

Saxifraga umbrosa — an extinct relict of the Sudeten Mountains

Saxifraga umbrosa — vyhynulý relikt Sudet

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JENÍK J. (1980): *Saxifraga umbrosa* — an extinct relict of the Sudeten Mountains. — Preslia, Praha, 52 : 193—201.

The available evidence suggests that *Saxifraga umbrosa* L., a species presently native in the western fringes of Europe, survived as a relict in the Sudeten Mountains until the beginning of the 19th century. The glacial cirque of Velká kotlina in the Hrubý Jeseník range has been identified as the last Post-Glacial refuge of this attractive plant. The small relict population was readily eradicated by careless collectors.

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INTRODUCTION

Three ranges of the Sudeten Mountains, viz. Krkonoše, Králický Sněžník and Hrubý Jeseník, exceed the level of upper timberline. Their summits and glacial cirques contain isolated alpine and subalpine 'islands' with little colonies of relict species surviving on exposed cliffs and in frequent avalanche paths. The severe mechanical forces of wind, snow and rockslides were the main factors continuously resisting the expanding forest and krummholz during warm Post-Glacial periods. All the Sudeten refuges are comparatively easily accessible and, for several centuries, were exposed to the activities of keen collectors. Depletion of the Krkonoše flora by Silesian herbalists and horticulturists started as early as the 16th century. In the other ranges, too, botanical rarities were eradicated soon after their discovery, and, particularly, after they had been described in the first floristic works. Botanists themselves contributed to the genocide of many relict populations as witnessed by abundant herbarium specimens exceeding in numbers the living plants to be found in the sites to-day. A few of these species could have been eradicated even prior to their scientific identification, and therefore never appeared in floristic lists. Others, though recorded, soon fell into oblivion prior to satisfactory evaluation. The latter fate seems to have befallen *Saxifraga umbrosa*, a species described for science by Linnaeus in 1762, and recorded even in the Sudeten Mountains — far from its present-day area of distribution.

KROCKER'S FIRST RECORD

MATTUSCHKA's "Flora Silesiaca" (1779), the first regional flora referring to the Sudeten Mountains, contains only three common *Saxifraga* species: *S. granulata*, *S. tridactylites* and *S. cotyledon* (= *Saxifraga paniculata* MILLER). The prevalence of topographic names from the Krkonoše range suggests that, for MATTUSCHKA's contemporaries, the vegetation of other Silesian

mountains reaching alpine elevations was a complete blank. In the second volume of the monumental flora compiled by KROCKER (1787—1823) eight saxifrages are listed. One of them, called *Saxifraga punctata*, was accompanied by a Latin diagnosis that concurred with Linnaeus' *Saxifraga umbrosa*. KROCKER (1790 : 20—21) wrote: "...Caulis pedem, aut sesquipedem longus... in paniculam diffusus, stipulis raris, minimis obsesses, teres, hirsutus rubens. Folia ad radicem fasciculata, subrotunda... ad oras cincta margine argenteo, calloso, dentato... Flores minores, quam in *Saxifraga Geo*, magis inferi, quam superi. Cal. exiguus, ex rubro viridescens, villosus. Petala ovata, alba, punctis rubris punctata". KROCKER (l. c.) added that a specimen in his possession was brought to him from an unknown locality in the alpine region of the Silesian territory — in original wording "ex alpinis accepi loco non indicato".

Accepting the identity of *Saxifraga umbrosa* we must then concern ourselves with the locality indicated by KROCKER. In his work the author distinguished between indigenous and introduced plants, and the reliability of his records was fairly high. Many species, in his work vaguely indicated "quoque in alpinis nostris", proved with the passage of time to be genuine members of the alpine flora of the Sudeten Mountains, e. g. *Plantago atrata* subsp. *sudetica*, *Sorbus sudetica*, *Androsace obtusifolia*, etc. In the 18th century it was quite usual to use the term "in alpinis" in a broad sense covering any area situated above the timberline. Krocke's work referred to the entire historical Silesia, regardless of its division in 1742 when part of its territory was annexed by Prussia. Thus, a specimen of *Saxifraga umbrosa* could have been collected in any one of the three Sudeten ranges named above, or even in Babia Góra, the westernmost part of the Carpathians, lying on the southeastern edge of Silesia. However, the more continental climate of the Silesian Carpathians seems to provide a less favourable environment for a refuge of *Saxifraga umbrosa*. The Krkonoše range, on the other side, was well explored and covered by topographic names so that location of a rare plant could easily have been indicated. Thus the Hrubý Jeseník and Králický Sněžník ranges appear as the most probable guess for the origin of the outstanding record of *Saxifraga umbrosa* in Krocke's flora.

We have to add that the contemporary monograph on *Saxifraga* genus (STERNBERG 1810 : 13) described the area of distribution of *Saxifraga umbrosa* only as "in the Cantabrian Mts. and the Pyrenees". It was only later in the second supplement to this monograph (STERNBERG 1831 : 97) among "addenda et emendanda" at the end of the volume that one may read: "*Saxifraga umbrosa*, adde loco natali: quoque in montibus Moraviae et Silesiae". This note, obviously derives from another independent source of information than that of KROCKER.

SECOND INDEPENDENT RECORD

Three major floristic works referring to the Bohemian side of the Sudeten mountains (SCHMIDT 1793—1794; POHL 1809—1814; J. S. et K. B. PRESL 1819) do not contain any comment on the occurrence of *Saxifraga umbrosa* in the Sudeten Mountains. However, 34 years after Krocke's record a second reference to the presence of *Saxifraga umbrosa* in the Sudeten Mts. appeared

Tab. 1. — Occurrence of *Saxifraga umbrosa* in the Hrubý Jeseník range (Sudeten Mts.) according to regional floras and monographs published in the first half of the 19th century

Author	Location, habitat	Collector
GÜNTHER et al. (1824)	Am hohen Falle, im Gesenke	MÜCKUSCH, HOCHSTETTER
HOCHSTETTER (1825)	In der am höchsten gelegenen Felsgegend, im mährischen Gesenke	—
WIMMER et GRABOWSKI (1827)	Am hohen Fall, im Thale zwischen Altvater und Peterstein	MÜCKUSCH, HOCHSTETTER
REICHENBACH (1830—1832)	An feuchten Stellen, im mährischen Schlesien, am Gesenke	MÜCKUSCH, HOCHSTETTER
STERNBERG (1831)	Loco natali, quoque in montibus Moraviae et Silesiae	—
WIMMER (1832)	Am hohen Falle, im Gesenke, auf feuchten Felsen	HOCHSTETTER
ROHRER et MAYER (1835)	Am Janowitzzer Hohenfall, im mährisch-schlesischen Gesenke, auf feuchten Stellen der höchsten Gebirge	HOCHSTETTER
SCHLOSSER	Am Janowitzzer Hohenfalle, Mähren	HOCHSTETTER
SCHLOSSER (1843)	Am Janowitzzer Hohenfalle, Mähren	HOCHSTETTER
SLOBODA (1852)	Na pohoríh, v horním Slezsku	—

in the critical enumeration of Silesian plants published by GÜNTHER et al. (1824). This flora for the first time clearly identified “montes Freywaldensium” or “Gesenke”, the Latin and German contemporary equivalents, respectively, of the present day Hrubý Jeseník range. In the same work (op. c.: 72) we read: “*Saxifraga umbrosa* L. — Am hohen Fall im Gesenke (von Mückusch, Hochstetter)”. Mückusch was a very experienced amateur botanist who was first to explore the Hrubý Jeseník range and collected plants for herbaria (see DUDA 1951, 1964). He discovered numerous rare species and was in contact with many contemporary botanists. Hochstetter was one of his learned collaborators, and, presumably identified or merely confirmed the classification of *Saxifraga umbrosa*. Based on this evidence HOCHSTETTER (1825) himself reported *Saxifraga umbrosa* as a natural component of the Moravian flora.

A most important detail in the above quoted record of *Saxifraga umbrosa* seems to be the precise indication of locality — “am hohen Fall”. Our recent account of the old toponymy in the Hrubý Jeseník range (JENÍK, BUREŠ et BUREŠOVÁ, Ms.) shows that the topographic name “Hoher Fall” (incl. the variants “Hohenfall”, “Mohrafall”, “Janowitzzer Hohen Fall”) was one of the 25 synonyms for the present day Velká kotlina cirque, a botanical locality known also under the German name “Kessel” or “Grosser Kessel”. The Velká kotlina cirque is a prominent refuge of many relict and endemic plants and animals in the Sudeten Mountains, which makes the native occurrence of *Saxifraga umbrosa* a highly probable phenomenon.

In the following decades several floristic works listed *Saxifraga umbrosa* as an indigenous species of the Sudeten Mountains. Table 1 summarizes these references. Mückusch and/or Hochstetter appear in all cases as the collectors of the species. The location was gradually defined with more

precision: the name "Janowitzter Hohefall" clearly refers to the south-eastern flanks of the present-day Vysoká hole (1464 m a.s.l.), called in the 18th and 19th century "Janowitzter Heide" and belonging to the Janovice Estate, Moravia. These flanks stretch into the Velká kotlina cirque, whose major part, including the rocky ravine, are situated in Moravian territory. Only a smaller area on the northeastern edge of the Velká kotlina belonged to the Bruntál Estate, in Silesian territory.

Table 1 also gives a few details about the habitat of *Saxifraga umbrosa* in the Velká kotlina cirque: 'wet rocky and shady site' agrees well with habitats reported from the sites of indigenous occurrence in Western Europe (see e.g. MEUSEL et al. 1965 : 518).

Most floristic works referring to Silesian and/or Moravian territory in the first half of the 19th century accepted the occurrence of *Saxifraga umbrosa* in the Hrubý Jeseník range. None of them expressed any doubts about the indigenous nature of this species. REICHENBACH (1830—1832), the author of a much appreciated critical flora of Europe, is known to have been assisted by Hochstetter with regard to localities in Moravia. From Hochstetter he received the report on *Saxifraga umbrosa* in the Sudeten Mountains, but he did not inspect a herbarium specimen from this area (see Reichenbach's note on p. 560). This could have thrown slight doubts on the natural occurrence of this species, and possibly, resulted in the hesitation of Wimmer, who excluded *Saxifraga umbrosa* from the later editions of his Silesian flora. At the same time, however, the monographer of the genus *Saxifraga* (STERNBERG 1831) considered the locality of *S. umbrosa* in the Sudeten Mountains to be a native occurrence.

DISAPPEARANCE FROM FLORISTIC WORKS

A gradual change in the attitude towards *Saxifraga umbrosa* can be seen in successive editions of Wimmer's "Flora of Silesia". While in that from 1832 the species is properly quoted according to Hochstetter, in the second edition from 1840 the same species does not appear at all. Later on, in the third edition a note can be found at the end of the book (WIMMER 1857 : 471): "Anmerkung: *Saxifraga umbrosa* wurde von Hochstetter 'am hohen Falle zwischen Altvater und Peterstein angegeben'. An mehreren Punkten des Gesenkes welche den Namen hoher Fall führen ist bisher vergeblich nach dieser Pflanze gesucht worden". This is probably the last trace of *Saxifraga umbrosa* in both Silesian and Moravian floristic works. It appears that Wimmer left out this species merely because it could not be newly collected and because the location appeared ambiguous to him. The latter reason, however, did not apply: the topographical name "Janowitzter Hohenfall" was a clear synonym to "Kessel", a name commonly used by Silesian botanists and WIMMER himself for the present-day Velká kotlina cirque.

" In the following period distinguished compilers both of Silesian floras (FIEK 1881; SCHUBE 1904) and of Moravian floristic works (OBORNY 1883 — 1886; FORMÁNEK 1887—1892) did not list *Saxifraga umbrosa*. Neither native, nor cultivated or escaped plants were reported. In the flora of Germany, GÄRCKE (1903) made the next logical step denying the indigenous nature of *Saxifraga umbrosa* populations in the Central Europe. Referring

rather incorrectly to the old records he wrote (op. c.: 242). “*S. umbrosa* kommt weder bei Goldstein im Mährischen Gesenke, noch an einer anderen Stelle im Gebiete wild vor, findet sich aber in den Vogesen naturalisiert...”. Neither FRITSCH (1909 : 293) listed the Sudeten Mts. among the Austrian localities of “cultivated or escaped” *S. umbrosa*. HEGI’s flora (1923 : 627) rules out “with all probability” the indigenous existence of this species in Central Europe; however, Hegi confirms its vitality in this region by point-

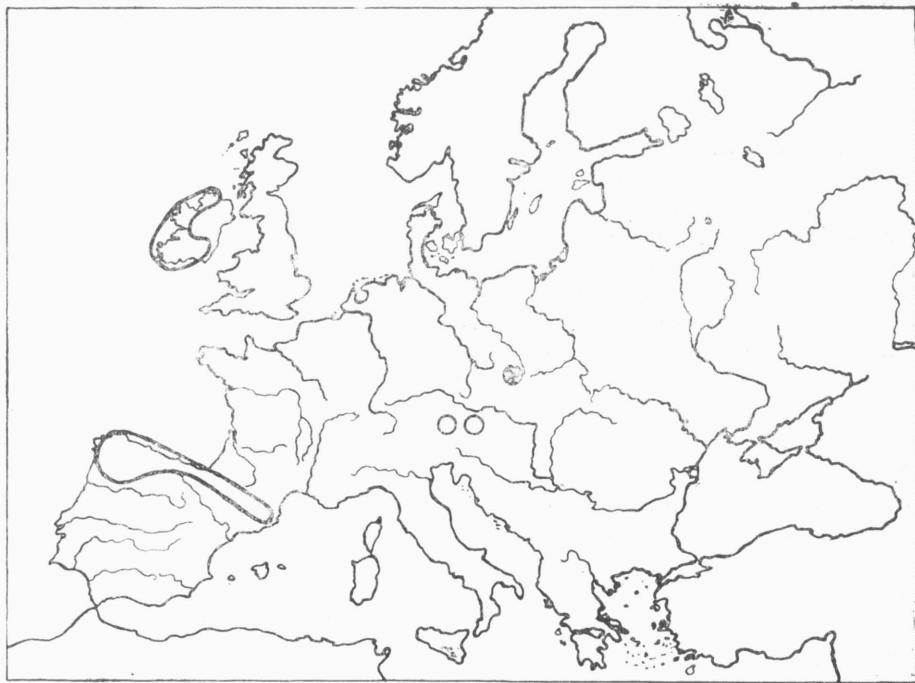


Fig. 1. Areas of assumed indigenous distribution of *Saxifraga umbrosa* L. (after MEUSEL et al. 1965) and situation of the relict locality in the Sudeten Mountains (black dot); suspected relict localities in the Alps are marked by a circle, while numerous escapes are left unrecorded.

ing out several cases of successful naturalization. DOSTÁL et al. (1948—1950) and DOSTÁL (1954) recorded the escape of *Saxifraga umbrosa* in the park in Sobotín. The former work recommends for further verification a Rohrer’s locality at Jelení Studánka, a site not distant from the Velká Kotlina in the Hrubý Jeseník; this presumably is another mistake which has arisen by

translation of the topographic name "Janowitzter Hohenfall" mentioned in ROHRER and MAYER's flora (1835).

The prevailing opinion of present day botanists is clearly expressed in the comparative chorology of Central-European plants by MEUSEL et al. (1965 : 518). These authors assume indigenous distribution of *Saxifraga umbrosa* in the Cantabrian Mts., Pyrenees and Ireland only. In agreement with CLAPHAM et al. (1959 : 191) they deny even its native occurrence in the British Isles (Fig. 1).

HERBARIUM SPECIMENS

Important though not decisive evidence of the native occurrence of *Saxifraga umbrosa* in the Sudeten Mountains can be derived from respective exsiccates deposited in herbaria. Our search for these specimens was only partly successful. Czech and Moravian herbaria contain specimens brought from the Pyrenees, exsiccata from the Alps (some considered to be components of native populations), and specimens of cultivated or escaped plants from various locations in Europe. Those from the Alps were collected mainly in two localities in Austria: mount Schoberstein near Ternberg on the Enns river, and in the environs of Salzburg. The escapes in Czechoslovakia refer to the park in Sobotín (southern foot of the Hrubý Jeseník range), a limestone quarry near Černice (district of Plzeň) and a scree-forest near Brandov in the Krušné hory Mountains (the last locality according to F. Mladý).

Two specimens of *Saxifraga umbrosa* in the herbarium of Charles University in Prague (PRC) deserve special attention: One specimen bears a label reading in Czech "in mountains of the Upper Silesia" and containing an abbreviated signature "P" and a date 19/7/1907. Many circumstances suggest that this label was translated and rewritten from an much older model, possibly one of the Krockner's period. The wording of the locality resembles the descriptions at the start of the 18th century.

The other herbarium specimen of interest bears a label displaying distinct indication of the locality: "Auf Felsen des Hohen Falls im Gesenke, Janowitzter Herrschaft". Though lacking a collector's name and date of collection, this specimen appears to originate from the period of the activity of Mückusch and Hochstetter. The wording of the label is similar to that of the respective location of *Saxifraga umbrosa* in the enumeration by GÜNTHER et al. (1824). Its situation in the Velká kotlina cirque in the Hrubý Jeseník range is beyond any doubt. The small size and growth form of the specimens suggest a component of a native population exposed to competition and environmental stress. Again, the label was rewritten by one of the later possessors of the herbarium specimen, possible by G. Braun (see DUDA 1964 : 90).

Taxonomic evaluation and further search for other herbarium specimens (particularly in Wrocław) might elucidate further details of the natural occurrence of *Saxifraga umbrosa* in the Sudeten Mountains. This task, however, was beyond the scope of this paper.

The available evidence suggests that we can reasonably discuss the past indigenous occurrence of *Saxifraga umbrosa* in the Sudeten Mountains. If accepted, the species would represent a very unusual member of the Central-European flora: an isolated population of a geoelement with an Atlantic type of distribution, a genuine relict of a western and oceanic species. The outstanding biogeographic feature of this species together with its frequent escape from gardens require careful reconsideration of the whole matter.

Two independent reports by distinguished botanists about the occurrence of *Saxifraga umbrosa* in the Sudeten Mountains, together with the preserved herbarium specimens appear to be sufficient backing for the assumption that this species actually grew in a remote locality far from the main area of distribution. There are many arctic-alpine relicts growing in refuges many hundred kilometers distant from the territory where they are widely distributed. Even species of an Atlantic type of distribution, such as *Erica tetralix* or *Narthecium ossifragum*, were preserved in refuges distant from the main area of distribution.

The Velká kotlina cirque, the identified site of Mückusch's collection of *Saxifraga umbrosa* in the Sudeten Mountains, provided a favourable habitat for the survival of a variety of plants during the Post-Glacial period (for details see JENÍK, 1961; HOLUB et al. 1970). The rocky ravines in the centre of this cirque were never shaded by the woodland canopies because of the incessant action of avalanches. The variety of substrata (graphitic phyllite with veins rich in calcium) and diversity of moisture (dry crags and flushed rock faces) offered a wide choice of habitats even during the changing macroclimate of the Post-Glacial period. Thus *Saxifraga umbrosa* could easily have survived in the neighbourhood of other arctic-alpine and continental species. The immigration of this species into the Central-European area possibly took place in a wetter period of the Tardiglacial. The population of the Velká kotlina represented a genuine relict of a formerly widely distributed species.

The ornamental habit of *Saxifraga umbrosa* made this species an attractive garden perennial which frequently escaped from rockeries and borders. HEGI (1923 : 627) reports the planting of *Saxifraga umbrosa* in Silesia in the 17th century. Were not these garden plants perhaps a source of artificially grown population in the Velká Kotlina cirque of the Hrubý Jeseník? Our study of historical materials referring to alpine and subalpine zones (JENÍK, BUREŠ et BUREŠOVÁ, Ms.) suggests that both Krocker's and Mückusch's specimens could have been collected right at the beginning of the discovery of botanical richness of the Velká kotlina refuge. An attempt to establish a mountain botanical garden is known from the vicinity of Ovčárna Chalet at the beginning of the 19th century. No similar attempt has been reported from the Velká kotlina cirque. Conversely, however, the early cultivation of *Saxifraga umbrosa* in the lowlands of Silesia could be in connection with indigenous occurrence of this species in the Sudeten Mountains. Past refuges of this species on the summit rocks, such as the Petrovy kameny or Vozka, could have been easily exploited by prospectors and herbalists visiting the mountains since the 14th century.

The present-day level of floristic research in the Velká kotlina and in the entire alpine and subalpine area of the Hrubý Jeseník range allows the conclusion that *Saxifraga umbrosa* does not grow in these mountains at present. It appears justified to assume that this relict species belongs to the list of extinct species whose local population was eventually destroyed by man.

SOUHRN

Dva vzájemně nezávislé literární údaje a dvě nalezené herbářové položky nasvědčují tomu, že druh *Saxifraga umbrosa* přežíval jako relikv ve Vysokých Sudetech až do začátku 19. století. Velká kotlina v Hrubém Jeseníku byla pravděpodobně posledním útočištěm malé populace, která byla snadno dostupná a brzy vysbíraná pro zahradnické či botanické účely. V druhé půlce 19. století údaje o tomto druhu vymizely ze slezských i moravských květen zejména proto, že druh již nebyl později nalezen a protože zůstala neznáma synonymika topografických jmen pro Velkou kotlinu (= Janowitz Hohen Fall = Kessel). Zdrojem dalších pochybností byla skutečnost, že *Saxifraga umbrosa* byla dávno oblíbenou skalničkou schopnou rychle se naturalizovat. Zatím nelze najít vážné důvody pro o přirozeném výskytu lomikámenu stinného v Sudetech pochybovat, i když jde o fytogeograficky výjimečný případ. Nálezy dalších herbářových položek a jejich taxonomické hodnocení by mohly do řešení vnést větší jistotu.

LITERATURA

- CLAPHAM A. R. et al. (1959): Excursion flora of the British Isles. — Cambridge.
- DOSTÁL J. (1954): Klíč k úplné květeně ČSR. — Praha.
- DOSTÁL J. et al. (1948—1950): Květena ČSR. — Praha.
- DUDA J. (1951): První opavský botanik. — Přírod. Sborn. Ostrav. Kraje, Ostrava, 12 : 178—189.
- (1964): Poznámky k některým botanikům slezské oblasti. — In: „150 let Slezského muzea“, p. 87—99. — Opava.
- FIEK E. (1881): Flora von Schlesien preussischen und österreichischen Antheils. — Breslau.
- FORMÁNEK E. (1887—1897): Květena Moravy a rakouského Slezska. — Brno.
- FRITSCH K. (1909): Exkursionsflora für Österreich. — Wien.
- GARCKE A. (1903): Illustrierte Flora von Deutschland. — Berlin.
- GÜNTHER K. CH. et al. (1824): Enumeratio stirpium phanerogamarum quae in Silesia proveniunt. — Vratislaviae.
- HEGI G. (1923): Illustrierte Flora von Mitteleuropa. Vol. 4/2. — München.
- HOCHSTETTER G. E. (1825): Übersicht der Merkwürdigsten aus Mährens Flora. — Flora, Wien, 8 : 513—525, 529—537.
- HOLUB J., J. MĚSIČEK et V. JAVŮRKOVÁ (1970): Annotated chromosome counts of Czechoslovak plants (1—15). — Folia Geobot. Phytotax., Praha, 5 : 339—368.
- JENÍK J. (1961): Alpínská vegetace Krkonoš, Králického Sněžníku a Hrubého Jeseníku. — Praha.
- (1971): Příčiny druhového bohatství Velké Kotliny v Hrubém Jeseníku. — Campanula, Ostrava, 2 : 25—30.
- JENÍK J., L. BUREŠ et Z. BUREŠOVÁ (Ms.): Subalpine cirque ecosystem: Origin, pattern and factors of outstanding diversity in Velká Kotlina, the Sudeten Mountains.
- KROCKER A. J. (1790): Flora silesiaca. Vol. 2. — Vratislaviae.
- MATTUSCHKA H. G. (1776—1777): Flora silesiaca. Vol. 1 et 2. — Breslau et Leipzig.
- (1779): Enumeratio stirpium in Silesia . . . — Vratislaviae.
- MEUSEL H. et al. (1965): Vergleichende Chorologie der Zentraleuropäischen Flora. Vol. 1. — Jena.
- OBORNÝ A. (1883—1886): Flora von Mähren und oesterr. Schlesien. — Brünn.
- REICHENBACH H. G. L. (1830—1832): Flora germanica excursoria. — Lipsiae.
- ROHRER R. et MAYER A. (1835): Vorarbeiten zu einer Flora des Mährischen Gouvernements. — Brünn.
- SCHLOSSER J. C. (1843): Anleitung, die im Mährischen Gouvernement wildwachsenden und am häufigsten cultivierten phanerogamen Pflanzen . . . zu bestimmen. — Brünn.

- STERNBERG C. (1810, 1822, 1831): *Revisio Saxifragarum iconibus illustrata*. — Ratisbonae.
- SCHUBE T. (1904): *Flora von Schlesien, preussischen und österreichischen Anteils*. — Breslau.
- WIMMER F. (1832): *Flora von Schlesien*. — Berlin.
- (1840): *Flora von Schlesien preussischen und österreichischen Antheils*. — Breslau, Ratibor et Pless.
- (1857): *Flora von Schlesien preussischen und österreichischen Antheils*. Ed. 3. — Breslau, Ratibor et Pless.

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