

DISTRIBUTION OF THE GENUS *Vanessa* Fabricius, 1807 (NYMPHALIDAE) IN SIBIU (ROMANIA) AND ITS SURROUNDINGS FROM 1904 TO 1984

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Abstract. The study of museum collections is a permanent concern for us, and the publication for the first time of the data from these collections have scientific, systematic and faunistic importance, providing information about the evolution in time of different species of lepidopterans. This paper aimed to present the collection data for two species belonging to the Genus *Vanessa*, *Vanessa atalanta* and *Vanessa cardui*. The collections of Lepidoptera studied and where these species have been identified are made by: Daniel Czekelius, Eugen Worell, Viktor Weindel, Heinrich Hann von Hanneheim, Rolf Weirauch and Eckbert Schneider. Following the analysis, a total of 101 specimens were concentrated, 52 of the *Vanessa atalanta* species and 49 specimens of *Vanessa cardui*. Most of the specimens collected during the time interval between 1904-1984, come from Sibiu and the surroundings of Sibiu or other places in Transylvania. Within the collections, there are also some specimens coming from Dobrogea and Banat but also from other countries such as Republic of Moldova and Spain.

Key words: *Vanessa atalanta*; *Vanessa cardui*; Lepidoptera; Nymphalidae.

INTRODUCTION

The genus *Vanessa* (Nymphalidae) is represented by the species *V. atalanta* and *V. cardui* in Sibiu, its surroundings and other Transylvanian localities, as well as other regions of Romania. They are both represented in several collections in the country.

Vanessa atalanta (Linnaeus, 1758) (Nymphalidae), commonly known as the Red Admiral, is a West-Palaearctic, typical species in the Western Asian and Mediterranean peninsulas (Asia Minor, Balkans), Holomediterranean [1, 11-15, 47]. The species is widespread in Europe, Asia, North Africa, the Americas, the Caribbean and New Zealand. It is a migratory species, highly adapted to climate changes, and have been found to be a resident species throughout the years, in England and Ireland [2, 3, 12, 14].

After studying collection samples [4, 8, 16, 22, 27, 30-37], it was found that the adults fly from mid-March to mid-May and from mid-June to the end of October [48]. This migratory species is spreading in all ecosystem types. The larvae feed on plants of the *Urticaceae* Family: *Urtica dioica*, *U. urens* with species *Parietaria officinalis* [47].

Vanessa cardui cardui (Linnaeus, 1758), popularly called steppe admiral, family *Nymphalidae*, is a Cosmopolitan and Extrapalaearctic species [12, 40-43].

In Romania it is widespread in all provinces including: Banat, Crișana, Maramureș, Transylvania, Oltenia, Muntenia, Moldova and Dobrogea [48], being signaled in the time interval between 1981-2001 [26].

MATERIAL AND METHODS

This work is based on the information gathered from several specimens in the collections of: Daniel Czekelius, Eugen Worell, Viktor Weindel, Heinrich Hann von Hanneheim, Rolf Weyrauch, and Eckbert Schneider. Also, data was obtained from literature published elsewhere [3, 4-9, 10, 16-20, 21-24, 28-30,

38, 48-50]. However, there are many unpublished data on these Lepidopteran collections, are of scientific and historical importance. The aim of this paper is to bring new data regarding the past collection period of the species *V. atalanta* and *V. cardui*, which span from 1904 to 1984, from localities near Sibiu, other places in Transylvania or Romania (Fig.7, Fig. 14).

For each collector the number of existing specimens, the collection site, the data of collecting (day, month, year) and the name of the collector (leg.) as well as photos of the specimens existing in the studied collections were specified. Not all labels contain complete data, but we have reproduced the exact information and if indecipherable, the names are accompanied by the question mark.

The species existing in the collections are presented under the name of the collector, in chronological order of the days, months and years of collection.

RESULTS

The genus *Vanessa* in the studied collections is represented by only two species: *V. atalanta* and *V. cardui*. Data from the six studied collections of lepidopterans is presented in the tables (Table 1, 2).

1. Daniel Czekelius's collection (Fig. 1)

Currently, the collection of Transylvania Lepidoptera of Daniel Czekelius (1857-1938), includes 7162 specimens and about 2100 species, while the collection of Palaearctic Lepidoptera Daniel Czekelius has 6.929 specimens from Transylvania or other European countries [29]. Some families and numerous species have been verified by specialists but relatively few faunal-taxonomic data have been published in papers [1, 4, 22].

Daniel Czekelius' collection has also specimens, collected from outside Romania. His catalogs of Lepidoptera with data as old as 1897 and 1898 [9, 10], were also consulted. His tireless Transylvanian



Figure 1. A. *Vanessa atalanta*, B. *V. indica*, C. *V. vulcanica*, in Daniel Czekelius' collection

research, has reported 1095 species from Transylvania out of the 2116 species known and throughout his activity, he published 18 papers on Lepidoptera [9, 10].

Material examined: 1921, Braşov (5°39'N 25°36'E) (without the day and month of collection), leg. Czekelius D. (Cz.); (no data), Transylvania, leg. Czekelius D. (Cz.); no data collection, Sibiu (45°47'45"N 24°9'8"E), (two specimens), leg. Kiss E.; no data collection, Sibiu, (one specimen), leg. Czekelius D. (Cz.).

Vanessa indica (Herbst, 1794)

Material examined: July 18, 1969, Unsuri (?), Vmh, July 20, 1969, Unsuri (?).

Vanessa vulcania Godart, 1819

Material examined: Tenerife, Santa Cruz (Spain) (two specimens), leg. Funlhesni (no data).

2. Eugen Worell's collection (Fig. 2)

Lepidoptera collection of Eugen Worell (1884-1961) comprises a number of 896 species and 6.646 specimens, whose collection data contribute to the knowledge of the distribution of a large number of species, and includes rare species, little known or new for science. The species come from all areas of Romania, but the material collected is mostly from Sibiu and the surroundings of Sibiu [31].

Material examined: June 15, 1932, Dobrudja, leg. Worell E. (Wo.); April 29, 1937, Chişinău (7°01'0"N 28°52'0"E), leg. Worell E. (Wo.); May 14, 1937, Chişinău, leg. Worell E. (Wo.); September 16, 1937, (four specimens) Chişinău, leg. Worell E. (Wo.); September (without collection day), 1940, (three specimens) Sibiu (45°47'45"N 24°9'8"E), leg. Worell

E. (Wo.); July 30, 1951, Sibiu, leg. Worell E. (Wo.); August 15, 1951, (two specimens) Sibiu, leg. Worell E. (Wo.); October 10, 1951, Sibiu, leg. Worell E. (Wo.); August 15, 1956, Sibiu, leg. Worell E. (Wo.).

3. Viktor Weindel's collection (Fig. 3)

Viktor Weindel (1887-1966) Transylvanian Lepidoptera Collection consists of 573 species and 3.490 specimens with a collecting activity of over 60 years (1900-1959). The species contained in the collection come from Sibiu and surrounding areas (Viile Sibiului, Guşteriţa, Cîsnadioara, Cîsnădie, Măgura Cîsnădiei, Dumbrava Sibiului Forest, Sadu, Păltiniş) from Southern and Eastern Transylvania, from Turnu Rosu (the old border between Sibiu and Vâlcea Counties), and from other regions of Romania [28].

Material examined: July 4, 1904, Guşteriţa/Hammersdorf (45°48'19"N 24°11'31"E) (H.B.), leg. Weindel; August 1, 1922, Şanta (45°39'39"N 23°57'40"E) (Cibin Mountains), leg. Weindel; August 3, 1921, Borsec (46°58'0"N 25°34'12"E) (Harghita), leg. Weindel; August 13, 1922, Păltiniş/Hohe Rinne (45°39'10"N 23°55'55"E) (Cibin Mountains), leg. Weindel; August 17, 1922, Păltiniş, Hohe Rinne (Cibin Mountains), leg. Weindel; August 26, 1956, Râu Vadului (45°31'2"N 24°16'47"E) (Sibiu), leg. Weindel; October 9, 1957, Păltiniş, Hohe Rinne (Cibin Mountains), leg. Weindel.



Figure 2. *Vanessa atalanta* in Eugen Worell's collection



Figure 3. *Vanessa atalanta* in Viktor Weindel's collection

4. Heinrich Hann von Hannenheim's collection (Fig. 4)

Heinrich Hann von Hannenheim (1895-1971) Collection of butterflies includes over 1500 specimens, captured in the Southern Carpathians, but also from the surroundings of Sibiu. This collection was donated to the Museum of Natural History in Sibiu in 1964 and has been consulted over time by several specialists [22, 28]. Most data in the collection is unpublished, although it contains important faunal information.

Material examined: September 11, 1955, (indecipherable label), leg. Plattner H.; June 10, 1957, Valea Fratelui-Pasul Turnu Roșu (45°37'03"N 24°18'18"E) (Sibiu), leg. Hannenheim H. (Ha.); September 5, 1957, Dobârca (45°50'53"N 23°46'15"E) (Sibiu), leg. Hannenheim H. (Ha); October 20, 1962, Sibiu, leg. Hannenheim H. (Ha).



Figure 4. *Vanessa atalanta* in Heinrich Hann von Hanneheim's collection

5. Rolf Weyrauch's collection (Fig. 5)

Rolf Weyrauch (1906-1984) Lepidoptera collection includes 888 species and 6.043 specimens from Sibiu and its surroundings (Gusterita Hill, Slimnic Hill, Magura Cisnădiei, Cisnădioara, Dumbrava Sibiului Forest, Turnu Roșu Pass and Cozia Mountain), Metaliferous Mountains of Transylvania, different areas of the Southern and Eastern Carpathians, Herculane Spa, Dobrogea and the Danube Delta. Even though the collection contains extremely valuable material from a faunal point of view, information related to Weyrauch's collecting sites has not been published before. His catalog of butterflies was published in 1982 by his former student Eckbert Schneider [29].

Material examined: April, 1949 (without the day and place of collection), leg. Weyrauch R. (Wey.); July 15, 1951, Turnișor/Nependorf (45°47'35"N 24°07'30"E) (Sibiu), leg. Weyrauch R. (Wey.); August, 1953 (without collection day), Roșia Montană (46°18'22"N 23°07'50"E) (Alba), leg. Weyrauch R. (Wey.); March 14, 1958, Covasna (45°54'N 26°02'E), leg. Weyrauch R. (Wey.); July 11, 1960, Hagieni Forest (43°47'2"N 28°28'48"E) (Constanța) Dobrudja, leg. Weyrauch R. (Wey.); June 22, 1966, Băneasa (44°29'33"N 26°04'45"E) (București), leg. Weyrauch R. (Wey.); July 17, 1973, Hagieni Forest (Constanța) Dobrudja, leg. Weyrauch R. (Wey.); July 5, 1974, Băile Herculane/ Herculabad (44°52'43"N 22°24'51"E) (Caraș-Severin), leg. Weyrauch R. (Wey.); July 11, 1960, Hagieni Forest/Dobrudja (Constanța), leg. Weyrauch R. (Wey.); August 15, 1975, Dobrudja, leg. Weyrauch R. (Wey.).



Figure 5. *Vanessa atalanta* in Rolf Weyrauch's collection

6. Eckbert Schneider's collection (Fig. 6)

The Eckbert Schneider Lepidoptera Collection (1927-) contains over 20.000 specimens collected from Sibiu, its surroundings and Southern Transylvania, but also from the other regions of Romania: Banat, Crișana, Dobrogea, Danube Delta, Oltenia, Moldova.

Material examined: October 10, 1966, Gușterița/Hammersdorf (45°48'19"N 24°11'31"E) (H.B.), leg. Schneider; May 3, 1970, Gușterița/Hammersdorf (H.B.), leg. Schneider; April 28, 1971, Hagieni/Dobrudja (43°47'2"N 28°28'48"E) (Constanța), leg. Schneider; May 12, 1971, Murighiol (44°58'17"N 29°09'05"E) (Tulcea), leg. Schneider; August 4-16, 1973, Hamba/Hahnbach (45°51'47"N 24°11'49"E) (Sibiu), leg. Schneider; April 8, 1974, Măgura Cisnădie/Götzenberg (45°42'29"N 24°8'4"E) (Sibiu), leg. Schneider; July 28, 1974, Sibiel (45°45'58"N 23°54'29"E), Cibin Mountains, Southern Carpathians, Southern Carpathians; 1974, (without the day and month of collection), Vrancea Mountains (45°47'N 26°58'E)/Eastern Carpathians (1380m)-Golul Vespei, leg. Schneider.



Figure 6. *Vanessa atalanta* in Eckbert Schneider's collection

Table 1. The Lepidoptera collections where the species *Vanessa atalanta* was identified

Crt. no.	Collection	Specimens	Period of collection	The area of collection
1	Daniel Czekelius	9	1921-1969	Transylvania
2	Eugen Worell	15	1932-1956	Transylvania, Republica Moldova
3	Viktor Weindel	7	1904-1957	Transylvania
4	Heinrich Hann von Hanneheim	4	1955-1962	Transylvania
5	Rolf Weyrauch	9	1949-1975	Dobrudja, Transylvania
6	Eckbert Schneider	8	1966-1974	Dobrudja, Transylvania
Totals:		52	1904-1975	

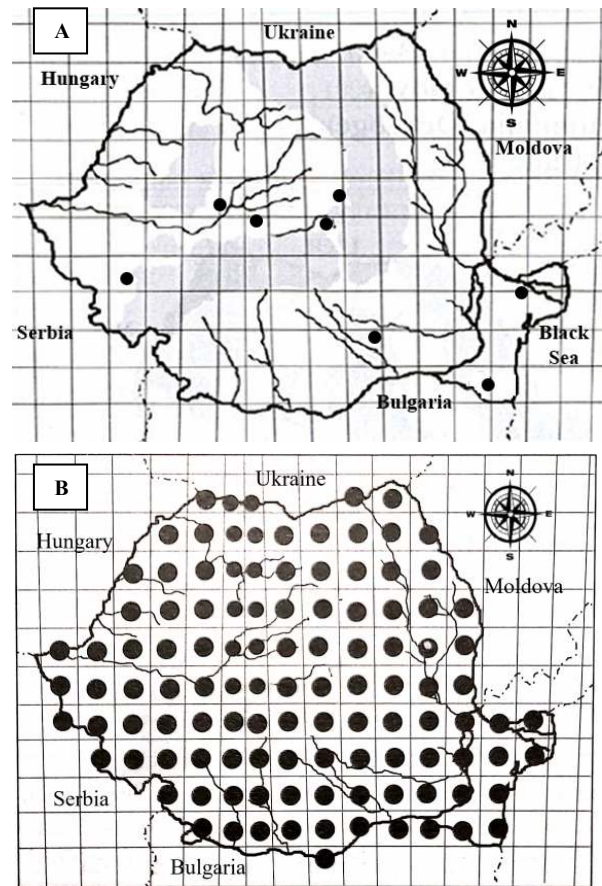


Figure 7. A. Distribution of *Vanessa atalanta* within the collections from Natural History Museum in Sibiu, Romania; B. Distribution of *Vanessa atalanta* in Romania: black circle records, (after Székely, 2008 [48])

Other collections containing *Vanessa cardui* Linnaeus, 1758 (Nymphalidae) follows:

1. Daniel Czekelius's collection (Fig. 8)

Material examined: September 25, 1907, Sibiu (45°47'45"N 24°9'8"E), (two specimens), leg. Czekelius D. (Cz.); July 17, 1909, Sibiu (two specimens), leg. Czekelius D. (Cz.); 1916, without the day and month of collection, Banyuls, without author; July 2, 1919, (indecipherable label), without author; June 29, 1929, Danncu (?), leg. Czekelius D. (Cz.); no data collection, Sibiu, leg. Kiss E.; no data collection, Sibiu, leg. Czekelius D. (Cz.).

2. Eugen Worell's collection (Fig. 9)

Material examined: October 28, 1935, Chișinău (7°01'0"N 28°52'0"E), leg. Worell; July 16, 1936, Băile Herculane/Herkulesbad (44°52'43"N 22°24'51"E) (Caraș-Severin), leg. Worell; September 1, 1937, Chișinău, leg. Worell; 1937 (without the day and month of collection), Chișinău (six specimens), leg. Worell. July 15, 1939, Sibiu, leg. Worell; September 1, 1952, Sibiu, leg. Worell.



Figure 8. *Vanessa cardui* in Daniel Czekelius' collection

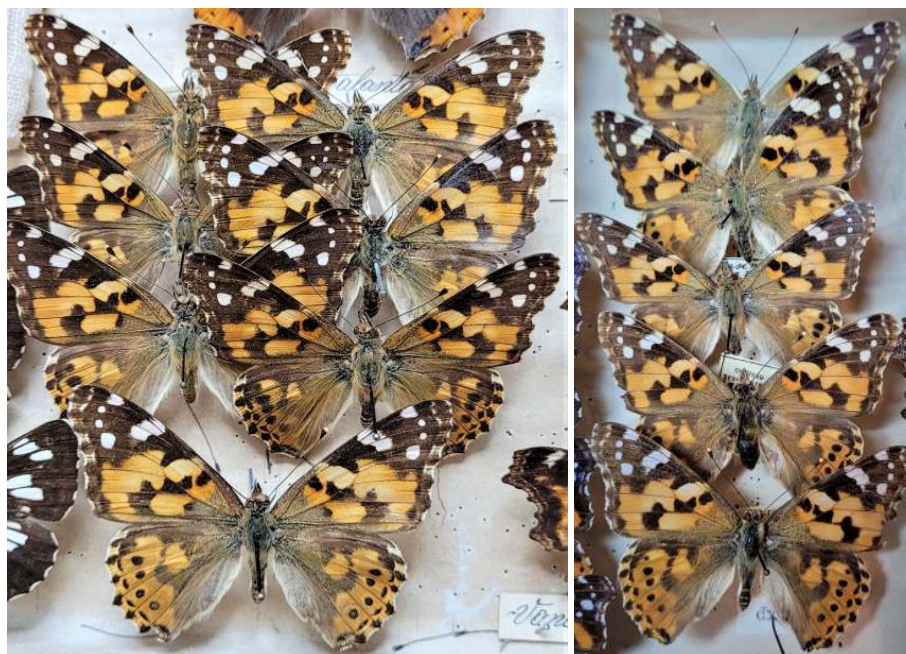


Figure 9. *Vanessa cardui* in Eugen Worell's collection

3. Viktor Weindel's collection (Fig. 10)

Material examined: July 6, 1907, Gușterița/Hammersdorf (45°48'19"N 24°11'31"E) (H.B.), leg. Weindel; July 30, 1907, Cisnădioara/Michelsberg (45°42'16"N 24°6'46"E) (Sibiu), leg. Weindel; August 2, 1907, Cisnădioara/Michelsberg (Sibiu), leg. Weindel; September 28, 1918, Gușteriței Hill/Hammersdorf (44°52'43"N 22°24'51"E) (H.B.), leg. Weindel; August 12, 1922, Păltiniș/ Hohe Rinne (45°39'10"N 23°55'55"E) (Cibin Mountains), leg. Weindel; August 18, 1925, Sibiu (two specimens), Cisnădioara, leg. Weindel; July 18, 1954, Gușterița Forest/Hammersdorf (H.B.), leg. Weindel; September 16, 1967, Gușteriței Hill/Hammersdorf (H.B.), leg. Weindel.

4. Heinrich Hann von Hanneheim's collection (Fig. 11)

Material examined: April 20, 1946, Sibiu, leg. Hanneheim; 1955 (without the day and month of collection), Slimnic (45°55'08"N 24°09'14"E) (Zakel Hill), leg. Hanneheim; July 23, 1958, Bălea/Bulea (45°36'12"N 24°37'02"E) (1300 m) (Făgăraș Mountains), leg. Hanneheim; August 22, (without the year of collection), Valea Fratelui-Pasul/Turnu Roșu (45°38'34"N 24°17'55"E) (Sibiu), leg. Hanneheim.

5. Rolf Weyrauch's collection (Fig. 12)

Material examined: August 14, 1954, Băile Herculane/Herkulesbad (44°52'43"N 22°24'51"E) (Caraș-Severin), leg. Weyrauch; July 1955 (without collection day), Păltiniș Hohe Rinne (45°39'10"N 23°55'55"E) (Cibin Mountains), (two specimens), leg. Weyrauch; July 7, 1963, Suru (45°35'16"N 24°26'18"E), leg. Weyrauch; June 30, 1966, Delta Dunării (three specimens), leg. Weyrauch; June 19, 1969, Mangalia (43°49'N 28°35'E) (Constanța), leg. Weyrauch; June 30, 1969, Mangalia (43°49'N 28°35'E) (Constanța) (two specimens), leg. Weyrauch; July 31, 1972, Lacul Roșu/Gyilkos (46°47'N 25°47'E) (Harghita), leg. Weyrauch; August 8, 1984, Valea Fratelui-Pasul Turnu Roșu (45°38'34"N 24°17'55"E) (Sibiu), leg. Weyrauch.

6. Eckbert Schneider's collection (Fig. 13)

Material examined: April 19, 1970, Sibiu (45°47'45"N 24°9'8"E), leg. Schneider; May 28, 1971, Beștepe (45°05'32"N 29°00'53"E) (Tulcea) Dobrogea, leg. Schneider; August 4-16, 1973, Hamba/Hahnbach (45°51'47"N 24°11'49"E) (Sibiu), leg. Schneider; June 6, 1976, Sibiu, leg. Schneider.



Figure 10. *Vanessa cardui* in Viktor Weindel's collection

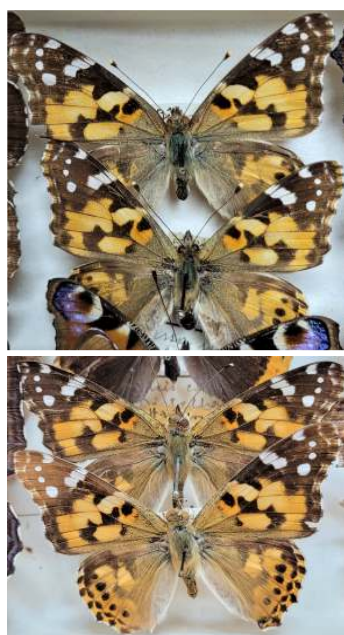


Figure 11. *Vanessa cardui* in Heinrich Hann von Hanneheim's collection



Figure 12. *Vanessa cardui* in Rolf Weyrauch's collection



Figure 13. *Vanessa cardui* in Eckbert Schneider's collection

Table 2. The Lepidoptera collections where the species *Vanessa cardui* was identified

Crt. no.	Collection	Specimens	Period of collection	The area of collection
1	Daniel Czekelius	9	1907-1929	Transylvania
2	Eugen Worell	12	1935-1939	Transylvania, Republica Moldova
3	Viktor Weindel	9	1907-1967	Transylvania
4	Heinrich Hann von Hanneheim	4	1946-1958	Transylvania
5	Rolf Weyrauch	11	1954-1984	Dobrudja, Banat, Transylvania
6	Eckbert Schneider	4	1970-1976	Dobrudja, Transylvania
Totals		49	1907-1984	

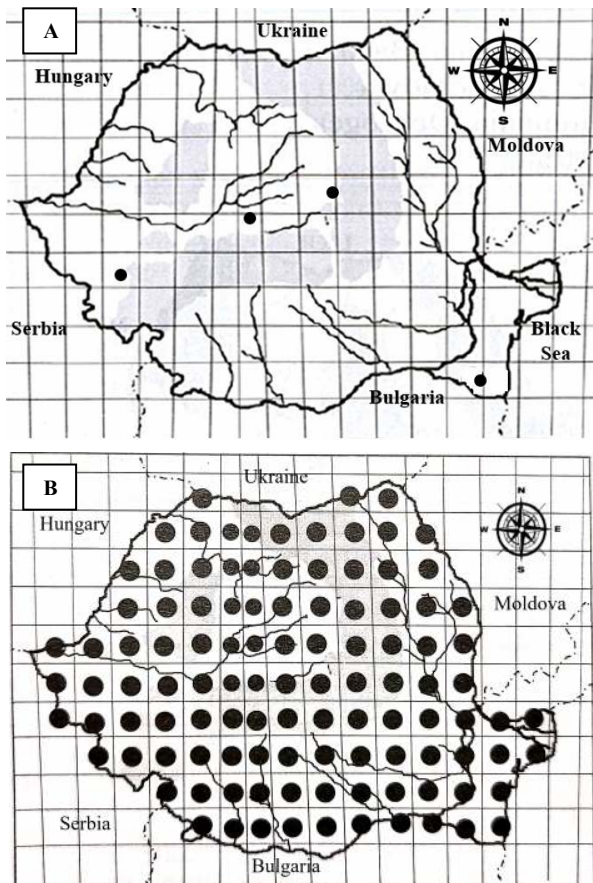


Figure 14. A. Distribution of *Vanessa cardui* within the collections from Natural History Museum in Sibiu, Romania; B. Distribution *Vanessa cardui* in Romania: black circle-records (after Székely, 2008 [48])

To add to the previous information we found that in the Catalog of the Collection of Lepidoptera N. Delvig. From the Braşov County Museum, there are six specimens (4 ♂♂ and 2 ♀♀) of *V. atalanta* collected in the years: 1941, 1957 and 1975 from Braşov, The Solomon's Stones, all the specimens were collected in August [8]. In the same catalog, *V. cardui* is represented by six specimens (3 ♂♂ and 3 ♀♀) collected in the years: 1941, 1958, 1962 and 1968 from Braşov (Tâmpa), Poiana Braşov, Săcele, Lacul Roşu, Lupeni and Dealul Lempeş [8].

The Lepidoptera Collection of the Oltenia Museum Craiova, 39 specimens of *V. atalanta* are preserved which were, collected between 1969-1991, from several counties in the Oltenia region and Dobrogea, in July and August [5-7]. *V. cardui* has 71 specimens collected between 1969-1990 from Oltenia and Dobrogea in the months: June, July and August [5-7].

The "Ioan Lăzărescu" Collection of Lepidoptera, curated at the "Grigore Antipa" National Museum of Natural History from Bucharest, 11 specimens (5 ♂♂ and 6 ♀♀) of the *V. atalanta* species are preserved which have been collected between 1965-1971, from the Banat region, Timiş County (Timișoara, Pădurea Verde), Caraş-Severin County (Căvâran), and from Transylvania, Alba County (Runcul Gorges) and Harghita County (Red Lake). The period of catching the specimens was in the months of June, July, August,

September and October [38]. *V. cardui* has ten specimens (7 ♂♂ and 3 ♀♀), collected between 1963-1973, from Banat, Timiş County (Timișoara, Pădurea Verde), Caraş-Severin County (Băile Herculane), and from Transylvania, Mureş County (Vidrăsău) and Retezat Massif [38].

Specimens of *V. atalanta* are also found in other collections such as that of dr. Vladimir Olaru, within the Muzeal Complex of Natural Sciences Galați, with ten specimens (7 ♂♂ and 3 ♀♀), collected in the years: 1966, 1967, 1968, 1969, from the Gârboavele Forest, Hanul Conachii, Caraorman and Letea Forest localities from Dobrogea, the specimens being captured in July and August [16].

DISCUSSIONS

The richness of faunal elements and especially the numerous existing species of Lepidoptera of Transylvania have been of interest to several researchers and collectors since the last years of the 19th century. There is a high Scientific value on the information that can be obtained from those collections. The data presented herein, obtained from the revised collections, is the oldest known from our country. Most of the gathered data was found to be from 1904 to 1984, mainly from Sibiu and its surroundings, but includes also other areas of Transylvania and other regions of Romania, Banat and Dobrogea. Some specimens were collected abroad in the Republic of Moldova and Spain. Many of the the studied specimens seem to be the oldest preserved specimens in Romanian museums.

From the main collections studied, we were able to identify 52 specimens of *V. atalanta* collected in the time interval between 1904-1975 and 49 examples of *V. cardui* collected between 1907-1984. The Collection of D. Czekelius, contain also two specimens of *V. indica* (inelegible label) and *V. vulcanian* from Spain.

Based on the literature, among the diurnal butterflies from Romania, *V. atalanta* have been collected between 1981-2001 in the following regions: Banat, Transylvania, Maramures, Oltenia, Muntenia, Moldova and Dobrogea, and in Crisana. In the case of *V. cardui*, it has been found from 1901 to 1980 [25, 47]. According to some authors, *V. cardui* has been reported in all regions of Romania including: Banat, Crisana, Transylvania, Maramures, Oltenia, Muntenia, Moldova and Dobrogea, during 1981-2001 as well [25].

In our country, *V. atalanta* is a species frequently found at forest clearings, swamps, parks, gardens and meadows, very rarely in places deprived of vegetation. During the migration flight it was observed in all habitat types, from the tundra area to the subtropical areas. Studies on the migration of the species in Europe and North Africa have been analyzed over several years, between 1994-1999, noting that the species migrates from northern and central Europe to the Mediterranean area to winter there [3, 11, 39]. The

species flies in habitats with nettle bushes. The altitude at which the species flies is between 0-2400 m. In Romania this species is common [26] and was reported in all provinces between the years 1981-2001, according to the data from the reference work Catalog of lepidopterans in Romania [25]. It is found from the Danube Delta to Fagaras Mountains [46-48].

It has been reported from altitudes of 0-2500 m in our country, the presence is also confirmed from the labels data of the specimens existing in the collections or data presented in the specialized literature [44-47]. Flight period is from mid-April to mid-November [48].

Protection status of *V. cardui* is of not much concern both regionally and nationally. Its frequency is from common and very common [26]. Its larvae feed on plants of *Actium lappa* (Asteraceae), *Carduus acanthoides* (Asteraceae), *Cirsium arvense* (Asteraceae), *Onopordum acanthium* (Asteraceae), *Tussilago farfara* (Asteraceae), *Urtica dioica* (Urticaceae) [47].

This work presents information that might be of use in systematic or faunistic studies. In relation to climate changes, we could notice that the migration of *V. atalanta* and *V. cardui* seem to be affected and apparently has push them to move to new areas of distribution [41-43].

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Conflict of interest. There is no actual or potential conflict of interest in relation to this article.

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