

A new species of the "brown *Agrodiaetus*" complex from the Crimea (Lepidoptera: Lycaenidae)

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Samenvatting. Een nieuwe soort in het complex van bruine *Agrodiaetus*-soorten uit de Krim (Lepidoptera: Lycaenidae)
De auteurs beschrijven een nieuwe soort in het complex van bruine *Agrodiaetus*-soorten, die tot nu toe verward met *Polyommatus (Agrodiaetus) admetus* (Esper, [1785]). Zij vergelijken deze nieuwe soort met alle andere bruine soorten uit het subgenus *Agrodiaetus*.

Résumé. Une espèce nouvelle du complexe des *Agrodiaetus* bruns provenant du Krim (Lepidoptera: Lycaenidae)
Les auteurs décrivent une espèce nouvelle du complexe des *Agrodiaetus* bruns, qui a été confondue avec *Polyommatus (Agrodiaetus) admetus* (Esper, [1785]) jusqu'à présent. Ils comparent cette espèce nouvelle avec toutes les autres espèces brunes du sous-genre *Agrodiaetus*.

Резюме. Новый вид из комплекса коричневых *Agrodiaetus*-ов из Крыма (Lepidoptera: Lycaenidae)
Авторы описывают новый вид из комплекса коричневых *Agrodiaetus*-ов, которого раньше смешивали с *Polyommatus (Agrodiaetus) admetus* (Esper, [1785]). Приводится сравнение нового вида с другими коричневыми видами подрода *Agrodiaetus*.

Key words: *Polyommatus budashkini* sp.n. - brown *Agrodiaetus* complex - new species - Crimea - Ukraine

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Introduction

The Crimean peninsula has received considerable attention from lepidopterists because of the peculiar fauna reflecting its isolated position on the northern Black Sea coast and the vast array of habitat types to be found there. These range from lowland steppes and xerothermic submediterranean slopes to mountain forests and the unique yaila (plateau-like highlands). The last-mentioned formations stretch along the southern coast of the peninsula, and shelter the most notable butterflies in Crimea - endemic taxa like *Proterebia afra krymaea* (Sheljuzhko, 1929), *Pseudochazara euxina* (Kuznetsov, 1909), and the recently described *Polyommatus (Agrodiaetus) pljushtchi* Budashkin & Lukhtanov, 1993. Before the last mentioned species was discovered, two other Crimean members of subgenus *Agrodiaetus* were reported by Nekrutenko (1985): the endemic taxon *P.(A.) poseidon krymaeus* (Sheljuzhko, 1928), and the relatively widespread in Southeast Europe and Turkey *P.(A.) admetus* (Esper, [1785]). However, the taxon referred to as *admetus* in the peninsula has not been subject to close examination previously. Its superficial treatment in the literature has thus created a long-lasting confusion concerning its true identity.

The first remark ever about the Crimean brown lycaenid is found in Oberthür's description of the taxon *fabressei* from Spain (Oberthür 1910: 260):

"*Lycaena Rippertii*, Boisduval. M. Fabresse found at Albarracin, in July and beginning of August 1907, together with *Damon*, a new geographical form which I name *Fabressei*. The male is relatively small; it is very dark on the upperside, but on the underside it is more brown and less grey than the French specimens; moreover, it lacks the white longitudinal stripe. The female has a prominent white stripe; the ground colour of its wings is of a more reddish brown than in French specimens. The male has very well marked black points

along the terminal border of the upperside [sic] of hindwings and these have a reddish crescent. The same race is found in Crimea." [our translation]

In the first catalogue of butterflies of the Soviet Union, Korshunov (1972: 365) listed three brown *Polyommatus* (*Agrodiaetus*) species which, according to him, were found in Crimea: *admetus*, *fabressei*, and *ripartii*. For *fabressei*, Korshunov stated:

"686. *fabressei* Oberthür, 1910, - Crimea. The specific distinctness of this form has been confirmed by a study of the chromosomes (de Lesse, 1960)". [our translation]

However, the chromosome studies in question were not carried out on Crimean individuals, but on Spanish ones. What de Lesse (1960: 146) actually noted when erecting *fabressei* to full species, is:

"At last, one should notice that Oberthür, in his description of *fabressei*, mentioned that this subspecies was found also in Crimea. If this is correct, which I could not check, such disjunct occurrence would also suggest [that *fabressei* is] a specifically distinct taxon." [our translation]

The uncertainty in the specific interpretation of the Crimean taxon thus created was summarized by Nekrutenko (1985: 141):

"Notes on systematics. The dark-coloured species of *Agrodiaetus* comprising the *admetus* - *riparti* [sic]¹ group are extremely difficult to identify on external features and their male genitalia are practically indistinguishable (no one has studied the female genitalia). Attempts to clarify their relationships using karyological analysis failed to produce unequivocal results too, although it was shown that the number of chromosomes formed in the first division during the maturation of the first-order spermatocytes, is 78-80 in *P.(A.) admetus* and 90 in both *P.(A.) ripartii* [sic] and *P.(A.) fabressei* but for different karyotypes (de Lesse, 1960).

Judging by the original descriptions and the accompanying illustrations, *P.(A.) admetus* (type locality: Hungary) differs from *P.(A.) ripartii* [sic] (type locality: Spain) in that it lacks the white "streak" on the hindwing underside. One needs just to collect a series of the butterflies in Crimea, where they are abundant (near Sudak, on the Ai-Petri yaila and in other places), to see that it will consist of individuals with this feature variously developed - from a streak completely absent to a bright, pure white stripe spanning from wing base to the submarginal row of ocelli.

Observations in the wild show that mating is not selective with regard to this feature, which does not allow to classify these phenotypes under different specific names. Obviously because of the considerable variability of these blues in Crimea, Oberthür found some individuals similar to *P.(A.) fabressei* described by him from Spain (Albaracin, Teruel), and de Lesse, who erected this form to a good species, suggested a disjunct distribution which led Korshunov (1972) to include it in the Crimean fauna. In such a situation, a thorough study of these lycaenids, involving karyological methods as well, is no doubt necessary. However, for practical reasons it seems appropriate to retain the oldest available name for them at present." [our translation]

It is surprising that this remarkable account has failed to elicit the interest it deserves for almost a decade. It is also not clear why Nekrutenko, in spite of his observations, chose to retain the name "*admetus*" for this insect. The colour photos of undersides (Nekrutenko 1985: table XXIV, 4 b & c), accompanied by text reading "*P. admetus* - extremes of the underside variation" [our translation], clearly depict specimens very dissimilar from *admetus*. Anyway, what is most important is that Nekrutenko showed convincingly that only one, albeit polymorphic, species of the brown complex occurs in the Crimea.

A couple of years ago, the second author obtained 14 specimens of the Crimean

¹ Nekrutenko (1985: 3) states that for that work, "The names of all taxa at the species level have been checked with the original descriptions and are here presented in their original spellings, thus rejecting any subsequent incorrect spellings...". However, he uses "*riparti*" throughout whereas Freyer's description (1830: 128) reads "184. Pap. Ripartii. Tab. 133. Fig. 3."

taxon for the Vlaamse Lepidoptera Collectie Antwerpen (VLCA). Last year, the first author found 11 specimens, identified as "*Agrodiaetus admetus*", in the collections of the University of Tartu (Estonia) and Tõnu Kesküla (Tartu). Examination of these rather worn specimens and the male genitalia strongly argued for a specifically distinct, unnamed taxon. Further 31 specimens were kindly sent to us by Dr Budashkin. The description of the new species was completed in Antwerpen using mainly the material in VLCA.

Polyommatus (*Agrodiaetus*) budashkini sp. n.

(Plate 1, figs 1-6)

ripartii auctt., nec Freyer, 1830.

admetus auctt., nec Esper, [1785].

fabressei auctt., nec Oberthür, 1910.

Male: length of forewing 13.2-17.0 mm (mean 15.3 mm).

Upperside (Plate 1, figs 1, 2): forewing strongly pointed; ground colour from rather pale to medium greyish brown with strong yellowish sheen; wing margin and discal bar darker brown, veins poorly contrasting. Androconial patch prominent, lacking the yellowish sheen. Fringes brown. Hindwing of same colour as forewing, veins contrasting better except for discal proximal bar. Basal part of fringes as on forewing, most often outer part distinctly paler brown to whitish, especially near hindwing apex.

Underside (Plate 1, figs 4, 5):

· **Forewing** cold grey to yellowish grey, marginal markings absent or very faint; margin with fine darker outline. Discal bar black, with faint whitish outline; postdiscal ocelli large, black ringed whitish, often the double ocellus in cell 1 and, rarely, that in cell 6 very faint or absent. Basal half of fringes pale brown grey, outer half much darker brown.

· **Hindwing** as forewing but with less of greyish tinge, inconspicuous to rather well developed greenish dusting at base, and very faint traces of marginal markings, occasionally dusted faint orange in cells 1, 2 and 3. Postdiscal black ocelli broadly ringed white, only slightly to about twice smaller than forewing ocelli (that in cell 6 often absent altogether), arranged in a row running roughly parallel to the wing margin. Discal bar vestigial or absent, with barely visible pale outline; in one male a faint ocellus is present in discal cell.

· **White streak** rarely prominent (in about 10 % of the examined specimens) and even then relatively narrow (about half the width of cell 4 or less), vestigial in the basal half of discal cell and only seldom reaching more than one-third of the distance between postdiscal ocellus and wing margin. Most typically, vague whitish suffusion can be noticed between postdiscal spot and discal bar, hardly reaching beyond postdiscal ocellus. Outer half of fringes darker than basal half but not as dark and contrasting as on forewing.

Female: length of forewing 12.5-16.5 mm (mean 14.8 mm).

Upperside (Plate 1, fig. 3): ground colour more reddish brown than in male. Forewing discal spot, hindwing veins (except discal bar) and margin wider and more contrasting. Forewing margin between veins 2-5 nearly straight or even inwardly concave, bulging between veins; on hindwing more scalloped than in male. Fringes pale greyish brown on forewing, paler yellowish to greyish white on hindwing.

Underside (Plate 1, fig. 6): more yellowish brown to reddish and postdiscal ocelli deeper black, generally larger on forewing and smaller on hindwing than in male. Forewing submarginally between veins 1-5 darker grey than rest of wing, sometimes with faint, diffuse orange lunules; fringes pale brownish, inconspicuously darker in the outer

half. Streak developed as in male but more yellowish and, on average, slightly more pronounced. Greenish blue basal dusting almost absent. Very faint orange scaling submarginally in spaces 1-3; fringes light brownish grey, paler than ground colour.

Male genitalia (Figs 1-3): Typical of the subgenus. Valva measurements (n=7): 2.50 - 2.89 mm long (mean 2.67 mm), 0.58 - 0.70 mm wide (mean 0.62 mm).

Female genitalia (Figs 4-5): As with other taxa in the monomorphic complex, no distinctive characters could be found.

Material examined

Holotype ♂ (Plate 1, fig. 1), forewing length 16.5 mm: Crimea, Sudak, 3.VII.1990, J. Budashkin leg.

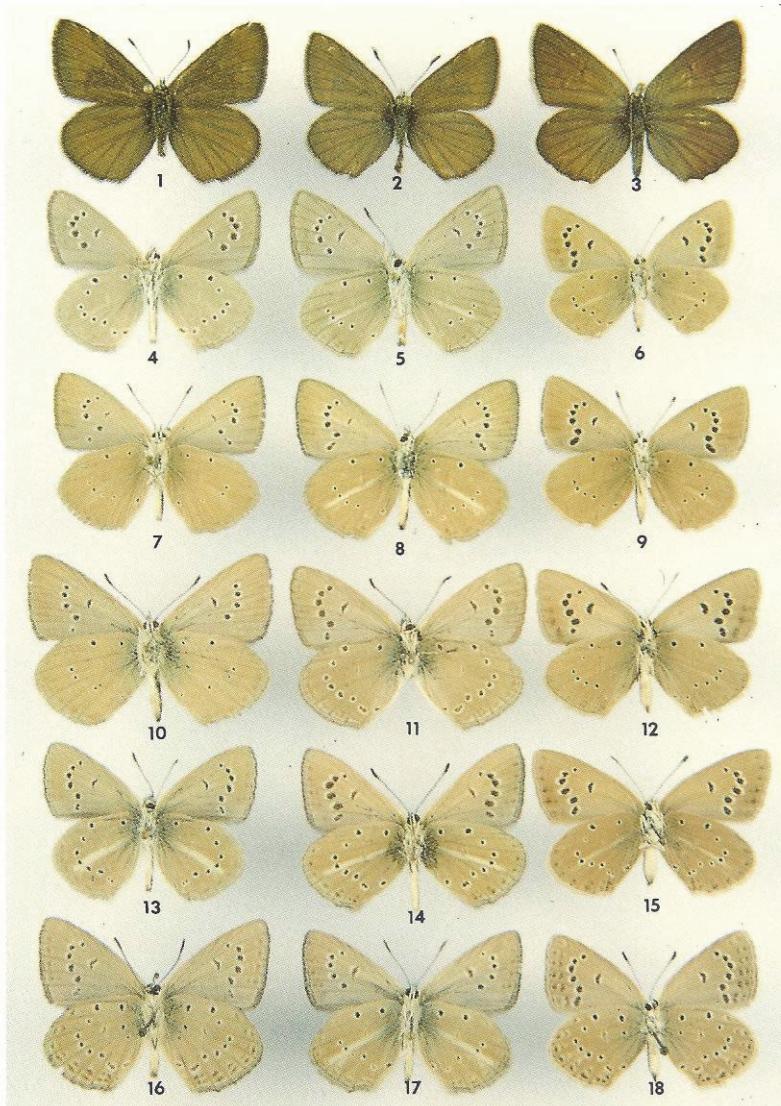
Paratypes: 55 specimens (36♂♂, 19♀♀), locality data as follows:

- 8♂♂, 5♀♀: Sudak: 21.VI.1986; 18.VII.1985; 20.VII.1984; 3.VII.1990, Y. Budashkin leg.;
- 2♂♂, 2♀♀: Sel-Buhra m[ountain], 03.08.1985, T. Pani leg.;
- 1♂, 1♀: Dzhurla, 16.08.1985, T. Pani leg.;
- 2♂♂: Tape-Kermen m[ountain], 07.08.1985, T. Kesküla leg.;
- 1♀: Trudoljubovka, 04.08.1985, M. Talve leg.;
- 1♀: Keskahelik, Tape-Kermen m[ountain], 500-542 m, 07.08.1985, T. Kesküla & T. Pani leg.;
- 1♀: Pahelik, Yuzhnay Demerdzhi m[ountain], 1000-1239 m, 16.08.1985, T. Kesküla & T. Pani leg.;

Plate 1. Uppersides (figs.1-3) and undersides (figs. 4-18) of monomorphic *Polyommatus (Agrodiaetus)* species. All specimens in VLCA. Slightly enlarged.

1. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♂ Holotype: Crimea, Sudak, 3.VII.1990, Y. Budashkin leg.
2. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♂ Paratype: Crimea, Sudak, 21.VI.1986, Y. Budashkin leg.
3. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♀ Paratype: Crimea, Sudak, 20.VII.1984, Y. Budashkin leg.
4. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♂ Paratype: Crimea, Sudak, 21.VI.1986, Y. Budashkin leg.
5. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♂ Paratype: Crimea, Sudak, 3.VII.1990, Y. Budashkin leg.
6. *Polyommatus (Agrodiaetus) budashkini* sp.n., ♀ Paratype: Crimea, Sudak, 18.VII.1985, Y. Budashkin leg.
7. *Polyommatus (Agrodiaetus) aroaniensis* (Brown, 1976), ♂: Greece, Achaia, Kalavrita, 7.VII.1985, D. v. d. Poorten leg.
8. *Polyommatus (Agrodiaetus) aroaniensis* (Brown, 1976), ♂: Greece, Drama, N. Falakro, 1600 m, 3.VII.1984, D. v. d. Poorten leg.
9. *Polyommatus (Agrodiaetus) aroaniensis* (Brown, 1976), ♀: Greece, Drama, Mikropoli, 1000 m, 24.VII.1985, J. Dils leg.
10. *Polyommatus (Agrodiaetus) humedasae* (Toso & Balletto, 1976), ♂: Italy, Valle d'Aosta, Pondel 900 m, 14.VII.1981, C. Warnotte leg.
11. *Polyommatus (Agrodiaetus) agenjoi* (Forster, 1965), ♂: Spain, Tarragona, Prades 900 m, 1-10.VII.1967, H. & Th. v. Oorschot, J. & M. Lourens leg.
12. *Polyommatus (Agrodiaetus) agenjoi* (Forster, 1965), ♀: Spain, Tarragona, Prades 900 m, 1-10.VII.1967, H. & Th. v. Oorschot, J. & M. Lourens leg.
13. *Polyommatus (Agrodiaetus) ripartii* (Freyer, [1830]), ♂: Bulgaria, Rhodopi, Persenk mine, 900 m, 30.VII.1981, J. Ganev leg.
14. *Polyommatus (Agrodiaetus) fabressei* (Oberthür, 1910), ♂: Spain, prov. Teruel, Royuela, 1200 m, 24.VII.1984, W.O. De Prins leg.
15. *Polyommatus (Agrodiaetus) fabressei* (Oberthür, 1910), ♀: C Spain, Huelamo, 1450 m, 18.VII.1979, D. v. d. Poorten leg.
16. *Polyommatus (Agrodiaetus) admetus* (Esper, [1783]), ♂: Greece, Drama, Ór. Falakró, 800 m, 9.VII.1981, D. v. d. Poorten leg.
17. *Polyommatus (Agrodiaetus) admetus* (Esper, [1783]), ♂: Turkey, St.1735, Tunceli, 5 km S Tanyeri, 1200-1300 m, 21.VII.1991, D. v.d. Poorten & W. De Prins leg.
18. *Polyommatus (Agrodiaetus) admetus* (Esper, [1783]), ♀: Greece, Drama, Ór. Falakró, 1000 m, 9.VII.1981, D. v. d. Poorten leg.

Plate 1



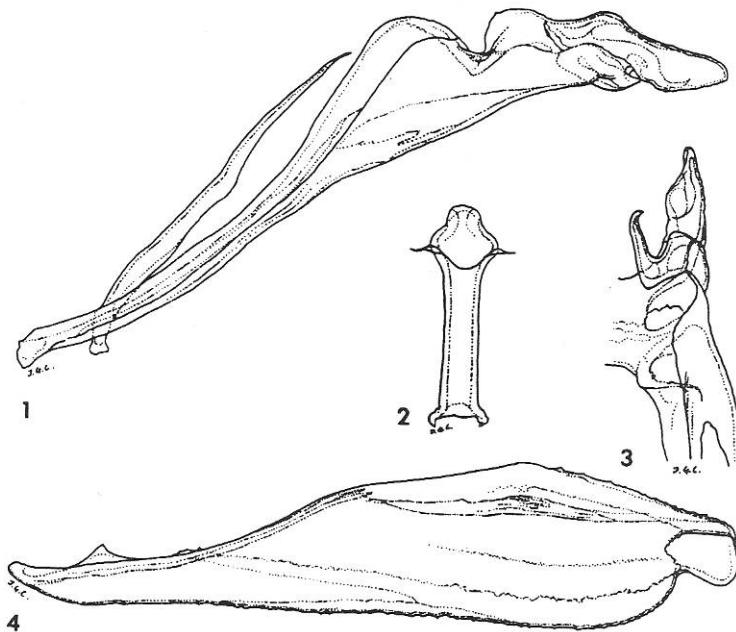


Fig. 1-4: *Polyommatus (Agrodiaetus) budashkini* sp.n., male genitalia; 1. uncus + tegumen, lateral view; 2. aedeagus; 3. uncus lobes, ventral view; 4. valva.

19♂♂, 7♀♀: Karadag: 27.VI., 7.VII., 8.VII., 11.VII., 16.VII., 18.VII., 20.VII., 22.VII., & 27. VII. 1985, Y. Budashkin leg.;

4♂♂, 1♀♀: Ai-Petri yaila, 26.VII.1994, Y. Budashkin leg.

The holotype is deposited in VLCA, and the paratypes in the collections of VLCA, ITZA, Tartu University (Estonia), Zoological Museum of Helsinki University (Finland), Kiev Zoological Institute (Ukraine), Zoological Institute of St. Petersburg (Russia), T. Keskula (Tartu, Estonia), and Z. Kolev.

Etymology. We are pleased to name this species after Dr Yuri Budashkin, a leading expert on Crimean Lepidoptera who, being well aware of the probable specific distinctness of this taxon, studied the biology of the species in detail and collected most of the type material.

Diagnosis. Externally most specimens of *Polyommatus (Agrodiaetus) budashkini* sp.n. can be easily distinguished from most hitherto described taxa. Typical diagnostic features are:

- forewings rather sharply pointed;
- upperside rather pale brown with strong yellowish sheen;
- underside ground colour cold grey in males and yellowish grey (seldom darker shade of brown) in females;
- white stripe variable, usually absent or only as vague whitish dusting;

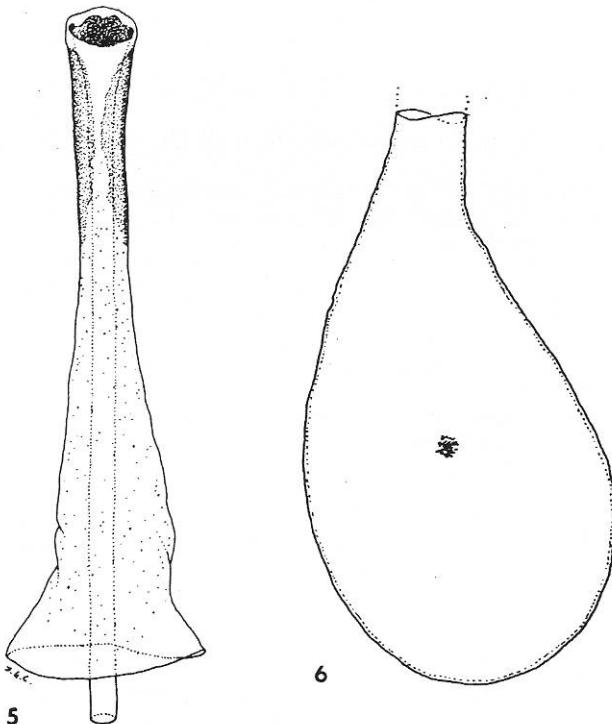


Fig. 5-6: *Polyommatus (Agrodiaetus) budashkini* sp.n., female genitalia; 5. ostium bursae and henia; 6. corpus bursae.

- marginal markings on hindwing underside vestigial or absent;
- usually outer part of fringes on upperside of hindwing distinctly paler than basal part.

In what follows, relevant features of all monomorphic taxa currently recognized as being specifically distinct are briefly described in comparison to those of *budashkini* sp.n. This account is based on original descriptions and, except for *exuberans* and *valiabadi*, material in VLCA. Additional material of *agenjoi* in the collections of the Instituut voor Taxonomische Zoölogie (Amsterdam) was also studied.

Polyommatus (Agrodiaetus) ripartii (Freyer, 1830). TL: Spain; France. Karyotype n=90 (*Polyommatus (Agrodiaetus) pelopi* (Brown, 1976); TL: Greece, Mt. Chelmos). (Plate 1: 13).

Polyommatus (Agrodiaetus) exuberans (Verity, 1926). TL: Italy, Cottian Alps. Karyotype unknown.

Polyommatus (Agrodiaetus) galloii (Balletto & Toso, 1979). TL: South Italy, Mt. Pollino. Karyotype n=66.

Polyommatus (Agrodiaetus) nephohiptamenos (Brown & Coutsis, 1978). TL: North-

East Greece [Mt. Pangeon]. Karyotype n=8-11.

Polyommatus (Agrodiaetus) demavendi (Pfeiffer, 1938). TL: Iran, Demavend. Karyotype n=66-74.

Polyommatus (Agrodiaetus) interjectus (De Lesse, 1960). TL: Turkey, Erzincan. Karyotype n=29-32.

Polyommatus (Agrodiaetus) alcestis (Zerny, 1932). TL: Lebanon. Karyotype n=19-22.

The largest group of taxa in the complex, otherwise rather heterogeneous (especially karyologically) but characterized by the regular presence of a prominent white stripe on the underside of hindwing. At its widest, it is typically almost as wide as, or even wider than cell 4, and reaches beyond the postdiscal ocellus halfway and often farther towards the wing margin; only occasionally it may be reduced or absent (for *budashkini* sp.n. see the male description above).

Polyommatus (Agrodiaetus) mithridates (Staudinger, 1879). TL: Turkey, Amasya. Karyotype n=21-27.

Males are unique within the brown complex in lacking the distinctive patch of androconial scales. These are dispersed all over the forewing (mainly along veins) which, because of this, has a smooth, "unbroken" appearance. Contrasting white stripe present.

Polyommatus (Agrodiaetus) valiabadi (Rose & Schurian, 1977) (*Polyommatus (Agrodiaetus) rjabovi* (Forster, 1960), homonym). TL: Iran, Elburs. Karyotype unknown. Unique in having bright white marginal spots on underside of all wings; bright white stripe also present.

Polyommatus (Agrodiaetus) humedasae (Toso & Balletto, 1976). TL: Italy, Val d'Aosta. Karyotype n=38 (Plate 1, fig. 10).

On average much larger (largest in the complex), upperside rich chestnut brown and underside warm, glossy light brown. White streak always absent. Hindwing postdiscal spots much reduced in size and a few usually absent.

Polyommatus (Agrodiaetus) admetus (Esper, [1783]). TL: Hungary. Karyotype n=80 (Plate 1, figs 16-18).

On average larger, with broader forewings; darker brown on the upperside. The most reliable single character separating *admetus* from the related taxa is not absence of the white stripe, as Nekrutenko (1985) notes, but, rather, the pronounced marginal and submarginal marks on underside of hindwing, especially in females. In the south-eastern part of its range (Turkey, and sometimes the Balkan peninsula), *admetus* individuals with well developed white streak (Plate 1, fig. 17) are not uncommon.

In various respects *P. budashkini* sp.n. is most similar to three European monomorphic species (the last two of which regularly show variable development of the white streak): *agenjoi*, *aroaniensis*, and *fabressei*.

Polyommatus (Agrodiaetus) aroaniensis (Brown, 1976). TL: Greece, Mt. Chelmos. Karyotype n=15-16 (Plate 1, figs 7-9).

Upperside darker, reddish brown. Underside clearly warmer reddish brown; hindwing postdiscal ocelli smaller, a few often vestigial or absent. White stripe, when best developed, narrow but reaches more than halfway from the postdiscal spot towards the margin; in about 50 % of the individuals completely absent though often weak whitish dusting is

present.

Polyommatus (Agrodiaetus) fabressei (Oberthür, 1910). TL: Spain, Teruel, Albaracin. Karyotype n=90 (Plate 1, figs 13-15).

(The taxon *Polyommatus (Agrodiaetus) violetae* (Gomez-Bustillo, Esposito-Hermosa & Martinez-Borrego, 1979) (TL: Spain, Málaga, Sra de Almijara) is morphologically and anatomically very similar to *fabressei*. Until its karyology is known we have chosen to provisionally regard the two as conspecific.)

Both fore- and hindwings more elongated and pointed. Characteristic marginal marks on the hindwing underside, seen as slightly blurred dark spots, are clearly visible in both males and females, but sometimes faded; faint submarginal marks only well noticeable in cells 1b and 2 on hindwing. White stripe variable, as in *aroaniensis* (Oberthür (1910: 260) was wrong to state that males always have it and females do not).

Polyommatus (Agrodiaetus) agenjoi (Forster, 1965). TL: Spain, Barcelona, Taradell. Karyotype unknown (Plate 1, figs 11, 12).

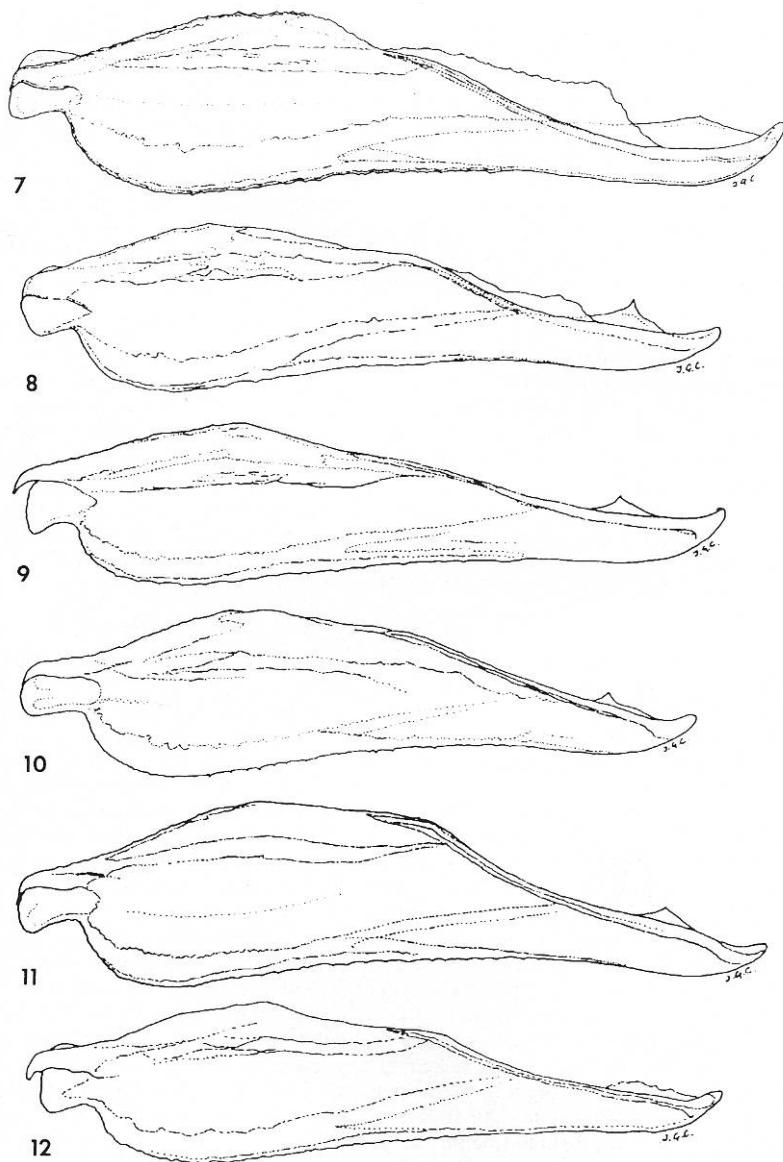
Larger, wings broader and more rounded, resembling those of *admetus* but hindwing margin less scalloped. Upperside of male pale, often more yellowish and less brown than in *budashkini* sp.n. Underside has similar greyish flush but clearly darker and more yellowish brown in both sexes. Marginal marks vestigial but better developed, especially in the male. White stripe absent but can be indicated by very weak whitish suffusion.

The taxon *agenjoi* is here treated as a good species on the basis of constant and significant morphological and anatomical differences from *fabressei*. Externally it resembles *budashkini* sp.n. rather than any other species of the complex. The chromosome numbers of both these taxa are unknown at present.

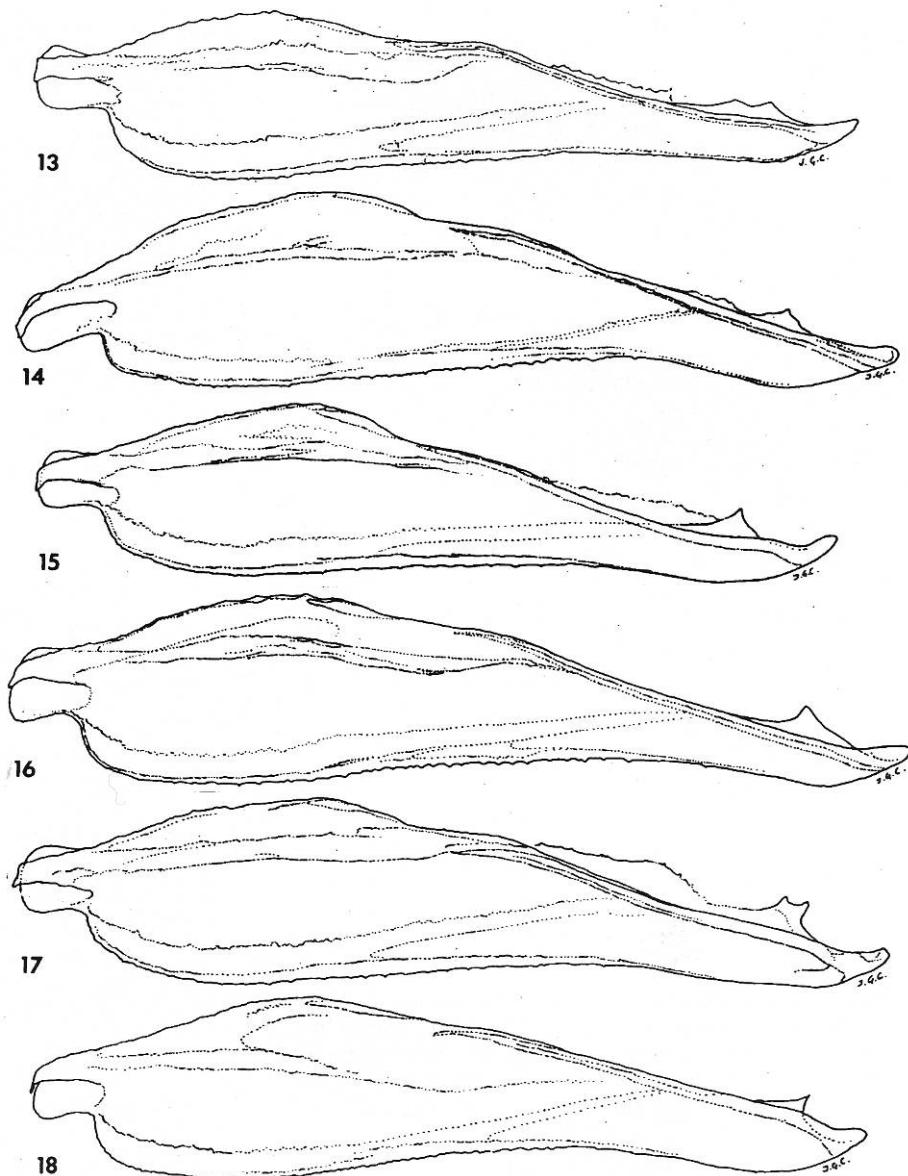
Male genitalia

The structure of the male genitalia in subgenus *Agrodiaetus* as a whole, and the monomorphic complex in particular, have long been believed to be practically identical in structure and therefore to offer no characters of importance for specific recognition. Partly as a result of this, and also due to the widely accepted use of karyological methods in recent times, the genital anatomy has been largely neglected by workers of this difficult group. For the first time Brown (1976: 80) used statistically substantiated dimensions of the male genitalia, the length of valva in particular, as a useful taxonomic character in distinguishing between some species of brown *Agrodiaetus*. Subsequent research (Coutsis 1985: 8; 1986) showed convincingly that careful examination of some genital characters, including dimensions, yields good results in separating some externally very similar blue *Agrodiaetus* taxa. Recently Kolev (1994) compared the four Balkan species of the brown complex with regard to the differences in the length of their valvae.

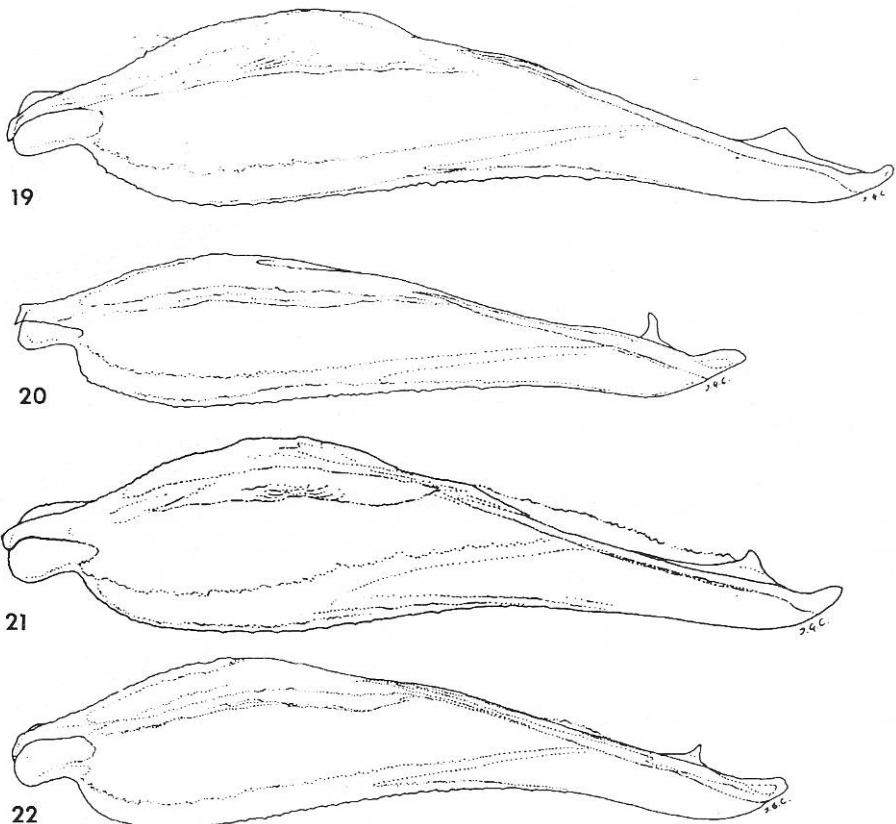
While studying and drawing the male genitalia of various brown *Agrodiaetus* species, Mr J.G. Coutsis noted that the length of the valva differed considerably between different species and that variation in length was not correlated to variation in the size of the specimens. The species would generally fall within two groups, one with long valvae and the other with short valvae. To make this division more precise, he devised an index produced by dividing the length of the forewing by that of the valva. Values and indices for all taxa under consideration are shown in table 1, and drawings of their valvae are presented in figs 7-22. It should be noted, however, that the data in table 1 are derived from single individuals and should be only tentatively used; a comprehensive statistical study of both the male and female genitalia of the monomorphic *Agrodiaetus* complex is to follow. Nevertheless, it is interesting to note that, whilst this index is very different for



Figs 7-12: Left valva in lateral view of different *Polyommatus* (*Agrodiactes*) species:
7. *P. (A.) agenjoi*; 8. *P. (A.) budashkini* sp. n.; 9. *P. (A.) galloii*; 10. *P. (A.) nephohiptamenos*; 11. *P. (A.) ripartii*; 12. *P. (A.) ripartii* (*pelopi*).



Figs 13-18: Left valva in lateral view of different *Polyommatus* (*Agrodiaetus*) species:
13. *P. (A.) admetus*; 14. *P. (A.) alcestis*; 15. *P. (A.) aroaniensis*; 16. *P. (A.) demavendi*; 17. *P. (A.) fabressei*; 18. *P. (A.) fabressei* (*violetae*).



Figs 19-22: Left valva in lateral view of different *Polyommatus (Agrodiaetus)* species:
19. *P. (A.) humedasae*; 20. *P. (A.) interjectus*; 21. *P. (A.) mithridates*; 22. *P. (A.) valiabadi*.

budashkini n. sp. on one hand and *aroaniensis* and *fabressei* on the other, it is very similar for *budashkini n. sp.* and *agenjoi*. This, should it be confirmed statistically, might reflect their closest relationship within the complex suggested on morphological grounds earlier in this paper. At the same time, the mean length of the valva per se is already proven to differ consistently for these two taxa: in *budashkini n. sp.* it is 2.67 mm whereas in *agenjoi* it is 2.93 mm (n=4).

Habitat and biology

Unlike the other Crimean endemic taxa of Rhopalocera (see Introduction), *Polyommatus (Agrodiaetus) budashkini sp.n.* is relatively widespread in the south of the

Table 1: Measurements in mm of forewing length (FL) and valva length (VL) of different brown *Polyommatus* (*Agrodiatus*) species and computing of the index (FL/VL). The species are arranged alphabetically within two groups: species of the "short valva type" (index>6) and species of the "long valva type" (index<6) (data from J.G. Coutsis).

Species	Locality	Prep. No.	FL	VL	Index
Species of the "short valva type" (index>6)					
<i>agenjoi</i>	Spain, Barcelona, env. Tona	848	18.00	2.81	6.40
<i>budashkini</i> sp. n.	Crimea, Sudak	2158	16.45	2.55	6.45
<i>galloii</i>	Italy, Mt. Pollino	852	15.50	2.54	6.10
<i>nephohiptamenos</i>	Greece, Mt. Pangeon	858	16.00	2.45	6.53
<i>ripartii</i>	Spain, Albarracin	853	18.00	2.73	6.59
<i>ripartii</i> (<i>pelopi</i>)	Greece, Mega Spileon	856	16.00	2.48	6.45
Species of the "long valva type" (index<6)					
<i>admetus</i>	Turkey, Nevşehir, Zelve	855	17.10	3.01	5.68
<i>alcestis</i>	Turkey, Hakkari, Üzümçü	1570	16.10	3.23	4.98
<i>aroaniensis</i>	Greece, Mt. Falakron	867	16.67	2.93	5.69
<i>demavendi</i>	Iran, Demavend	1698A	18.00	3.31	5.44
<i>fabressei</i>	Spain, Jaén, Sra Cazorla	863	18.10	3.50	5.17
<i>fabressei</i> (<i>violetae</i>)	Spain, Albacete, Riopar	1564	17.80	3.40	5.24
<i>humedasae</i>	Italy, Aosta, Pondel	842	18.60	3.17	5.87
<i>interjectus</i>	Turkey, Sivas, Gökpınar	1565	14.90	2.64	5.64
<i>mithridates</i>	Turkey, Nevşehir, Aski Tepe	1168	16.60	3.02	5.50
<i>valiabadi</i>	Azerbaijan, Transcaucasia, Talysh	1765	16.80	3.15	5.33

peninsula, but only in mediterranean and submediterranean habitats. Such can be found in sparse *Quercus pubescens* - *Pistacia terebinthus* woodland, on steppe-like southern mountain slopes, and at the foot of southern slopes of the yaila. Most characteristic are south-facing mountain macroslopes from 0 to 1200 m above sea level. *Polyommatus budashkini* sp.n. is typically absent from forest glades and true steppes but, as the peninsula is rather small, submediterranean microhabitats can often be found wedged there as well. Thus, this species can be found in biotopes that are not typical for it, as on the completely steppe Kertch peninsula or on the yaila (e.g. Ai-Petri).

Polyommatus budashkini sp.n. is univoltine, with adults on the wing from mid-June to mid-August. The butterflies prefer to feed on the flowers of *Teucrium polium* L., a common flowering plant on southern slopes at that time. The larvae are monophagous on *Onobrychis miniata* Stev.. Eggs are laid singly attached to dried flower-bearing stems, seldom to leaves; they hatch in about 7-8 days. Young larvae dwell in the fold of young leaves and feed on parenchyma. After 2-3 weeks (2nd - 3rd instar) they stop feeding and prepare for hibernation in the soil. Feeding continues in spring from March on for 5-6 weeks: the larvae live openly on the leaves and are attended by ants. Pupation takes place in the soil; the pupal stage lasts 5 weeks (Budashkin 1987; Budashkin in litt. 6.XI.1994).

Among the species of Rhopalocera which can be found sympatrically with *Polyommatus budashkini* sp.n. are *Carcharodus orientalis* Reverdin, 1913, *Muschampia proto*

(Ochsenheimer, 1808), *Pyrgus cinarae* (Rambur, [1839]), *Chazara persephone* (Hübner, [1805]), and *Polyommatus poseidon krymaeus* (Sheljuzhko, 1928) in the Karadag State Reserve, or *P. pljushtchi* Budashkin & Lukhtanov, 1993 on the Ai-Petri yaila. So far as is known, *P. budashkini* sp. n. is the only species of its complex occurring in Crimea.

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Inhoud:

Dils, J. & Van De Weijer, G.: A new species of <i>Anthrax</i> Scopoli, 1763 from northwestern Greece (Diptera: Bombyliidae)	85
Gibeaux, C.A.: Étude des Pterophoridae (37e note) Sur quelques espèces de Pterophoridae d'Asie Centrale (Lepidoptera)	91
Henderickx, H.: A new <i>Eudarcia</i> -species from Terceira (Azores): <i>Eudarcia atlantica</i> n. sp. (Lepidoptera: Tineidae)	105
Kolev, Z. & De Prins, W.: A new species of the "brown <i>Agrodiaetus</i> " complex from the Crimea (Lepidoptera: Lycaenidae)	119
Tolman, T.: Concerning the biology and conservation of <i>Polyommatus</i> (<i>Agrodiaetus</i>) <i>iphigenia</i> (Herrich-Schäffer, [1847]) in Greece (Lepidoptera: Lycaenidae)	113
Vanholder, B.: Trekvlinders in 1994, elfde jaarverslag (Lepidoptera)	65
Boekbesprekingen	90, 112, 118