

Clarifications and new data on the distribution of *Cacyreus marshalli* Butler, 1898 in Bulgaria (Insecta, Lepidoptera, Lycaenidae)

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Abstract. We report a new locality of the invasive butterfly *Cacyreus marshalli* Butler, 1898 from Vinarovo village in NW Bulgaria, by far the northernmost observation in Bulgaria and also the most inland observation in the Balkan Peninsula and one of the northernmost records in Southeast Europe.

Key words: *Cacyreus marshalli*, distribution, Bulgaria

Introduction

The South-African lycaenid *Cacyreus marshalli* Butler, 1898, was introduced to the western Mediterranean in the late 1980's (Eitschberger & Stamer 1990). A specialist on *Pelargonium* (Geraniaceae) commonly grown as decorative plants throughout South Europe, the Geranium Bronze began spreading inexorably east along the Mediterranean coast of Europe, reaching the Balkan Peninsula two decades later (Kosmač & Verovnik 2009, Pamperis 2009, Polak 2009, Anastassiou *et al.* 2010, Verovnik *et al.* 2011).

Langourov & Simov (2014) reported two localities for *C. marshalli* from Novo Hodzhovo and Levunovo villages in the extreme south-west of Bulgaria (Fig. 1: 2 & 3), where they recorded several specimens in August 2014. Hristova & Beshkov (2017) also mentioned an anonymous internet report from Trigrad village in Mt. Rodopes (Fig. 1: 4). However, the cited source is not available online, nor has it been possible to find more definite first-hand information on the record in question. In the recent review of the distribution of *C. marshalli* in the Balkan Peninsula (Langourov & Simov 2017), the following text appeared concerning said record: "As a result of our study three new localities of the Geranium Bronze were recorded: 1) in Bulgaria (Trigrad Village, the West Rhodope Mountains, 1200 m a.s.l., 08.2014, data from the Internet)". However, no specific source is quoted. The absence of reliable data regarding the Trigrad record is regrettable as, despite the relative proximity of the village mentioned to the Mediterranean coast, its climate is montane and between Trigrad and the coast lies a high and wide part of Rodopes Mts. with dense coniferous forests and altitudes exceeding 1500 m, in places 1800 m a.s.l. Therefore, it does not appear likely that a stray specimen from northern Greece would have reached Trigrad on its own, by flying over this mountain ridge. Hence, a hypothesis of accidental introduction with *Pelargonium* cultivars is far more likely. Further to the aforementioned published Bulgarian records of *C. marshalli*, the map in Langourov & Simov (2017) shows, besides the two dots marking the Novo Hodzhovo and Levunovo records, also a third dot in South-west Bulgaria. In the paper, however, there is no discussion or attribution whatsoever of this third record. In reality, the source of the record in question is the senior author of the present report. It is important to hereby clarify the origin of the data in question, since in fact this is

chronologically the first ever record of the species from Bulgaria, predating the records of Langourov & Simov (2014) by a full year.

The first Bulgarian observation of *Cacyreus marshalli* Butler, 1898

In an e-mail from August 2013, Mr. J. G. Coutsis (Athens, Greece) informed Z. Kolev (ZK) that during the summer of 2013 *C. marshalli* had undergone a spectacular population explosion in the northern part of mainland Greece, becoming widespread and common in and around Thessaloniki as well as on Halkidiki Peninsula. J. Coutsis accordingly felt that, in view of that mass outbreak, the species might well have reached adjacent Bulgaria. Acting upon that information, in late August and early September 2013 ZK conducted a focused search for *C. marshalli* in the lower Struma valley of Bulgaria, a region immediately adjacent to the discussed region of Greece and, moreover, the hottest place in the whole country with a strong Mediterranean climatic influence penetrating along the Struma Valley. ZK searched several villages, towns, and landmarks with greater concentrations of cultivated *Pelargonium*, namely: the Rupite locality near Petritch town; the villages Kulata, Chuchuligovo, Marino Pole and Marikostinovo; and the town of Melnik. Despite the abundance of *Pelargonium* in most of these places, the search for *C. marshalli* was successful only in the last-mentioned locality. A single specimen was clearly observed flying around potted flowering *Pelargonium* on the second-floor window sills of one of the traditional houses adorning the main pedestrian street of Melnik. The specimen could not be collected or photographed but was observed clearly enough to be positively identified as the Geranium Bronze, especially as ZK had prior personal experience with *C. marshalli* elsewhere in South Europe. Nevertheless, ZK decided against publishing this record at the time. The reason was the lack of collection material or photos in nature: it was considered prudent to first obtain a more tangible proof or independent confirmation in order to publish a species new to Bulgaria.

A year later, Langourov & Simov (2014) observed and reported their two records of *C. marshalli* from Levunovo and Novo Hodzhovo villages, respectively 8 and 13 km from Melnik – thereby confirming the presence of this species in Bulgaria, and indicating also its survival in the mentioned region over the winter of 2013-2014. In September 2014, M. Langourov e-mailed ZK a digital copy of the freshly published Langourov & Simov (2014) paper, whereupon ZK informed him by e-mail of his earlier record of the species from Melnik. The observation of the first Bulgarian record of *C. marshalli* from Melnik was published later (Kolev & Shtinkov 2016), but this inexplicably remained unacknowledged by Langourov & Simov (2017) and Hristova & Beshkov (2017).

A new Bulgarian record of the Geranium Bronze

We hereby report a new and particularly interesting record of *Cacyreus marshalli* Butler, 1898 from the extreme North-west of Bulgaria. On 28.12.2017, T. Tsvetanov (TT), took note of a small butterfly flying around the yard of his family house in Vinarovo village. The time was around midday, and the weather was unseasonably warm: ca. 10° C at the time, sunny and almost windless. The specimen settled for a while and could be photographed (Fig. 2). Following a discussion between the authors, TT was able to glean the following further data:

Decorative *Pelargonium* is widely grown in Vinarovo village but exclusively in pots, as is the custom throughout Bulgaria. The pots are brought indoors in autumn to protect the plants from freezing temperatures. In this case, the potted geraniums have been brought indoors already at the end of October 2017, two months prior to the discovery of the butterfly. Most of the potted geraniums of TT's family have been cultivated locally but four pots with plants have been received from a neighbor earlier that year. These have been purchased in the nearby Vidin town but, beyond that, it has not been possible to establish their origin. TT searched all potted geraniums in the house for other life stages of *C. marshalli*, and discovered a single pupal exuvia belonging to the species (ZK det.) on the

upper side of a *Pelargonium* leaf (Fig. 2). It thus appears most likely that the photographed adult, whatever its origins (see below), has at least emerged locally.

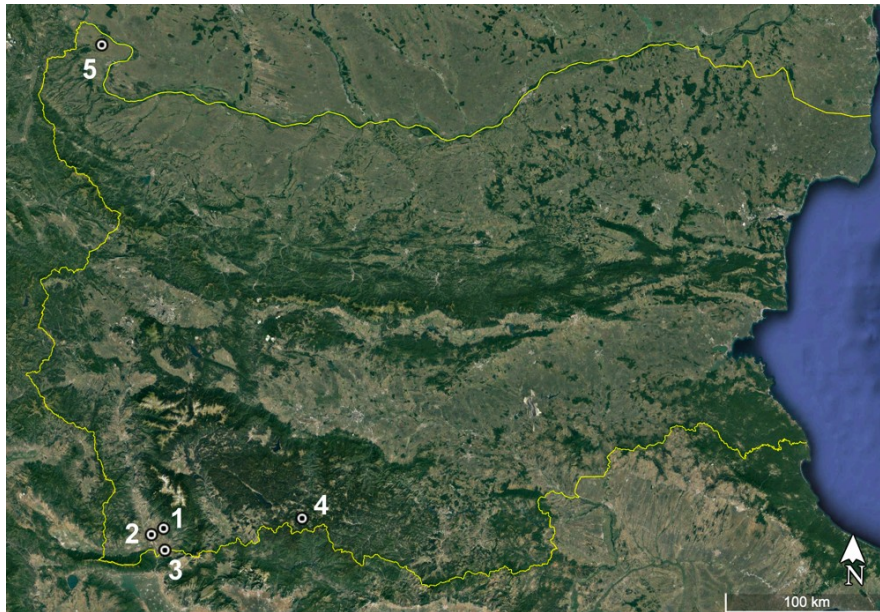


Fig. 1. Known localities of *Cacyreus marshalli* Butler, 1898 from Bulgaria. 1: Melnik (2013), 2: Levunovo (2014), 3: Novo Hodzhovo (2014), 4: Trigrad (2014), 5: Vinarovo (2017). Map: Google Earth.



Fig. 2. Right: Adult *Cacyreus marshalli* Butler, 1898 from NW Bulgaria: Vinarovo, 28.12.2017; left and center: Pupal exuvia of *Cacyreus marshalli* Butler, 1898 on a *Pelargonium* leaf, same locality. Photos: Tsvetomir Tsvetanov.

Discussion

This is the northernmost observation of *C. marshalli* in Bulgaria, and the most inland locality in Southeast Europe by a very wide margin. Almost all hitherto known records from this part of Europe have been confined to coastal areas, rarely more than 20 km inland and always within the Eu-Mediterranean and Sub-Mediterranean climate zones (Langourov & Simov 2017). So far, the outliers in terms of distance from the sea coast have been, in descending order:

1. Rep. Macedonia: Grad village (Micevski & Micevski 2017), 144 km inland;
2. Rep. Macedonia: St. Naum Monastery (Langourov & Simov 2017), 100 km inland;
3. Bulgaria: the three clustered localities in South-west Bulgaria (Melnik, Levunovo and Novo Hodzhovo), 77-90 km inland;
4. Bulgaria: the problematic record from Trigrad village in Mt. Rodopi, 72 km inland;
5. North-west Greece: [Konitsa?] (Langourov & Simov 2017), 60-70 km inland;
6. Slovenia: Škofja Loka (Verovnik et al. 2011), 68 km inland.

Compared to the above records, the newly reported locality (Bulgaria: Vinarovo village) lies 365 km from the Adriatic Sea, 377 km from the Aegean Sea and 416 km from the Black Sea. Moreover, this area of the Balkan Peninsula has a strongly continental climate with cold, snowy winters. It appears unlikely that the species has reached this area on its own from established populations along the Balkan coastline; therefore, accidental introduction with *Pelargonium* cultivars is more plausible. Considering the habit of the locals to bring the potted *Pelargonium* plants indoors for the duration of the cold season, it is possible that specimens and perhaps even breeding populations of the Geranium Bronze may survive winter in the harsh continental conditions of the region. Similar conclusions were reached by Verovnik *et al.* (2011) regarding the record from Škofja Loka, in the cool interior of Slovenia.

In light of the hereby reported facts and conclusions, raising awareness among the wider population is considered essential to yield new data on the distribution of this invasive species in Bulgaria. In any event, considering the climate of this country, it is improbable that this thermophilous butterfly will ever become a serious pest in the country, unlike another recent invasive Lepidopteran species, the Box-Tree Moth *Cydalima perspectalis* (Walker, 1859) (Crambidae).

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