

## UNCERTAIN SPECIES IN THE CORMOFLORA FROM SIBIU COUNTY

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**Abstract:** The present paper deals with the cormophyte species from Sibiu county that are mentioned as extinct in the Red List, as well as with those uncertain or cited and not found again. The majority was first mentioned in the second half of the XIX<sup>th</sup> century and not confirmed afterwards. Some species (38) became extinct due to the destruction or spoiling of the habitats where they once grew, or to the substitution of the traditional agriculture with the modern one, based on different agricultural techniques, on pesticides and using new culture species and varieties accompanied by other segetal plants. Some other 26 species were incorrectly mentioned in the flora of Sibiu County, because of the confusion with very similar species.

### Introduction

Sibiu county shelters one of the richest cormophyte flora in Romania, due both to its geographical position, great diversity of geological structures, relief and high amplitude of altitude recorded (2265 m), climate rich in nuances, large variety of soil types, and to over two centuries of uninterrupted botanical research in the area. Counting 2455 species (among them 169 hybrids), this flora represents 63 % of the Romanian cormoflora (Drăgulescu, 2003). Almost a quarter (23.88 %) of the cormophytes from Sibiu county are endangered, vulnerable or rare species, needing protection in order to assure their survival. It has to be mentioned that 1.31 % of the species are already extinct in Sibiu county and 1.58 % are uncertain. The present paper deals with these last categories of plants, namely the species mentioned to inhabiting the county (probably mistaken), but not confirmed later, and the uncertain species.

### Material and Methods

The results presented in this paper were obtained based on the published literature regarding the cormophyte flora of Sibiu county, on the personal researches in the field and in collections. The consulted herbaria, mentioned in this paper, are coded as follows: HCS - Cecidologic Herbarium of the Transylvanian Society for Natural Sciences in Sibiu, HD - M.I. Doltu Herbarium, HF - M. Fuss Herbarium, HKA- A. Kayser Herbarium, HKL - J. Kladny Herbarium, HL - J. Lerchenfeld Herbarium, HLGL - “Gh. Lazăr” Highschool's Herbarium, including a part of Chr. J. G. Baumgarten Herbarium, HS - Herbarium of the Transylvanian Society for Natural Sciences in Sibiu, HU - K. Ungar Herbarium (all these being found in the Natural History Museum from Sibiu).

The species which were incorrectly mentioned in the flora of Sibiu County are marked with \*.

### Results and Discussion

The researches carried out in the field, cabinet and herbarium collections lead to the following results:

*Acorus calamus* L.: Bradu: [13, 32], HF/8002-8005 leg. M. Fuss 1866 and 1872; Cristian: [24]; Sibiu: [13, 18]; Daia locality mentioned in the [32] is situated in Mureș county, not in Sibiu. The species was not found again because of the changes underwent by the Olt and Cibin

flood areas. Exactly in the spot where this plant grew at Cristian, a chicken farm was built. In spite of the repeated researches, the species was not found in the last decades, so we assume it disappeared from the county.

- \**Adonis annua* L. (*A. autumnalis* L.): Gușterița: [13, 29, 32], HF/11482 leg. Sigerus, no collecting date, HU/38339 leg. Sigerus, no collecting date; Micăsasa: [1, 3, 29, 32]; Sibiu: [28], as *A. perramosa* Schur cited by [29, 32]. Schur [28] wrote that the plant was rarely encountered in sown fields during July. The author verified the specimens from HF and HU, but they belong to *A. aestivalis*, not to *A. annua*, because the fruits present teeth. Moreover, it was not found again neither at Gușterița nor at Sibiu. Probably the specimens observed by J. Barth were also *A. aestivalis*.
- \**A. flammea* Jacq.: Gușterița: [13, 29, 32], HF/11486 leg. M. Fuss (1847); Mediaș: [22, 29, 32]; Nocrich: [2, 29, 32]; Sibiu: [28, 29, 32]. The specimen found in HF is not *A. flammea* because the sepals are not hairy and the fruits' rostrum is not blackish. However, it is not impossible that the species exists in the eastern or northern part of the county.
- \**Aira caryophyllea* L.: Mentioned from Boița: [8, 13]; Poplaca: [28] ap. HU/35979; Sibiu: [4, 8, 13 ap. 28], HF/5765 leg. F. Schur and HU/35978 leg. F. Schur. The data refer to *Aira elegantissima* Schur because [13] cites it as *Aira caryophyllea* Schur and *A. praecox* Schur, which are synonymes with *A. elegantissima* Schur (*A. elegans* Willd.). Doltu et Schneider-Binder [4] cite the species from Sibiu based on the biological material collected by F. Schur, found in the M. Fuss Herbarium. But both in HF and HU leg. F. Schur from Sibiu and HU leg. Kladni from Poplaca it is *A. elegantissima*. Besides, all three localities are mentioned by [26, 27, 28] in the description of the species *A. elegantissima*.
- Apium nodiflorum* (L.) Lagasca: Sibiu - Dumbrava close to "The Robbers' Fountain" (Rauberbrunnens): [28, 29]. It has disappeared (if ever present) due to the changes in the habitat where it was recorded.
- A. repens* (Jacq.) Lagasca: Sibiu: [28, 29]. Not found again. Simonkai [29] considers this species extinct in the Transylvanian flora.
- \**Arctostaphylos uva – ursi* (L.) Spreng.: Sibiului Mountains: [13]. This information is taken over also in the [32], where it is mentioned that it might be an error. It was indeed a confusion of this species with *Vaccinium vitis-idaea*.
- Armeria pocutica* Pawl.: Sibiu: [28] as *A. vulgaris* Willd., mentioned also in [32]. It might be *A. pocutica* Pawl. (*A. elongata* auct. rom. non alior) or even *A. elongata* (Hoffm.) K. Koch. According to [29] in Transylvania the plant might have spread in the wild from culture. Since then, the species was never mentioned again by other researchers, being certainly extinct.
- Avena barbata* Brot.: Nocrich: [13] as *A. hirsuta* Roth; Sibiu: [13, 28] as *A. hirsuta* Roth, then [29, 32]. F. Schur observed it in July 1852 in barley fields at Sibiu (and earlier, in July 1845 in oatfields at Sebeș). Not found again. Probably extinct due to the use of herbicides.
- A. sterilis* L.: Miercurea Sibiului: [28, 29]. Not found again.
- Barbarea stricta* Andrz.: Bungard, rare: [28, 29]. Not found again.
- \**Betula humilis* Schrank: Arpașu (de Sus): [16, 29]; Mții. Arpaș as *B. intermedia* Koch: [28]. This would be the southeast point of its world range. However, it seems that the species is not found in Sibiu county, as E. Pop [16] mentions Arpaș according to [29], who, at his turn, cites [28] according to a "news" published by Fuss [9] as *B. intermedia*. Pop, 1935 considers that there was confusion with *B. pubescens* f. *rhomboidalis* syn. *B. intermedia* Koch or with *B. hybrida*.
- \**Bryonia dioica* Jacq.: Sibiul: [8]; Sibiu: [28, 29, 32], HCS/81996, collected in 1912. Sibiul was mentioned incorrectly, instead of Sibiu. The plant from HCS is *Bryonia alba* L. Besides, Simonkai [29] considers the species doubtful in the Transylvanian flora.
- Bunias erucago* L.: between Slimnic and Ruși: [18, 28, 29, 32]; between Veștem and Tâlmaciui:

- [28]. Sibiu cited by [18] means Veștem, because in Schur Lvov Herbarium the label of *B. erucago* f. *integrifolia* Schur (which, according to Zapalowicz, is *B. dubia* Zapal.) mentions "near Sibiu, at Veștem". Schur, 1866 considers it an annual plant "without a stable site". Not found again.
- Calendula arvensis* L.: Sibiu on fields at "Trei Stejari": [2, 13, 28, 32], Extinct because of habitat destruction.
- \**Calla palustris* L.: Avrig: [13, 29, 32]; Poiana Neamțului: HF/7726 leg. M. Fuss, 1864. The right sampling site is Avrig towards Poiana Neamțului, but the specimen (the fruit) from HF is *Arum maculatum* L.
- \**Campanula excisa* Schleich.: Podrăgel Peak, Vârtop Peak: [28]. According to Hegi, 1906-1931 it grows only in Switzerland.
- \**C. sparsa* Friv. ssp. *sphaerotrix* (Griseb.) Hayek: Sibiu: [32 ap. 28 as *C. welandi* Heuff., which Schur, 1866 considers that might be the hybrid *C. rapuncululus* x *C. patula*.
- Carex mucronata* All.: Vârtopu Peak – Arpașului Mountains: [28] as *Vignantha mucronata* Schur; on Vârtop at 6000 feet, [13, 29, 32]. In Flora [32] it is considered as a doubtful species in Romania.
- \**Ceterach officinarum* DC.: Sadu (Mts.): HKA. The specimens from HKA/29034, with the mention Sadu might have been collected from Sadu Valley, but it could also be a labeling mistake, as the author searched for this species several years in the whole Sadu River Basin.
- Corynephorus canescens* (L.) P. Beauv.: Tălmăciu: [2, 18, 29, 32]. According to the Flora [32], it is an uncertain species in Romania, as there are no collected specimens from this area in either of the herbaria.
- \**Crepis taraxacifolia* Thuill.: Sibiu, adventive in clover fields - observed during several years in the clover fields at "Trei Stejari": [28] as *Barkhausia taraxacifolia* DC. mentioned also in [32]. Not found again. However, its presence is possible in Sibiu county, although it is more likely that there was confusion with *C. setosa* Hall. Simonkai [29] does not mention it from Transylvania, and the Flora [32] considers it an uncertain species in Romania.
- Cryptogramma crispa* (L.) R.Br.: Doamnei Valley: [31, 32], HU/35521 leg. Ungar, no collecting date). The author repeatedly searched for it in the Doamnei glacial valley during the last years, without any result.
- \**Dentaria enneaphyllos* L.: Măgura Cîsnădiei and Suru Mt.: [2]. The information is taken over by [13], but it is *D. glandulosa* W. et K.
- Eruca sativa* Mill.: Cârțișoara: [30]; Sibiu: [28, 29, 32]. Not found again, at least around Sibiu.
- Erucastrum gallicum* (Willd.) O.E. Schulz: Racovița: [28, 29, 32]. Simonkai, 1866 considers it extinct or not ever present in the Transylvanian flora.
- E. nasturtiifolium* (Poir.) O.E. Schulz: Sibiu in lucerne fields: [28, 29, 32]. Not found again. According to Simonkai, 1886 it is extinct or was never present in the Transylvanian flora.
- \**Erysimum crepidifolium* Rchb.: Gușterița: [13, 32]; Păuca: [6]; Sibiu: [13, 32]; Tălmăciu: [13, 32]. Misidentification of *E. repandum*.
- Festuca scoparia* (Kern. et Hack.) Nym. ssp. *lutea* (Hack.) Beldie: Arpașu Peak: [32] mentioned with ?). In the Schur Herbarium from Lvov there are 2 specimens identified by Hackel himself as *F. scoparia* var. *lutea*, one from Arpaș Mt (identified by Schur as *F. xanthina* R. et Sch. proxima *F. alpinae* vel *rupestris* et *varia*) and one from Hășmașul Mic (identified by Schur as *F. varia* Host var. *flavescens* Bell.). In his Flora, Schur, 1866 considers the specimens from Arpaș as *F. flavescens* Bell. syn. *F. xanthica* R. et Sch., together with specimens collected from Făgăraș Mts., Brașovului Mts and Bucegi.
- Gagea callieri* Pascher: Arpaș Mts.: M. Fuss [13] as *G. bohemica* Schult cited by [29, 32], HF/8403 leg. Kladny); Sadu beyond the factory: [29, 32]. The specimens from HF present *G. callieri* characters. Not found again, probably the data refer to *G. saxatilis* Koch [32]. Sanda et al. [24] include the *G. callieri* in *G. szovitzii* (A.F. Lang) Besser. According to [29]

it is extinct from Transylvania, or was never present here.

\**G. spathacea* (Hayne) Salisb.: Măgura Cisnădiei: [28, 32]. Simonkai [29] considers it *G. minima*.

*Hippuris vulgaris* L.: Agnita: [2, 29, 32]; Nocrich: HL/34443; Sibiu F. Schur [28, 29, 32]. Not found again, probably extinct.

*Hottonia palustris* L.: Bradu: HF/19592 leg. M. Fuss, 1871; Sibiu in "Butchers' Field" (Fleischerwiese) and towards Șura Mare: [4, 13, 18, 29, 32], HL/34595 leg. Lerchenfeld ? from Fleischerwiese, no collectind date, HKA/31184 leg. Kayser, no collecting date, HU/40611 leg. Sigerus, no collecting date, HD/99295 leg. M.I. Doltu, from between Sibiu and Șura Mare, 1959. First recordings date back to the end of the XVIII<sup>th</sup> century (HL and J.C. Eder, al mscr., the last observing the species at 30<sup>th</sup> of April 1789 on Fleischerwiese. Since 1959 there is no recording of this species in Sibiu county. It is posible that the biological material found in HD originates from HF. At Sibiu it is extinct because Șesului Măcelarilor was turned into agricultural land.

*Juncus capitatus* Weigel: In Arpaș Valley on humid and sandy fields with *Centunculus minimus*: [28], not in Arpaș Mts. as is mentioned by [29, 32]. Not found again.

\**J. paniculatus* Hoppe: Ocna Sibiului: [28] cited by Simonkai [29, 32]. Uncertain in the Romanian flora [32]. Maybe the plant cited by Schur [28] is an infrataxon or a hybrid of *J. inflexus*.

\**J. sphaerocarpus* Nees: Sibiu: [28, 29, 32]. According to Flora [32] it is uncertain in Romania. Probably Schur [28] included here specimens belonging to *J. buffonius* (ssp. *capillaris* Schur).

\**J. tenageia* Ehrh.: Bradu: F. Schur [28]; Tălmăciu in the Olt Valley [28, 32]. According to Simonkai [30] it is *J. buffonius* and the Flora [32] mentions it as an uncertain species in Romania.

*Legousia speculum-veneris* (L.) Fisch.: Mediaș: [1, 2, 13]; Nocrich: [2, 13]; Sibiu - on fields, frequent in some years: [28] as *Specularia speculum* DC, information taken over in Flora [32]. Not found again, at least at Sibiu and Mediaș. According to Simonkai [30] it is certainly extinct not only from Sibiu county but also from Transylvania.

*Linaria arvensis* (L.) Desf.: Mediaș: [1, 2, 13, 18, 29, 32]; Sibiu: [28]. Schur observed it in August 1846, describing it as *L. striata* DC. syn. *L. repens* Desf., mentioning that "ist leicht mit *L. arvensis* zu verwechseln, durch den geraden kurzen Sporn und die eckigen Samen gleich zu unterscheiden" (it's easy to mistake it for *L. arvensis*, from which it can be distinguished through the short straight spores and the snaggy seeds). Simonkai [29] mentions it as an uncertain species in Transylvania, and the Flora [32], in Romania.

*Nuphar lutea* (L.) Sm.: Agnita: [2, 13, 29, 32], HU/38081, leg. Sigerus, no collecting date, probable 1850). It has disappeared together with the suitable habitat around Agnita.

*Nymphaea alba* L.: Agnita: [2, 13, 29, 32]; Sibiu at "Trei Stejari": [13, 19, 29, 32], HF/11416-11417 leg. M. Fuss from Jickeli's garden at "Trei Stejari", 1875, HKL/84498-84499 leg. Bielz, 1868 from "Trei Stejari", HS/44106 leg. C. Fuss, 1863 from "Trei Stejari", HU/38079 leg. Sigerus, 1850 and 38080 leg. M. Fuss, 1875). From Sibiu was first mentioned in 1863 (Verh. u. Mitt. d. Siebenb. Ver., XIV, 130), collected by C. Fuss from Jickeli's garden in the "Trei Stejari" area, then by [14, 19]. The last author mentions that in Jickeli's garden it appeared in 1856, probably brought by birds. Both *Nymphaea alba* and *Nuphar luteum* were growing in the XVIII-XIX<sup>th</sup> centuries in the puddles near Agnita, situated in the Hârțibaciu flood area, but disappeared together with these. The species became extinct from Sibiu probably in the first half of the XX<sup>th</sup> century, after the "Trei Stejari" beer factory was built.

*Nymphoides peltata* (Gmel.) O. Ktze.: Sibiu: [11, 12, 13, 29, 32], HU/40780 leg. Sigerus, no collecting date). It disappeared in the same time as the puddles around Sibiu where it once grew.

- Omphalodes verna*** Mnch.: Răşinari: [2, 10, 18, 29, 32]; Turnu Roşu: HLGL/74689. On the label from HLGL the species' name is written in one type of ink and the locality (Vörös Torony) in another type.
- \****Ornithogalum nutans*** L.: It is cited from Sibiu: [28, 32]; Amnaş [32], but it was mistaken with *O. boucheanum* [29, 32].
- \****Pedicularis sudetica*** Willd.: Cristianului Mts. near springs with *Luzula sudetica* [28]. Simonkai [29] considers that this species does not exist in the Transylvanian flora.
- Petrocallis pyrenaica*** (L.) R. Br.: Căprăreasa Peak - Arpaşului Mts. at 7000 feet: [28, 29, 32]. Its presence is doubtful in the Romanian flora.
- Pimpinella peregrina*** L.: Between Sibiu and Şelimbăr: [28, 29, 32]. Simonkai [29] considers that it does not grow in the wild and it must not be included in the spontaneous flora from Transylvania. In the Flora [32] is it considered an uncertain species in Romania.
- Potamogeton coloratus*** Vahl.: Sibiu – Reussbach: [28] as *P. hornemanni* Meyer, information taken over in Flora [32], but with ?. According the Simonkai [29] is became extinct or never existed in the Transylvanian flora.
- P. compressus*** L.: Ocna Sibiului: [20]; Sibiu: [28]. Not found again.
- P. obtusifolius*** Mert. et Koch: Sibiu: [28, 32]. Simonkai [29] considers that the species disappeared from Transylvania or was never present here.
- \****Ranunculus hybridus*** Biria: Bâlea at 6000 feet: [15, 28, 29, 32]. The species' presence in Romania is considered doubtful in the Flora [32].
- Rapistrum rugosum*** (L.) All.: Nocrich towards Marpod: [2, 13, 32]. Not found again.
- \****Salix lapponum*** L.: V. Hârtibaciului: [2] as *S. limosa* Wahl. Hegi [15] notes that it is very rare in the Carpathians. The species is not mentioned in the Flora [32]. However, it is very unlikely that it was identified in Hârtibaciu Valley, at only 500-600 m height. It was probably *S. rosmarinifolia*.
- Saxifraga bulbifera*** L.: Tâlmaciu: [12, 29, 31, 32], HU/38837). Doltu and Erika Schneider-Binder [4] mention it from Tâlmaciu based on the material collected by Schur and stored in HU. Not found again.
- \****S. squarrosa*** Sieb. et Tausch: Vârtope Peak: F. Schur [28, 29]. Flora [32] considers that this is a mistake, the species growing only in the Alps.
- Scandix pecten-veneris*** L.: Guşteriţa: [32], HU/40365 leg. Kladni, no collecting date; Sibiu: [18, 28, 29]. Not found again.
- Schoenus nigricans*** L.: Sibiu: [18, 28, 29]. It became extinct with the drainage of the marshes between Sibiu and Răşinari from where, presumably, it was mentioned by Schur [28].
- Scolymus hispanicus*** L.: Sibiu: [32]. Not found again (wrong citation or the species became extinct).
- \****Silaum silaus*** (L.) Schinz et Thell.: Merghindeal: [2, 13, 32]. Simonkai [29] puts under question the existance of the species at Merghindeal “sed in herbario Baumgarten specimen desiderantur”.
- Sisymbrium austriacum*** Jacq.: Sibiu: [28, 29, 32 with ?]. It was mentioned by Schur [28], but it is not found in his herbarium from Lvov. For this reason, Simonkai [29] considers this species extinct or never present in Transylvania. Schur [28] also quotes from Dumbrava Sibiului towards Şelimbăr, *S. acutangulum*, which might be a variety of *S. austriacum*.
- S. irio*** L.: Sibiu: [29, 32] ap. Herb. Schur Lvov. Not found again, probably extinct due to the change in the land uses.
- \****Tragopogon porrifolius*** L.: Cîsnădie: [28, 32]; Mediaş: [1, 13, 21, 32]. Flora [32] considered those data as refering to *T. orientalis* L.
- Trapa natans*** L.: Bradu: [13, 29, 32], HF/18137, HU/40283-40284, in both herbaria leg. M. Fuss, in 1862, from a dead branch of the Olt River); Sibiu: [13, 18, 28, 29, 32]. Extinct due to the drainage of the Olt's dead branches from Bradu and the puddles around Sibiu.

\**Trientalis europaea* L.: Cisnădie: [10, 13, 29, 32]. Extinct or mis-identified.

\**Vicia hybrida* L.: Sibiu- Rușcior Valley in sown fields: [13, 28, 29, 32], HF/16414 leg. M. Fuss 1847); Șura Mare: [13, 29, 32], HF/16415 leg. M. Fuss 1851). The material from the M. Fuss Herbarium, collected from Sibiu and Șura Mare (on which all the mentions are based) is not *V. hybrida* L., because the flowers' vexil is not hairy. According to Flora, the presence of this species in Romania is doubtful.

### Conclusions

The researches carried out in the field and in the herbarium collections lead to the conclusion that 26 of the investigated species were incorrectly cited as found in the flora of Sibiu county and other 38 became extinct or were not found again due to the destruction or spoiling of the habitats where they grew in the past centuries, or to the agriculture's development and use of chemicals.

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## SPECII NECONFIRMATE ȘI INCERTE ÎN FLORA JUDEȚULUI SIBIU

### (Rezumat)

Lucrarea analizează speciile de cormofite din flora județului Sibiu înscrise în lista roșie în categoria plantelor dispărute, respectiv a celor incerte sau neconfirmate ulterior citării lor. Marea majoritate au fost semnalate în a doua jumătate a secolului al XIX-lea și de atunci n-au mai fost confirmate. Unele specii (38 la număr) au dispărut sau nu s-au regăsit datorită distrugerii ori deteriorării habitatelor în care vegetau sau datorită înlocuirii agriculturii tradiționale cu cea modernă bazată pe altă agrotehnică, pe pesticide și alte specii și soiuri de plante de cultură cu alte specii segetale însoțitoare. Altele 26 specii (notate cu \*) au fost citate eronat din flora județului Sibiu din cauza confuziei cu alte specii foarte asemănătoare. Acestea sunt: *Adonis annua* L., *Adonis flammea* Jacq., *Aira caryophyllea* L., *Arctostaphylos uva – ursi* (L.) Spreng., *Betula humilis* Schrank, *Bryonia dioica* Jacq., *Calla palustris* L., *Campanula excisa* Schleich., *Campanula sparsa* Friv. ssp. *sphaerotrix* (Griseb.) Hayek, *Ceterach officinarum* DC., *Crepis taraxacifolia* Thuill., *Dentaria enneaphyllos* L., *Erysimum crepidifolium* Rchb., *Gagea spathacea* (Hayne) Salisb., *Juncus paniculatus* Hoppe, *Juncus sphaerocarpus* Nees, *Juncus tenageia* Ehrh., *Ornithogalum nutans* L., *Pedicularis sudetica* Willd., *Ranunculus hybridus* Biria, *Salix lapponum* L., *Saxifraga squarrosa* Sieb. et Tausch, *Silaum silaus* (L.) Schinz et Thell., *Tragopogon porrifolius* L., *Trientalis europaea* L., *Vicia hybrida* L. Catalogarea acestor specii ca inexistente în flora județului Sibiu s-a făcut pe baza consultării materialelor de ierbar ori a opiniilor unor experimențați botaniști români și străini.