

HISTORICAL RECORDS: *COLIAS CHRYSOTHEME* AND *C. PALAENO* IN THE VALLEY OF RIVER CRIȘUL ALB (LEPIDOPTERA: PIERIDAE)

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ABSTRACT. Occurrence data of the species *Colias chrysotheme* (Esper, 1781) and *C. palaeno europeme* (Esper, 1778) for the region Crișana based on historical specimens curated in the Hungarian Natural History Museum (Budapest) are given. The specimens are documented and the data are discussed.

Key words. Carpatho-Pannonian region, fluctuation, migration, Region Crișana, old specimens, type locality.

INTRODUCTION:

The Hungarian Natural History Museum has an extensive collection of Lepidoptera specimens captured in the Carpatho-Pannonian region (= Carpathian Basin), housed in 3700 drawers of 75 cabinets. The oldest specimens are dated back certainly to the end of the 18th century (collection Tobias Koy, cf. Bálint 2008). In the drawers there are many curiosities and voucher specimens representing the only known records of the species for the region or for an area where the species never has been observed again.

Regarding western area of Romania, from this large museum data source we previously presented a set of records for *Boloria aquilnonaris*, an extremely local member of the Romanian butterfly fauna (Bálint & Katona 2016). The aim of the present paper is to provide further unpublished data for the western part of Romania, in this case to report on the occurrences of two *Colias* species.

MATERIALS AND METHODS:

Specimens are kept in the Carpatho-Pannonian (= Carpathian Basin) Lepidoptera collection of the Hungarian Natural History Museum (HNHM), cabinet 68A.

Under the entry „Results” first we document the specimens; (//) indicates a line-break in the label script); then we provide some historical aspects on the collectors and collection sites, and the way of acquisitions or receptions.

In the discussion we present explanations on the plausibility of the records.

RESULTS:

Colias chrysotheme (Esper, 1781), male (Fig. 1), labelled as (1) „Bj. 913. VIII. 17. // Col. Chryso- // theme ♂” (oblong, yellowed label, letters in pencil, handwriting of L. Diószeghy), (2) „1913. VIII. 17. // Borosjenő // Diószeghy” (oblong, white label, date handwritten by black ink, names printed in black) and (3) Coll. // Bessenyei” (oblong, white paper, letters printed in black). The specimen was collected by László Diószeghy (1877-1942), who lived and intensively collected in the region of Borosjenő (Ineu), a settlement in the valley of Crișul Alb (coordinates:

46° 26' 0"N, 21° 50' 0"E). The species has not been listed in the catalogue of the Diószeghy-collection as captured in the vicinity of Ineu (Capușe & Kovács 1987). The specimen originally belonged to the collection of Elemér Bessenyei, an amateur entomologist contemporary of Diószeghy. His collection was donated to the HNHM before the Second World War.

Colias palaeno europeme (Esper, 1778), male (Fig. 2), labelled as (1) „Rái, // Merk // 95” (white quadrant label with double black frame, letters handwritten in black ink, numbers in red ink) and (2) „Palaeno” (yellowed oblong paper, handwritten by pencil). The labelling indicates that the specimen was purchased or exchanged in the end of the 19th century by the museum staff and has been labelled in the manner of those times. The decipherment of „Rái” is Brazii, a village situated in the valley of Crișul Alb, with coordinates 46° 14' 29"N, 22° 20' 5"E. The script “Merk” most probably indicates “Merkl”. The numbers „95” indicate „1895”. The specimen was presumably collected by Ede Merkl, who was living in Resița and collected extensively in the region (Abafi-Aigner 1898; personal data not known, but Merkl still showed publication activity in 1906). Coleopteran and lepidoperan specimens collected by Merkl were repeatedly purchased by the HNHM.

DISCUSSION:

Colias chrysotheme – The presence of the species in the region Crișana was not indicated by the literature; but recent records supported the existence of the species in Transylvania, while the old data from the region Banat were not confirmed (Rákossy *et al.* 2003, Székely 2008). The species was recorded by us in the region of Sălaj (Bálint *et al.* 2016). At present *C. chrysotheme* has no permanent population in the southeastern part of Hungary. In the Pannonian plain, between the rivers Duna and Tisza there were flourishing populations of *Colias chrysotheme* (Kovács 1954). Therefore it cannot be excluded that the record of Ineu indicates that the Crișan valley serves as a migratory route for connecting populations of the Pannonian plain and the Transylvanian highland, as we also presumed for the Sălaj-populations (see Bálint *et*

al. 2016). It is a plausible hypothesis that the Pannonian populations fluctuate intensively, and in 1913 there was a gradation, when the species could extend its range to the very edge of the plain. Probably this phenomenon is the answer for the type locality of „*Papilio chrysothème*”, that is „Cremnitz” (= Körmöcbánya, Kremnica, Slovakia) considered erroneous by some workers. Taking into consideration the phenomenon of highly fluctuating populations plus the evidence that at the end of the 19th century the region of Cremnitz was completely deforested and used as extensive pastures, the type locality of *C. chrysothème* can be regarded correct with high probability.

Colias palaeno – This species was recorded from Ortoaia (Dorna Arini) and from Rădăuți (both in county Suceava today) in the Eastern Carpathians and in the southern part of Bukovina, but considered to be extinct (Székely 2008). The species *C. palaeno* was observed or collected in the present territory of Hungary only as a stray (Balogh 1967, Gyulai 1977).

In the northern part of Slovakia there are existing populations (Kulfan & Kulfan 1991). According to our knowledge, in the region of Brazii, at present there is no suitable habitat for *C. palaeno*. But it cannot be excluded that one of the acidic marshes or peat bogs in the mountains of Bihor or Apuseni could once have supported a population. The imagines of all *Colias* species are highly migratory or vagrant. This behaviour fits also for *C. palaeno*, which can also graduate in certain years and consequently a number of imagines leave the original habitat. Probably this happened in 1895, as this was certainly the case in 1959 when *C. palaeno* has been observed in the Mountains of Bükk, Hungary (cf. Balogh 1967; the voucher specimen is in the HNHM). There is more than 100 km distance between the site where *C. palaeno* was observed in Bükk and the closest existing population in the Orava region of the northern Carpathians, Slovakia. Anyway, it is rather unlikely that a population of *C. palaeno* in Romania will be discovered, but it cannot be absolutely excluded as the case of *Boloria aquilonaris* reveals (Bálint & Katona 2016).



Fig. 1: *Colias chrysothème* (Esper, 1781), male, museum specimen collected by László Diószeghy in dorsal (left) and ventral (right) views with original labels (in centre) (Scale: 1 mm) (Photos: Gergely Katona, HNHM) (scale: 1mm)



Fig. 2: *Colias palaeno europeme* (Esper, 1778), male, museum specimen collected by Ede Merkl in dorsal (left) and ventral (right) views with original labels (in centre) (Scale: 1 mm) (Photos: Gergely Katona, HNHM)

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REFERENCES:

- Abafi-Aigner L, A lepkeszét története Magyarországon. Királyi Magyar Természettudományi Társulat, Budapest, vi + 1–202, 1898.
- Bálint Zs, Lepidoptera collections of historical importance in the Hungarian Natural History Museum. *Annales Historico-Naturales Musei Nationalis Hungarici* 100, 17–35, 2008.
- Bálint Zs, Katona G, On the Occurrence of *Boloria aquilonaris* Stichel, 1908 (Insecta: Lepidoptera) in the Southwestern Carpathians (Banat, Romania). *Studia Universitatis „Vasile Goldis”, Seria Științele Vieții* 26(3): 358–360, 2016.
- Bálint Zs, Katona G, Ronkay L, Data to the knowledge of the Macrolepidoptera fauna of the Sălaj-region, Transylvania, Romania (Arthropoda: Insecta). *Studia Universitatis Vasile Goldis Seria Științele Vieții*, 26, Supplement 1: 59–74, 2015.
- Balogh I, A Bükk-hegység lepkefaunájának kritikai vizsgálata I.-II. *Folia Entomologica Hungarica*, 20 (1,2), 95–165, 521–588, 1967.
- Capușe I, Kovács A, Catalogul colecției de lepidoptere „László Diószeghy” de la muzeul Județean Covasna Sfintu Gheorghe, Institutul de Speologie „Emil Racoviță”, București, 1–397, 1987.
- Gyulai P, A Bükk hegység makrolepidoptera faunájának ökofaunisztikai-állatföldrajzi vizsgálata. II. Diurna 1. Herman Ottó Múzeum Évkönyve, Miskolc 16, 345–373, 1977.
- Kovács L, The Macrolepidoptera characteristic to our sandy districts, *Annales Historico-Naturales Musei Nationalis Hungarici* 47, 327–342, 1954.
- Kulfan J, Kulfan M, Die Tagfalterfauna der Slowakei und ihr Schutz unter besonderer Berücksichtigung der Gebirgsökosysteme, *Oedipus* 3, 75–102, 1991.
- Rákosy L, Goia M, Kovács Z, Catalogul Lepidopterelor României / Verzeichnis der Schmetterlinge Rumäniens, Societatea Lepidopterologică Română, Cluj-Napoca, 1–446, 2003.
- Székely L, The Butterflies of Romania / Fluturii de zi din România, Brasov County History Museum, Brasov, 1–305, 2008.