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COLLECTIONS OF INVESTIGATORS OF XIX CENTURY HUNGARIAN FLORA IN E.E. LINDEMANN'S HERBARIUM (MSUD)

Life of outstanding Hungarian investigators of flora was described and geography their scientific collections was analysed. The main attention was paid to herbarium collections, gathered or identified by A. Tauscher, V. Borbas, V. Janka in XIX century, which are components of E. E. Lindemann's herbarium – a valuable historical herbarium of Odesa Mechnykov National University (MSUD) included into the list of objects, which represent national property of Ukraine. The species from MSUD collection, collected and identified by the named scientists, are presented.

Key words: herbarium, MSUD, collection, Hungarian investigators, A. Tauscher, V. Borbas, V. Janka

In the herbarium's collection of E. E. Lindemann, which is a part of MSUD herbarium, there are plants from different regions of the earth. Eduard Emanuelovich Lindemann (1825-1901), a well-known systematic botanist and florist, as a collector, not only collected and described herbarium samples but also actively exchanged with other herbariums, thus the list of collection authors contains more than 800 names (<http://news.onu.edu.ua/eng/treasures/single/11>) [1]. However, most herbarium sheets are from Europe. Many of them belong to investigators from the Austria-Hungarian Empire of XIX century: A. Tauscher, V. Borbas, and V. Janka, which have the most specimens [2, 3]. Our work was aimed at choosing in the herbarium of E. E. Lindemann and analyzing collections of the investigators, who studied Hungarian flora, describing their role in the investigation of the said flora, and emphasizing their main life events. Besides the indicated scientists, there are herbarium specimens of L. Vagner from Marmarosh (*Gentiana pyrenaica* L., *Sedum hispanicum* L., *Saxifraga pedemontana* All.), J.F. Freyn from Tatry and Hungary (*Dianthus glacialis* Haenke, *Cerastium alpinum* L., *Alsine glomerata* Fent.), Cardinal Dr. J. Haynseld from Transylvania (*Bruchenthalia spiculifolia* Reichb. and *Gallium capillipes* Reichb.), A. Schneller (*Allium ursinum* L., *Urtica radicans* Balla), L. Richter (*Lepidium perfoliatum* L. β *simplex mini*, *Serratula radiata* M.B.), Janos Kunstr (*Fritillaria Meleagris* L.), and P.P. Wierzbicki (*Bupleurum gerardia* Jacq, *Valeriana sudetia* W.),

in addition to the mentioned ones there are unidentified collectors: Vralolyi (*Alsine setacea* Mert.et Koch. γ *pubescens* Fenzl.) and Simkovich (*Micropus conizaensis* Dubois) from Hungaria.

Materials and methods

As the materials for investigation served the herbarium collections of famous Hungarian investigators of flora A. Tauscher, V. Borbas, and V. Janka, which are a part of historical E.E. Lindemann's herbarium collection. The biographical materials of those scientists and considerable facts from their life were presented.

The herbarium sheets, gathered or identified by those scientists in the XIX century in different parts of Hungaria, Europe, and also Asia were analyzed. The names of plants, their taxonomy are presented in accordance with the terminology of those times. The names of settlements are quoted from the information on the labels. In the work classical generally known methods of herbarium collection analysis were used.

Research result and discussion

The major part of the collection from Hungaria belongs to Gyula Ágoston (Julius August) Tauscher (08.01.1833-16.03.1882), who was a famous doctor and botanists [fig.1]. There is no information about his secondary education. In 1851 he became a student of medical faculty of Pest University. His study was interrupted by the war on Sardinia. In 1861, he became a medical doctor, who first worked in Tarnaori and from 1867 with Doctor Simon Georg Erch - in Ersch. In 1874 due to his active work, he became the principal doctor of the company. The significant scientific investigation allowed him to become a famous Hungarian scientist.



Fig.1 Gyula Ágoston (Julius August) Tauscher [5]

He published two books: "Flora of Czepel" and "Flora of Transsilvania" in contact with famous scientists E. Halashi, L. Reichenbach, A. Kerner von Marylaun.

As a specialist on studying Caryophyllaceae family he published the description of genus *Scleranthus* in Austrian Botanical Journal No 22 (1872) and No 24 (1874) - article "To flora of Hungary." He was inspired by Salamon Peten to also investigate in the field of ornithology. In 1862, he became a member of the Hungarian Academy of Sciences [4, 7, 8].

In table 1, G. Tauscher collection from Czepel (1871-1872) is presented in systematical order of his time.

Table 1

Systematical list of herbarium' collection of G. Tauscher

NN	Family	Quantity of		
		genera	species	forms
1	Aceraceae	1	1	
2	Amarylidaceae	1	1	
3	Boraginaceae	2	2	
4	Caesalpiniaceae	1	1	
5	Campanulaceae	1	2	
6	Caryophyllaceae	7	12	
7	Celastraceae	1	1	
8	Chenopodiaceae	5	5	1
9	Compositae	15	22	1
10	Crassulaceae	1	1	
11	Cruciferae	7	8	1
12	Gramineae	3	3	1
13	Juncaginaceae	1	1	
14	Labiatae	6	7	2
15	Leguminosae	4	9	
16	Liliaceae	1	4	2
17	Limoniaceae	1	1	
18	Lythraceae	1	1	
19	Malvaceae	1	1	
20	Melantiaceae	1	1	
21	Oleaceae	1	1	
22	Plantaginaceae	1	1	
23	Ranunculaceae	4	5	
24	Resedaceae	1	2	
25	Rosaceae	1	1	
26	Rubiaceae	1	1	
27	Salicaceae	1	1	
28	Santalaceae	1	1	
29	Saxifragaceae	1	1	
30	Scrophulariaceae	2	2	
31	Simaroubaceae	1	1	
32	Solanaceae	1	1	
33	Umbelliferae	3	4	
34	Urticaceae	1	1	
35	Violaceae	1	1	

In the herbarium, there are 112 herbarium sheets of 109 species and eight forms of plants from Magnoliophyta, which belong to 82 genera and 35 families. The most species there are in Compositae (Asteraceae) (15 g. 22 sp.), Caryophyllaceae (7 g. 12 sp.), Leguminosae (Fabaceae) (4 g. 9 sp.), Cruciferae (Brassicaceae) (7 g. 8 sp.), Labiatae (Lamiaceae) (6g. 7 sp.), Chenopodiaceae (5 g. 5 sp.), Ranunculaceae (4 g. 5 sp.), Umbelliferae (Apiaceae) (3 g. 4 sp.), Liliaceae (1 g. 4 sp.), Gramineae (Poaceae) (3 g. 3 sp.). Boraginaceae and Scrophulariaceae have two genera and two species, one genus and two species – Campanulaceae and Resedaceae. 21 families have one species.

The biggest genera are *Scleranthus* (5 sp.), *Allium* (4 sp.), *Astragalus*, *Cytisus*, *Inula*, *Senecio* (3 sp.). There are 10 genera with with two species. We must indicate that between species of *Scleranthus*, which are in this herbarium, three species were identified by L. Reichenbach, and one received his name in honor of Tauscher: *S. biennis* Reutrm., *S. dichotomus* Horng., *S. stipatus* Reichb., *S. tauscheri* Reichb., *S. tenellus* Reichb. (syn. *S. verticillatus* Tauscher, 1829)

Among the herbarium species the name of Tauscher was given to *Centaurea tauscheri* Kern. (which was gathered on 2.08.1872 by Tauscher in Pest) and *Aegilops tauschii* Coss. (syn. *A. squarrosa* L.), which was gathered in Caucasus by Medvedev. Among the species, defined by Tauscher, we indicated *Marrubium reichardtii* Tausch. [Fig. 2.], *Bromus brachystachys* Horng. (syn. *B. aegypticus* Tausch.), *Ribes multiflorum* Kit. (syn. *R. urceolatum* Tausch.).

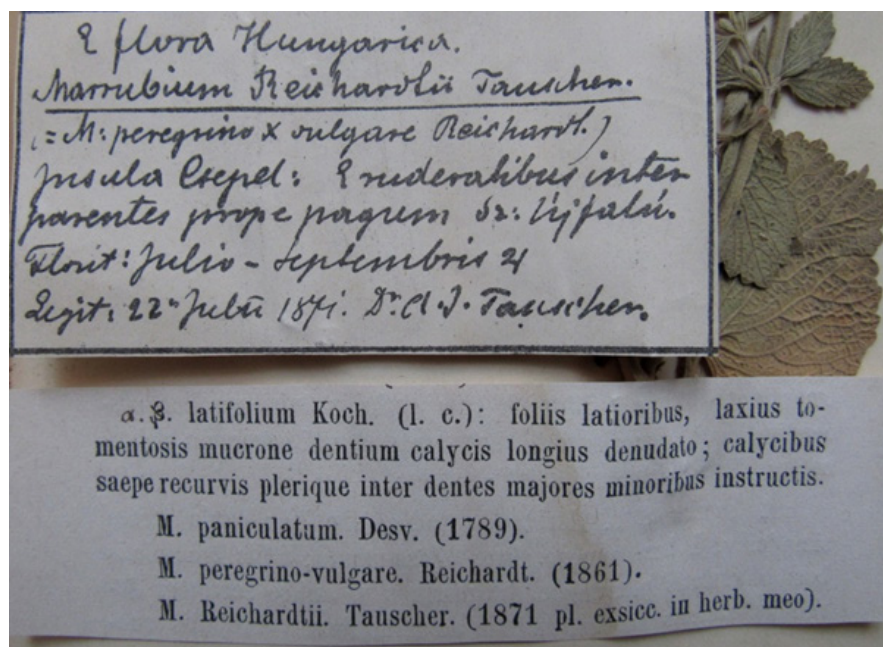


Fig. 2. Label of *Marrubium Reichardtii* Tauscher (1871), which was collected by A. Tauscher 22 July 1871 in Czepel

Vince Borbas von Deiter (29.07.1844-7.07.1905) – Hungarian doctor, botanist and philologist [fig. 3].

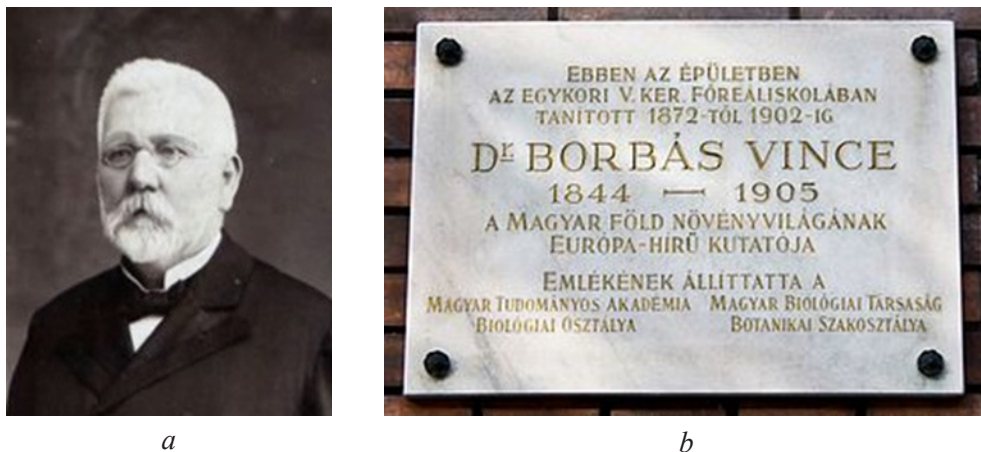


Fig. 3. a. Vince Borbas von Deiter. b. Memorial plaque on the school, where he was a teacher in 1872-1902 [9]

He was born and lived firstly in poverty, so everything that he achieved in his life he realized himself. In 1860, he graduated from a gymnasium and in 1868 became a student of Budapest University, where in 1871 he became an assistant of botany professor Layosh Urania. In 1874, he received the rank of a doctor of philosophy. In 1874 - 1875 he worked with famous systematics scientists Alexander Braun in Berlin and Anton Kerner in Innsbruck. In 1880 he became a doctor of technical sciences and in 1898 – an extraordinary professor. In the same time in 1872-1902 he worked as a teacher of a real school in Budapest [fig.3, b]. He regularly investigated the flora of different parts of Hungary. In 1902, he became a Cluj university professor and director of the botanical garden, where he worked to the end of his life. He named 101 plant species, for example, *Acer bedoi* Borbas, *Heliotropium gymnocarpum* Borbas etc.

In the herbarium on the 69 sheets, there are 1873-1888 collections mainly from Walachia. Their systematical list is presented in table 2.

In table 2 there are plants, which belong to 61 species and 3 forms from 44 genera, 22 families, three classes: Polypodiopsida, Liliopsida and Magnoliopsida and two sections: Polypodiophyta and Magnoliophyta. The greatest quantity of species are in Compositae (Asteraceae) (11 g. 13 sp.), Caryophyllaceae (4 g. 10 sp.), Leguminosae (Fabaceae) (7 g. 9 sp.), а також Campanulaceae (2 g. 4 sp.), Liliaceae, Labiatae (Lamiaceae) (3 g. 3 sp.), Cruciferae (Brassicaceae), Saxifragaceae, Valerianaceae (2 sp.). There are 13 families with one species. The genus *Scleranthus* is biggest on with 6 species, which were identified by Reichenbach or named in his honor: *Scleranthus galescens* Reichb., *S. juvenis* Rchb., *S. Neogradensis* Reichb.,

S. Reichenbachii Taush., *S. subbracteatus* Rscb., *S. valachius* Reichb. There is one genus with three species *Cytisus*: *Cytisus leucotrichus* Kit., *C. procumbens* Lpr., *C. supinus* L. and 6 genera with 2 species: *Achillea*, *Alsine*, *Artemisia*, *Cerastium*, *Saxifraga*, *Valerianella*.

In fig. 4 there is the label of *Picris pyrenaica* L., which was gathered on August 6, 1873 by Borbas in the shady forests (*Silvio umbrosio*) of flora Banatica.

Table 2

Systematical list of plants from V. Borbas' herbarium

NN	Family	Quantity of		
		genera	species	forms
1	Aspidiaceae	1	1	
2	Aspleniaceae	1	1	
3	Campanulaceae	2	4	
4	Caryophyllaceae	4	10	
5	Compositae	11	13	2
6	Crassulaceae	1	1	
7	Cruciferae	2	2	
8	Euphorbiaceae	1	1	
9	Fagaceae	1	1	
10	Iridaceae	1	1	
11	Labiatae	3	3	
12	Leguminosae	7	9	1
13	Liliaceae	3	3	
14	Melantiaceae	1	1	
15	Ranunculaceae	1	1	
16	Rosaceae	1	1	
17	Rubiaceae	1	1	
18	Saxifragaceae	1	2	
19	Scrophulariaceae	1	1	
20	Umbelliferae	1	1	
21	Valerianaceae	1	2	
22	Violaceae	1	1	

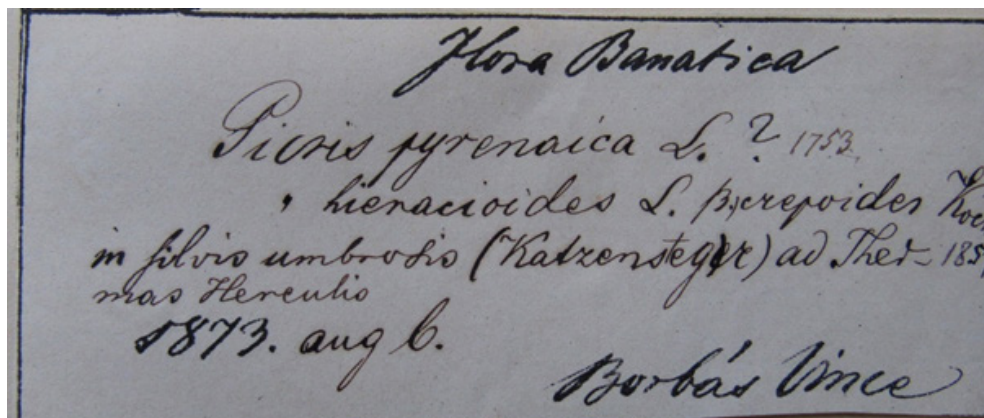


Fig. 4. Label of *Picris pyrenaica* L., collected by Borbas in 1873



Fig. 5. Victor Janka von Bulcs

Victor Janka von Bulcs (24.12.1837–8.08.1890) – Austrian military officer and botanist [fig.5].

He was born in Vienna, served as an officer in a cuirassier regiment of Austrian Emperor's army. After resigning, he became the curator of the botanical section of Budapest National Museum, where he worked till 1889. He gathered many plants in Austria-Hungarian Empire, which now are in herbarium of Romanian university in Babes-Bolyai [6], identified and described some species of plants, including *Colchicum hungaricum* Janka. His name was given to relict genus *Jankea*, and such species as - *Himantoglossum jankae* and *Chamaecytisus jankae*. In table 3 there is systematical spectrum of plants, collected by him and included into MSUD herbarium.

The collection of plants in MSUD, gathered by V. Janka are on the 15 herbarium sheets, they belong to 8 families, 10 genera, 14 species. There is genus with three species *Dianthus* (*D. aridus* Griseb., *D. pinifolius* Sm., *D. viscidus* Bor.et Chaub.) and genus with two species: *Achillea* and *Hypericum*.

We indicated the species, which were identified by V. Janka, but gathered in other places: *Achillea sericea* Janka (which was gathered in 1865 in Serbia) and *Prim-*

ula frondosa Janka (which was gathered in 1871 in Turkey)[6] etc. It is necessary to draw the main attention to *Achillea pseudopectinata* Janka, which was gathered 12.06.1871, and received his name in 1871.

Table 3

Systematical spectrum of plants, gathered by V. Janka in 1865-1871

NN	Family	Quantity of	
		genera	Species
1	Caryophyllaceae	2	4
2	Campanulaceae	1	1
3	Compositae	2	3
4	Boraginaceae	1	1
5	Guttiferae	1	2
6	Leguminosae	1	1
7	Primulaceae	1	1
8	Rubiaceae	1	1



Fig. 6. Herbal sheet and label of *Primula frondosa* Janka (autotypus), which was collected by V. Janka in 1871

Among the species, identified by V. Janka, but gathered by other investigators, there are *Euphorbia fragifera* Jan. – species, which was gathered by Buhse in Triest and *Melica ciliata* L.var., which is a synonym of *M. Magnolii* Janka.

Conclusion

So, in E.E. Lindemann's herbarium collection in MSUD there are 200 species, which were gathered in XIX cent. by investigators of Hungarian flora. The greatest quantity belongs to G.Tauscher, V. Borbas and V. Janka. These historical herbarium samples can be used to study the changes in the flora of Europe, the study of climate change, as well as the dynamics of the genetic diversity of populations. The stored samples can be used as autotypes to clarify scientific priority and understand the volume of taxa.

Стаття надійшла до редакції 25.03.2020

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ЗБОРИ ДОСЛІДНИКІВ УГОРСЬКОЇ ФЛОРИ XIX СТ. У ГЕРБАРІЇ Е.Е. ЛІНДЕМАННА (MSUD)

Резюме

Вступ. Гербарна колекція кафедри ботаніки Одеського національного університету імені І. І. Мечникова (MSUD) представлена низкою іменних колекцій визначних вчених-ботаніків XIX-XX століття. Окреме місце серед них має гербарій Е. Е. Ліндеманна (1825-1901), у матеріалах якого, окрім рослин власноруч зібраних та визначених колектором, зберігаються гербарні збори більш ніж 800 вчених-ботаніків, що були отримані внаслідок гербарного обміну. **Метою** роботи було виділити з гербарію Е. Ліндеманна та проаналізувати збори угорських дослідників, охарактеризувати їх роль у вивченні регіональної флори та окремих таксонів, підкреслити основні події в біографії вчених.

Результати. Назви рослин та їх систематику подано за термінологією того часу. Прив'язка до географічних пунктів здійснювалася відповідно до тексту етикеток. В дослідженні використовувалися основні загальновідомі методи аналізу гербарних колекцій та літературних джерел. Значна частка гербарних зразків з колекції Е. Ліндеманна, зібраних у різних куточках Угорщини (а також інших регіонів Європи та Азії), належить дослідникам з Австро-Угорської імперії XIX ст.: А. Таушеру, В. Борбасу та В. Янці. В статті коротко охарактеризовано їх життєвий шлях і вказано види, зібрані і визначені ними. Окрім цих дослідників зустрічаються гербарні збори Л. Вагнера з Мармарошу (L. Vagner), Й. Ф. Фрейна з Тарту та Угорщини (J. F. Freyn), Кардинала доктора Й. Гайнсельда з Трансільванії (Cardinal Dr. J. Haynseld), О. Шнеллера (A. Schneller), Л. Ріхтера (L. Richter), Яноса Кунстра (Janos Kunstr) та П. П. Вержбицького (P. P. Wierzbicki), окрім цього є неідентифіковані нами колектори: Vralolyi та Simkovich.

Заключення. З колекції Е. Ліндеманна було виділено та проаналізовано понад 200 видів рослин, зібраних угорськими вченими, що може бути використано при виявленні змін у флорі Європи, вивченні впливу клімату, динаміки генетичного розмаїття популяцій, тощо. Також перспективним напрямком гербарних досліджень є виявлення та дослідження аутотипів з метою встановлення наукового пріоритету в описі виду та обсягу авторського розуміння таксонів.

Ключові слова: гербарій, MSUD, колекції, угорські дослідники, А. Таушер, В. Борбас, В. Янка

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