CYTISUS PLANTS CONSERVED IN ”ALEXANDRU BELDIE” HERBARIUM

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Abstract. *The present article analyses the plant species belonging to the Cytisus Genus and present in Al. Beldie Herbarium from Marin Drăcea National Institute for Research and Development in Forestry (INCDS), Bucharest. This Herbarium is registered in Index Herbariorum and contains over 40 000 vouchers. Cytisus Genus belongs to the Fabaceae Family which contains over 490 plant species with medicinal properties. The species from this Genus are cultivated both for their ornamental aspect as well as for their bioactive properties. The Genus is present in Europe, Asia, North Africa and South Africa. Among the species present in the Herbarium we mention: Cytisus nigricans L., Cytisus hirsutus L., Cytisus elongatus Waldst. & Kit., Cytisus albus., Cytisus albus Hacq., Cytisus austriacus L., Cytisus falcatus Waldst. & Kit., Cytisus leucotrichus L., Cytisus leucanthus Waldst. & Kit., Cytisus heuffelii Wierzb. etc. These plants were gathered from all over Romania as well as from abroad by renowned specialists such as Al. Beldie, P. Cretzoiu, G. P. Grințescu, St. Purcelean, At. Haralamb, Al. Borza, C.C. Georgescu, S. Paşcovschi, I. Pop, I. Prodan, A. Richter, Wolff, E. Reverchon and E.I. Nyárády. The data from each voucher include the name of the species, the harvesting year, the harvesting place, the person who has collected them as well as their conservation degree. The plants were gathered over 140 years, from 1850 until 1990. The oldest plant dates back to 1852, while the majority of them were harvested in the period 1930-1939. The most number of species from this Genus were collected from Romania, namely from Argeş, Bihor, Ilfov, Bistrița Năsăud, Caraș Severin, Dolj, Mureș, Sibiu, Brașov and Cluj counties. A small number of species were gathered from Europe, especially from France, Hungary and Italy. The plants were kept in good conditions so that their conservation degree is very good.*

Keywords*: Cytisus, herbarium, plants*

INTRODUCTION

Cytisus Genus belongs to the *Fabaceae* Family, *Fabales* Order and contains approximately 80 species widespread in Eurasia, North and South Africa. The species from this Genus are cultivated for ornamental purposes, as well as for their bioactive properties (MEYER, S.E. 2008, PEREIRA O. R., *ET AL*. 2012). Cytisus is derived from the Greek word ”kutisos”, that refers to a shrubby clover (PETERSON, D. J. AND PRASAD, R. 1998). The *Fabaceae* Family contains over 490 plant species that have medicinal properties (GAO, T *ET AL*., 2010).

”Alexandru Beldie” Herbarium is located in Bucharest, within the “Marin Drăcea” National Institute for Research and Development in Forestry. The Herbarium contains approximately 40.000 vouchers and is inscribed in Index Herbariorum (CHISĂLIȚĂ, *ET AL*., 2017; VECHIU *ET AL*., 2018).

The Herbarium contains: 69 *Potentilla* genus species (CRIȘAN, V. *ET AL*,, 2017), 19 *Androsace* species (DINCĂ, M. *ET AL*., 2017), 15 *Ornitogalum* species (ENESCU, R. *ET AL*, 2017), 19 *Centaurea* species (DINCĂ L., *ET AL*. 2017A), 16 *Abies* species (ENESCU, C *ET AL*., 2018), 112 *Hieracium* species (DINCĂ L., *ET AL*., 2017b), 32 *Arabis* species (DINCĂ L., *ET AL*., 2017c), 29 *Allysum* species (CÂNTAR , I. *ET AL*, 2018), and 19 *Scorzonera* species (DINCĂ L. AND CÂNTAR I.C. 2017).

MATERIAL AND METHODS

The present study was based on the 210 vouchers from the “Al. Beldie” Herbarium that belong to the *Cytisus* Genus. The data from each voucher (namely species, harvesting year

and place, the person who has gathered them and their conservation degree) were introduced in a data base. The following table presents an excerpt of the *Cytisus* inventory (Table 1).

Table 1

Cytisus inventory (excerpt from the data base)

Drawer no	Plate no	Herbarium/ Botanic collection/ Institution	Species name	Harvesting date	Harvesting place	Collected/ Determined by:	Conservation Degree (1..4)
58	1	Botanic Laboratory Herbarium, Bucharest Polytechnics School	*Cytisus aggregatus* Schur.	1931.07.09.	Hunedoara	P. Cretzoiu	2
58	34	ICEF, Forest Research and Experimentation Institute	*Cytisus austriacus* L.	1942.10.26.	Buzau	C.C. Georgescu	3
61	17	ICEF, Forest Research and Experimentation Institute	*Cytisus hirsutus* L.	1944.06.07.	Valea Popii, Muscel	At. Haralamb, M. Ciuca	1
61	50	ICEF, Forest Research and Experimentation Institute	*Cytisus leucotrichus* Schur	1943.06.19.	Severin	S. Pascovschi	1
59	7	ICEF, Forest Research and Experimentation Institute	*Cytisus nigricans* L.	1935.09.18.	Trei Izvoare	At. Haralamb	1
59	15	ICEF, Forest Research and Experimentation Institute	*Cytisus nigricans* L.	1935.06.29.	Vrancea Valea Sarii	At. Haralamb	4
58	7	ICEF, Forest Research and Experimentation Institute	*Cytisus albus* Hacq.	1936.06.10.	Valea Nehoiasului Buzau	At. Haralamb si Al. Beldie	1

RESULTS AND DISCUSSIONS

”Al. Beldie” Herbarium contains the following species belonging to the *Cytisus* Genus: *Cytisus aggregatus* Schur., *Cytisus albus* Hacq., *Cytisus alpestris* Schur., *Cytisus austriacus* L., *Cytisus capitatus* Scop., *Cytisus creticus* Boiss. & Heldr., *Cytisus elongatus* Waldst. & Kit., *Cytisus falcatus* Waldst. & Kit., *Cytisus fontanessii* Ball., *Cytisus glaber* L.f., *Cytisus heterochrous* Colmeiro, *Cytisus heuffelii* Wierzb., *Cytisus hirsutus* L., *Cytisus kerneri* Blocki., Cytisus leiocarpus A. Kern., Cytisus leucanthus Waldst. & Kit., Cytisus leucotrichus L., *Cytisus monspeliensis*, *Cytisus monspessulanus* L., *Cytisus nigricans* L., *Cytisus procumbens* (Willd.) Spreng., *Cytisus purpureus* Scop., *Cytisus ramentaceus* Sieber., *Cytisus ratisbonensis* Schaeff., *Cytisus rhodopaeus* Wagner, *Cytisus rochelii* Wierzb., *Cytisus sessilifolius* L. and *Cytisus triflorus* L.

Figure number 1 presents the percentages of *Cytisus* species. As such, the most common species are *Cytisus nigricans* L. (31 %), *Cytisus leucotrichus* L. (20 %) and *Cytisus austriacus* L. (11.4 %), *Cytisus albus* Hacq. (9 %). On the other hand, the species that can be found in a smaller percentage are: *Cytisus hirsutus* L. (4 %), *Cytisus heuffelii* Wierzb. (3 %), *Cytisus elongatus* Waldst. & Kit., and *Cytisus falcatus* Waldst. & Kit. (2 %) followed by others that are in an even smaller percentage.

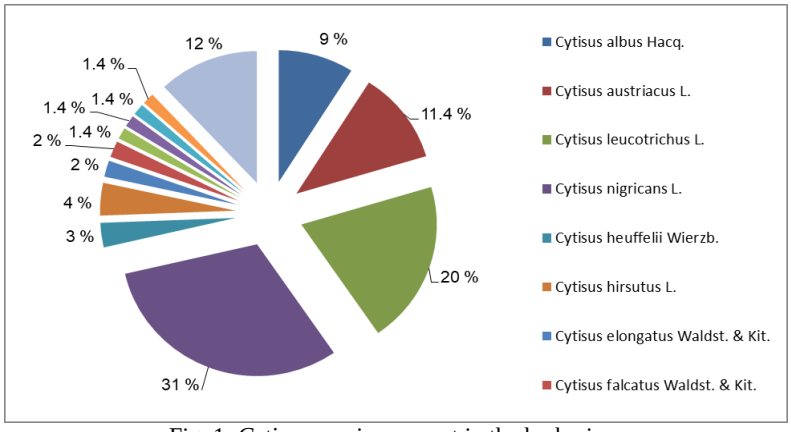
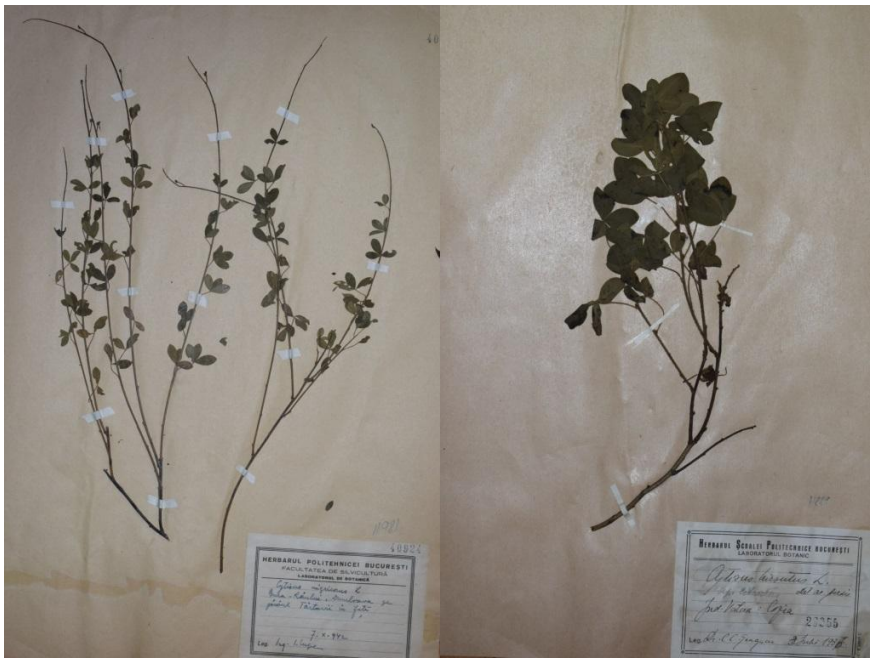


Fig. 1. *Cytisus* species present in the herbarium

Cytisus nigricans L.(Figure 2, left) is a shrub that can grow up to 1,5 m in height, growing in South and South-East Europe. Its leaves are trifoliate, erect, green and palmate, while the flowers are yellow and grouped in a terminal erect raceme (STEFANOVIC, O., AND COMIC, L. 2011, ARNOLD ARBORETUM, 1916, ŞOFLETEA N. AND CURTU L. 2007). The plant grows in our country from the field area up to the mountain one, preferring loamy, heavy and moderately-acid soils (STĂNESCU *ET AL*., 1997).



Cytisus nigricans L. *Cytisus hirsutus* L.

Fig.. 2. Samples of preserved biological material

Cytisus hirsutus L. is an indigenous species, spread out in Europe and Asia. It can reach 1 m in height, having reclining stems and erect branches. The leaves are obovate, elliptical or oblanceolate and silky on the outside, while the flowers are grouped 5-6 each, in a 20-40 cm raceme. The flowers are yellow and bloom from April until June (STĂNESCU *ET AL.*, 1997, STEFANOVIC, O., AND COMIC, L., 2011 ,http://ibuflora.ibu.edu.tr).

Cytisus albus Hacq. has a wide spreading areal, the species being found in South-East Europe and the Mediterranean area. It develops well on chalky soils and prefers sunny expositions (PRZEMYSKI, A. AND PIWOWARSKI, B. 2009).

As it can be observed in Figure number 3, the plants are very well preserved, most of them being situated in the 1st degree of conservation, namely well fixed and complete plants. The 2nd degree is represented by almost complete plants (they lack parts from their stem), while the 3d and 4th degree have detached plants or plants that lack some parts.

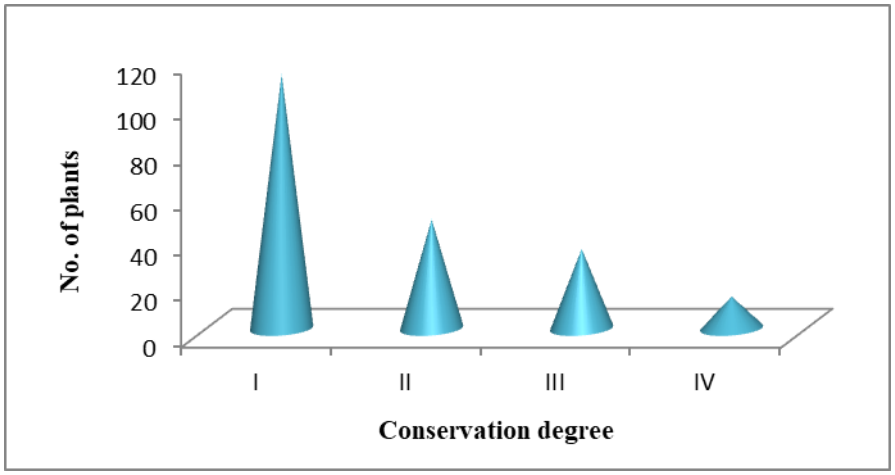


Fig. 3. Conservation degree of plants

The first plant from the Al. Beldie Herbarium dates back to 1852 and was gathered by Wollf outside our country. The first plant that was gathered from Romania dates to 1982, namely from Tușnad, being gathered by the botanist S. Pașcovschi. The most number of *Cytisus* plants were gathered during 1930 – 1939 and beyond this period *(*Figure 4).

The plants were gathered by Romanian specialists such as Al. Beldie, S. Pașcovschi, N. Iacobescu, Al. Borza, I. Pop, I. Prodan, G. P. Grințescu, P. Cretzoiu, C. C. Georgescu, M. Petcuț, At. Haralamb, I. Bunea, I. Morariu, I. Lupe, I. Rusu, St. Purcelean, L. Leandru, C. Chirilă, El. Dobrescu, V. Ciocârlan, M. Păun, Al. Buia and Șt. Purcelean, as well as foreign botanists: E. Reverchon, E.I. Nyárády, Wolff, R. Fritze and A. Richter.

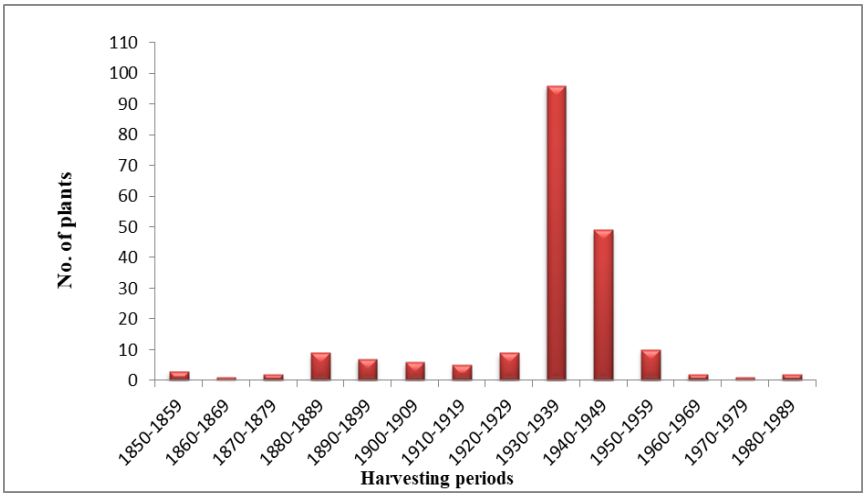


Fig. 4. Harvesting periods

The majority of *Cytisus* species were gathered from Romania (figure 5), namely from the following Counties: Argeș, Bacău, Bihor, Bistrița Năsăud, Ilfov, Brașov, Prahova, Buzău, Cluj, Caraș Severin, Dolj, Mureș, Hunedoara, Ialomița, Gorj, Timiș ,Vâlcea, Mehedinți, Sibiu and Vrancea. From Europe, a few number of plants were collected from Italy, France and Budapest.

Fig. 5. Gathering place of *Cytisus* species in Romania (source: cantemir.ro)

CONCLUSIONS

Al. Beldie Herbarium from INCDS Bucharest hosts an impressive collection of plants. Relevant for the present article were the 210 plants belonging to the *Cytisus* Genus, from 28 species, plants that are mainly used for their ornamental as well as medicinal role.

The plants were gathered in the period 1852-1984, with a maximum harvesting period during 1930-1939. They were gathered by renowned Romanian specialists such as Al. Beldie, P. Cretzoiu, C. C. Georgescu, or S. Paşcovschi, as well as foreign botanists such as A. Richter, E. Reverchon and E.I. Nyárády.

The plants are in a very good conservation state.

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