

The First Records of *Cacyreus marshalli* BUTLER, 1898 from Israel, the East Mediterranean, Western Asia¹ & Alexandria, Egypt

(Lepidoptera, Lycaenidae)

by

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Abstract: On 8.XI.2019 SHALEM KURMAN (12), a young boy began monitoring his butterfly track at the Carob Trail, Ein Kerem Valley, Jerusalem (31.770650°N; 35.167190°E, 626.7 m a.s.l.). At 13:00 he saw and photographed a small, brown fast-flying single Lycaenide (fig. 1) nectaring for short periods on *Polygonum equisetiforme* SM. (fig. 9). His photographs soon appeared in the Facebook page of the Israeli Lepidopterist's Society and its members were introduced to *Cacyreus marshalli* BUTLER, 1898 a new butterfly species to the East Mediterranean – West Asia and an addition to the Israeli – Hermon - Jordan & Sinai fauna of 147² species (BENYAMINI, 2002). Two months later on the 6.I.2020 the Geranium Bronze was photographed in Alexandria, Egypt completing its invasion to the Mediterranean basin.

First records: Over thirty years have elapsed since *C. marshalli* BTL. was first recorded in 1989 at Mallorca, the Balearic Islands (Spain) at the west Mediterranean (EITSCHBERGER & STAMER, 1990) and Spain mainland in 1992. However, JOHN et al. (2018) noted that “in fact, the species appears to have been first observed on the island on 1987, but was not reported upon until seven years later (PETER CRAMP pers. comm., in WARING & THOMAS, 1994)”. The first author expected its arrival to Israel much faster (BENYAMINI, 1998, 2004 & 2014). During this period *C. marshalli* BTL. expanded eastwards along southern Europe and was recorded for the first time in Gündoğan, Bodrum, SW Turkey on August 2011 (SOYHAN et al., 2013). The average expansion rate of about 140 km per year stopped for a while because in the recent publication (JOHN et al., 2018) it was expanding to Crete and the western coast of Turkey, not moving further eastwards. The butterfly was still 1.200 km short (by land) off Jerusalem, Israel when it suddenly appeared in Ein Kerem suburb of Jerusalem, Israel on 8.XI.2019. So, while John et al. (2018) expected a further eastwards expansion from Marmaris in SW Turkey, local photographers already reported to DB that by mid November 2019 *C. marshalli* BTL. was already known from Izmir to Antalya a further 270 km eastwards from Marmaris along Anatolia's southern coast. However it was not recorded further eastwards nor at Hatay (ALI ATAHAHAN pers. comm.). The recent appearance of *C. marshalli* BTL. in Israel is not attributable to direct overland expansion from southern Europe and an African origin cannot be ruled out.

Following the first East Mediterranean record of a single specimen in Ein Kerem by SHALEM KURMAN on 8.XI.2019 a thorough search for the new lycaenid was made of Ein Kerem valley (fig. 2) over the next three days by members and photographers of the Israeli Lepidopterist's Society. Starting from Emek HaTeimanim (The Yemenite Valley at: 31.770200°N; 35.163730°E 578.6 m a.s.l), six to ten specimens were observed inside a local community garden (fig. 3) in each of the three days, nectaring on wild *Polygonum equisetiforme* SM (Polygonaceae) and cultivated *Euryops chrysanthemoides* (DC) B. NORD. (Asteraceae). In the early morning they basked with open wings (Fig. 4), later, when warmed up, territorial *C. marshalli* BTL. ♂♂ aggressively defended their perches on the flowers, driving away outnumbered *Leptotes pirithous* (LINNAEUS, 1767) blues (fig. 5). Other butterflies that visited the flowers were: *Pieris rapae* (LINNAEUS, 1758), *Anaphaeis aurota* (FABRICIUS, 1793), *Vanessa cardui* (LINNAEUS, 1758), *Limnitis reducta* STAUDINGER, 1901, *Zizeeria karsandra* (MOORE, 1865) and *Deudorix livia* (KLUG, 1834). On 9.XI., at a flat area further along the bottom of the valley up to twenty *marshalli* adults were attracted to nectar provided by a large predominant concentration of thousands of flowers of wild *P. equisetiforme* and *Dittrichia viscosa* (31.770400°N; 35.164880°E 589.5 m a.s.l) but numbers of *C. marshalli* BTL. reduced to four to six over the next two days. Observations comprised nectaring adults, courting pairs and couples *in cop.* (Figs 6 & 7). When searching for possible larval hostplants, the author found only three plants of *Pelargonium* spp. (Geraniaceae), all in the community garden. A large, flowerless *Pelargonium hortorum* that grew in the shade of a palm tree was found to be the preferred choice, having up to five eggs on young leaves, all laid on the underside of leaf margins (fig. 8). Holes in these leaves indicated larval activity (fig. 9). A calynging bush of *P. quercifolium* hybrid was the next choice, with one record of a photographed ♀ that laid a single egg on a flower calyx (fig. 10). A thorough search revealed no more eggs on other flowers. A large *P. graveolens* did not attract ♀♀ and was found to be devoid of eggs (fig. 11). A search for eggs on hostplants growing along nearby streets of Ein Kerem yielded eggs also on leaves of *P. peltatum*. In the lab. LEAH BENYAMINI photographed an L1 after emergence from its egg, it did not eat the eggshell and was observed wandering down the stalk. Young vulnerable larvae, in urgent need of finding a flower bud into which to borrow and hide, are infrequently observed. The hairy larva was approximately 1.2 mm long with a yellow body and a black head (fig. 12).

Origin of the Levant's *Cacyreus marshalli* BUTLER, 1898: Our present data suggest that the Jerusalem record might represent the third (known) reported introduction of *C. marshalli* BTL. into the Palaearctic region:

- 1) In 1978 larvae were found in the UK on imported *Pelargonium* sp. but the butterfly did not establish itself.
- 2) In 1987 *C. marshalli* BTL. was first noted as having arrived from South Africa to Mallorca in the Balearic Archipelago with imported ornamental *Pelargoniums*.
- 3) In early November 2019 we found the accidental introduction to the Levant reported here. Until the publication of this MS it is clear that all the south European *C. marshalli* BTL. originated from the 2nd introduction because its expansion is continuous and each of its movements from one country to the other and in numerous islands not least that of Crete, was well monitored, closely recorded and documented by over 200 papers. However the Jerusalem appearance is not directly linked to S. Europe let alone count over 30 direct weekly flights and many more indirect flights from African countries to Israeli air terminals.

¹) Unlike western Turkey that is western Asia Minor

²) 146 species in the book + *Chilades pandava* (BENYAMINI & SHALMON, 2015)

Two legs of Jerusalem Pelargonium Bronze (DB19035) were sent for DNA sequencing to Dr. MARTIN WIEMERS, Head of Ecology, Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany and resulted as follows:

“its COI barcode is identical to the most common haplotype which is found throughout southern Europe, see attached BOLD tree. This means that the Israeli population could have come from any place, but most probably from some other place in the Mediterranean region.”

Summary and Final Word: In early November 2019 a flourishing community of *C. marshalli* BTL. was discovered in Ein Kerem, Jerusalem's western suburb, Israel. This included several worn specimens suggesting an earlier colonization. At the bottom of Ein Kerem valley, a plentiful supply of autumn-flowering nectar plants provided a source of nutrients, while egg-laying opportunities were offered by cultivated *Pelargoniums* in public and private gardens.

Alexandria, Egypt: When this MS was ready for submission after the final editing of EDDIE JOHN (Cowbridge, UK). Dr. MARTIN WIEMERS (Müncheberg, Germany), who was informed about the Jerusalem record, drew the attention of the author to the first note of the Geranium Bronze appearance in Alexandria, N Egypt. On 6.I.2020 MUHAMED ALI photographed a single specimen with open wings on a wall. The GPS location 31.211° N ; 29.994° E is on the NW side of the Nile Delta, at the town of Izbat Sakinah, near the intersection of Gamela Abou Hred and Al Kadsia roads. It is 1,6 km NE of the airport farm lake, 4,5 km ENE of Alexandria International Airport and five km from the Mediterranean coast – the photograph appeared in Observation.org site. Only 14 and a half months earlier the Geranium Bronze was photographed between Hammamet Sud and Hammamet in CE Tunisia by Ronald Poels, about 1900 km west of Alexandria, Egypt. The Geranium Bronze could not recover this distance by flying over the vast North African desert within a year and without human support. The close proximity to El Nouzha Alexandria International Airport suggests that this was possibly its port of entry to Egypt. However, we hope that DNA analysis will uncover the real origins of the Egyptian Geranium Bronze Lycaenids.

The aim of this “short communication” is to inform Lepidopterists and Naturalists about the sudden eastwards “jumps” or new introductions of the Geranium Bronze/Pelargonium Butterfly to the Eastern Mediterranean and Egypt. In follow-on papers we and our colleagues in neighboring Middle Eastern countries will inform the readers on its next movements.

Acknowledgements: SHALEM KURMAN (12) and his father YAAKOV (59), on 8.XI.2019, were the first to find *C. marshalli* BTL. in the East Mediterranean. DUDU BEN-OR, OZ BEN-YEHUDA, MOSHE LAUDON, YARON MISHAN, AVNER RINOT, YAAKOV SALEVITS and SHALEV WIESMAN, members of the Israeli Lepidopterists Society and keen photographers, contributed their records and photographs to this paper. EDDIE JOHN edited the MS, LEAH BENYAMINI photographed a young L1 and prepared the color plate. Last but not least Dr. MARTIN WIEMERS, Head of Ecology, Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany, drew the attention of DB to its latest appearance in North-Western Nile Delta at Alexandria, Egypt on January 6th 2020 and expedited the sequencing and preparation of DNA BOLD NJ tree. We thank them all for their fine contributions.

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Fig. 1: First *Cacyreus marshalli* BUTLER, 1898 record, the Carob Trail, Ein Kerem Valley. Photo SHALEM KURMAN, 8.XI.2019.

Fig. 2: The Ein Kerem Valley general view. Photo DUBI BENYAMINI, 11.XI.2019.

Fig. 3: The local community garden in the Yemenite Valley. Photo DUBI BENYAMINI, 11.XI.2019.

Fig. 4: Basking *Cacyreus marshalli* BUTLER, 1898 – *Polygonum* stock location as in fig. 3. Photo DUDU BEN-OR, 16.XI.2019.

Fig. 5: Territorial *Cacyreus marshalli* BUTLER, 1898 ♂ – location as in fig. 3. Photo MOSHE LAUDON, 10.XI.2019.

Fig. 6: Courting of *Cacyreus marshalli* BUTLER, 1898 – location as in fig. 4. Photo SHALEV WEISMAN, 10.XI.2019.

Fig. 7: Couple *Cacyreus marshalli* BUTLER, 1898 in copula – location as in fig. 4. Photo DUDU BEN-OR, 9.XI.2019.

Fig. 8: The preferred LHP - *P. hortorum*- location as in fig. 3 Photo DUBI BENYAMINI, 11.XI.2019.

Fig. 9: Signs of larval activity in leave of *P. hortorum* - location as in fig. 3 Photo DUBI BENYAMINI, 11.XI.2019..

Fig. 10: Egg laying *Cacyreus marshalli* BUTLER, 1898 ♀ on *P. quercifolium* flower calyx – location as in fig. 3. Photo YAKOV SALAVIZ, 10.XI.2019.

Fig. 11: *P. graveolens* clean of *Cacyreus marshalli* BUTLER, 1898 eggs – location as in Fig. 3 Photo DUBI BENYAMINI, 11.XI.2019.

Fig. 12: *Cacyreus marshalli* BUTLER, 1898, L1 on *P. hortorum* – location as in fig. 3. Photo LEAH BENYAMINI, 11.XI.2019.

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