

## Notes on *Parnassius charltonius vaporosus* AVINOV, 1913

(Lepidoptera, Papilionidae)

by

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**Summary:** The study of the museum and newly collected specimens originating from Darvaz mountain system confirms the subspecies status of *Parnassius charltonius vaporosus* AVINOV, 1913 which inhabits Darvazsky and the neighbouring Mazorsky ranges (Tajikistan). Afghan Badakhshan as well as the western part of Tajik Badakhshan (Gorniy-Badakhshan area of Tajikistan, West Pamirs) are populated by *P. ch. kabiri* EISNER & NAUMANN, 1980 **stat. rev.** The taxon *Koramius (Kailasius) charltonius safronovi* KORB, SHAPOSHNIKOV, ZATAKOVY & NIKOLAEV, 2013 **syn. nov.** is a synonym of the latter subspecies.

**Резюме:** Исследование музейных и недавно собранных экземпляров из Дарвазской горной системы подтверждает подвидовой статус таксона *Parnassius charltonius vaporosus* AVINOV, 1913, который населяет Дарвазский и соседний с ним Мазорский хребты (Таджикистан). На территории афганского и таджикского Бадахшана (Горно-Бадахшанская автономная область Таджикистана, Зап. Памир) распространен подвид *P. ch. kabiri* EISNER & NAUMANN, 1980, **stat. rev.**, синонимом которого является *Koramius (Kailasius) charltonius safronovi* KORB, SHAPOSHNIKOV, ZATAKOVY & NIKOLAEV, 2013 **syn. nov.**

**Introduction:** The detailed study of the old and newly collected material belonging to *Parnassius charltonius vaporosus* AVINOV, 1913 reveals some unknown facts and mistakes made by the previous authors, including the first author of the present paper (CHURKIN, 2009). The clarification of the status of this and other closely related taxa is the purpose of the study.

**Abbreviations:** FW - fore wing, HW - hind wing, TL - type locality; ZISP- Zoological Institute of Russian Academy of Sciences, S.-Petersburg; ZMKU - Zoological Museum of Kyiv National Shevchenko University, Ukraine.

### 1. Historical aspect and old material

*Parnassius charltonius vaporosus* AVINOV, 1913 was first collected by A. GOLBECK in Darvaz, Tajikistan (AVINOV, 1913). The lectotype was correctly designated by A. V.-A. KREUZBERG (1985), the selected butterfly is identical to the image published together with the description. KREUZBERG (1985: 49) stated that “all *vaporosus*-specimens from AVINOV’s collection have the same labels as the lectotype...” and identical with the populations of West Pamirs. It was the general opinion, and CHURKIN (2009) repeated it in his first *charltonius*-paper. Later Churkin noted that his expeditions found two new populations of *P. ch. charltonius* GRAY, 1852 in Darvaz mountain system: one was described as *P. ch. marusya* CHURKIN & PLETNEV, 2012, but another presented a serious taxonomic problem (CHURKIN & PLETNEV, 2012). This situation resulted in a new and detailed study of the description and type material of *P. ch. vaporosus* Av. deposited in ZISP.

It was found out that KREUZBERG made the mistakes based on wrong locality labels and the lack of additional material from the Pamirs.

AVINOV did not specify in his description how many specimens he had - he mentioned only one ♀ (lectotype). Later he noted several ♀♀ in his possession and informed that he had received new series from A. GOLBECK; he published the photo of the previously unknown ♂ (AVINOV, 1915). The first series was collected in 1911, the second one - in 1913. Thus, the specimens from the second series are not the syntypes and cannot be included in the paralectotype series.

We found a full box of the butterflies with the labels “Darwas” in the collection of ZISP. Three different types of the locality labels are attached to the specimens:

- handwritten,
- printed with handwritten collecting data,
- printed without any handwritten notes.

Only 3 ♀♀ have handwritten labels, all of them were captured in 1911 - they are the lectotype and the paralectotypes (col. plate 2: 1-3).

The lectotype has 4 labels: “*vaporosus*” (handwritten by AVINOV, red ink), “*vaporosus* AVINOV//1913//Lectotypus ♀//A. KREUZBERG design// 12.10.1984” (handwritten by A. V.-A. KREUZBERG), “К. АВИНОВА” [AVINOV’s collection] (printed), “с. Вискхарви / 30.VII.1911 г.” [Viskharvi village / 30.07.1911] (handwritten by GOLBECK - many special, easy-to-recognize GOLBECK’s labels are found in the ZISP collection).

The labels of the paralectotypes are figured on the colour plate below. The following red labels are added to these type

specimens: “PARALECTOTYPE / *Parnassius charltonius vaporosus* AVINOV, 1913 - Horae Soc. Ent. Ross. **40**: 15. Des. S. CHURKIN, 2013”.

More than 40 specimens have the printed label “Бухара. Дарвазъ / пер. Висхарви / А. Гольбекъ” [Bukhara, Darvaz, Viskharvi Pass, A. GOLBECK leg.]. Only a few of them, including two ♂♂, presented on the colour plate, have the additional handwritten (with black ink) collecting data “17.VII.1913” or “15.VII.1913” (col. plate 2: 4, 5); they are placed in the different parts of the box without any system.

The characters of these ♂♂ correspond with that of the ♀♀ captured in 1911, but the specimens without handwritten data demonstrate an absolutely different phenotype: their discal spots are large, the ground colour is whitish, the colour of the HW spots is deep reddish; the ♀♀ have a developed M3-Cu1 spot and other distinguishing signs of *P. charltonius romanovi* GRUM-GRSHIMAILO, 1885.

We found the series of the latter subspecies (collected in 1886) which had come to ZISP from AVINOV’s collection - and this series is identical to the series of wrong “*vaporosus*” with printed label “Viskharvi” (colour plate 1).

**Note:** The lectotype of *P. ch. romanovi* GR.-GR. was designated by CHURKIN (2009) and deposited in the collection of ZMKU). Now we found the series of the paralectotypes of this taxon in ZISP, the series includes 6 ♂♂, 8 ♀♀. Each specimen bears the labels: “Колл.[екция] Вел.[икого] Князя Николая Михайловича” [Coll. Grand Duke NIKOLAI MIKHAILOVICH] and “Pamir” [GRUM-GRSHIMAILO’s hand on green rectangular paper]. Two ♂♂ and three ♀♀ have an additional label handwritten by GRUM-GRSHIMAILO on thin grey paper:

- 1 ♂, “Арамъ-Кунгей/ 9.VII.86” [Transalai, Aram-Kungei, 9.07.1886];
- 1 ♂, “Арамъ-Кунгей/ 7.VII.86” [Transalai, Aram-Kungei, 7.07.1886];
- 1 ♀, “Арамъ-Кунгей/ 3.VII.86” [Transalai, Aram-Kungei, 3.07.1886];
- 1 ♀, “Арамъ-Кунгей/ 11.VII.86” [Transalai, Aram-Kungei, 11.07.1886];
- 1 ♀, “8/7.86” [Transalai, Aram-Kungei, 8.07.1886].

Each newly found paralectotype was provided with the red labels “PARALECTOTYPE/ *Parnassius charltonius romanovi* GRUM-GRSHIMAILO, 1885, in ROMANOFF, N.M. Memoires sur les Lep., St.-Petersbourg **2**: 235-236, designated by S. CHURKIN, 2009” and “PARALECTOTYPE/ *Parnassius charltonius princeps* HONRATH, 1887, Neue Rhopalocera. VI., Berl. Ent. Z. **31**: 351-352, designated by S. CHURKIN, 2009”.

One more specimen with printed label “Viskharvi” but without handwritten data has the printed red label “Allotypus” and the older handwritten label “*charltonius* v. *vaporosus* AVINOFF/ Darwas” (allotype designation was never published). This specimen belongs to *P. ch. romanovi* GR.-GR. and represents an interesting aberration, its characters have nothing to do with *P. ch. vaporosus* Av.; the person who prepared these wrong labels is unknown (col. plate 3: 20).

In addition, four specimens with printed Viskharvi-label represent *eisnerianus*-like butterflies (col. plate 3: 19). They look identical to the series of *P. ch. charltonius* GRAY labelled “Rupshu” which was found in ZISP also.

Unfortunately, we are not sure that all specimens with printed labels and handwritten data are actually originate from Viskharvi. One of the true ♂♂ mentioned above is worn, and it means that the series was too small again and the collector was so late, that even a worn ♂ was mounted. Only 3 specimens were selected (2 ♂♂, 1 ♀) as topotypes without any doubts; we provided them with the special “Topotype” labels and put separately from other specimens but together with the lectotype and the paralectotypes.

Some very worn and not prepared *charltonius*-specimens were placed in the same box. Probably, they belong to *P. ch. vaporosus* Av., but the preparation seems senseless.

It is not the first time when wrong labels are found in the collection of ZISP (CHURKIN, 2002, 2005) - and in all cases these are the series of the butterflies with printed labels from AVINOV’s collection. So, the mistakes were made by the attendants when they replaced the temporary labels with the printed ones (AVINOV usually put the numbers only on his temporary labels, thus enabling the misidentification in the future quite possible). These attendants knew the butterflies poorly and did not pay much attention to their work (the case of Indian *charltonius*-specimens clearly proves that). Nobody knows when the mistake was made, during the 1st World War or after Russian revolution, but it resulted in a number of problems and wrong opinions especially owing to the fact that new material from Darvaz was not practically available up to 2011, i. e. precisely for one hundred years.

**Note:** We found one more case of wrong labels in the *Parnassius* collection of ZISP. The large series of *P. staudingeri* A. BANG-HAAS, 1882 from “Ispajran” (Alai, Isfaram-Sai river) includes true representatives of *P. delphius* EVERS-MANN, 1843. According to the variant of the preparation of the specimens and their colouration, these butterflies are identical with the series originated from “Джай-Базар” [Dzhau-Bazar] (Kyrgyzsky range, Kyrgyzstan). Both series are from AVINOV’s collection. It could be the reason why these two taxa were wrongly united by some careless authors. For example, one of AVINOV’s specimen with a wrong label is figured in the book published by TSHIKOLOVETS (2005, plate 17: 9); the latter author treated this individual as “*P. delphius infernalis*” from “Ispajran” while in reality it is a true *P. delphius* Ev. from Dzhau-Bazar.

Everybody who briefly study this box with two chaotically mixed subspecies must be under impression that *P. ch. vaporosus* Av. is identical with *P. ch. romanovi* GR.-GR. (for example, TSHIKOLOVETS did it). However, one must come to the opposing opinion when studying the original description. The position of KREUZBERG seems dual: he kept the status of both taxa, but noted that he compared two original *vaporosus*-series collected in 1911 and 1913 and found that both are identical without any additional remarks (even in regard to the Indian specimens!).

Worth to note that the pair of *romanovi*-specimens with the label “Viskharvi” was received by EISNER when he visited Leningrad (one wrong Viskharvi-specimen with the label in German “studiert von EISNER” was found in the box). The photos of this pair are published (BRYK, 1935: fig. 688-688a) as the photos of the “paratypus”. Both specimens belong to *P. ch. romanovi* GR.-GR. and show all its characters being very similar or even identical with the photos of true *romanovi*-specimens published at the previous page of the same book. Nobody has paid attention to this remarkable fact before.

As above mentioned, the first author of the present paper also trusted KREUZBERG’s work and opinion just noting that new material from Darvaz was not known. He had several photos from ZISP collection which demonstrate all variants of the colouration, so, that an actual comparison was impossible to make. Important to note, that the characters of *P. ch. vaporosus* Av. were given based on the populations from West Pamirs, especially from Vanch Range, and this fact was especially marked (CHURKIN, 2009). Only now the study of all old series is completed, the mistakes are found out, and the investigation of geographical variability can be continued.

## 2. Distribution of *P. ch. charltonius* GRAY, 1852 at West Pamirs and adjacent territories and known taxa

*Parnassius ch. charltonius* GRAY is not rare but local in the West Pamirs. We assume that the experienced collector may find it in any range of the system. We know the populations (including some with high density) from many ranges - Vanchsky, Jazgulemsky, Rushansky, Shugnansky, Ishkashimsky (Kuhi-Lal), Shakhdarinsky, Juzhno-Alichursky - i. e. everywhere within the borders of Tajik Badakhshan. At the same time, the material from the south-eastern part of the Pamirs is insufficient, and we have at our disposal only few specimens (3 pairs) from three southern ranges listed above. These specimens are similar to those from Vanch just being more whitish, somewhat smaller and often with more reduced pattern. The ♀♀ have a more or less reduced additional Cu1-Cu2 spot (sometimes partly, sometimes totally, but statistics are not complete), and these variations are typical for the ♀♀ from Vanch.

The same characters are known for the butterflies from Dzhilandy, which live under very hard conditions (4500 m a. s. l. according to the data of D. GOSHKO, a collector from Moscow) and are characterized by obviously smaller than usual size.

The *charltonius*-butterflies of Afghan Badakhshan must be similar to those of West Pamirs but the territory is still underexplored. Fortunately, we have a series of the nominotypical *P. ch. kabiri* EISNER & NAUMANN, 1980, collected by I. PLJUSHCH (Kyiv) and O. PAK (Donetsk) at the true type locality of the taxon - Shiva Lake (Afghanistan, Badakhshan, 5 km from Shiva L., 3700 m a. s. l., Merim-Bisti loc., 18.-20.07.2011). These specimens are identical with the types on the published photos. The locality is situated not far from Khorog (less than 25 km to the West) without any serious natural barriers in between, except for the narrow Pyandzh (Pyanj) river. CHURKIN & PLETNEV (2012) published the photo of the pair. Our opinion fully agrees with that of an experienced entomologist I. PLJUSHCH, who collected *charltonius*-butterflies at Shiva lake as well as at Vanchsky range: “they are somewhat smaller with some distinctive features/characters but these minor differences from the butterflies of Vanch-populations are infraspecific in general” (I. PLJUSHCH, pers. comm.). These butterflies are very similar to those from Khorog area (up the mountains behind Khorog Botanical garden, Sangou-Dara river).

One more subspecies was described recently in the following taxonomic combination: *Koramius (Kailasius) charltonius safronovi* KORB, SHAPOSHNIKOV, ZATAKOVY & NIKOLAEV, 2013 (the generic problems with the genus *Koramius* MOORE, 1902 is out of the limits of the present paper). We do not share the opinion of KORB et al. (2013), but the description of the name is valid and can not be disregarded.

The type locality is given as „Шахдаринский хребет, 35-45 км севернее г. Хорог, 3700 м...” [Shakhdarinsky Range, 35-45 km northern of Khorog town, 3700 m a. s. l.]. Shakhdarinsky range lies to the south of Khorog, so we suppose that the type locality is given with a mistake/missprint. The article is titled “On the first finding of *Koramius (Kailasius) charltonius* ...from South-West Pamir...”, that is simply wrong - for example, the photos of a pair from Ishkashimsky Range, SE Pamirs were already published by TSHIKOLOVETS (2004).

The type series includes 2 ♂♂, 9 ♀♀. The description was published in September but in October one unmounted pair of the paratypes was sold at eBay. The photo of this pair was available - it means that the description of the ♂ was based on the characters of one specimen only, the holotype.

At the beginning of the paper KORB et al. (2013) listed the known *charltonius* taxa (*P. ch. kabiri* EISNER & NAUMANN is omitted) and marked that *P. ch. vaporosus* Av. occurs at NW Pamirs, i. e. has the distribution area that is connected with the area of the described taxon. The name „*vaporosus*“ never appears again in the article, the comparison between the new subspecies and *P. ch. vaporosus* Av. is completely absent. Moreover, *P. ch. deckerti* (VERITY,[1907]) is also listed



in the introduction as populating East Pamirs, and at the same time KORB et al. (2013) confirmed the status of *P. c. anjuta* SHCHETKIN & KAABAK, 1985 and *P. ch. mistericus* KAABAK, SOTSHIVKO & TITOV, 1996, both described from the East Pamirs. Mentioning the island rule (FORSTER's rule) to prove the status of two latter subspecies, KORB et al. (2013) totally ignored the scientific sense of this rule as a whole.

As a result, *P. ch. safronovi* (KORB et al.) is described in comparison with *P. ch. voighti* BANG-HAAS, 1927 (actually, its distribution area connects with that of *P. ch. wernickei* KOTZSCH, 1936) and the “*deckerti* complex of subspecies” as one having a intermediate position between them! For example, the main stated similarity between “*safronovi*” and “*deckerti*” is unsufficiently the absence of well developed white ocelli inside the red HW spots. It is senseless to point out other mistakes like wrong identification of the food plant, the absence of any published information about the distribution of different *Corydalis* spp., or the idea that northern and southern *charltonius*-populations demonstrate much more diversity compared with the central part of the species' distribution area. In addition, in the other part of the article the authors state that “ssp. *romanovi*” demonstrates stability of the characters - which, for one thing, simply conflicts with the first idea (because it is the northern taxon) and moreover just wrong (because the list of known forms of this subspecies is much longer than those of any other subspecies of *P. charltonius* GRAY).

The actual characters of the new taxon are identical with those of *P. ch. kabiri* EISNER & NAUMANN, which type locality is not far away (see above). Finally, *Koramius (Kailasius) charltonius safronovi* KORB, SHAPOSHNIKOV, ZATAKOVY & NIKOLAEV, 2013 **syn. nov.** = *Parnassius (Kailasius) charltonius kabiri* EISNER & NAUMANN, 1980.

The taxa described from Afganistan, Pakistan and East Pamirs belong to other complexes of the subspecies, their relations with *vaporosus*-complex will be discussed in a subsequent article.

### 3. New material from Darvaz

Two new populations were found in 2011 in Darvaz zoogeographical district. The first one was described as *P. ch. marusya* CHURKIN & PLETNEV, 2012, the type series was collected by S. SALUK at Obikhingou river (between Peter the Great range and Darvaz itself). The second series is originated from Mazorsky range, situated between Darvaz and Peter the Great ranges, along Obimazor river, left tributary of Obikhingou. The distance between two populations is less than 15 km without any barriers. The distance between the southern environs of Viskharvi Pass and the locality at Mazorsky range is less than 25 km, but these localities are divided by Darvaz Range tops covered by disjointed ice sheets.

Seven ♂♂ were captured by S. TREMASOV at Mazorsky range for CHURKIN's collection. The trip was organized together with SALUK's expedition since Obikhingou basin was supposed to be the area of potential co-habitation of two different *charltonius*-taxa. Eventually, this idea was fully confirmed. We will discuss the complicated relations between these two populations and all known taxa in a subsequent article (*P. ch. marusya* CHURKIN & PLETNEV does not belong to *vaporosus*-complex). It is important to remind that the present article contains only the comparison of Mazor population with nominotypical *vaporosus*-series and other butterflies known from neighbouring parts of West Pamirs/Badakhshan.

In 2012 only one ♂ was observed by V. TREMASOV and his team during their visit to Mazorsky range; but in 2013 the additional series was collected. The butterflies occurred very locally and flew very early for such high elevations (3400 m a. s. l.) - in the first part of July. It corresponds with the data of A. GOLBECK who was too late trying to collect the butterflies in the second part of July or in August (+14 days to his collecting data according to the differences between old and new calendar). In total 30 ♂♂, 8 ♀♀ were captured, including some worn individuals. The density of the population is very low and only big effort and some luck assured such a success of the third expedition to the locality. The food plant is *Corydalis* sp., but the species has not yet been identified.

In general, the Lepidoptera fauna of Mazorsky range combines West-Pamirian and specific Darvazian elements. The high tops of the range are populated by *Parnassius staudingeri inaccessibilis* J. J. SHCHETKIN, 1979 described from Peter the Great range. It occupies the intermediate position between *P. st. darvasicus* AVINOV, 1916 originated from Vanch Range and *P. st. illustris* GRUM-GRSHIMAILO, 1888 from West Transalai range. The tops of Peter the Great range are inhabited by *Melitaea alraschid irinae* CHURKIN et al., 2012, while *M. shandura* EVANS, 1924 which is close to West-Pamirian subspecies was collected at Mazor (the final status of this new population cannot be stated because the material is insufficient). V. TREMASOV also collected some *Paralasa* specimens with very strange and variable colouration which seems to be intermediate between *P. jordana kipnisi* CHURKIN & PLETNEV, 2012 from Peter the Great range and *P. ida* GRUM-GRSHIMAILO, 1890, known from Vanchsky range.

Note: The *Paralasa*-series marked above was mistakenly included to the type series of *P. jordana kipnisi* CHURKIN & PLETNEV, 2012 (CHURKIN & PLETNEV, 2012 a: 130). It must be placed in another paragraph of the description, “Additional material”. Now we can correct this mistake and exclude these specimens from the paratype series. A possibility of hybridization between different subspecies of *P. jordana* STAUDINGER, 1882 and *P. ida* GR.-GR. is discussed in CHURKIN & PLETNEV (2012 a). The series from Mazor could be a key to solve this problem.

In 2013, after his trip to Mazorsky range, i.e. during flight period, V. TREMASOV tried to find the nominotypical population of *P. ch. vaporosus* Av. above Viskharvi village at the southern slopes of Darvaz, without any success,

though the rocks over the village were searched out in a 10 km range, but neither *Corydalis*-plants nor *P. charltonius*-butterflies were found. According to the handwritten labels prepared by A. GOLBECK, his butterflies were collected at Viskharvi Pass and not in the vicinity of the village. However, this pass was heavily mined after the Civil War and it is prohibited to get there. We can assume that the biotops nearby Viskharvi pass, i. e. the tops of Darwaz range might be very similar to those of Mazor.

OHYA & INOMATA (1987: I, 5-6) published the photos of the pair originated from "Darwas, Pamir (Y. IVAMOTO collection)" which are very similar to the nominate butterflies. Unfortunately, we have any information about the locality.

#### **4. The characters of *P. charltonius vaporosus* AVINOV, 1913 and the status of *P. ch. kabiri* EISNER & NAUMANN, 1980 stat. rev. (col. plate 2, 3).**

The butterflies from Mazorsky range are definitely smaller than those from Vanch. FW length is 33-39 mm in ♂♂ and 36-38 in ♀♀, while Vanch butterflies have 35-41 mm in ♂♂ and 37-43 mm in ♀♀. The ♂♂ from Mazor very often have FW length 34-36 mm, while in Vanch population such small specimens are rare (not more than 10% of the population). In general, the size of Mazor butterflies is the same as in Dzhilandy population living one kilometer higher. *Parnassius ch. kabiri* EISNER & NAUMANN is of intermediate size (usually 36-38 in ♂♂), the same is true for other known West-Pamirian populations.

The FW statistically has a more expressed postdiscal band (which, however, is reduced compared with other *romanovi*-taxa). The types of *P. ch. vaporosus* Av. from Viskharvi have a fully reduced costal eye at the HW upperside, one ♂ has a reduced anal red mark. The latter character is rare in the *romanovi*-group as a whole, but was registered among the ♂♂ from Mazor. The reduction of the costal eye is more frequent, this spot is usually very small or (rarely) practically fully absent.

Nominotypical ♀♀ as well as those from Mazor always do not have a dense ground colour, and ♀♀ with the same ground colour as in the ♂♂ are unknown.

The postdiscal band is obviously more developed than in all other populations from West Pamirs, sometimes this band is full (but not thickened as in the *deckerti*-group). FW discal spots are slightly thicker than in West-Pamirian ♀♀, while the HW blackened area around submarginal spots is less developed and widely separated from the big eye - in opposite to the main character of the Vanch population, where this area is maximally developed among subspecies of the *romanovi*-group and only slightly separated from the big eye. The same is true for Afghanian specimens. It seems that in the ♀♀ from SE Pamirs sometimes have this area reduced, but the available material is insufficient.

Both sexes have statistically more reduced HW submarginal spots, that resembles those of *P. ch. romanovi* GR.-GR. Important to note, that Vanch specimens sometimes have moderately enlarged HW submarginal spots, while such specimens are unknown from any other Pamirian populations.

In general, Darvazian butterflies are similar to *P. charltonius*-specimens from Pamirs, but have less reduced pattern, except HW submarginal area which (on the opposite) is reduced. The size of HW anal mark and HW costal eye mainly differs in the ♂♂, the ♀♀ have more expressed black pattern at the FW but reduced blackened submarginal area at the HW. This hiatus looks not as abrupt as between other taxa of *romanovi*-group, but however distinctive owing to the ground colour and the colour of the red eyes.

As it was marked by CHURKIN (2009), the main ground colour of living butterflies is different in different taxa and in some cases it can be very important (since chemical attraction is not developed). Vanch butterflies are white with dirty-yellowish hue when alive, comparing with whitish representatives of *P. ch. romanovi* GR.-GR. The butterflies from Darvaz are distinctively more yellowish than Vanch-specimens, and living specimens from Mazor are clearly yellowish. The colouration is so distinctive, that TREMASOV was rather perplexed for a while when he saw the first specimen in 2011 having no clue what species he was looking at (V. TREMASOV, pers. communication). Moreover, he collected *P. charltonius* GRAY at Bartang river in the same year and described those specimens as whitish. The same observations were made in 2013 at the localities of Mazor and Bartang.

Prepared specimens from Mazor are yellowish even when fresh, while prepared fresh specimens from Vanch look dirty-whitish. It is quite common that "old" ♂♂ (older than one week), turn more yellowish in comparison with the fresh ones - this phenomenon is known for all *romanovi*-populations, but especially for West Pamirian (and, partly, for *P. ch. sochivkoi* CHURKIN). The specimens from Mazor acquire very unusual creamy-yellowish colour after 2-3 days of flight; moreover, even absolutely fresh ♂♂ sometimes have the same colouration/hue - and in this case the colour of the HW eyes is also changing.

At the first glance, such specimens have pale-yellowish sun-bleached spots, but actually the red-crimson colour of the spots is very dark and deep with violet tinge and the suffusion of black scales. It is quite obvious when you look at the spots at an acute angle of vision. A worn paralectotype ♂ of *P. ch. vaporosus* Av. demonstrates exactly such a colour, however, this kind of colouration was not found in any other studied populations.

In addition, the yellow hue of the ground colour is more obvious when you compare the Darvazian butterflies with the Pamirian ones at different angles of vision. We can conclude that white pigment of their wings is not the same.

As mentioned above, Vanch specimens objectively look more yellowish than those from Khorog, Dzhilandy or SW Pamirs; they are intermediate between the latter and the nominate populations. However, Vanch population differs most dramatically in the pattern from SW Pamirian populations.

Summing up all the facts, we suppose that it is better to limit the distribution area of *P. ch. vaporosus* Av. within Darvaz, while West Pamirs (Tajik Badakhshan) and the neighbouring part of Afghan Badakhshan are populated by *P. ch. kabiri* EISNER & NAUMANN, 1980 **stat. rev.**

We cannot exclude that this variant of the distribution can be changed in the future. To shed light on this issue it is necessary to study freshly collected series from the type locality (=Viskharvi pass) of *P. ch. vaporosus* Av. It might turn out much more similar to Vanch populations, than to the population from Mazorsky range, the northern side of Darvaz. In this case it will be necessary to describe the Mazor population as a subspecies, giving a name for these small yellowish butterflies.

As a whole, Darvaz and West Pamirs are inhabited by the complex of similar populations which are slightly different in each range, forming the system of clines. Theoretically, we have two more variants of subspecific structure:

- 1) to unite all studied populations in one subspecies (that seems not logical zoogeographically ignoring the simple fact: the butterflies from Vanch have some characters opposite to Mazor population, except in the ground colour) upsetting the clines and presenting the other line of the variability.
- 2) to divide this area in 4 parts describing some more taxa: Darvaz (both sides or the northern part only), Vanch (or Vanch plus Viskharvi), Dzhilandy area and Badakhshan itself (Khorog, Shiva Lake, Ishkashim); this variant seems senseless, because it ignores the zoogeographical aspect, the formed clines and the simple fact that most populations from the last three areas can not be identified without any locality data (in the opposite to Darvazian specimens).

We are based on the simple idea, that the subspecies represent a biological unit and thus, subspecific structure cannot be based on the convenience or inconvenience of collectors but has to reflect the actual situation in nature.

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# Colour plate 1



Fig. 1-10: *Parnassius charltonius romanovi* GRUM-GRSHIMAILO, 1885.

Fig. 1-5: Transalai, Aram-Kungei, coll. AVINOV, 4 ♂♂, 1 ♀.

Fig. 6-10: Wrongly labelled "Бухара. Дарвазъ / пер. Висхарви / А. Гольбекъ" [Bukhara, Darvas, Viskharvi Pass, A. GOLBECK leg.], col. AVINOV, 3 ♂♂, 2 ♀♀.



## Colour plate 2



Fig. 1-10: *Parnassius charltonius vaporosus* AVINOV, 1913; (1) lectotype ♀, data see text, (2) paralectotype ♀, c. Vickharvi/30.VII.1911 [c. Viskhavi], col. AVINOV, (3) paralectotype ♀, c. Vickharvi/31.VII.1911 [c. Viskhavi], col. AVINOV, (4) topotype ♂, “Бухара. Дарваз/пер. Висхарви/17.VII.1913 A. ГОЛБЕК” [Bukhara, Darvas, Viskharvi Pass, 17.VII.1913 A. Гольбек leg.], col. AVINOV, (5) topotype ♂, “Бухара. Дарваз/пер. Висхарви/17.VII.1913 A. ГОЛБЕК” [Bukhara, Darvas, Viskharvi Pass, 15.VII.1913 A. Гольбек leg.], col. AVINOV, (6-10) Tajikistan, Darvas system, Obimazor r., Mazorsky Range, 2.-15.07.2013, 3500-3600 m, V. Tremasov leg., 3 ♀♀, 2 ♂♂.



### Colour plate 3

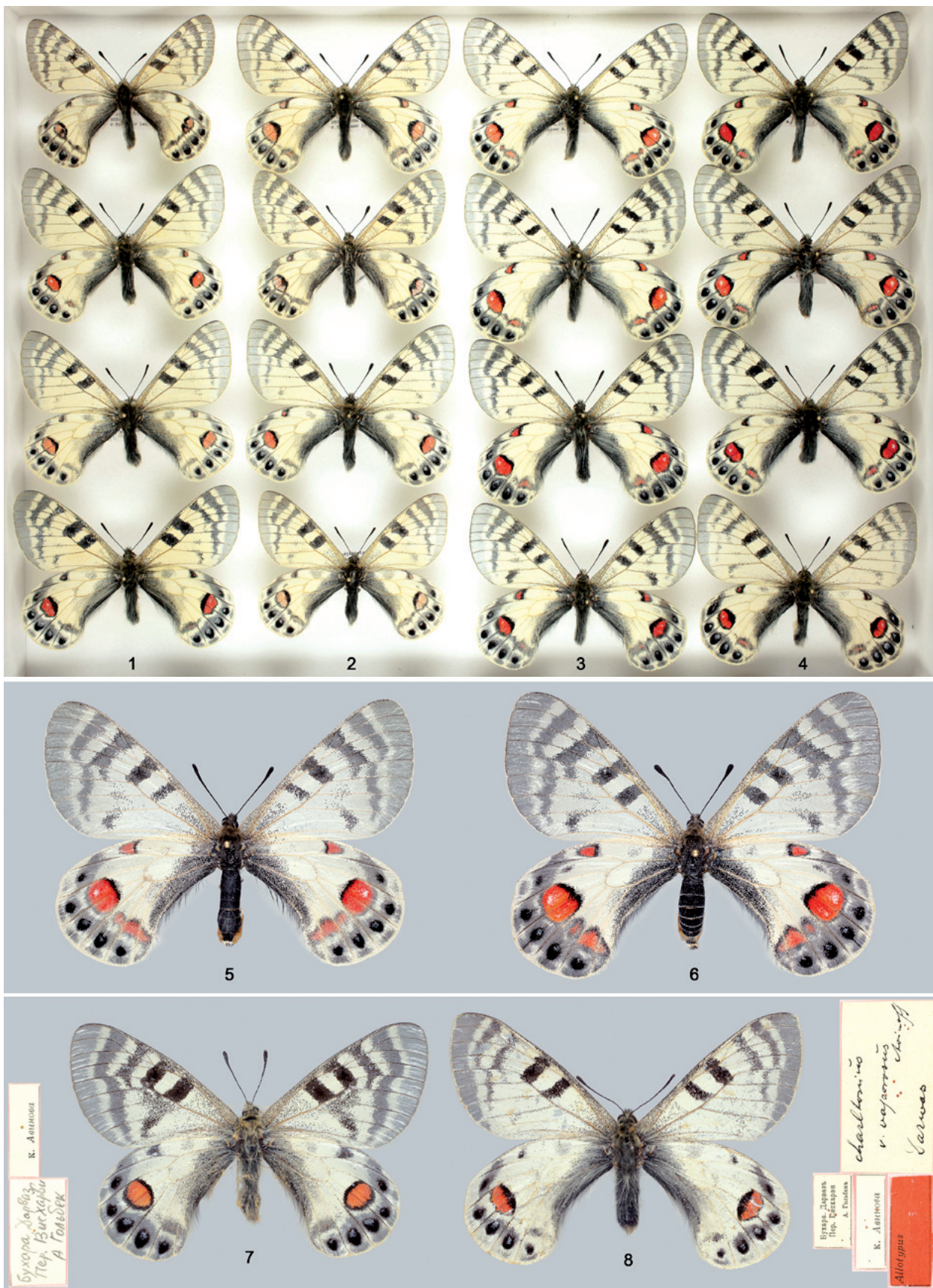


Fig. 1, 2: *Parnassius charltonius vaporosus* AVINOV, 1913, Tajikistan, Darvaz system, Obimazor [river], Mazorsky Range, 2.-15.07.2013, 3500-3600 m, V. TREMASOV leg.

Fig. 3-6: *Parnassius charltonius kabiri* EISNER & NAUMANN, 1980, *stat. rev.*, (3, 4) 8 ♂♂, (5, 6) 2 ♀♀, Vanch Range, Gyskhkun vall., 3200-3500 m, VII.2003.

Fig. 7: *Parnassius charltonius (eisnerianus)* BRYK, 1931, [Bukhara, Darwas, Viskharvi Pass, A. GOLBECK leg.], coll. AVINOV, wrongly labelled specimen.

Fig. 8: *Parnassius charltonius romanovi* GRUM-GRSHIMAILO, 1885 (aberration), wrongly labelled "Allotypus" and "*charltonius v. vaporosus* AVINOFF/Darwas".

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