardui* and a single *Pieris rapae*. In addition to these species, observations made in the park during early May yielded *Pieris brassicae*, *Pontia daplidicae*, *Colias hyale*, *Thersamonia thersamon* and a single *Inachis io*. During early June a single *Polygonia c-album* was also seen on the street. No further observations were made in Karaganda city in 2001.

In 2002 Karaganda was my main headquarters and, although none of the habitats between there and Aksu Aiuli looked very promising, I found a spot some 30 km to the south, close to Spask, as a convenient area to be studied. The only observations made in the local park came at the end of May, when a *Proterebia afra* was seen. A nearby garden boasted *Pieris rapae* and *Pieris brassicae*, which were common at the beginning of August, but no other observations were then made in cultivated areas. A nearby dry steppe in the outskirts of Karaganda contained rows of small planted trees, where the commonplace species were *Hesperia comma*, *Colias erate*, *Colias hyale*, *Pontia daplidicae*, *Thersamonia thersamon*, *Polyommatus icarus*, *Coenonympha pamphilus*, *Hyponophele lycaon* and *Chazara briseis*. Single specimens of *Lycaena phlaeas*, *Plebeius argyrognomon* and *Nymphalis xanthomelas*, were also identified. My final observation in Karaganda was of a *Vanessa atalanta* on 20th August, a migrant considered rare to the east of the Ural Mountains.

Aksu Aiuli

My first observations amongst the hills of Aksu Aiuli were made at the end of April 2001, when nothing was seen except for a single *Lycaenidae* that was probably *Celastina argiolus*.

On 4th May *Proterebia afra* was identified at km 933. Again, this was the only butterfly encountered on that date but about a week later it was joined by a few more, including a single *Coenonympha pamphilus*, and some *Oeneis tarpeja* and *Triphysa phryne*. There was also a small off-white species flying around that I then believed to be a moth. Much later I realised that it had been the female gender of *Triphysa phryne*! Much to my delight a male and a female *Zegris eupheme* were also caught, as well as the expected *Pontia daplicidae*, and a few *Colias erate* which included a male of the *hyaloides* form.

In mid May butterflies were generally scarce, although *Oeneis tarpeja* and *Triphysa phryne* were commonplace. Single *Syrichtus cribrellum* and *Melitaea phoebe* were caught, along with *Coenonympha amaryllus*, *Polyommatus icarus*, and *Polyommatus amanda*. In late May I decided to go 10 km north of Aksu Aiuli in the direction of Zharyk. As the first part of this road runs parallel to the main highway, the area is only about 5 km west of the Aksu Aiuli hills. In this very dry area, just single *Oeneis tarpeja* and *Polyommatus icarus*, and, much to my surprise, a *Coenonympha glycerion* was found. Early in June just one *Melanargia russiae* appeared back in the hills, although later in June and in July it flew in numbers. A couple of *Thersamonolycaena alchiphron* and single *Plebeius argyrognomon* and *Plebeius pylaon* were also recorded. A small red Lycaenidae was also seen – probably a *Thersamonia thersamon* – but it was not positively identified. In the middle of June a *Parnassius apollo* was caught after a long chase. A *Melitaea* was then also hotly pursued for another couple of hundred metres in the opposite direction. This butterfly was not caught, or ever settled, and I never got closer to it than a few metres; but the crimson red ground colour, the size, the flight pattern and the unlikely possibilities for similar looking *Melitaea* in this region, eliminated all other species except *Melitaea didyma*.

On 17th July the contractor was going to initiate the laying of the final asphalt course at km 908, in the Aksu Aiuli hills. The weather was not good, it was raining – and you cannot lay asphalt while it is raining – so I went for a walk while waiting for the weather to improve. A very dark Lycaenidae was caught after a short but hectic flight. It was a species totally unexpected in this dry area: *Maculinea nausithous*. I then caught another just 10 minutes later, in exactly the same area. It was found on the high side of the road in a very limited area of 20×50 metres, away from any water source but in a relatively green area, which indicated special ground-water conditions. In fact 5 out of 6 specimens caught at Aksu Aiulu were found within a 5×5 metre square, even though the whole area and adjacent places were investigated several times. In the surrounding district many *Hyponephele lycaon*, a couple of *Satyrus ferula*, and a single *Hyponephele lupina* were also identified. During late August and early September 2001 *Chazara briseis* and *Arethusiana arethusa* were common, together with *Vanessa cardui*, *Colias erate*, *Colias hyale* and *Pontia daplicidae*. Less numerous, but still fairly frequent, was *Chazara heydenreichi*; a total of five specimens, all females, were caught. A single *Coenonympha pamphilus* and a worn *Melanargia russiae* were also observed.

The 2002 observations began on 22nd May, when only *Proterebia afra*, *Pontia daplicidae*, a single *Vanessa cardui*, some *Triphysa phryne* (including females) and *Coenonympha pamphilus*, and a couple of *Pontia cloridice*, were seen. Next day, surprisingly, a *Pyrgus malvae* was caught and some *Melitaea phoebe* observed. On 26th May many *Melitaea phoebe* were in flight, and the first *Papilio machaon* and *Oeneis tarpeja* were also noted. Next day, another *Papilio machaon* was identified, along with three *Scolitantidis orion* in the same area where *Melitaea phoebe* was again common, and a single *Glaucopteryx alexis* was also seen. An

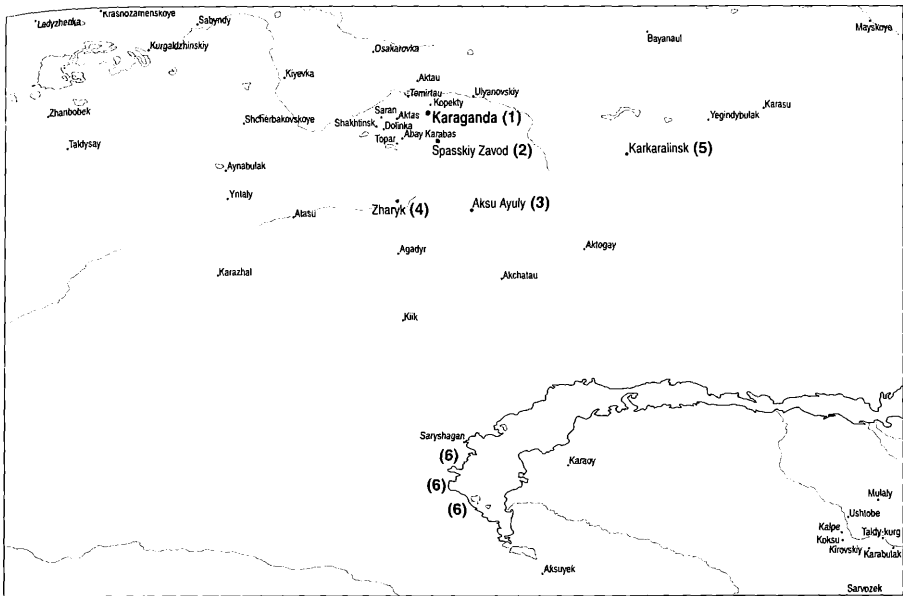


Map 1: Karaganda Oblast in the centre of Kazakstan with major Kazak towns: 1: The capital: Astana, 2: Karaganda city and 3: The largest town and the commercial centre in Kazakstan: Almaty.

expedition a week later also produced *Coenonympha amaryllis* and *Oeneis tarpeja*. Another visit in the middle of June did not produce any additional species, although *Colias erate* and *Colias hyale* appeared sporadically throughout the summer, becoming more numerous towards the end of the season.

The first visit after my vacation on 1st August instantly produced two *Maculinea nausithous* in the same place as before, and also a single *Tongeia fischeri* (amongst the tiniest of butterflies). A couple of days later a single *Parnassius apollo* was again seen when it became involved in a fight with a *Chazara briseis*, the two specimens whirling away at a tremendous speed. In the field there were numerous *Hyponephele lycaon*, *Chazara briseis*, *Arethusiana arethusa*, some *Pseudochazara hippolyte*, and single *Hyponephele lupina* and *Heodes tityrus* were also in flight. Visits on the 10th and 12th of August added male *Chazara heydenreichi* (Note: *C. heydenreichi* at Aksu Aiuli, both males and females, are markedly smaller than *C. briseis*) and some *Hesperia comma*. Numerous *Polyommatus icarus* were also examined but none turned out to be *P. thersites* (these being without the cell spot).

A total of almost 40 species were positively identified from Aksu Aiuli in 2001 and 2002, and two more remain to be determined.



Map 2: Areas investigated: 1: Karaganda, 2: Spask, 3: Aksu Aiuli, 4: Zharyk, 5: Karkaralinsk and 6: West side of Balkash Lake.

Zharyk

In the middle of June 2001 we were invited to a short picnic at the Topar Lake and drove from Aksu Aiuli towards Zharyk. Here at Zharyk, *Melanargia russiae* was found to be very numerous, single *Brenthis hecate* and *Fabriciana adippe* were taken, and many *Plebeius argyrognomon* and *Colias erate* observed. In another spot close-by, a single *Parnassius apollo* accompanied *Polyommatus icarus* and the always common *Pontia daplicidae*.

In the middle of July the site was revisited. Apart from many *Melanargia russiae*, a couple of *Pontia callidice* and a single specimen of *Maculinea nausithous*, *Thersamonia thersamon*, *Thersamolycaena alciphron* and *Heodes tityrus* were also seen or captured. It was 30th May 2002 before I visited Zharyk again, when small numbers of *Polyommatus icarus*, *Polyommatus amanda*, *Pontia daplicidae*, *Proterebia afra*, *Coenonympha pamphilius*, *Triphrysa phryne*, and single specimens of *Glaucopsyche alexis*, *Oeneis tarpeja*, and *Scolitantidis orion*, were also encountered. By the middle of June the number of species had increased: *Syrichthus cribrellum*, *Syrichthus tessellum*, *Mellicta britomartis*, *Coenonympha glycerion*, *Coenonympha amaryllis*, *Coenonympha pamphilius*, and *Plebeius argyrognomon*, flew in plenty, while single *Thersamonia thersamon*, and *Maculinea arion* were caught. *Melitaea cinxia* and a few *Neptis rivularis*, *Colias erate*, *Pontia daplicidae*, *Pontia cloridice* and *Oeneis tarpeja* were also identified.

On 2nd August the „grass“ butterflies (Satyridae) had become common: *Chazara briseis*,

Arethusiana arethusa and *Hyponephele lycaon* flew commonly along with a few *Satyrus ferula*, *Melanargia russiae*, and *Pseudochazara hippolyte*. In addition, single specimens of *Hyponephele lupina*, *Inachis io*, *Aglais urticae* and *Pieris rapae* were also observed. On 11th of August *Heodes tityrus* proved to be quite numerous everywhere in the area, a few *Hespera comma* were seen, a single *Lycaena phlaeas* was caught (the first I saw in Karaganda Oblast) and single specimens of *Thersamonia thersamon* and *Fabriciana adippe* noted.

More than 40 butterflies were identified during the rather limited collecting undertaken in Zharyk in 2001 and 2002, but another 10 to 20 species may well also occur at this spot.

Karkaralinsk

My first visit took place at the beginning of June 2001, when I visited a resort called Zhakhtjor, situated about 8 km south of Karkaralinsk. Most butterflies were collected from the lakeside hotel complex and from a number of wet and dry forest meadows, about up to three kilometres into the forest. However, the first expedition was not a success. The weather was mainly stormy, rainy, and the sky overcast, but at the end of the day it cleared up and single *Aporia crataegi* and *Neptis rivularis* were captured.

On the way from Karaganda to Karkaralinsk on 14th July, *Melanargia russiae* was seen in some open fields but not at Karkaralinsk itself, where observations were only made inside the forest. About 30 species were caught or identified in the forest on the 15th, including the following which flew in numbers: *Pyrgus serratulae*, *Syrichthus tessellum*, *Carterocephalus palaemon*, *Anthocharis cardamines*, *Leptidea sinapis*, *Thersamonolycaena alciphron*, *Maculinea arion*, *Scolitantidis orion*, *Cupido osiris*, *Polyommatus icarus*, *Melicta britomartis*, *Clossiana euphosyne*, *Neptis rivularis*, *Coenonympha glycerion* and *Lasiommata maera*. Single specimens of *Parnassius apollo*, *Colias hyale*, *Celastina argiolus*, *Maculinea alcon*, *Glaucopteryx alexis*, *Eumedonia eumedon*, *Cupido minimus*, *Cyaniris semiargus*, *Aricia artaxerxes*, *Brenthis hecate*, *Brenthis ino*, *Fabriciana adippe* and *Aglais urticae*, were also seen.

After spending most of the 2001/2002 winter working elsewhere, I arrived back at Karaganda on 18th May 2002. I headed for Karkaralinsk straight away. The weather was splendid but cool, and there were only a few species to be seen. *Nymphalis xanthomelas* was everywhere, although no *Nymphalis vaualbum* were seen, and a single *Leptidia morsei* was caught in a large meadow in the forest where *Proterebia afra* proved to be common. A couple of *Celastina argiolus* were also encountered in the forest, together with single *Polygonia c-album* and *Inachis io*. At the hotel complex *Leptidia sinapis* was commonplace and a single *Aglais urticae* also flew by.

The next visit to the area was on 2nd June. This was a complete failure. With 24 hours of constant rain, not a single butterfly was spotted. There was nothing to do except enjoying the beautiful landscape of the lake, forest and mountains. I returned to the forest on the 9th and this time I had better luck. A single *Aporia crataegi* and some *Clossiana selene* were seen at the lake and flying over the meadows inside the forest. The only *Callophrys rubi* I saw at Karkaralinsk was discovered unconscious in the bottom of my butterfly net after catching a *Clossiana selene*. *Anthocharis cardamines*, *Scolitantidis orion* and *Melicta britomartis* were commonplace. A couple of *Coenonympha pamphilus*, *Coenonympha glycerion* and single

specimens of *Carterocephalus palaemon*, *Pieris rapae* and *Vanessa cardui* were also seen. *Leptidae sinapis* was common, and a few specimens were examined, but none turned out to be *Leptidae morsei*. In a big meadow in the forest – a spot underwater in May 2002, but one of the localities where *Maculinea arion* was found in 2001 – single specimens of *Pyrgus malvae* and *Clossiana euphrosyne* were caught. On the way back through the forest a few *Clossiana selene*, and single *Pyrgus malvae*, *Cupido osiris*, and *Polygonia c-album*, were observed. In the open field close to the hotel complex, *Mellicta britomartis*, *Pontia daplicidae*, *Polyommatus icarus* and *Pyrgus serratalae* were commonplace. *Colias hyale* also occurred.

The 23rd June was my last chance before my vacation to go to Karkaralinsk. First stop was at a parking place just entering the Karkaralinsk area, where single *Brenthis hecate* and *Maculinea arion* were caught. Many *Neptis rivularis* were also observed. Leaving the area, I saw a large Satyridae that was either *Satyrus ferula* or *Minois dryas*. I then parked my car at the edge of a small forest one kilometre from the entrance to the hotel complex. Here there were many butterflies. *Mellicta britomartis* was especially common but genitalia preparations of nine specimens proved that one was *M. aurelia*, which suggests that the accurate identification of *Mellicta* spp. in Central Asia is not possible based on an examination of their external characteristics alone. *Clossiana euphrosyne*, *Maculinea arion*, *Polyommatus icarus*, *Polyommatus amanda*, *Plebeius argyrognomon*, *Coenonympha pamphilius* and *Coenonympha glycerion* were also found in numbers, together with *Syrichthus cribrillum* and *Syrichthus tessellum*. A couple of *Melitaea cinxia* were also caught, as well as single specimens of *Ochlodes venatus*, *Pieris napi*, *Cyaniris semiargus*, *Plebeius idas* (somewhat darker and with a wider black border than *P. argyrognomon*), *Melitaea diamina* and *Melitaea phoebe*. In the middle of the afternoon, as the clouds were closing in, I took a couple of *Polyommatus eroides*. My next visit to the parking area was on the 4th August. After about 15 minutes of observations, *Chazara briseis*, *Pseudochazara hippolyte*, *Hyponephele lycaon*, *Hyponephele lupina*, *Arethusiana arethusana*, and *Minois dryas*, had been recorded. Several *Parnassius apollo* and a single *Papilio machaon* were also seen flying over nearby open fields.

On 5th August, about 1–2 kilometres from the lake, many *Parnassius apollo* and *Pontia daplicidae* were seen in flight over open ground. The usual *Satyridae* species were seen as well, *Heodes virgaureae* being found in a number of places. Many *Parnassius apollo* were seen flying on the open fields on the walk towards the lake. At the lakeside single *Thersamonolycaena dispar*, *Pieris brassicae*, and *Hesperia comma*, were identified. Rather large numbers of *Nymphalis vau-album* were also observed flying from the lake area into the forest. Inside the forest *Argynnis paphia* was common, a few *Leptidea sinapis* and *Neptis rivularis* were seen, and a single *Fabriciana aglaja* caught. Further up in the forest a single *Thersamonolycaena alchiphron* was caught on a small meadow together with some *Minois dryas*, *Pseudochazara hippolyte* and *Parnassius apollo*. On a large meadow some kilometres into the forest nothing much else than *P. apollo* and a few *Arethusiana arethusana* were observed.

On my way back I caught a beautiful female *Agrodiadetes damone*. In another big meadow, single *Fabriciana niobe*, *Brenthis ino*, and *Celastina argiolus* were noted. In two smaller meadows near the edge of the forest two female *Maculinea nausithous* were caught. On the open fields out of the forest *Colias hyale* and *Colias erate* were seen flying in numbers, together with the blues and browns. After leaving the forest and parking my car in the same place close to the Karkaralinsk hotel, where I collected in the end of June, *Parnassius apollo* was everywhere. Single specimens of *Eumedonia eumedon* and *Polyommatus eroides* were caught, and a *Heodes virgaureae* seen.

A total of 70 species have been verified from Karkaralinsk in 2001 and 2002. It is likely that more than 100 species will be found by a more lengthy and thorough investigation, including such species as *Pontia cloridice*, *Thersamonia thersamon*, *Heodes tityrus*, *Lycaena phlaeas*, *Melitaea didyma*, *Nymphalis antiopa*, *Triphysa phryne*, *Melanargia russiae*, *Oeneis tarpeja* and *Satyrus ferula*.

Spask

My first visit to this area was on 5th June 2002. *Syrichis cribellum* and *Coenonympha pamphilius* were seen in numbers, plus some *Pontia cloridice*, *Pontia daplicidae*, *Colias hyale*, *Colias erate* and *Proterebia afra*. A few *Glaucopsyche alexis* and singleton *Thersamonia thersamon* and *Melitaea phoebe* were also seen. In addition to these butterflies, on the next day *Pyrgus malvae*, *Polyommatus icarus*, *Polyommatus amanda*, *Vanessa cardui*, and a *Thersamonia thersamon* were spotted. A couple of days later *Oeneis tarpeja* and *Triphysa phryne* started arriving in some numbers and single specimens of *Pieris rapae* and *Zegris eupheme* were also caught. No additional species were found during a number of further visits in June, except for a single specimen of *Polyommatus thersites*, the commonest butterflies of the month being *Coenonympha pamphilius*, *Oeneis tarpeja* and *Syrichis cribellum*.

On the 28th July *Chazara briseis*, *Pseudochazara hippolyte*, *Hyponephele lycaon* and *Arethusana arethusa* were plentiful. Then, on the 2nd August, single *Plebeius argyrognomon* and *Polyommatus thersites* (without the „*icarus*“-cell spot) were caught. During the following week the area was searched a couple of times again, and one more *Polyommatus thersites* captured. The spot was revisited 12th August when single *Melitaea didyma*, a female, and *Syrichis tessellum* were caught; *Hesperia comma* flew in numbers. My last visit to the area was on the 14th August, where single *Plebeius argyrognomon*, *Polyommatus icarus* and *Polyommatus thersites* were found along with many *Hesperia comma*.

Almost 30 species were identified from the Spask area in 2002.

Ecological and hygro-thermic peculiarities

A couple of common species caught in 2001 and 2002 show peculiarities in their colouration that might be associated with the different local ecological or hygro-thermic conditions that prevail in the Karaganda Oblast. For example, four *Maculinea arion* caught in 2001 all look normal with a clear blue ground colour, distinct black spots, and a wide clearly defined black border. However, all five *M. arion* caught in 2002 are heavily suffused with grey with a less pronounced bluish ground colour, the black spots also being ill-defined. These differences may be related to the hygro-thermic conditions during those years. Similarly, all four males of the *Maculinea nausithous* caught in 2001 have a very dark ground colour with only a trace of violet scales and black spotting. However, the single male caught in 2002 looks normal, with a wider area of the violet ground colour, and has more clearly defined black spots. Furthermore, the two females from the Karkaralinsk forest have a markedly lighter underside than the two females caught from Aksu Aiuli. And the *Scolitantidis orion* found in May 2002 at Aksu Aiuli and Zharyk are very small, with a wingspan of about 10 mm, while those at Karkaralinsk taken at the same time are somewhat bigger at 12–13 mm. This difference in size may be due to

different ecological conditions. The *S. orion* that were found at Karkaralinsk in mid July 2001 were even larger, the wingspans ranging from 12 to 16 mm, but this is most likely due to natural differences in size between first and second generation.

The *Melitaea phoebe* caught on the steppes at Aksu Aiuli in 2001 and 2002, and the one seen at Spask in 2002, all have the same appearance: Orange-yellowish ground colour with weak black markings, wingspan about 20 mm, and the band on the underside hindwing whitish with diffuse black markings. Females are slightly more colourful than males. The species flight period came during mid May in 2001, and at the end of May and beginning of June in 2002. A second brood is possible but was not observed. The newly emerged *M. phoebe* caught at Karkaralinsk in late June 2002 looks markedly different: this specimen has a reddish-orange ground colour with pronounced black markings, wingspan about 25 mm, and the band on the underside hind wing is yellowish with clearly defined black markings. The butterflies at the steppe and at Karkaralinsk could be different ecological forms or different species, but expert opinion differs (Reference 2 and 3).

Conclusion

Butterflies found on the steppes in the greater Karaganda area, and especially at the forest at Karkaralinsk, appear to be a mirror of those inhabiting South West Siberia and the Altai. Observations have only showed *Zegris eupheme* emanating from the west and *Chazara heydenreichi* from the south (or east). Expert examination of *Parnassius apollo* from Karkaralinsk indicates that this subspecies is more closely related to the *apollo* from the east (the Altai) than from the north (South-Western Siberia). Conversely, on the western side of the Balkash Lake the representation is different – most of the butterflies found here during just two days of observations in May 1997 indicate that they are mostly penetrating from a southerly direction (*Parnassius apollonius*, *Zegris pyrothoe*, *Polyommatus miris*, *Plebeius christophi* and *Lyela myops*).

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Appendix: Checklist of species from Karaganda Oblast

Name of species/ location/year	Aksu Aiuli		Zharyk		Karaganda		Spask	Karkaralinsk		Balkash Lake 1997
	2001	2002	2001	2002	2001	2002	2002	2001	2002	
Hesperiidae										
<i>P. malvae</i>		x					x		x	
<i>P. serratulae</i>								x	x	
<i>S. cribrellum</i>	x			x			x		x	
<i>S. tessellum</i>				x			x	x	x	
<i>C. palaemon</i>								x	x	
<i>O. venatus</i>									x	
<i>H. comma</i>		x		x		x	x		x	
Papilionidae										
<i>P. machaon</i>		x							x	
<i>P. apollo</i>	x	x	x					x	x	
<i>P. apollonius</i>										x
Satyridae										
<i>C. pamphilus</i>	x	x		x		x	x		x	
<i>C. amaryllis</i>	x	x		x						
<i>C. glycerion</i>	x			x				x	x	
<i>L. myops</i>										x
<i>T. phryne</i>	x	x		x			x			
<i>C. afra</i>	x	x		x		x	x		x	
<i>O. tarpeja</i>	x	x		x			x			
<i>M. russiae</i>	x		x	x						
<i>L. maera</i>								x		
<i>A. arethusa</i>	x	x		x		x	x		x	
<i>S. ferula</i>	x	x								
<i>M. dryas</i>									x	
<i>C. briseis</i>	x	x		x		x	x		x	
<i>C. heidenreichi</i>	x	x								
<i>P. hippolyte</i>		x		x			x		x	
<i>H. lycaon</i>	x	x		x		x	x		x	
<i>H. lupina</i>	x			x			x		x	
Pieridae										
<i>L. sinapis</i>								x	x	
<i>L. morsei</i>									x	
<i>P. rapae</i>				x	x	x	x		x	
<i>P. brassicae</i>					x	x			x	
<i>P. napi</i>									x	
<i>P. daplidicae</i>	x	x	x	x	x	x	x		x	x
<i>P. cloridice</i>		x		x			x			x

Name of species/ location/year	Aksu Aiuli		Zharyk		Karaganda		Spask	Karkaralinsk		Balkash Lake 1997
	2001	2002	2001	2002	2001	2002	2002	2001	2002	
<i>P. callidice</i>			x							
<i>A. crataegi</i>								x	x	
<i>Z. eupheme</i>	x						x			
<i>Z. pyrothea</i>										x
<i>A. cardamines</i>								x	x	
<i>C. erate</i>	x	x	x	x	x	x	x		x	x
<i>C. hyale</i>	x	x		x	x	x	x	x	x	
Nymphalidae										
<i>M. aurelia</i>										x
<i>M. britomartis</i>				x				x	x	
<i>M. diamina</i>										x
<i>M. phoebe</i>	x	x					x			x
<i>M. cinxia</i>				x						x
<i>M. didyma</i>	x						x			
<i>C. selene</i>										x
<i>C. euphrosyne</i>								x	x	
<i>B. hecate</i>			x					x	x	
<i>B. ino</i>								x	x	
<i>M. aglaja</i>										x
<i>F. paphia</i>										x
<i>F. adippe</i>			x	x				x		
<i>F. niobe</i>										x
<i>N. rivularis</i>				x				x	x	
<i>P. c-album</i>					x					x
<i>N. xanthomelas</i>						x				x
<i>N. vau-album</i>					x					x
<i>N. antiopa</i>					x					
<i>I. io</i>				x	x					x
<i>A. urticae</i>				x				x	x	
<i>V. atalanta</i>						x				
<i>C. cardui</i>	x	x		x	x		x			x
Lycaenidae										
<i>C. rubi</i>										x
<i>T. thersamon</i>			x	x	x	x	x			
<i>L. tityrus</i>		x	x	x						
<i>L. phlaeas</i>				x		x				
<i>L. virgaureae</i>										x
<i>L. alciphron</i>	x		x					x	x	
<i>L. dispar</i>										x
<i>C. argiolus</i>								x	x	x
<i>S. orion</i>		x		x				x	x	

Name of species/ location/year	Aksu Aiuli		Zharyk		Karaganda		Spask	Karkaralinsk		Balkash Lake 1997
	2001	2002	2001	2002	2001	2002	2002	2001	2002	
<i>M. alcon</i>								x		
<i>M. arion</i>				x				x	x	
<i>M. nausithous</i>	x	x	x						x	
<i>G. alexis</i>		x		x			x	x	x	
<i>P. pylaon</i>	x									
<i>P. idas</i>									x	
<i>P. argyrognomon</i>	x		x	x		x	x		x	
<i>P. icarus</i>	x	x	x	x		x	x	x	x	
<i>P. thersites</i>							x			
<i>P. eroides</i>									x	
<i>T. fischeri</i>		x								
<i>E. eumedon</i>								x	x	
<i>A. damone</i>									x	
<i>P. miris</i>										x
<i>P. christophi</i>										x
<i>P. amanda</i>	x			x			x		x	
<i>C. semiargus</i>								x	x	
<i>A. artaxerxes</i>								x		
<i>C. minimus</i>								x		
<i>C. osiris</i>								x	x	

Total										
Summation	28	27	13	36	11	17	27	28	65	9
Per area	37		41		35			70		9
Total	93									

Plates XI and XII illustrate a collection of butterflies photographed live in nature in the Karaganda Oblast during 2002.

Explanation of colour plate XI (p. 275):

- Fig. 1: *P. apollo* (Karkaralinsk).
- Fig. 2: *H. comma* (Karaganda).
- Fig. 3: *S. cribrillum* (Spask).
- Fig. 4: *A. palaemon* (Karkaralinsk).
- Fig. 5: *P. serratulae* (Karkaralinsk).
- Fig. 6: *Z. eupheme* (Spask).
- Fig. 7: *L. sinapis* (Karkaralinsk).
- Fig. 8: *T. thersamon* (Zharyk).
- Fig. 9: *L. tityrus* (Zharyk).
- Fig. 10: *P. amanda* (Spask).
- Fig. 11: *G. alexis* (Aksu Aiuli).
- Fig. 12: *S. orion* (Karkaralinsk).

1	2	3
4	5	6
7	8	9
10	11	12

Explanation of colour plate XII (p. 277):

- Fig. 1: *C. selene* (Karkaralinsk).
- Fig. 2: *M. phoebe* (Aksu Aiuli).
- Fig. 3: *N. xanthomelas* (Karkaralinsk).
- Fig. 4: *N. vau-album* (Karkaralinsk).
- Fig. 5: *P. afra* (Karkaralinsk).
- Fig. 6: *T. phryne* (Aksu Aiuli).
- Fig. 7: *O. tarpeia* (Spask).
- Fig. 8: *C. amaryllis* (Aksu Aiuli).
- Fig. 9: *M. russiae* (Zharyk).
- Fig. 10: *C. briseis* (Aksu Aiuli).
- Fig. 11: *C. heidenreichi* (Aksu Aiuli).
- Fig. 12: *A. arethusa* (Aksu Aiuli).

Explanation of colour plate XIII (p. 279):

- Fig. 1: *Parnassius apollo*, ♂, Aksu Aiuli, mid June 2001.
 Fig. 2: *Parnassius apollo*, ♀, Zharyk mid June 2001.
 Fig. 3: *Parnassius apollonius*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 4: *Parnassius apollonius*, ♀, Saryshagan-Burubaital, Week 21 1997.
 Fig. 5: *Chazara heidenreichi*, ♂, 12.VIII.2002, Aksu Aiuli.
 Fig. 6: *Chazara heidenreichi*, ♀, Week 35 2001, Aksu Aiuli.
 Fig. 7: *Melitaea phoebe*, ♂, Karkaralinsk 29.VI.2002.
 Fig. 8: *Melitaea phoebe*, ♀, Aksu Aiuli, Week 22 2002.
 Fig. 9: *Zegris pyrothea*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 10: *Triphysa phryne*, ♂, Aksu Aiuli, Week 20 2001.
 Fig. 11: *Triphysa phryne*, ♀, Aksu Aiuli, Week 22 2002.
 Fig. 12: *Lyela myops*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 13: *Polyommatus miris*, ♂, Saryshagan-Burubaital, Week 21 1997.

1	2	
3	4	
5	6	9
		10
7	8	11
	13	12

Explanation of colour plate XIVa (p. 281):

- Fig. 14: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
 Fig. 15: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
 Fig. 16: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
 Fig. 17: *Maculinea arion*, ♀, Karkaralinsk, 15.VII.2001.
 Fig. 18: *Maculinea arion*, ♂, Zharyk, mid June 2002.
 Fig. 19: *Maculinea arion*, ♂, Karkaralinsk, 29.VI.2002.
 Fig. 20: *Maculinea arion*, ♂, Karkaralinsk, 29.VI.2002.
 Fig. 21: *Maculinea arion*, ♀, Karkaralinsk, 29.VI.2002.
 Fig. 22: *Maculinea nausithous*, ♂, Aksu Aiuli, Week 29 2001.
 Fig. 23: *Maculinea nausithous*, ♂, Aksu Aiuli, 1.VIII.2002.
 Fig. 24: *Maculinea nausithous*, ♀, Aksu Aiuli, Week 29 2001.
 Fig. 25: *Maculinea nausithous*, ♀, Aksu Aiuli, 1.VIII.2002.

1	2	3	4
5	6	7	8
9	10	11	12

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Colour plate XI

LARSEN, B. K.: Some butterfly observations in the Karaganda Oblast of Kazakstan (Lepidoptera, Rhopalocera). – *Atalanta* **34** (1/2): 153–165.

Fig. 1: *P. apollo* (Karkaralinsk).

Fig. 2: *H. comma* (Karaganda).

Fig. 3: *S. cribrellum* (Spask).

Fig. 4: *A. palaemon* (Karkaralinsk).

Fig. 5: *P. serratulae* (Karkaralinsk).

Fig. 6: *Z. eupheme* (Spask).

Fig. 7: *L. sinapis* (Karkaralinsk).

Fig. 8: *T. thersamon* (Zharyk).

Fig. 9: *L. tityrus* (Zharyk).

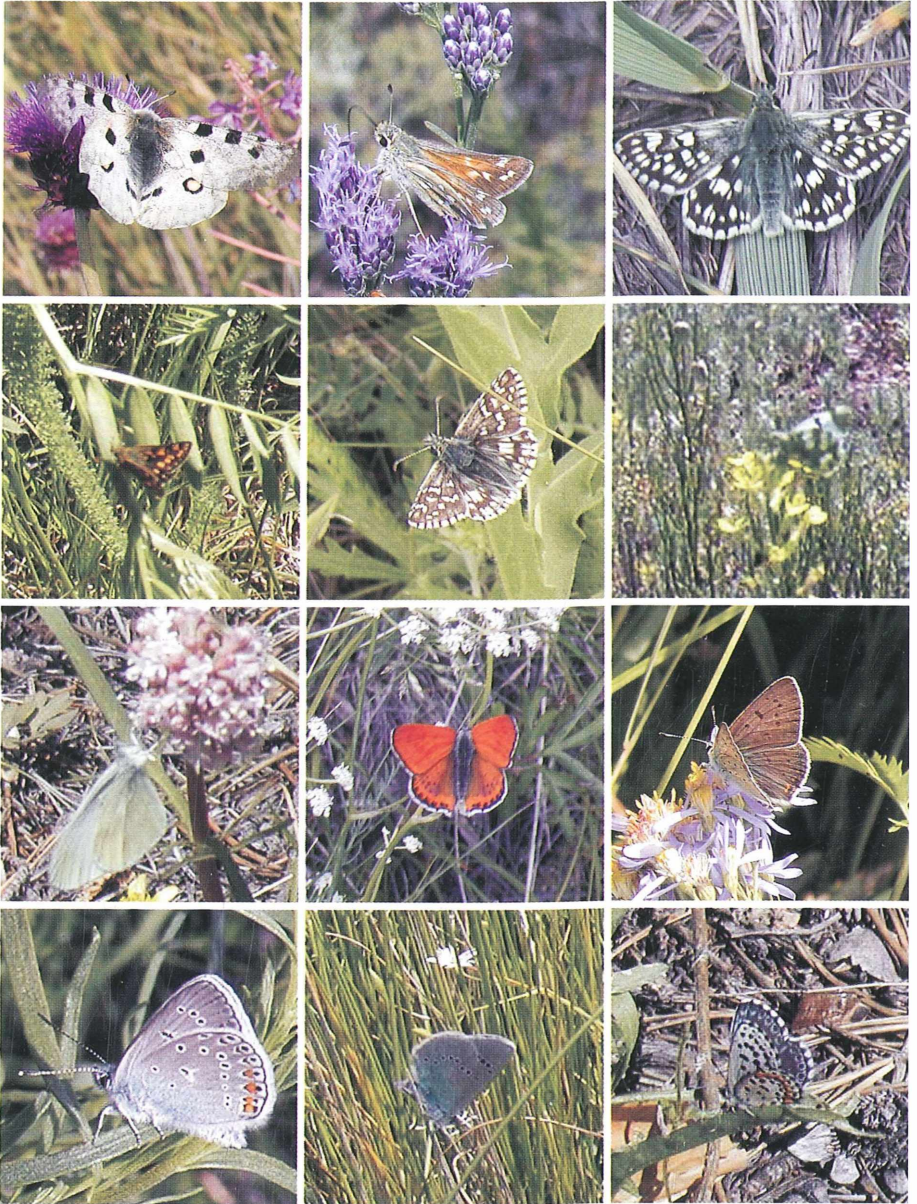
Fig. 10: *P. amanda* (Spask).

Fig. 11: *G. alexis* (Aksu Aiuli).

Fig. 12: *S. orion* (Karkaralinsk).

1	2	3
4	5	6
7	8	9
10	11	12

Colour plate XI



Colour plate XII

LARSEN, B. K.: Some butterfly observations in the Karaganda Oblast of Kazakstan (Lepidoptera, Rhopalocera). – *Atalanta* **34** (1/2): 153–165.

- Fig. 1: *C. selene* (Karkaralinsk).
- Fig. 2: *M. phoebe* (Aksu Aiuli).
- Fig. 3: *N. xanthomelas* (Karkaralinsk).
- Fig. 4: *N. vou-album* (Karkaralinsk).
- Fig. 5: *P. afra* (Karkaralinsk).
- Fig. 6: *T. phryne* (Aksu Aiuli).
- Fig. 7: *O. tarpeia* (Spask).
- Fig. 8: *C. amaryllis* (Aksu Aiuli).
- Fig. 9: *M. russeia* (Zharyk).
- Fig. 10: *C. briseis* (Aksu Aiuli).
- Fig. 11: *C. heidenreichi* (Aksu Aiuli).
- Fig. 12: *A. arethusa* (Aksu Aiuli).

1	2	3
4	5	6
7	8	9
10	11	12

Colour plate XII



Colour plate XIII

LARSEN, B. K.: Some butterfly observations in the Karaganda Oblast of Kazakstan (Lepidoptera, Rhopalocera). – *Atalanta* **34** (1/2): 153–165.

- Fig. 1: *Parnassius apollo*, ♂, Aksu Aiuli, mid June 2001.
 Fig. 2: *Parnassius apollo*, ♀, Zharyk mid June 2001.
 Fig. 3: *Parnassius apollonius*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 4: *Parnassius apollonius*, ♀, Saryshagan-Burubaital, Week 21 1997.
 Fig. 5: *Chazara heidenreichi*, ♂, 12.VIII.2002, Aksu Aiuli.
 Fig. 6: *Chazara heidenreichi*, ♀, Week 35 2001, Aksu Aiuli.
 Fig. 7: *Melitaea phoebe*, ♂, Karkaralinsk 29.VI.2002.
 Fig. 8: *Melitaea phoebe*, ♀, Aksu Aiuli, Week 22 2002.
 Fig. 9: *Zegris pyrothea*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 10: *Triphysa phryne*, ♂, Aksu Aiuli, Week 20 2001.
 Fig. 11: *Triphysa phryne*, ♀, Aksu Aiuli, Week 22 2002.
 Fig. 12: *Lyela myops*, ♂, Saryshagan-Burubaital, Week 21 1997.
 Fig. 13: *Polyommatus miris*, ♂, Saryshagan-Burubaital, Week 21 1997.

1		2	
3		4	
5	6	9	
		10	
7	8	11	
	13	12	

Colour plate XIII



Colour plate XIVa

LARSEN, B. K.: Some butterfly observations in the Karaganda Oblast of Kazakstan (Lepidoptera, Rhopalocera). - *Atalanta* **34** (1/2): 153-165.

- Fig. 14: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
- Fig. 15: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
- Fig. 16: *Maculinea arion*, ♂, Karkaralinsk, 15.VII.2001.
- Fig. 17: *Maculinea arion*, ♀, Karkaralinsk, 15.VII.2001.
- Fig. 18: *Maculinea arion*, ♂, Zharyk, mid June 2002.
- Fig. 19: *Maculinea arion*, ♂, Karkaralinsk, 29.VI.2002.
- Fig. 20: *Maculinea arion*, ♂, Karkaralinsk, 29.VI.2002.
- Fig. 21: *Maculinea arion*, ♀, Karkaralinsk, 29.VI.2002.
- Fig. 22: *Maculinea nausithous*, ♂, Aksu Aiuli, Week 29 2001.
- Fig. 23: *Maculinea nausithous*, ♂, Aksu Aiuli, 1.VIII.2002.
- Fig. 24: *Maculinea nausithous*, ♀, Aksu Aiuli, Week 29 2001.
- Fig. 25: *Maculinea nausithous*, ♀, Aksu Aiuli, 1.VIII.2002.

1	2	3	4
5	6	7	8
9	10	11	12

Colour plate XIVb

SALDAITIS, A., IVINSKIS, P. & S.-I. OHSHIMA: Some notes about *Cucullia platinea* RONKAY & RONKAY, 1987 (Lepidoptera, Noctuidae). - *Atalanta* **34** (1/2): 219-222.

- Fig. 1: *Cucullia platinea* (male).
- Fig. 2: *Cucullia platinea* (female).
- Fig. 3: *Cucullia splendida* (male).
- Fig. 4: *Cucullia splendida* (female).

	1	2	
	3	4	

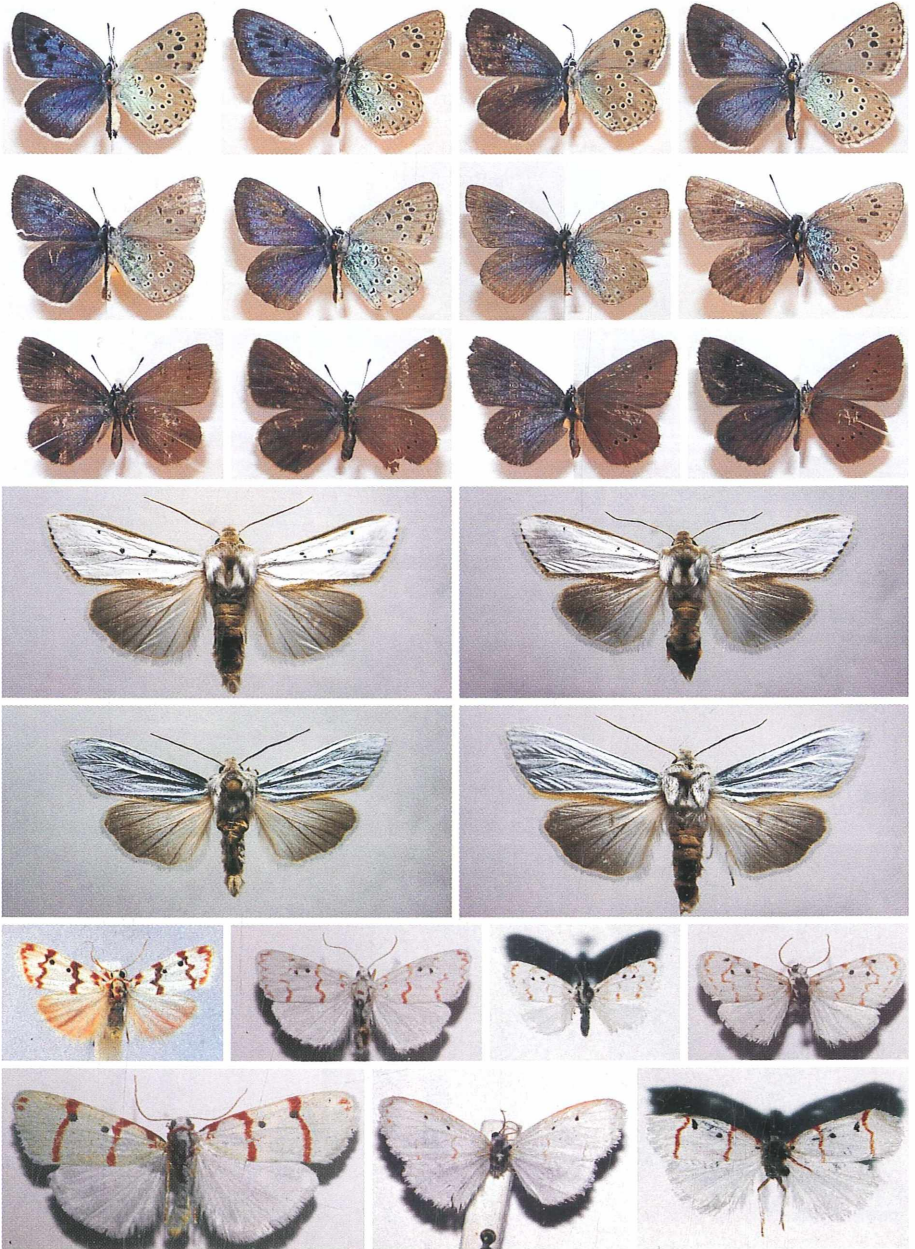
Farbtafel XIVc

KARISCH, T.: Beitrag zur Kenntnis der Gattung *Cyana* Walker, 1854 in Afrika (Lepidoptera, Arctiidae). - *Atalanta* **34** (1/2): 167-178.

- Abb. 1: *Cyana arenbergeri* spec. nov., Holotypus ♂, Tanzania: Mt. Meru, 30.VI.1988, leg. ARENBERGER (EMEM).
- Abb. 2: *Cyana pallidilinea* spec. nov., Holotypus ♂, Zaire: Irangi, Fluß Lucho, 3.-6.III.1984, leg. BURMEISTER, FUCHS, KÜHBANDNER (ZSM).
- Abb. 3: *Cyana quentini* KARISCH, 2003, ♂, Congo, Odzala National Parc, 29.I.-03.III.1997, leg. S. MURZIN & V. SINIAEV (MNVD).
- Abb. 4: *Cyana ruwenzoriana* spec. nov., Paratypus ♂, Ruwenzori: Obere Waldzone, 17.I.[19]61, leg. H. LÖFFLER (ZSM).
- Abb. 5: *Cyana ueleana* spec. nov., Holotypus ♂, [Belgisch Congo]: Uele: Paulis, 10.IX.1959, Dr. M. FONTAINE (MRAC).
- Abb. 6: *Cyana* spec., ♀, [Belgisch Congo]: Uele: Paulis, 9.I.1958, Dr. M. FONTAINE (MRAC).
- Abb. 7: *Cyana ugandana abyssinica* subspec. nov., Holotypus ♂, Äthiopien: Akaki River, Addis Ababa, 29.IX.1980, leg. DEMETER (EMEM).

1	2	3	5
	4	6	7

Colour plate XIVa/b – Farbtafel XIVc



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