

Plants from the Turda Area Included in the 'Alexandru Beldie' Herbarium

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RESEARCH ARTICLE

Abstract

The paper aims to present the plants collected from the former county of Turda and their characteristics, that are found in one of the most important herbariums in Romania - the 'Alexandru Beldie' herbarium of the 'Marin Drăcea' National Institute for Research and Development in Forestry. The article presents the studied material, the number of vouchers with species harvested from this region, as well as some characteristics of this large collection of plants, such as the period when the collection was constituted and the periods of plant harvesting. For the studied herbarium, the genera were systematized, as the most representative genera were highlighted. Not only the most important species collected from the Turda County are indicated but, at the same time, the specialists who left their mark on the grassland representation in this area were also mentioned.

Keywords: flora; 'Alexandru Beldie' herbarium; Turda.

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INTRODUCTION

The former Turda County covered 3,158 km² and was located in western part of Romania, in the western part of Transylvania on the Aries river valley. It was bordered by Cluj County to the north; the counties of Bihor and Arad to the west; the counties of Hunedoara and Alba to the south and the counties of Târnava Mică and Mureş to the east. Nowadays, the territory that comprised the greater part of Turda County is integrated in Cluj, Mureş and Alba counties (Figure 1). In the former Turda County we find the Bihor Mountains which still include forests of fir and spruce high in the mountains, and dense beech forests, below. Also, there are beautiful oak forests at the contact between the mountains and the plateau, on the higher hills. The 'Alexandru Beldie' herbarium was established in 1929. It is registered in the Index Herbariorum with the international BUCF code and contains approximately 40,000 plates (Vechiu and Dincă, 2019; Dincă et al., 2017). This herbarium is owned by the 'Marin Drăcea' National Institute for Research and Development in Forestry, Bucharest and comprises a multitude of plants belonging to many genera, such as: 42 species of *Alnus* genus (Dincă and Peticilă, 2019), 80 species of *Trifolium* genus (Cântar and Dincă, 2018), 17 species of *Amaranthus* genus (Dincă et al., 2018), 11 species of *Elymus* genus (Pleşca et al., 2019), 19 species of *Centaurea* genus (Dincă et al., 2017), 21 species of *Agrostis* genus (Cântar and Dincă, 2019), 36 species of *Bromus* genus (Tudor and Dincă, 2019), 7 species of *Lycopodium* genus (Vechiu et al., 2018) and 58 species of *Cornus* genus (Vechiu and Dincă, 2019). The plants were collected from various areas of the country, such as the former Vlaşca county (Ciontuand Dincă, 2019) or from the Bazoş park in Timisoara (Chisăliţă et al., 2017).

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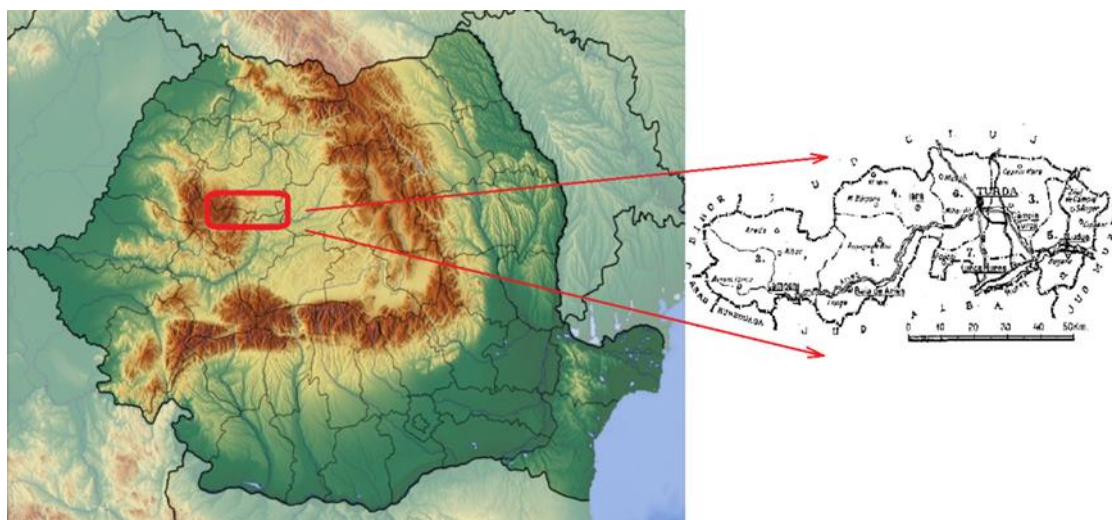


Figure 1. Map representing area of plant collection in the former Turda County (<http://romaniainterbelica.memoria.ro>)

MATERIALS AND METHODS

The database was created by researchers of the 'Marin Dracea' National Institute for Research and Development in Forestry (NIRDF) in order to update and present this valuable collection. It is a process in progress due to the high number of vouchers and the amount of time needed to complete the database. The vouchers are very fragile and each one must be handled very carefully.

We consider that this information is important and it must be known by other specialists and researchers from Romania or worldwide.

The article is based on material which consists of a number of 272 vouchers belonging to different genera in the studied area of Turda. The database was created using information written on the identification label of each voucher. Thus, the following data were taken from the labels: drawer number, voucher number, scientific name of the plant, name of the collection it belongs to, date of collection, place of collection, name of the collector and/or name of the person who identified the plant. Based on the fact that the methodology of creating the database involved the completion of each voucher, another characteristic of the database was added, namely the degree of preservation of each specimen (Table 1). Thus, a grade was given on a scale from 1 to 4 depending on the preservation quality as follows: 1 for the whole plant correctly attached to the plate and well preserved, 2 for the plant detached from the plate with existing but detached parts, 3 for the detached plant of the plant with missing parts and 4 for the detached and fragmented plant with over 50% of its components missing. Subsequently, it was verified that the scientific name is accepted internationally and it was updated according to The Plant List (<http://www.theplantlist.org>).

RESULTS AND DISCUSSIONS

As a result of the analysis of the plates of the 'Alexandru Beldie' herbarium and their systematization, 272 plates containing plants collected from the locality and the former Turda County, belonging to a number of over 100 genera, could be identified. The genera with the most representative plants collected in this area, which are found in the 'Alexandru Beldie' herbarium are: *Polygonum* (18 specimens of 12 species), *Bromus* (15 specimens belonging to 7 species), *Galium* (13 specimens of 10 species), *Trifolium* (11 specimens of 10 species) and *Artemisia* (10 specimens of 7 species). An extract regarding the systematization of the plates containing plants collected from the area of the former Turda County is exemplified in Table 1.

Artemisia campestris L., commonly known as field wormwood, belongs to the *Asteraceae* family and they are perennial herbs largely spread in the northern hemisphere with wide distribution in Europe, Asia and the arid regions of North Africa (Dib et al., 2016). Pharmacological studies reveal all ethnomedicinal uses of this herb, including anticancer, antifungal and antimicrobial as well as many other applications. Studies and research concerning the chemical composition of the different parts of *Artemisia campestris* are based on the raw extracts or essential oils (Dib et al., 2016).

The *Centaurea* genus (*Asteraceae*) is represented by more than 500 species, mostly located in the Mediterranean region and Western Asia. In recent years, a growing interest has developed in the field of biological activity of plant metabolites. Research in this area considering antimicrobial, antioxidant, cytotoxic, anti-inflammatory and other properties, is currently expanding, reporting various species to possess such biological effects. Among them, the *Centaurea* species are well known to be used in ethnomedicine (Sokovic et al., 2017). The species of *Centaurea* found

in the former Turda County are as follows: *Centaurea atropurpurea* Olivier, *Centaurea biebersteinii* DC., *Centaurea pseudo spinulosa* Borbás, *Centaurea solstitialis* L., *Centaurea spinosa* L.

Table. 1. Plants harvested from the Turda area in the collections of the ‘Alexandru Beldie’ herbarium, ‘Marin Drăcea’ National Institute for Research and Development in Forestry- extract

Drawer no.	Voucher no.	Herbar/Botanical Collection/Institution (from Herbar's label)	Name of species	Date of collection	Place of collection	Collected/ Determined by:	Preservation degree (1...4)
43	6	Al. Beldie Herbarium București	<i>Artemisia campestris</i> L.	1882.09.01	Torda	Wolff	1
44	30	Al. Beldie Herbarium București	<i>Artemisia maritima</i> L. ssp. <i>Salina</i> Willd.	1887.09.01	Torda	Wolff	2
61	110	Al. Beldie Herbarium București	<i>Bromus sterilis</i> L.	1895.06.01	Torda	Wolff	1
60	64	Museum Botanicum Universitatis Cluj	<i>Bromus commutatus</i> Schrad.	1939.06.05	distr. Turda, Băile Sărate 351 m	Todor	1
154	94	Museum Botanicum Universitatis Cluj	<i>Galium flavescens</i> Borb.	1933.07.19	distr. Turda, Cheia Turzii 500 m	Nyárády	1
154	47	Museum Botanicum Universitatis Cluj	<i>Galium boreale</i> L.	1923.06.17	distr. Turda, Borzești	Borza, Nyárády	1
126	42	Al. Beldie Herbarium București	<i>Polygonum aviculare</i> L.	1888.07.01	Torda	Wolff	1
126	37	Herbarium of Polytechnic School București	<i>Polygonum aviculare</i> L. var. <i>acutifolium</i> Schur	1887.09.01	Torda	Wolff	1
79	11	Museum Botanicum Universitatis Cluj	<i>Trifolium alpestre</i> L.	1938.06.18	distr. Turda	Cupcea, Todor	1
49	80	Museum Botanicum Universitatis Cluj	<i>Trifolium montanum</i> L.	1938.06.18	Distr. Turda, Valea Morii	Cupcea, Todor	1

Trifolium genus is very large and it includes annual and perennial species. Numerous *Trifolium* species have originated in the middle and south of Europe, North Africa and in the area ranging from the Asia Minor to China. *Trifolium* species are found throughout a wide variety of moist habitats (Temine and Necmettin, 2009). In the Turda area, botanists found five species: *Trifolium alpestre* L., *Trifolium campestre* Schreb., *Trifolium montanum* L., *Trifolium ochroleucum* Huds., *Trifolium repens* L. and *Trifolium rubens* L.

Subsequently, most of the plants collected from the Turda area which belong to the ‘Alexandru Beldie’ herbarium collections, are in good condition (Figures 2 and 3). Thus, out of the total of 272, most vouchers, 234, are in very good condition, 28 vouchers are in good condition, 7 vouchers are in poor condition and only 2 are in very poor condition. Most vouchers are kept in the original folders.

The systematization of the plants harvested from the area of the former Turda County concerning the harvesting year, within the ‘Alexandru Beldie’ herbarium, allowed the observation of the periods in which the harvesting took place and in which this geographical zone represented an important area of origin regarding the grassland development. Thus, the drawings in this area were collected between 1846 and 1950, with most of them, precisely 143, between 1882 and 1898.

Most of the approximately 180 plants from the area, which are found in the ‘Alexandru Beldie’ herbarium, were harvested by the botanist G. Wolff, who seems to have been very attached to this region. Nevertheless, in the herbarium we can also find vouchers with plants picked by other botanists such as Al. Borza, whose name is present on 23 vouchers, and E.G. Nyárády with a number of 15 vouchers. There are also other botanists who contributed with plans to the herbarium of the institute, though not to the extent mentioned above, namely: Gh. Bujorean, Tr. Săvulescu, E. Ghisa, E. Pop, P. Cretzoiu, St. Purcean, I. Todor, M. Peterfi, St. Purcean, V. Leandru, G.P. Grintescu.

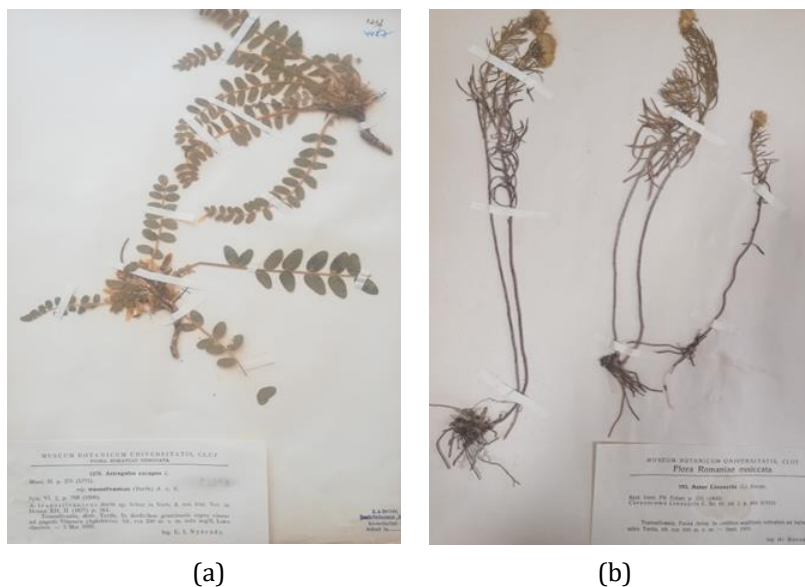


Figure 2. Plates with plants from the Turda area, located in the 'AlexandruBeldie' herbarium: (a) *Astragalus exscapus*; (b) *Aster linosyris* [lingulatus]

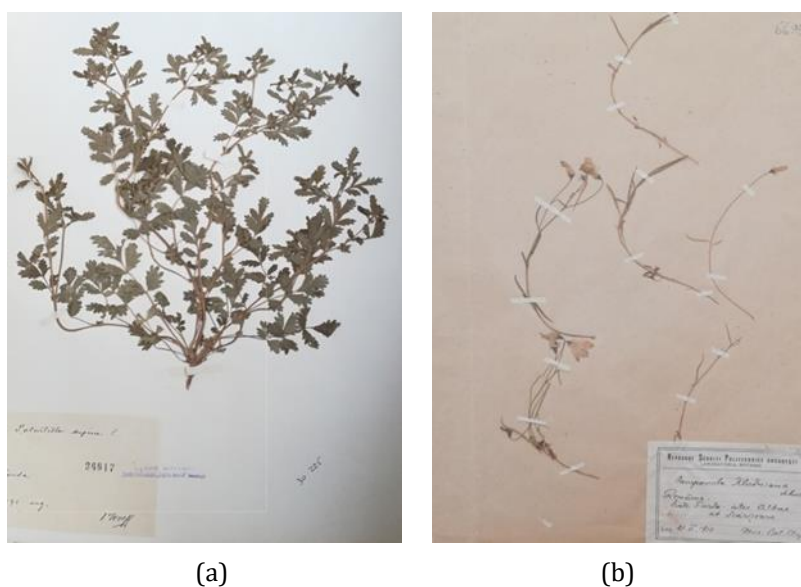


Figure 3. Plates with plants from the Turda area, extracted from the 'Alexandru Beldie' herbarium: (a) *Potentilla supina*; (b) *Campanula kladniana* [kirikkoleensis]

CONCLUSIONS

The area of Turda, as well as its surroundings which reached county or county level between 1876 and 1950, is a territory with a rich biodiversity. Consequently, it represents an important source which contributed to the development and enrichment of the 'Alexandru Beldie' herbarium of the 'Marin Drăcea' NIRDF. The plants collected in this region come from over 100 different genera of plants, most of them belonging to the *Polygonum*, *Bromus*, *Galium* and *Trifolium* genus, as the plants were collected between 1846 and 1950.

Numerous specimens of plants from Turda area can be found in the 'Alexandru Beldie' herbarium. Out of a total of 272 plants, the majority (143) were collected during 1882-1898. Even though more than 180 plates were assembled by the botanist G. Wolff, approximately 13 specialists collected plants from the forests, pastures and meadows of the former Turda County which expanded the collections of the 'Alexandru Beldie' herbarium. Information regarding these vouchers can be found at 'Marin Drăcea' NIRDF where this valuable collection is kept and it can be also accessed. To conclude, the 'Alexandru Beldie' herbarium is a valuable source of information which can be accessed by worldwide researchers and scientists in the process of scientific research, with a view to formulating and publishing academic papers.

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Conflicts of Interest

The authors declare that they do not have any conflict of interest

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