

## ORIGINAL PAPER

## THE NYÁRÁDY ERAZMUS GYULA'S HERBARIUM IN THE DEBRECEN UNIVERSITY'S PLANT COLLECTION

Katalin BARTÓK<sup>1\*</sup>, Attila TAKÁCS<sup>2</sup><sup>1</sup>Department of Taxonomy and Ecology, Babeş-Bolyai University, Romania<sup>2</sup>Department of Botany, Faculty of Science and Technology, University of Debrecen, Hungary

\*Correspondence:

Katalin BARTÓK

bartkatlen2012@yahoo.com

**Received:** 5 July 2018; **Accepted:** 10 July 2018; **Published:** 15 July 2018

**Abstract:** After the publication of the book entitled “Recollection of Gyula E. Nyárády” (2016), the interest of his inheritance increased significantly. His left behind herbarium was estimated to have 55,000 sheets (1988), while till 2016 its number increased up to 85,000. The herbarial investigations are taking place over the Romania's borders too, such as in the plant collection of the Debrecen University. With this occasion, we have studied the part collections of Rezső Soó (40,000 specimens), the Zoltán Siroki's (20,000 specimens), together with the kryptogame (3,000 bryophytes) ones. In the Debrecen University plant collection we found 166 plant species collected and determined by E. Gy. Nyárády, among them 154 are superior plant and 12 are moss. In the Soó collection 112 plants arose from E. Gy. Nyárády, 69% of them are from Slovakia, 29% from Romania and 1% from Poland. The Slovakian collections took place in the 1905-1916 period, the most of them (34 species) are from 1910, being collected in Késmárk and Tatra's region, where E. Gy. Nyárády was secondary school teacher. The Romanian collections took place in the 1905-1942 period, the 33 species mainly arise from the high mountains (especially Rodna Mountains), as well as from the Transylvanian Plain. We have found three endemic species among them: *Festuca carpathica* Dietr., *Koeleria transsilvanica* Schur (syn. *Koeleria macracantha* ssp. *transsilvanica* (Schur) A. Nyár., and *Thymus pulcherrimus* Schur. In the Siroki collection there are 42 plant sheets, originated from Slovakia, from 1908-1913 period. The four Romanian plants came from the Rodna Mountains. The Kryptogam Herbarium contains 12 Romanian moss species, collected between 1925 and 1929, most of them being from Székelyudvarhely (Odorheiu Secuiesc). The genus *Carex* occurs most frequently in the Nyárády-collection, due to his increased interest to sedges, forming 39% of the studied species. In accordance with the labels, in his collecting trips he was occasionally accompanied by Béla Husz (1911, Szepes) and Ádám Boros (1929, Korond).

**Keywords:** herbarium, collection of Rezső Soó, collection of Zoltán Siroki, Romania, Slovakia, history of botany.

## 1. Introduction

After the publication of the book entitled “Recollection of Gyula E. Nyárády” (Bartók et al., 2016), the interest on the work and inheritance of Nyárády increased significantly. The book presents in details the plant collections of Nyárády held in the Romanian

universities and museums. Based on these data the number of herbarium sheets collected by Nyárády is estimated to more than 85,000.

In this study, our aim was to conduct researches at the universities and museums beyond the borders of Romania, primarily in

Hungary, and find new materials and plant collections of Gyula E. Nyárády. At the beginning of our research we found 154 Nyárády sheets in the Móra Ferenc Museum from Szeged (disposable on the Internet), which arrived there in 1909 via exchange. These collections originate from the first decade of the 1900s. Today, the materials of the Museum and University of Szeged are owned by the Hungarian Natural History Museum, Budapest (Bartók et al., 2016). In October 2016, with the Domus Hungarica scholarship, a research was conducted in the Herbarium Carpato-Pannonicum from the Natural History Museum. This collection is not digitized, but the sheets are organized by taxonomic criteria. There is no separate collection for Gyula E. Nyárády. From the 630,000 herbarium pages found here, about 12,000 were checked, among which 98 plant taxa were collected and prepared by Nyárády. These data were digitized and the herbarium sheets were photographed. Our goal is to finish this research with a new Domus scholarship.

In the second part of the Domus scholarship (4-18 December, 2016), the research was continued with the botanical collections from the University of Debrecen. The Faculty of Humanities from this University was founded relatively late (in 1929), so their herbarium consists of a small number of sheets (under 100,000). The herbarium is composed of two parts: the vascular plant collection and the cryptogam collection. The vascular plant collection consists of 3 part collections: Rezső Soó Herbarium (RSH ~ 40,000 sheets), Zoltán Siroki Herbarium (ZSH ~ 20,000 sheets) and Árpád Degen Herbarium (ÁDH ~ 30,000 sheets); the cryptogam collection contains 3000 capsules with mosses and 2500 with lichens.

The RSH and the ZSH is digitized from 2013. Attila Takács, collaborator of the Department of Botany (Debrecen University), renewed the herbarium sheets, placed them in a

systematic order, recorded the data in a database, and photographed the sheets. All these have been the subject of his doctoral thesis (Takács, 2016).

The aims of this study were: the selection of herbarium sheets collected by Gyula E. Nyárády held at the University of Debrecen; the inclusion of the data in an electronic database; the completion of the sheets with different important collection attributes; the preparation of the photo collection about the specimens found.

## 2. Materials and Methods

The data about each specimen were recorded in a table: scientific name, exact place of collection (country, county, locality, mountains etc.), collection time (year, month, day), reviewer name, and review time (if applicable). Pictures were taken about all specimens found.

## 3. Results and discussions

In the herbarium of the University of Debrecen, 166 plants collected by Gyula E. Nyárády were found, of which 154 are vascular plants and 12 moss species (kept in capsules).

### 3.1 The Herbarium of Rezső Soó (RSH)

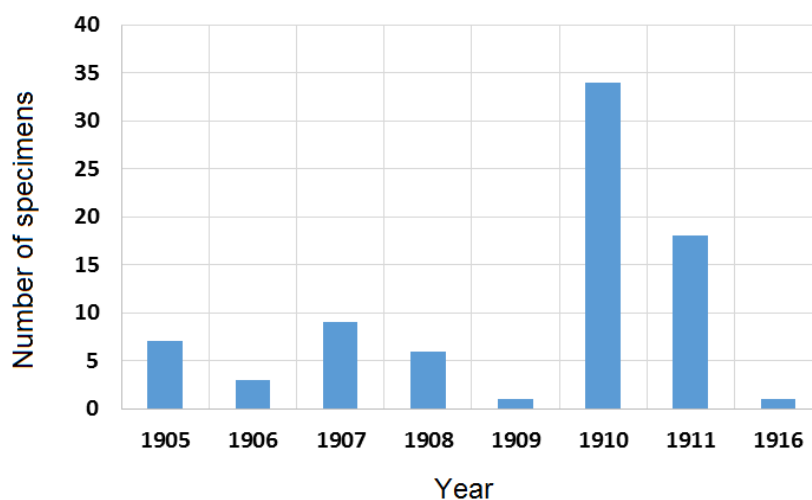
The RSH contains 112 plant sheets collected by Nyárády. The plants were collected in: Slovakia (69%, 79 sp.), Romania (29%, 33 sp.) and Poland (1%).

The material from Slovakia was collected by Nyárády between 1905 and 1919 (**Fig. 1**) when he was a secondary school teacher at Késmárk. Collection places, their meticulous description, and phenological observations of plants are found in the book "Recollection of Gyula E. Nyárády" (Chapter II/16 "Gyula E. Nyárády Self-description, life and work" p. 193-212, in Bartók et al., 2016). In his manuscripts Nyárády describes in details his

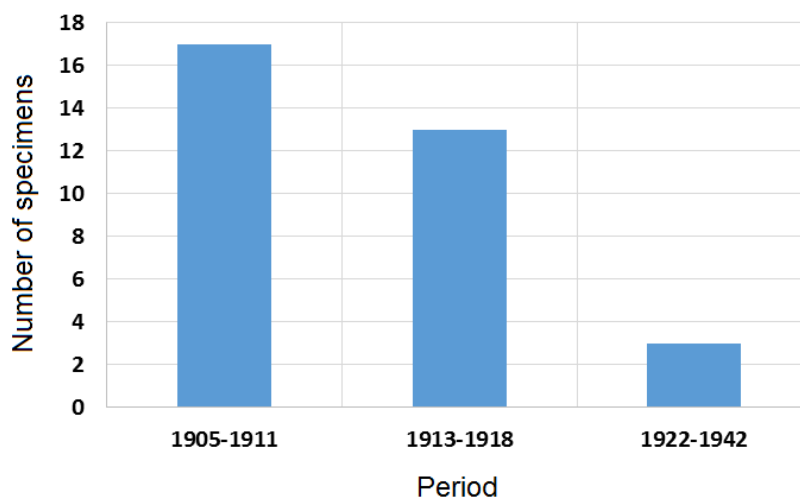
fieldtrips in Késmárk and its surroundings, the excursions in the Tatras, and the interesting plant taxa found during the fieldtrips.

The number of plants collected increases with the number of years spent in Késmárk and also with the length of the fieldtrips. While the median number of collected specimens did not exceed 5 herbarium sheets between 1905 and 1909, in 1911 their number reached 34. In the summer of 1911, he stopped being teacher in Késmárk (**Fig. 2**) and in autumn of the same year, he became teacher of the Roman Catholic Gymnasium from Marosvásárhely (Târgu Mureş), where he activated until 1922.

According to herbarium data, he returned only one time in Slovakia, in 1916, when he collected *Carex ornithopoda* W. near Bratislava. Nyárády made a statistic on his fieldtrips from the period 1905-1911 (Bartók et al., 2016, Chapter II/16, p. 204). According to this, he attended 106 trips in Késmárk and its surroundings, 59 in the High Tatras and the Low Tatras, 7 in the Western Tatras, 4 in Lőcse Mountains, 18 in Transylvania, and 1 in Bánát (Banat). Thus, in 7 years, he attended 225 fieldtrips. Would a botanist be able to do this nowadays, keeping in mind the road conditions and travel opportunities at that time?



**Fig. 1.** The number of yearly collected taxa by Nyárády in Slovakia (data from the Rezső Soó Herbarium)



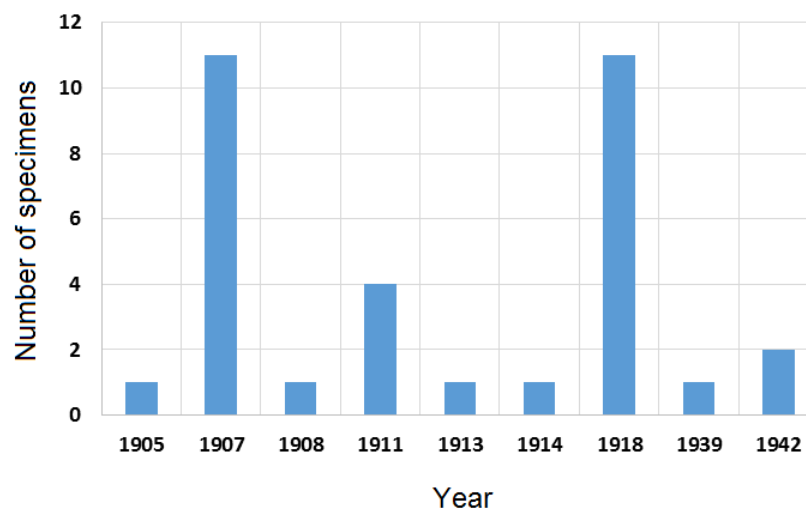
**Fig. 2.** Number of taxa collected by Nyárády during his teacher reasoning period (data from the Rezső Soó Herbarium)

According to the RSH, Nyárády collected a total of 33 plant taxa in Romania (Transylvania), between 1905 and 1942. Most plants (17 sp.) were collected in the period when he was teaching in Késmárk (1905-1911), spending the summer holidays at home, in Transylvania. From the time when he was teacher in Marosvásárhely (Târgu Mureș) (1912-1918) there are 13 herbarium sheets in the Soó-collection, while from the period 1922-1942, only 3 species were found (**Fig. 3**).

The data presented in **Fig. 1-3** do not reflect the real work of Nyárády as a botanist or the volume of his collections. It is known that between 1922 and 1942, Nyárády was the curator of University herbarium at Cluj, and it was his duty to enrich the herbarium material. During these years he traveled not only in Transylvania, but all around Romania, creating a remarkable herbarium collection. However, the RSH is almost completely lack of collections from these years. Why was not enriched this herbarium during these years? What sort of selection was made in case of those sheets which were included in the herbarium from that period? These remain unanswered questions. The majority of specimens from the RSH are collected from

high mountain area: Radnai-(Rodnei), Görgény (Gurghiu), Kelemen (Călimani), Fogarasi (Făgăraș). A smaller part was collected from the Transylvanian Plain. Three endemic species were found. Their accepted scientific names and conservation status were checked in Flora Europaea, List of Plant, certain internationally accepted technical books etc., and also in the latest Romanian botanical works (Ciocârlan 2009, Sârbu et al., 2013). First the name of the species found in the RSH is mentioned, followed by the valid synonym utilized today:

- *Festuca carpathica* F. Dietr. (Ciocârlan 2009; Sârbu et al. 2013); syn. *Leuceopea carpathica* (F. Dietr.) H. Scholz (Flora Europaea)-scientific name not used by Sârbu and Ciocârlan; Carpathian endemic present in Romania, Poland, Slovakia, Ukraine;
- *Koeleria transsilvanica* Schur.; syn. *Koeleria macrantha* ssp. *transsilvanica* (Schur) A. Nyár. (Ciocârlan, 2009; Sârbu et al. 2013; Flora Europaea), Endemic in Romania-R (Rare);
- *Thymus pulcherrimus* Schur. (Ciocârlan 2009; Sârbu et al., 2013; Flora Europaea). Carpathian endemic present in Romania, Poland, Czech Republic, Ukraine-R (Rare).

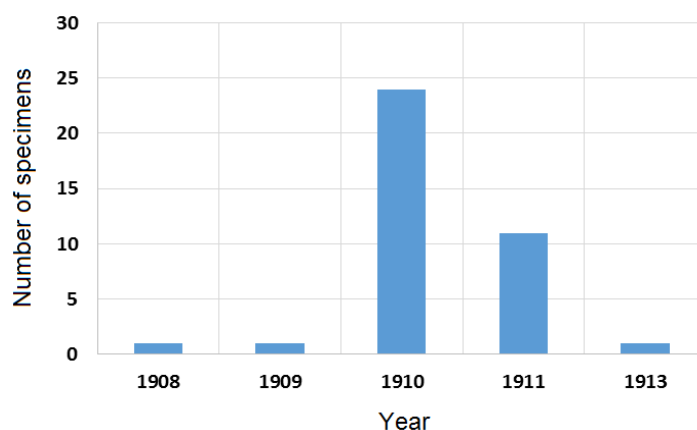


**Fig. 3.** The number of yearly collected specimens by Nyárády in Transylvania (data from the Rezsó Soó Herbarium)

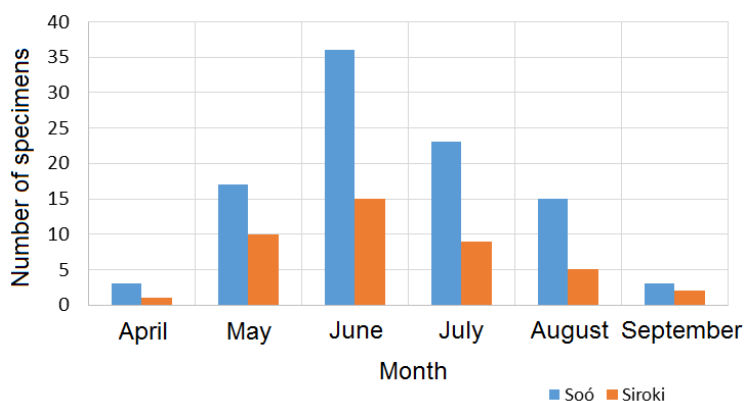
### 3.2 The Herbarium of Zoltán Siróki (ZSH)

Zoltán Siróki (1906-1987), ornithologist-botanist, agricultural engineer, is well-known in Debrecen, since his last workplace was at the Agricultural Academy of Debrecen, Department of Biology, where he was an associate professor. Zoltán Siróki is not known in Transylvania, so a few words about his activity will be noted. When he retired, he became preoccupied to study the Department's plant collection. With his successor, György Mándy, he accepted the entire herbarium of the former Seed Testing Station of Budapest, which was formed under Árpád Degen's board. It is likely that the species collected by Nyárády found in the ZSH are from the Degen-collection. These are kept by the Herbarium of the University of Debrecen. In the ZSH 42

species collected and preserved by Nyárády were found. From Slovakia were collected up to 90% (38 species) of the species, in the period 1908-1913. The herbarium sheets dating from 1910 are in higher number (24). The remaining sheets (11) are from 1911 (**Fig. 4**). There are only 4 sheets from Romania: *Carex pyreneica* Whlbg. (the same species from two collection points, dating from 22 July, 1909) from the Zănoaga Lake, Retezat Mountain; *Ranunculus crenatus* W. et K. from the Rodna Mountains, near Ünökő (Ineu), dating from 8 July, 1918; *Daphne mezereum* L. from Răstolița, Mureș Valley, dating from 7 June, 1914. When the number of plant species is observed as a function of collecting time (**Fig. 5**), the month of June is the most favorable for both collections (RSH-36 and SZH-15 collected specimens) (**Fig. 6**).



**Fig. 4.** The number of yearly collected specimens in Slovakia (data from the Zoltán Siroki Herbarium)



**Fig. 5.** Number of specimens in function of collecting time (months)

It should be also mentioned that in the ZSH 29 plants belonging to the *Carex* genus were found (collected in different locations), while in the RSH 31 species. There are a total of 60 sheets with *Carex* species in the herbarium from Debrecen, which represents 39% of the entire collection. Nyárády's special interest for the sedge species had resulted in the discovery of *Carex chordorrhiza* in 1910, in the area of Késmárk, a new species identified in the Carpathians. The discovery was reported in 1911, in the periodical Magyar Botanikai Lapok (Nyárády, 1911; Bartók et al., 2016). His interest for sedges remained, so later in 1962 he published an article on *Caricetum humilis* phytocoenosis, from Transylvania and Moldova.

### 3.3 The cryptogam collection

Of the 3000 moss species from the cryptogam collection only 12 were collected by Gyula E. Nyárády, between 1925 and 1929. These species were all collected from Romania (Transylvania):

- 8 species near Székelyudvarhely (Odorheiu Secuiesc, Harghita County) from different humid areas (Tolvajos rivulet, Festőmalom, Lucs, Oroszhegy);
- two species from the area around Gyergyóalfalu (Joseni, Harghita County).

These collections can be related with the foundation of the Department of Natural Sciences of the Székely National Museum from Sepsiszentgyörgy (Sfântu Gheorghe). The basis of the newly formed department consisted of vascular plants and cryptogam species collected, determined and donated to the Museum by Gyula E. Nyárády. The results of his botanical researches from Szeklerland have appeared in several works in 1929, for example: in the Memorial Book of the Sepsiszentgyörgyi Museum, Csíki Lapok, Ifjú Erdély, Pásztortűz (Bartók et al., 2016).

### 3.4 The Herbarium of Árpád Degen (ÁDH)

This part of the collection is not digitalized, so we had great hopes that we will find plant sheets collected by Gyula E. Nyárády. It is known (Bartók et al, 2016) that Degen, during a study trip around Késmárk, has discovered in Nyárády a young and novice teacher. The friendship and collegiality between the two botanists lasted until the death of Degen. Nyárády remembers Degen as his mentor, who helped greatly to define plants with dubious status. So it is impossible that there would be no exchange or gift making between them with the collected plants.

Unfortunately, we did not find any herbarium sheets from Nyárády in ÁDH, although we have reviewed many plant genera (*Poa*, *Nardus*, *Bromus*, *Lolium*, *Campanula*, *Solidago*, *Phyteuma*, *Bellis*) and families (Asteraceae, Rosaceae, Orchidraceae).

The Degen Herbarium, which we have reviewed, is from the second half of the 1800's, so it is made up of more than 150 years old plant sheets. The collectors were not Hungarians. We mention some of them: Richter (1876), Kugler (1882), Schultz (1861), Border (1879) etc. At that time Nyárády was not even born.

### Conclusions

It passed more than 50 years since the death of the great botanist Gyula E. Nyárády, although his work, his spread herbarium is still not fully known. The size of his herbarium from Romania is known, only accidental discoveries could increase the number of these herbarium sheets. We are currently searching for his herbarium sheets beyond the borders of Romania. Thus the purpose of our study was to explore the herbarium of the University of Debrecen. A total of 166 plants were found in the Rezső Soó Herbarium (RSH), Siroki Zoltán

Herbarium (ZSH), and in the cryptogam collection: 154 vascular plants and 12 moss species. There are 112 plants in the RSH, 42 in the ZSH. Both herbariums are dominated by the specimens collected in Slovakia (77 and 38, respectively), and the month of June was the preferred collection time. In the list of plants collected from Romania, three endemic species of Transylvania were found. Nyárády was very interested in the *Carex* genus, so in his collection 39% of the vascular plants are different sedge species.

### Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

### Acknowledgments

This work was supported by the scholarship of MTA Domus Hungarica. Funding was made by the Hungarian Ministry of Human Resources, New National Excellence Program ÚNKP-17-4.



**Fig. 6.** Herbarium sheets of Gyula E. Nyárády from the University of Debrecen: **A**-*Athyrium alpestre* (Tatras, 4 February, 1907); **B**-*Carex atrata* (Bélai Mountains, 29 June, 1910); **C**-*Ranunculus dentatus* (Călimani Mountains, 20 May, 1918); **D**-*Aster alpinus* (Szádélői Valley, 3 June, 1911).

## References

1. Bartók K (ed.) (2016) Nyárády Erazmus Gyula emlékezete. Kriterion Kiadó, Kolozsvár
2. Ciocârlan V (2009) Flora ilustrată a României. Pteridophyta et Spermatophyta. Ed. Ceres, București
3. Nyárády E Gy (1911) A *Carex chordorrhiza* Ehrb. felfedezése Magyarországon Késmárk környékén, a Magas Tátrában. MBL 10:1–76
4. Nyárády E J (1962) Fitocenoza de Caricetum humilis din Transilvania și Moldova. SCB 13(2):185–189
5. Pap L, Lisztes-Szabó Zs (2015) Siroki Zoltán (1906–1987) emlékezete. Kitaibelia 20(1):3–14S
6. Sârbu I, Ștefan N, Oprea A (2013) Plante vasculare din România. Determinator ilustrat de teren, Ed. Victor B. Victor, București
7. Takács A (2016) Esettanulmányok herbáriumok aktuális botanikai kutatásokban betöltött szerepéről. Egyetemi doktori (PhD) értekezés. Debreceni Egyetem, Természettudományi Doktori Tanács, Juhász-Nagy Pál Doktori Iskola, Debrecen
8. Takács A, Nagy T, Fekete R, Lovas-Kiss Á, Ljubka T, Löki V, Lisztes-Szabó Zs, Molnár VA (2014) A Debreceni Egyetem Herbárium (DE) I.: A „Soó Rezső Herbárium”. Kitaibelia 19 (1):142–155
9. Takács A, Süveges K, Ljubka T, Löki V, Lisztes-Szabó Zs, Molnár VA (2015) A Debreceni Egyetem Herbárium (DE) II.: A „Siroki Zoltán Herbárium”. Kitaibelia 20 (1):15–22