The *Pyrgus alveus*-complex in Greece (Lepidoptera: Hesperiidae)

John G. Coutsis & Willy De Prins

Abstract. The existence in Greece of two separate morphs by external characters, but identical by male genitalia, in the *Pyrgus alveus* species-group complex is presented, and the probability that they may represent two distinct species is discussed.

Samenvatting. De *Pyrgus alveus*-groep in Griekenland (Lepidoptera: Hesperiidae)
In Griekenland komen twee groepen uit het complex van *Pyrgus alveus* voor die onderscheiden kunnen worden met uiterlijke kenmerken, maar identiek zijn in de mannelijke genitalia. De mogelijkheid dat het om twee aparte soorten gaat, wordt besproken.

Résumé. Le complexe de *Pyrgus alveus* en Grèce (Lepidoptera: Hesperiidae)
En Grèce il y a deux groupes dans le complexe de *Pyrgus alveus* qui sont séparables par des caractères morphologiques externes, mais qui sont identiques en ce qui concerne les genitalia mâles. La possibilité qu'il s'agisse de deux espèces différentes est discutée.

Key words: Greece – Lepidoptera – Hesperiidae – *Pyrgus* – *Pyrgus alveus alveus* – *Pyrgus alveus iliensis* – Taxonomy – Faunistics

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Introduction

In over 50 years collecting in Greece by the first author it has been found that in that country the *Pyrgus alveus* (Hübner, [1803])-complex, apart from including the distinct by male and female genitalia *Pyrgus armoricanus* (Oberthür, 1910), also contains two morphs with identical *P. alveus*-type male genitalia, but with different external characters, the first one being similar in all respects to nominotypical *P. alveus*, and ranging from the north-central to the northern part of the country, while the other resembling to a high degree *P. alveus iliensis* (Reverdin, 1912), and ranging from the southern to the north-central part of the country. A description of *P. alveus iliensis* is included in de Jong (1972: 92), and figures of it in De Prins & van der Poorten (1955: 7, figs. 3, 4). For practical purposes the former morph will henceforth be referred to as the *P. alveus*-morph and the latter as the *P. iliensis*-morph. It must be born in mind, however, that by doing so no implication is being made that the *P. iliensis*-morph is in any way an actual *P. alveus iliensis*.

Greek material studied

***P. alveus*-morph**

44♂, 3♀ (coll. Coutsis), 11♂, 2♀ (coll. Ghavalás), 11♂, 3♀ (coll. Anastassíu).

***P. iliensis*-morph**

10♂ (coll. Coutsis), 1♀ (coll. Ghavalás).

P. alveus-morph

Diagnosis

Male (figs. 1–3). (3 males also figured in De Prins & van der Poorten (1995: 10, pl. 1, figs. 1–3).

Wings: FW 13.5–18 mm in length, usually broad. Upper side: ground-colour dark blackish brown, spattered with few, dispersed, whitish scales evident only microscopically; FW whitish spots usually small, postdiscal one in S1b usually roundish. HW submarginal light spots faint, often barely visible; postdiscal light markings faint, ranging from barely visible (fig. 1) to quite evident (fig. 3), the latter figure representing a specimen with the most evident ones in our whole series of 66 males, and recorded in a locality totally devoid of the *P. iliensis*-morph; variability of these light markings well within the range of that of other *Pyrgus* species-group taxa in Greece, such as *P. armoricanus*, *P. serratulae* (Rambur, [1839]), *P. carthami* (Hübner, [1813]).

Genitalia: valva (fig. 11) as in nominotypical *P. alveus*.

Female (fig. 13)

Wings: as in male.

Genitalia (fig. 15): as in nominotypical *P. alveus*, characterized by the presence of two ventral pre-vaginal plates.

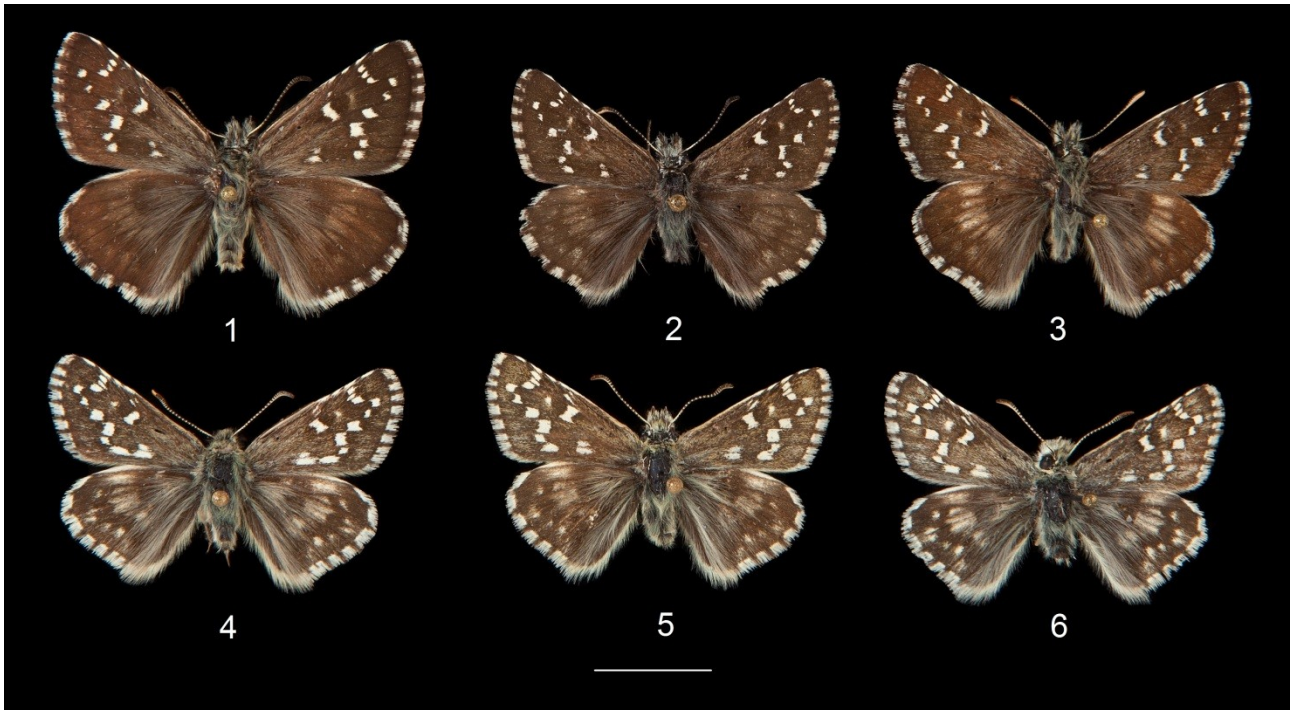
Bionomics

Locality records (map fig. 18, black circles): Makedonía (Mts. Varnús, Vítsi, Falakró, Kaimáktsalan, Zéna, Piramída, Lailiás, Béles; Rodópi range; Livaderó); Ípiros (S Píndos range, (Katára pass, Mts. Tzumérka, Lákmos; near Métsovo)); Thessalía (S Píndos range: Amárando, Tría Potámia, Mt. Kóziakas).

Flight altitude: 800–1500 m, exceptionally –2000 m.

Flight period: end June – mid August.

Habitat: openings in deciduous, coniferous and mixed forests; at high altitudes occasionally straying into more open, treeless areas.



Figs. 1–6. Upper side of male *P. alveus* species-group specimens from Greece. 1–3. *P. alveus*-morph, Makedonía. 1, 3. Flórina district, Mt. Varnús. 1. 1350 m, 30.vi.1990. 3. 1250 m, 20.vii.1991. 2. Dráma district, Mt. Falakró, 1600 m, 6.viii.1999. 4–6. *P. iliensis*-morph, Pelopónnissos, Mt. Zíria. 4, 5. 1650 m, 17.vii.2003. 6. 2000 m, 23.vii.2011. Scale bar = 1 cm.

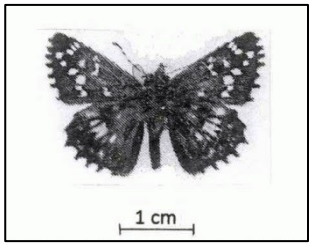
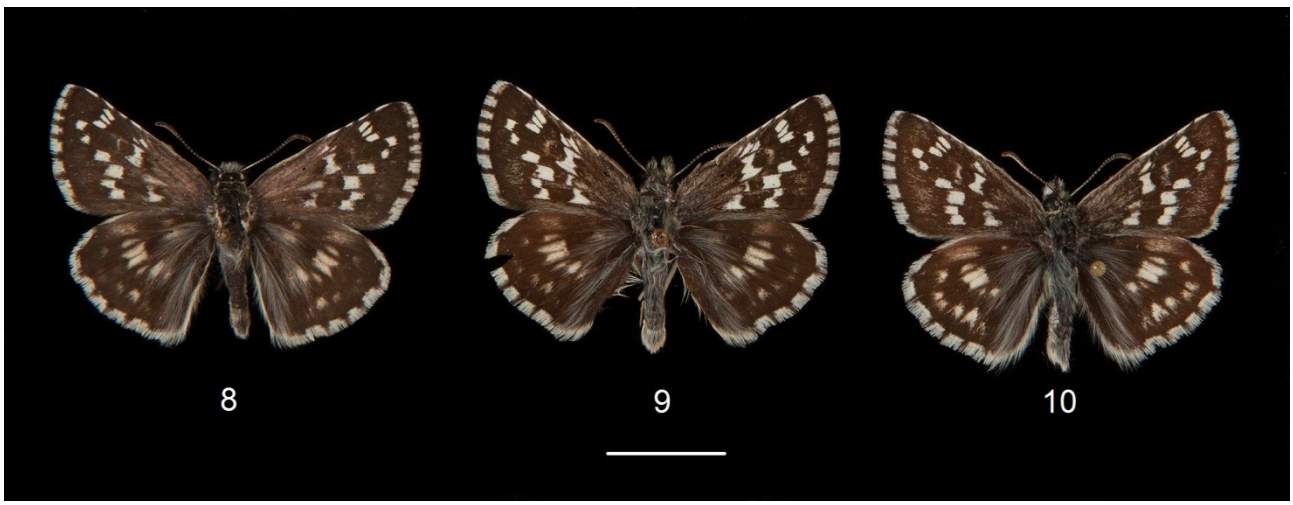


Fig. 7. Male *P. cinarae* from Greece (reproduced from De Prins & van der Poorten (1995: 10, pl. 1, fig. 4, erroneously identified as *P. alveus*). Makedonía, Dráma district, Mt. Falakró, 550 m, 9.viii.1983. Natural size.



Figs. 8–10. Male *P. cinarae* from Greece, Makedonía, Flórina district. 8. Kristalopigí, 1000 m, 3.vii.1995. 9, 10. Mt. Varnús. 9. 1100 m, 13.vii.1993. 10. 1250 m, 20.vii.1991. Scale bar = 1 cm.

P. iliensis-morph

Diagnosis

Male (figs. 4–6). (2 males also figured in De Prins & van der Poorten 1995: 10, pl. 1, figs. 5, 6).

Wings: FW 13–15 mm in length, usually elongated. Upper side: both wings quite heavily peppered with whitish scales (feebly evident macroscopically, and very obvious microscopically), making ground-colour appear greyish-brown; FW whitish spots usually large, postdiscal one in S1b usually oblong; HW light markings complete and well defined.

Genitalia: valva as in nominotypical *P. alveus* (Fig. 12), but specimens with short styles more usual than in *P. alveus*-morph.

Female (fig. 14).

Wings: the single specimen at hand differs from the male by a reduction of the whitish scale suffusion upper side, and the less evident, or absent, HW light markings, resembling quite closely *P. armoricanus*, but having a more elongated FW than the latter does. As, however, this specimen is somewhat worn (microscopically left FW upper side whitish scale suffusion almost completely rubbed off, right FW partly so), it cannot be described with any higher degree of accuracy.

Genitalia (fig. 16): as in nominotypical *P. alveus*. Distinguished from the quite similar by external characters and syntopic *P. armoricanus*, by the two ventral, pre-vaginal plates, always absent in the latter (fig. 17).

Bionomics

Locality records (map fig. 18, black triangles): Pelopónnissos (Mts. Zíria, Helmós); Stereá Ellás (Mts. Ágrafa, Vardússia, Kaliakúda, Gióna); Ípiros (S Píndos range: Mt. Tzumérka).

Flight altitude: 1400–2000 m.

Flight period: July – mid August (based on 10 males and a single female only; flight period probably starts end June).

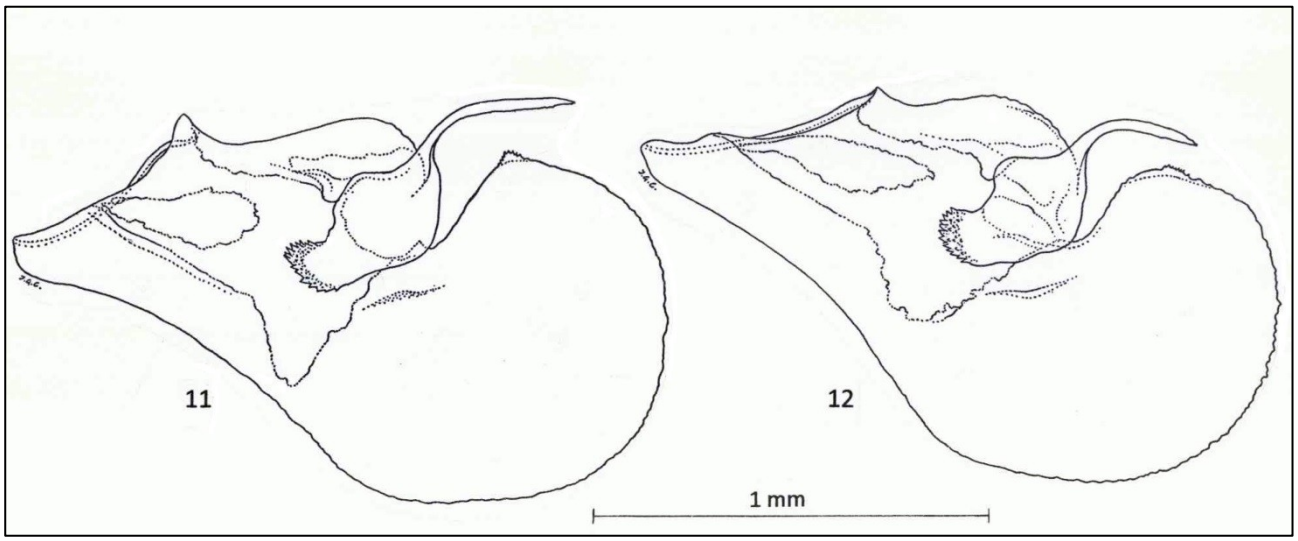
Habitat: exclusively xeric, rocky, with calcareous soil and sparse, bushy vegetation.

Intermediates

No intermediates between the two morphs have ever been recorded despite probable, occasional syntopism, as attested by the fact that on Mt. Tzumérka a *P. alveus*-morph specimen was recorded in *P. iliensis*-morph territory. The single male considered as an intermediate between the two in De Prins & van der Poorten (1995: 10, pl. 1, fig. 4), and reproduced here (fig. 7), is actually a *P. cinarae* (Rambur, [1839]), as can be seen by comparing it with three confirmed *P. cinarae* (figs. 8–10), and therefore should not have been used as a criterion for lumping together the *P. alveus*-morph and the *P. iliensis*-morph under *P. alveus alveus*.

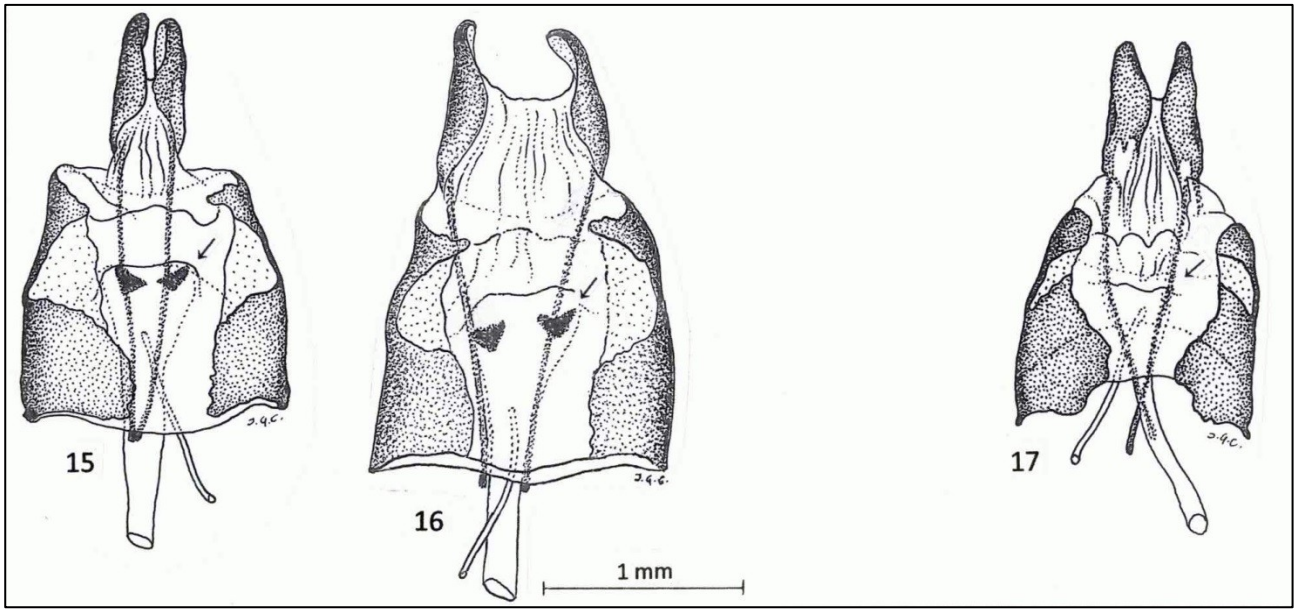
Conclusion

The constant external character differences between the two morphs under consideration, the lack of intermediates between them, despite occasional invasion of one morph into the other's territory, and their different habitat requirements, all are points suggesting that they probably represent two distinct species. A definitive answer to this hypothesis, however, must await knowledge of their chromosome number and karyotype, their DNA sequencing, as well as their immature stages and their breeding habits.



Figs. 11, 12. Lateral aspect of inner face of right valva of *P. alveus* species-group specimens from Greece. 11. *P. alveus*-morph. Makedonía, Flórina district, Mt. Varnús, 1250 m, 20.vii.1991. 12. *P. iliensis*-morph. Pelopónnissos, Mt. Zíria, 1650 m, 17.vii.2003.

Figs. 13, 14. Upper side of female *P. alveus* species-group specimens from Greece. 13. *P. alveus*-morph, Makedonía, Flórina district, Mt. Vítsi, 1350 m, 5.vii.1995. 14. *P. iliensis*-morph, Pelopónnissos, Mt. Helmós, 1700 m, 28.vii.2000. Scale bar = 1 cm.



Figs. 15–17. Ventral aspect of external genital elements of female *Pyrgus* specimens from Greece. 15, 16. P. alveus species-group specimens 15. P. alveus-morph, Ípiros, S Píndos range, near Katára pass, 1450 m, 5.vii.1971). 16. *P. iliensis*-morph, Pelopónnissos, Mt. Helmós, 1700 m, 28.vii.2000. 17. *P. armoricanus*, Makedonía, Dráma district, Mt. Falakró, 700 m, 6.viii.1982.

Biogeography

The distribution in Greece of the two *P. alveus* species-group morphs suggests that the *alveus*-morph most probably invaded that country from Central Europe, having found no geographic barriers along its expansion from north to south (the mountainous backbone of Greece, the Píndos range, extends in a north to south direction, and cannot act as a barrier). The fact that it did not expand any further south than northern and north-central Greece is probably due to the absence of suitable habitats to the south of these areas. The *P. iliensis*-morph, on the other hand, appears to have reached the Pelopónnissos from Asia Minor, probably at a time when Asia Minor and Greece were still geographically united, and the Aegean Sea had not yet been fully formed. Its northern expansion, reaching no further than north-central Greece, suggests probable lack of suitable habitats to the north of that area. There exist a number of other Greek butterflies supporting the hypothesis of an invasion to the Pelopónnissos from Asia Minor, these being *Lycaena thetis* Klug, 1834, *Turanana taygetica* (Rebel, 1902), *Kretania eurypylus* (Freyer, [1851]), *Neolysandra coelestina* (Eversmann, 1843) and *Polyommatus* (*Agrodiaetus*) *iphigenia* (Herrich-Schäffer, [1847]), two of which, *L. thetis* and *N. coelestina*, were eventually able to expand northwards to central Mainland Greece. Finally, it is of interest to note that in Asia Minor there exist *P. alveus* species-group morphs that resemble to some extent the *P. iliensis*-morph, one such being *Pyrgus aladaghensis* De Prins & van der Poorten, 1995 (De Prins & van der Poorten 1955: 36–39, pl. 5, figs. 17–19, 25–27).

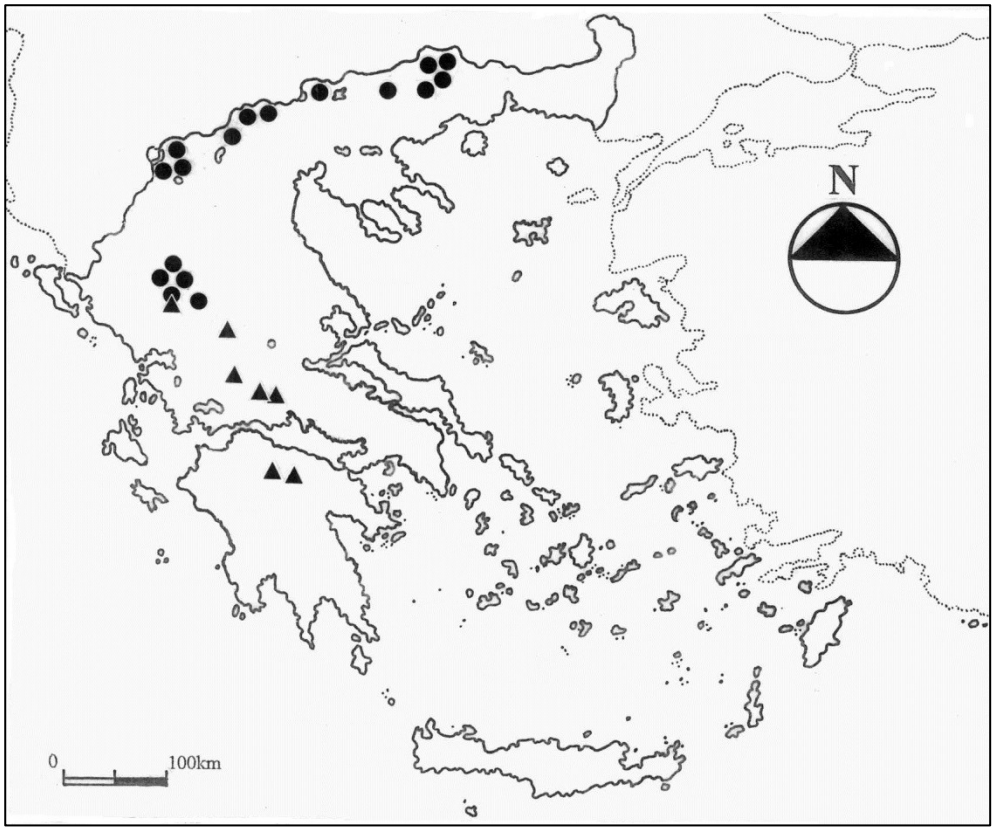


Fig. 18. Distribution map of *P. alveus*-morph (black circles) and *P. iliensis*-morph (black triangles) in Greece.

Acknowledgments

We are deeply grateful to Nick Ghavalás and Dr. Hrístos Anastassíu for having placed at our disposal all *P. alveus* species-group specimens in their collections, and provided bionomic information; to the former also for allowing us to dissect the single female *P. iliensis*-morph in his possession. Our sincerest thanks are also due to Dr. Rienk de Jong for having reviewed this paper and given important advice.

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