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# Typification of the Caucasian *Gagea* (Liliaceae) taxa described by Karl Koch

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## ABSTRACT

LEVICHEV, I. G. & J.-M. TISON (2004). Typification of Caucasian *Gagea* (Liliaceae) described by Karl Koch. *Candollea* 59: 119-133. In English, English, French and German abstracts.

Five lectotypes and one neotype are chosen for the taxa of the genus *Gagea* described by Karl Koch in 1849 from Caucasus and northeast Turkey: *G. commutata*, *G. glacialis*, *G. aurea*, *G. triphylla*, *G. anisanthos* and *G. sarmentosa*.

## RÉSUMÉ

LEVICHEV, I. G. & J.-M. TISON (2004). Typification des *Gagea* (Liliaceae) caucasiens décrits par Karl Koch. *Candollea* 59: 119-133. En anglais, résumés anglais, français et allemand.

Cinq lectotypes et un néotype sont choisis pour les taxons du genre *Gagea* décrits par Karl Koch en 1849 du Caucase et du nord-est de la Turquie: *G. commutata*, *G. glacialis*, *G. aurea*, *G. triphylla*, *G. anisanthos* et *G. sarmentosa*.

## ZUSAMMENFASSUNG

LEVICHEV, I. G. & J.-M. TISON (2004). Typisierung kaukasisch *Gagea* (Liliaceae) beschrieben Karl Koch. *Candollea* 59: 119-133. In Englisch, englische, französische und deutsche Zusammenfassungen.

Für die von Karl Koch im Jahre 1849 aus dem Kaukasus und der Nordosttürkei beschriebenen *Gagea* Taxa werden fünf Lectotypen und ein Neotypus ausgewählt, bzw. *G. commutata*, *G. glacialis*, *G. aurea*, *G. triphylla*, *G. anisanthos* und *G. sarmentosa*.

**KEY-WORDS:** LILIACEAE – *Gagea* – Lectotypification – Neotypification – Karl Koch (C. Koch) – Caucasus – Turkey

The first information about the genus *Gagea* on Caucasus was quoted by MARSCHALL VON BIEBERSTEIN (1808, 1819). Among the genus *Ornithogalum* he enumerated: *O. bulbiferum* Pall., *O. luteum* L., *O. pusillum* F. W. Schmidt, *O. villosum* M. Bieb. and *O. chloranthum* M. Bieb. A little bit later, Karl Henrich Emil Koch, after his two long travels through East Turkey and Caucasus, cited 13 species (KOCH, 1849); among them he described 6 new ones: *G. commutata* C. Koch, *G. glacialis* C. Koch, *G. aurea* C. Koch, *G. triphylla* C. Koch, *G. anisanthos* C. Koch and *G. sarmentosa* C. Koch. But this names were not perceived correctly by consecutive researchers, and sometimes were treated in contradiction with the Koch's priority notions (LEVICHEV, ined.). The use of the mentioned names became much more complicated after his herbarium collection had been destroyed in Berlin (1943). However, *duplicata* are kept at G, GOET, LE, MEL, MO (EDMONDSON & LACK, 1977). They make possible the interpretation of the author's conception of these taxa and allow the choice of lectotypes or neotypes.

The most important difficulties in the lectotypification are related to the deciphering of the handwriting, and to the determination of the category of the type material (lectotype – neotype), because in Koch's work the specimens' exact localities were not always cited. Some duplicates contain Koch's autographs as field labels with numbers and provisional plant names. Sometimes, instead of the name, there is a collection locality written in Gothic script. In addition, separate sheets contain descriptions of the plants written by the same hand as the field labels, which at high degree coincide with the texts published in 1849. Besides the original ones, there are many additional labels, including those written by two hands in French and German. The German anonym has written the species names and localities, the French one «Herb. C. Koch.», «Caucase», less often the number and the date. Koch's field numbers are sometimes different from the citations of localities in the later labels.

*Gagea commutata* C. Koch in Linnaea 12: 227. 1849.

**Lectotype (designated here):** «2720. *Gagea circinnata*. Elisabethp[ol].» (G), plant on the top of the sheet, on the left (Plates 1 & 2).

*Note.* – There are two sheets at G, but Koch's autographs are only present on one of them. As attested by the original field numbers 2720, 2685, 3081 and 2143, the plants were probably collected at different places in Caucasus. To know which plants corresponds to which number is not possible, especially for the plants without labels. However, the label «2720. Elisabethp» seems to designate the three upper plants of the sheet annotated by Koch. The labels 2685 and 3081 give no further information. On the label number 2143 is written: «ex Gaiguli – Kasanthshi» [i. e. Kaikull-Kasantschi: south-south-east of the modern Leninakan]. The fourth label looks like a general one for the sheet: «Nro. III. *Ornithogalum* 13/5.37. Gaiguli-Gasantschi [?sb??]». The fifth one gives a description: «*Gagea commutata* C. Koch. Bulbus simplex...». Later labels from other hands are fastened to the sheet: «Herb. C. Koch. *Gagea commutata* C. Koch. (Russisch-Armenien, Provinz Somcheth)» and five labels: «Herb. C. Koch.» The second sheet with ten plants bears no original labels, but many ones written in French: «Herb. C. Koch.» The pockets contain fragments of plants.

All the fifteen plants morphologically agree with *G. commutata*. They clearly demonstrate the habitual changeability of the species, which induced Koch's choose of the epithet «*commutata*» (i. e. changed). However, as usual for *Gagea exsuccata*, we cannot be absolutely certain that every sample belongs to this species (LEVICHEV, 2003). For this reason, as a lectotype was chosen a plant with label «2720. Elisabethpol» (Plate 1, a): the locality quoted by the initial description «Sehr häufig an Bergen durch ganz Grusien...» allows to classify any Koch's authentic Caucasian sample as isotype. «Elisabethpol» is a Caucasian locality corresponding to the modern city of Kirovabad in the western part of Shirvanian steppe (Armenia). Among the three plants possibly reliable to the number 2720, the upper one is the most representative of *G. commutata*, because of the presence of the bulb and of a very elongated peduncle.

*Gagea glacialis* C. Koch in Linnaea 12: 228. 1849.

**Lectotype (designated here):** «961. Dschimilbasch 26/5.44.» (G), flowering plant on the left (Plates 3 & 4).

*Note.* – In the protogue Koch quoted: «Auf dem Rücken des pontischen Gebirges des Ganes Hemschin». «Hemschin is a region on N side of Tatus Daghlari (incl. Kaçkar Dagh) between Ikizdere and Camlihemshin [Tu A8 Rize]» (LACK, 1978: 89). This region appears as a large historical district within the bounds of Lazistan, on the oriental Pontic chain which reaches 3937 m at the Kaçkar Dagh (East of Trabzon). Most likely «Dschimilbasch» is the name of a mountain above the locality Dschimil (Cimil), which, following Koch's travel planning (EDMONDSON & LACK, 1977), seems close to the modern city of Ikizdere. In Koch's collections of this part of route are known several specimens of *G. glacialis*. The plants with number 792 and 891 are dated from 30.VII and 1.VIII.1843. Dschimilbasch (number 961) was visited by Koch on 2.VIII.1843. The above-stated elements allow to believe that number 961 is a doublet of an herbarium sheet lost in Berlin, and to qualify it as a lectotype. There are three specimens on the sheet: a generative plant

with a single flower, a glabrous pedicel and, unfortunately, a broken off basal leaf, which is chosen as lectotype; another generative plant with flower and basal leaf broken off and lanose pedicel (this dimorphism is common in sect. *Fistulosae*), and a juvenile plant with a characteristic group of vegetative bulblets on the shortened peduncle.

***Gagea aurea*** C. Koch in *Linnaea* 12: 229. 1849.

**Neotype (designated here):** «N 919. *Gagea chlorantha*. Prope Tiflis, im monte Besobgal in prov Bambaki et in monte Alwar. legit Dr. Koch 1837. Hb Meyer» (LE), right upper plant (Plate 5).

*Note.* – The label is written by C. A. Meyer, with an addition by Fischer's hand in the lower corner: «Hb Meyer». According to Lack, from January till March 1837, Koch was collecting plants near Tiflis; in the middle of April he arrived at Stepanavan, and at the beginning of May at Leninakan. The geographical names enumerated on the label correspond to this travel part, but information about field number is absent (LACK, 1978). For an unknown reason, a single number corresponds to three points enumerated on Meyer's label. The plants mixed on the herbarium sheet were collected at different stages of the annual cycle: beginning of flowering and fruiting. This fact confirms their probable different geographical origin. About the reasons of this choice, see LEVICHEV (2003).

***Gagea triphylla*** C. Koch in *Linnaea* 12: 229. 1849.

**Lectotype (designated here):** «5285. *Gagea* Helenendorf. 26/5.44.» (G), (Plates 6 & 7).

*Note.* – According to LACK (1978) «Helenendorf» corresponds to Khanlar, south of the modern city Kirovabad (Armenia). As it often happens with *G. sarmentosa*, the basal leaves bear frostbite. This phenomenon is characteristic for species with winter-annual and autumn-winter vegetation.

***Gagea anisanthos*** C. Koch in *Linnaea* 12: 230. 1849.

**Lectotype (designated here):** «Nro. II. *Ornithogalum* 21/4.37. auf der Höhe zwischen Samis und Achsibajut.» (G), right plant in the middle row (Plates 8 & 9).

*Note.* – Two sheets bearing this name, kept at G and G-BOISS, were investigated. The preference is given to the G one, because Koch's autographs are present only on this sheet. The other sample: «*Gagea anisanthos* C. Koch Lelwar» is kept in G-BOISS collection; its label is not from Koch's hand, and, very probably, is posterior to the description of the species. It is probable, that this single specimen was sent away by Boissier after the first travel in 1836-38 and was not used by Koch for the description.

The sheet of G bears Koch's autographs of late period and was sent with collections of second travel (1843-44). It bears a field label «Nro. II. *Ornithogalum*...» and, on the middle row of exsiccata, a draft or manual copy of the description of the species. The locality «auf der Höhe zwischen Samis und Achsibajut» clearly corresponds to «Lelwar» cited in Koch's protologus. LACK (1978) quotes: «Lelwar: mts NE of Stepanavan [Ar]». Samis and Achsibajut also are located «NE of Stepanavan», on the both sides of Caucasian Small Mountain range: Samis in Georgia and Achsibajut in Armenia. Lelwar corresponds to this part of Caucasian Small Mountains. The specimen chosen as a lectotype was gathered close to the *locus classicus* and certainly was used together with the lost holotype for the description of *G. anisanthos*. This is confirmed by the joint draft of description. This sample formally corresponds to the concept of neotype, but the above-stated elements allow to qualify it as a lectotype. The later label: «Herb. C. Koch. Caucase. Avr. 1837. *Gagea anisantha* C. Koch. Südöstlicher Abfall des Kaukasus. (Schirwan)», written by two hands, is geographically unlikely, because «Schirwan» is a plain part of Kura river's valley, when this species always lives in high mountains. All plants on this sheet are compatible with the taxon known as *G. anisanthos*, including the immature specimens with a characteristic group of bulblets borne at the ground surface on a shortened peduncle. As usual in sect. *Fistulosae*, the pubescence of pedicels is variable: glabrous in upper and medium rows of plants, but sparsely villose in the downer one.

*Gagea sarmentosa* C. Koch in *Linnaea* 12: 230. 1849.

**Lectotype (designated here):** «2155. *Gagea reticulata*» (G), right plant in the upper row (Plates 10 & 11).

*Note.* – The right plant in the upper row fits well with the Koch's description: «*Bulbus... sarmentosus*»; it bears a characteristic, little more than one centimeter long stolon, ending in a rather large vegetative bulb partially covered with its own short sclerified roots. On the same sheet are arranged two rows of plants with a genuine label «2167. *Gagea circinnata*», and also the label with a draft of the description: «*Gagea triphyllos* [crossed out, from above] *sarmentosa* C. Koch. Bulbus duplex...». On the upper row is a later label: «*Gagea sarmentosa* C. Koch (Chanat Schirwan). Herb. C. Koch.», which apparently refers to both field numbers 2155 and 2187. According to LACK (1978), Koch visited Schirwan (Schemachi) just once in July-August 1844 and during this period the field numbers were superior to 5500. More, it is impossible to collect *Gagea* in the middle of the summer in this region. On the other hand, the Caucasian part of the journey in 1844 begins with number 2101 (EDMONDSON & LACK, 1977). From March till May 1844 Koch stayed at Tiflis. On this basis, the plants with field numbers 2155 and 2187 should be considered as syntypes, as the initial description of *G. sarmentosa* specifies: «In der Nähe von Tiflis...». The later label «Schirwan» should be regarded as a mistake.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

- EDMONDSON, J. R. & H. W. LACK (1977). The Turkish and Caucasian collections of C. Koch. I: Turkey. *Notes Roy. Bot. Gard. Edinburgh* 35: 321-344.
- KOCH, K. (1849). Beiträge zu einer Flora des Orientes (Fortsetzung): *Gagea*. *Linnaea* 22: 226-231.
- LACK, H. W. (1978). The Turkish and Caucasian collections of C. Koch. II: Caucasia. *Notes Roy. Bot. Gard. Edinburgh* 37: 79-94.
- LEVICHEV, I. G. (ined.). On age-related peculiarities of shoot structure in the context of the typification of Caucasian *Gagea* (Liliaceae), described by the Karl Koch. I: Sect. *Platyspermum*, *Plecostigma*, *Graminifoliae*.
- MARSCHALL von BIEBERSTEIN, F. (1808). *Fl. Taur.-Caucas.* 1: 271-277.
- MARSCHALL von BIEBERSTEIN, F. (1819). *Fl. Taur.-Caucas.* 3: 264-266.

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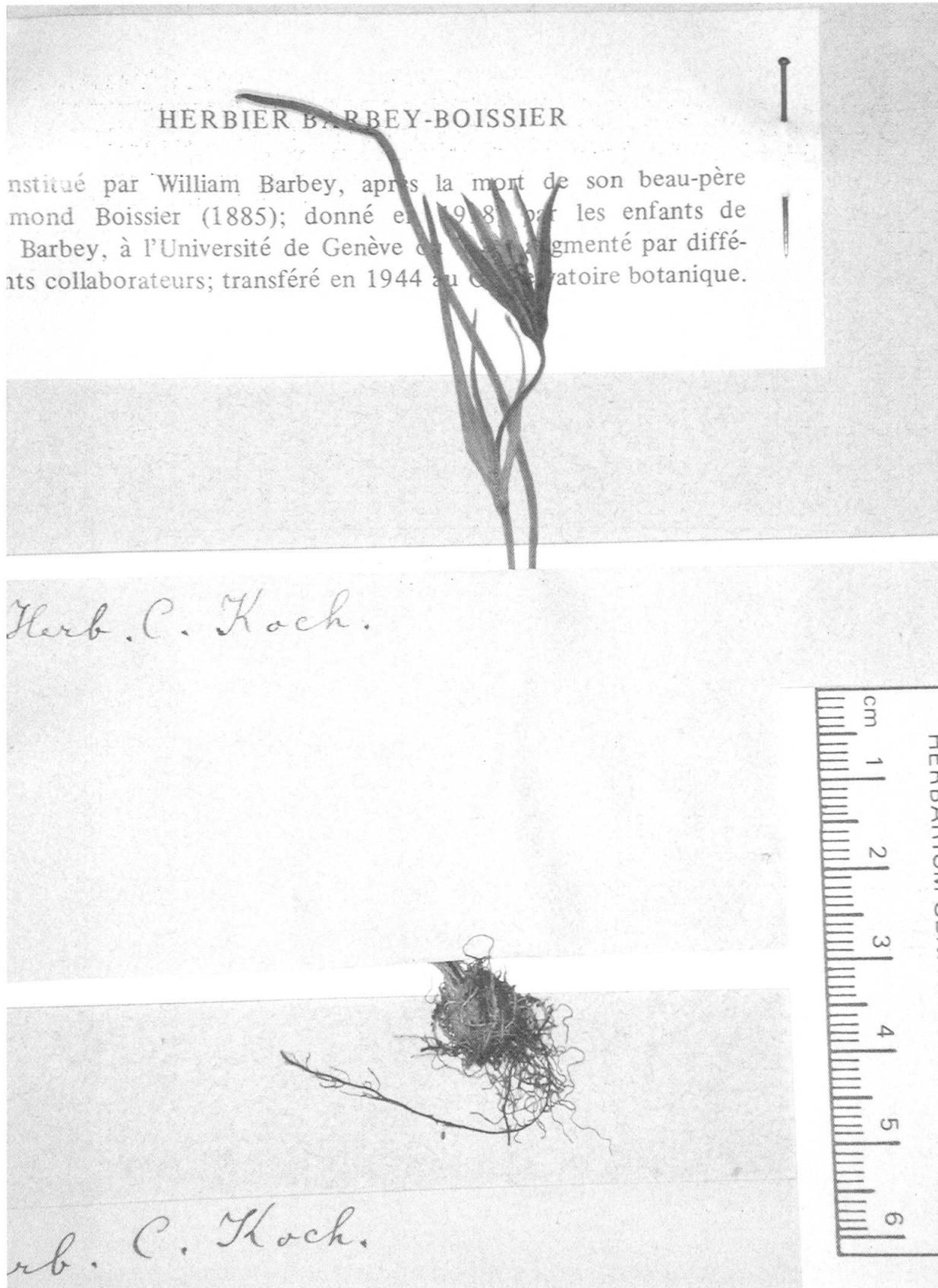


Plate 2.- Lectotype collection of *Gagea commutata* C. Koch (G).

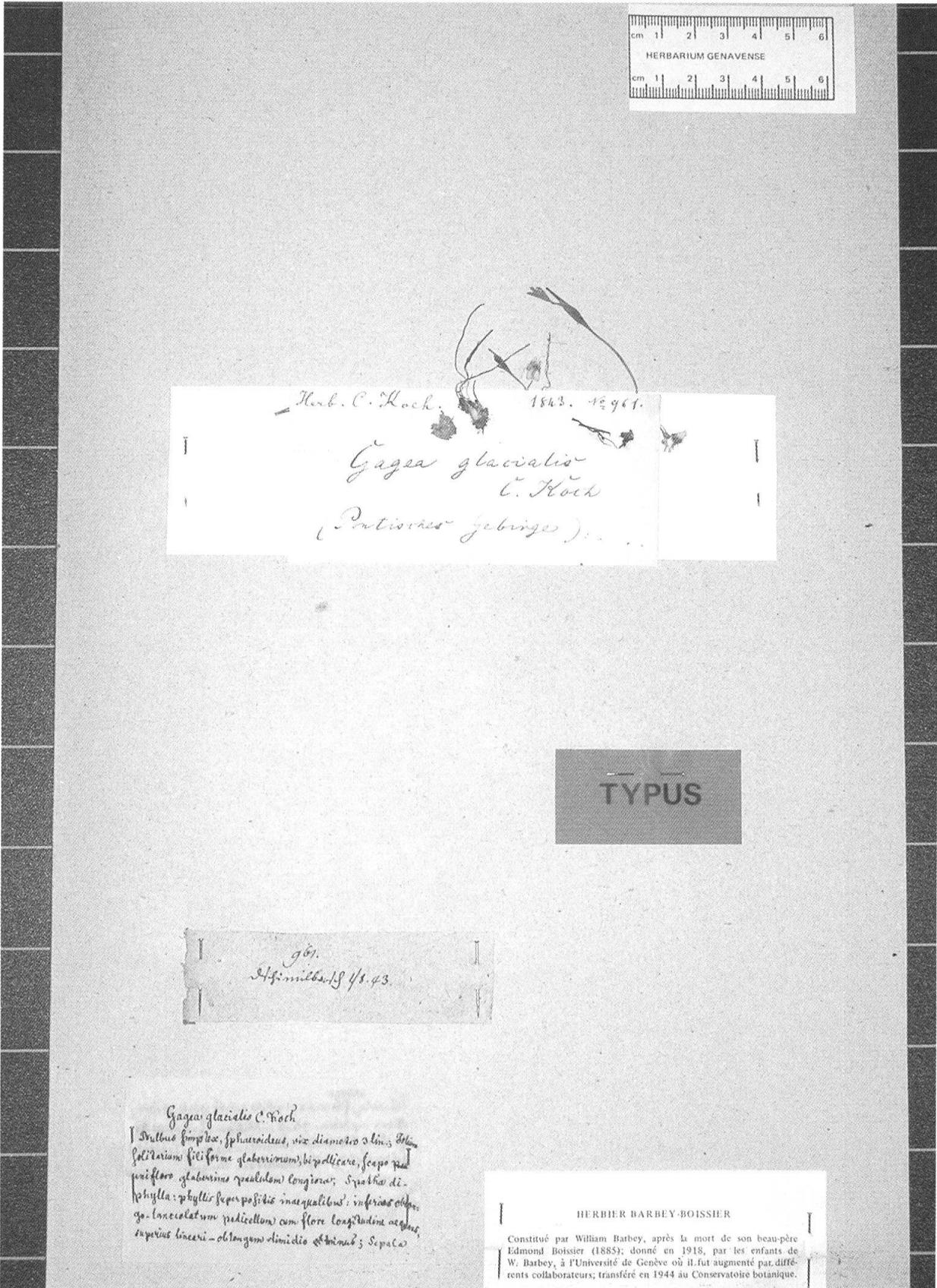


Plate 3.— Herbarium sheet of *Gagea glacialis* C. Koch.

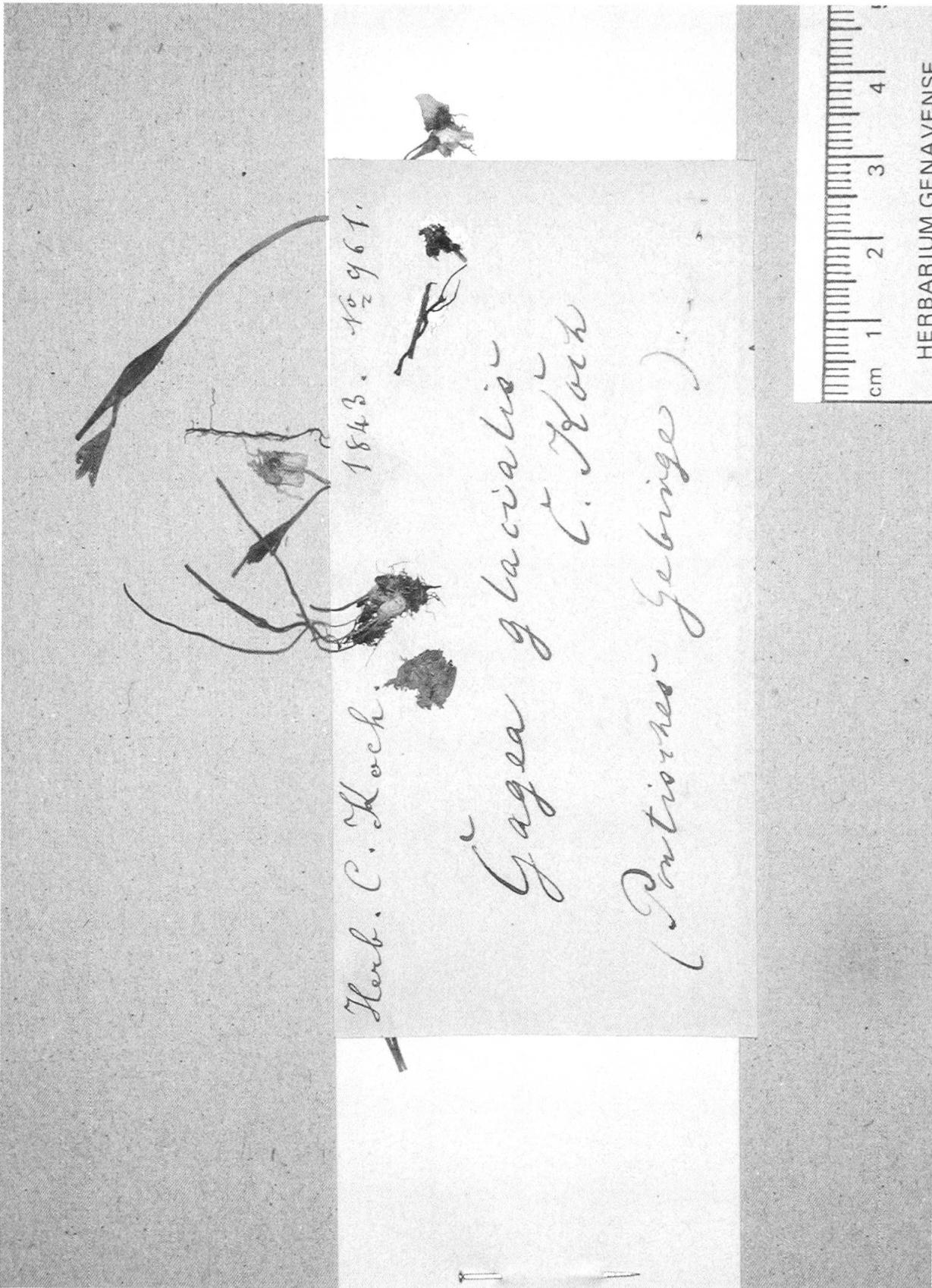


Plate 4.— Detail of the herbarium sheet of *Gagea glacialis* C. Koch.



**Neotypus**  
 Gagea aurea K. Koch  
 20.02.2002 I. Levichev (LE)

*G. chlorantha (L.) Res.*  
*N. Levichev*

cm  
 0 1 2 3 4 5 6 7 8 9 10  
 Sankt - Petersburg

Gagea chlorantha (L.) Res.  
 A. Grossheim.  
 1932

*Gagea*  
*Gagea chlorantha*  
 Prope Tiflis, in monte  
 Besoldal in prov. Barmbar.  
 et in monte Alvar legit  
 Dr Koch 1837  
 Hedley

Herbarium Academiae  
 Scientiarum Petropol.

Plate 5.— Herbarium sheet of *Gagea aurea* C. Koch.

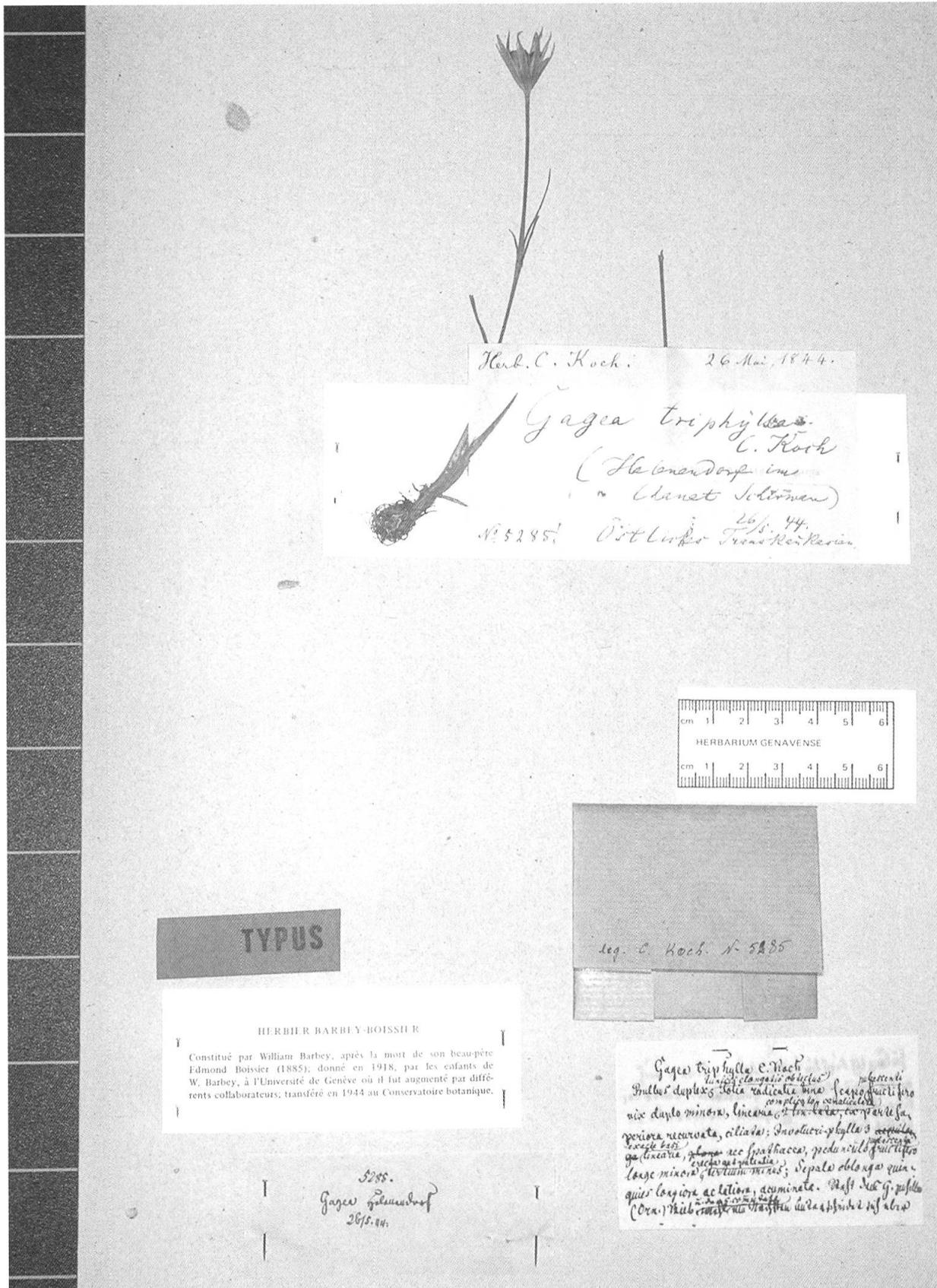


Plate 6.— Lectotype of *Gagea triphylla* C. Koch.

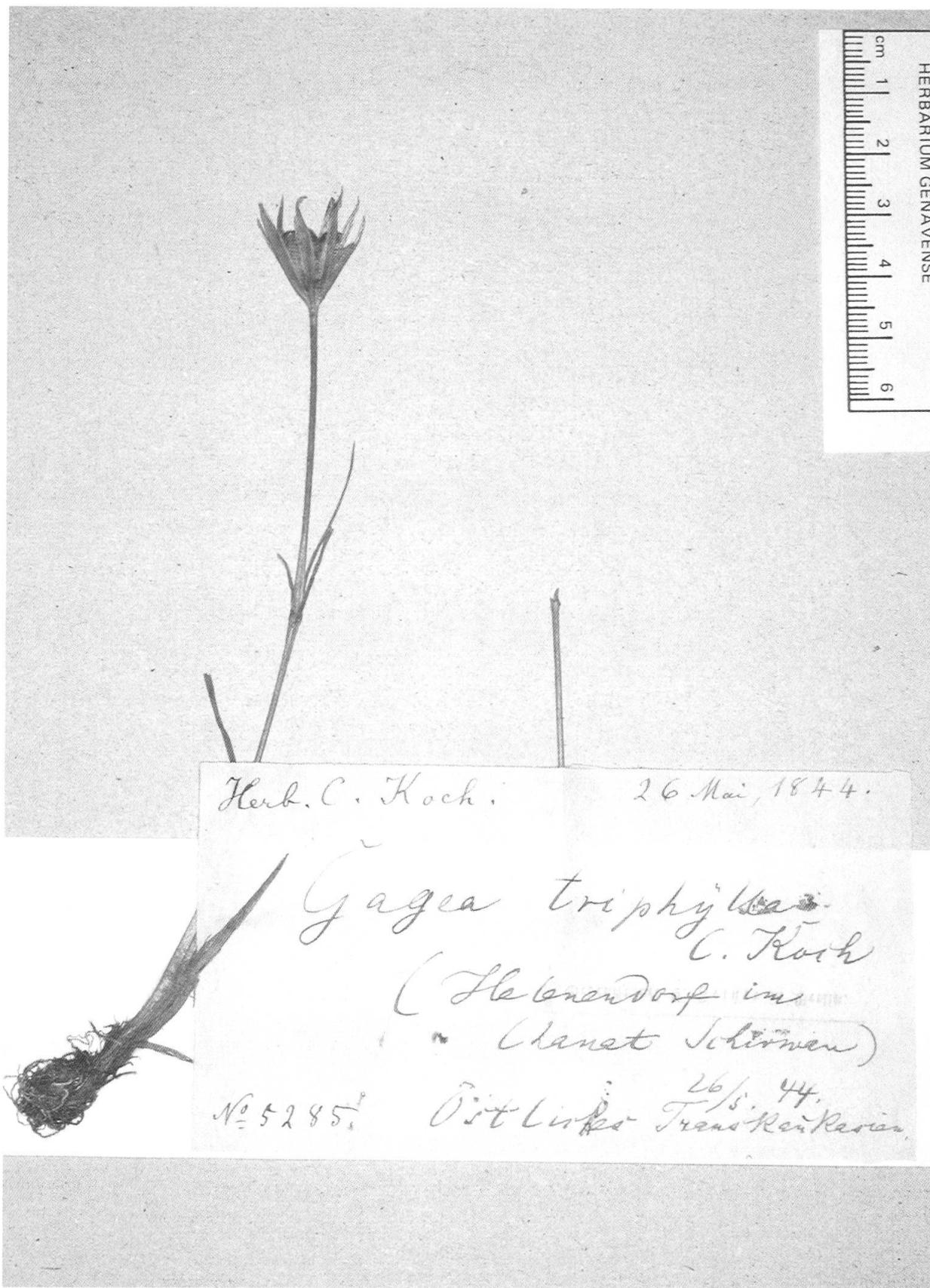


Plate 7.— Detail of the lectotype of *Gagea triphylla* C. Koch.



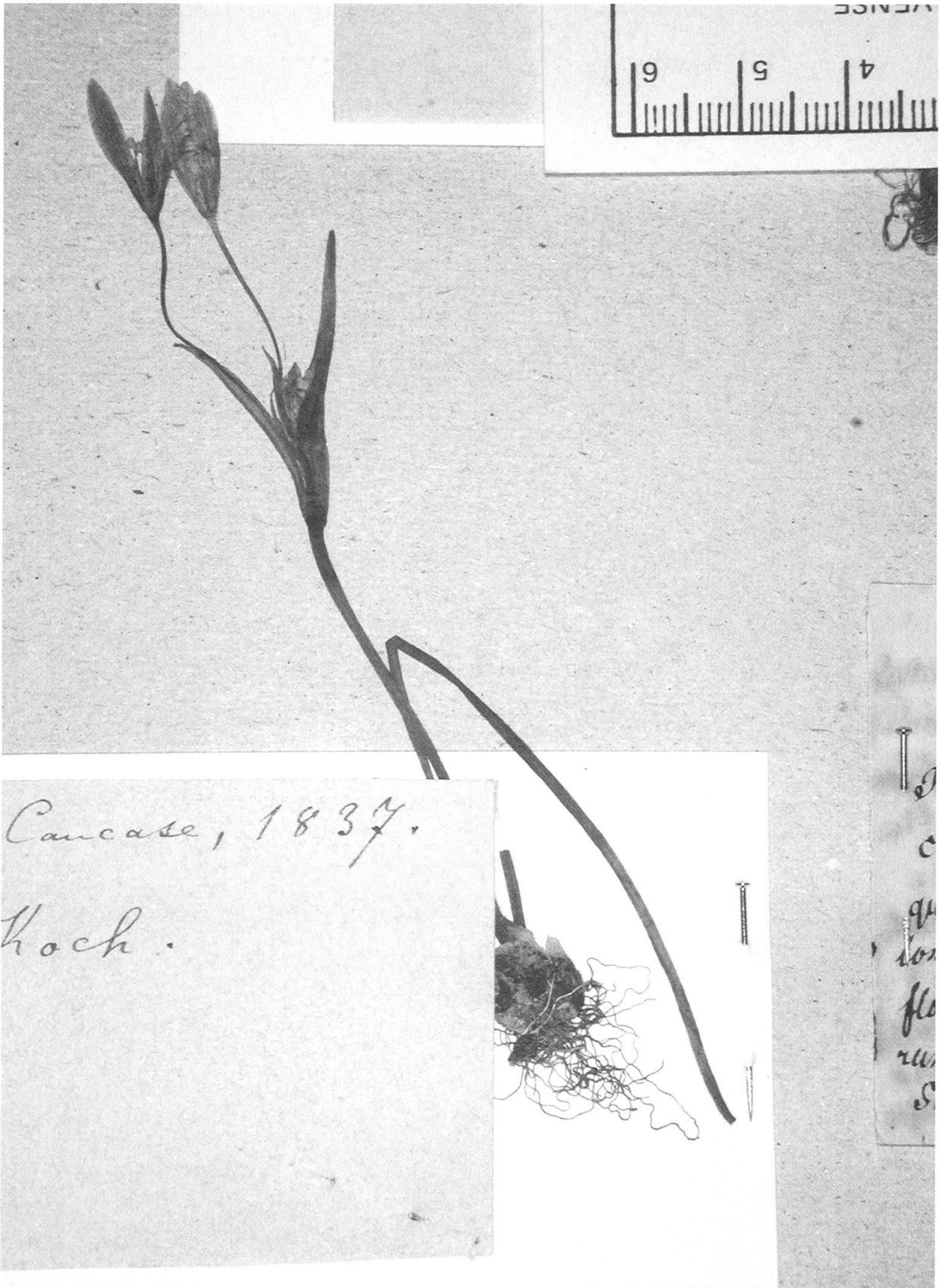


Plate 9.— Lectotype of *Gagea anisanthos* C. Koch.

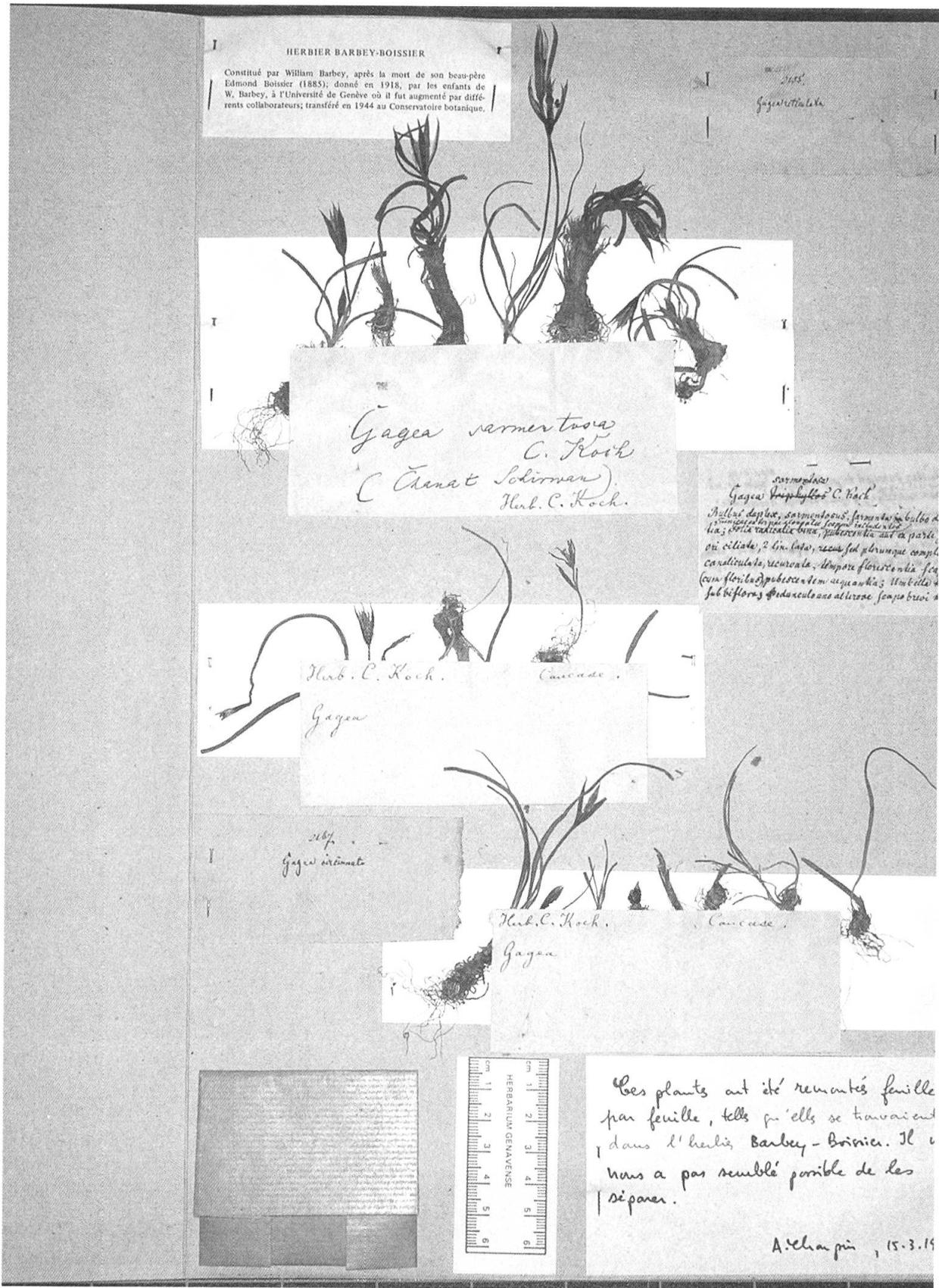


Plate 10.- Herbarium sheet of *Gagea sarmentosa* C. Koch.



Plate 11.— Lectotype of *Gagea sarmentosa* C. Koch.

