

SHORT COMMUNICATION

Hieracium gulanum, a new hawkweedspecies from limestone rocks around Geulhem, the Netherlands

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Hieracium gulanum
apomicts
biodiversity
conservation
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habitat islands
Hawkweed
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taxonomy

Abstract – *Hieracium gulanum* is described as a new species from the Netherlands. The description is accompanied by illustrations. The species is only known from a very restricted area near Geulhem and Valkenburg in South Limburg, where it occurs in open vegetation on steep limestone cliffs in the valley of the River Geul. The total number of individuals is estimated as being less than 200. Hence, the species is considered critically endangered according to the IUCN criteria. *Hieracium gulanum* faces two main threats: succession of the open vegetation in which the two populations occur and vegetation clearance of the rock faces in Geulhem.. We strongly plea for a special action plan to ensure the biodiversity value of the limestone cliffs in South Limburg, which provide a habitat that is very rare in the Netherlands.

Samenvatting – In 2003 werd op de rotsen boven de grotwoningen in Geulhem, Zuid-Limburg, een onbekende *Hieracium*-soort uit de sectie *Hieracium* gevonden. Tot voor kort werd gedacht dat deze vondst *Hieracium murorum* subsp. *euchloroprasinum* var. *subcinerascens* betrof, maar de herontdekking van een 'euchloroprasinum'-populatie bij Schinnen-Spaubeek, die reeds beschreven werd door De Wever, maakte deze determinatie onhoudbaar. In 2015 werd tijdens een excursie van de Plantensociologische Kring Nederland door Theo Muusse een tweede populatie van de onbekende soort gevonden op de rotsen boven het openluchttheater in Valkenburg. Het betreft een nieuwe soort, die hier wordt beschreven: *Hieracium gulanum*. Deze nieuwe soort wijkt af van *H. cardiophyllum* door het hebben van bladen met een afgeknotte, vaak scheve voet, een fijnere tanding, en een smallere bladtop, en een compacte bloeiwijze op een vaak bladloze, opvallend stevige stengel en omwindselbladjes met een opvallende rand van sterharen.

Hieracium gulanum is slechts bekend van een zeer beperkt gebied bij Geulhem en Valkenburg, waar de soort groeit op kalkrotsen langs het Geuldal. Uit het buitenland zijn veel meer kalk-havikskruiden beschreven met dergelijke kleine arealen. De geschatte totale omvang van de twee populaties van *H. gulanum* bedraagt minder dan 200 planten, en de soort is ernstig bedreigd ('critically endangered') volgens de IUCN-criteria. De belangrijkste bedreiging van *H. gulanum* wordt gevormd door successie van de open begroeiingen waarin de soort voorkomt, alsmede het schoonmaken van de rotsen in het dorp Geulhem. Het is wellicht mogelijk de populatie uit te breiden door het vrijmaken van de rotswanden die nu beschadigd worden door overgroeïende vegetatie in de directe omgeving van de bestaande populaties.

Rotswanden hebben tot nu toe nauwelijks aandacht gekregen in de Nederlandse botanische literatuur en natuurbescherming. Herstel en bescherming van de rotswanden is dringend noodzakelijk en we pleiten daarom voor een actieplan voor het behoud van de biodiversiteit van de rotswanden in Zuid-Limburg. Daarnaast zou een monitoringsplan voor de groeiplaatsen van de extreem zeldzame *Hieracium gulanum* overwogen moeten worden.

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INTRODUCTION

During field work in 2003 in the south of the Province of Limburg, the Netherlands, the attention of the first author (RH) was drawn to abundantly flowering plants of a *Hieracium* species above the cave houses in the hamlet of Geulhem, just south of Berg-en-Terblijt. The plants clearly belonged to *Hieracium* L. sect. *Hieracium*, but they differed from the locally rather common *Hieracium cardiophyllum* (Jord. ex Sudre) A.W. Hill in the shape of their leaves with unequal sides and a rounded to cuneate basis, a rather firm stem, reduced or absent stem leaves, and a distinct, rather compact inflorescence. Since its discovery, it was only known from this single location, but during an excursion of the Dutch Phytosociological Society (Plantensociologische Kring Nederland) in May 2015 in Valkenburg, a second location was discovered by Theo Muusse. Based on the first location and the minimal description given by van Soest (1929), the first author considered the plant at first to be conspecific with *Hieracium murorum* L. subsp. *euchloroprasinum* Zahn var. *subcinerascens* Zahn (1921). This variety was mentioned as “*Hieracium euchloroprasinum*” in a paper on the diversity of *Hieracium* in the lower valley of the River Geul (Haveman & de Ronde 2014). However, serious doubts on the initial identification arose when we rediscovered a population of *H. murorum* subsp. *euchloroprasinum* near Schinnen-Spaubeek, also in South Limburg, which was already mentioned by van Soest (1929) in his overview of the Dutch Hawkweeds. It was possible to relocate the exact location of this population through the detailed notes by de Wever, which are kept in the herbarium of the Museum of Natural History in Maastricht (MAAS). After comparing the plants from Schinnen-Spaubeek with those from the cave houses in Geulhem, it is clear that the plants from Geulhem are very different from the plants of *H. m.* subsp. *euchloroprasinum* from Schinnen-Spaubeek, and we concluded that the Geulhem plants clearly belong to another species.

To ensure this conclusion, we examined original material of *Hieracium tenuiflorum* Arv.-Touv. var. *subcinerascens* Arv.-Touv., on which Zahn based his *Hieracium murorum* subsp. *euchloroprasinum* var. *subcinerascens* (Fig. 1). It was included in the famous exsiccate series Hieraciotheca Gallica et Hispanica, which was distributed between 1897 and 1908 by Arvet-Touvet and Gautier (Rouy 1899); *H. tenuiflorum* var. *subcinerascens* was distributed as numbers 777 & 778. Photos of the original material were provided by the [Museum d'Histoire Naturelle de Grenoble](#) (GRM). The material consists of several plants mounted on two sheets (NHMGr.1914.37187 and NHMGr.1914.37188); they were collected in France at “Dauphiné (Drôme): Miribel, bois, soils argillo-siliceux” at May 31, 1901, by Constant Chatenier. Although micromorphological characters cannot be checked sufficiently from a photo, the two specimens in GRM very much resemble the plants from Schinnen-Spaubeek, and not those from Geulhem, supporting our conclusion that the Geulhem plants do not belong to *H. m.* subsp. *euchloroprasinum* var. *subcinerascens*. From a nomenclatural point of view, it is noteworthy that the examined sheets from the Hieraciotheca are lacking descriptions. Consequently, Arvet-Touvet's variety name is not validly published (Art. 38.1 ICN, Turland et al. 2018), thus the correct author citation for the taxon is Zahn's (1921) *H. murorum* subsp. *euchloroprasinum* var. *subcinerascens* Zahn. Because in the Netherlands this taxon is only known from the two sites in which *H. m.* subsp. *euchloroprasinum* occurs as well, we consider at least the Dutch specimens which Zahn (in van Soest 1929) identified as var. *subcinerascens* merely as a taxonomically insignificant form of *euchloroprasinum* with somewhat hairy leaves.

The *Hieracium* flora in the vicinity of Geulhem is relatively well studied. In the first decades of the 20th century several Dutch botanists, including F.C.A. de Wever, J.L. van Soest, T.Th. Henrard, A.W. Kloos, and J.J.P. Tap, collected hawkweeds in this region. Obviously, the hawkweed taxon we collected at the two sites in Geulhem and Valkenburg may have been collected before by one of these outstanding naturalists. Indeed, one specimen in the Kloos' herbarium, which is kept in the herbarium of [Naturalis Biodiversity Center](#) in Leiden (L), shows some resemblance with the recently collected plants from Valkenburg and Geulhem. This specimen was collected in May 1914 at the chalk hills near Geulhem and identified by Zahn as belonging to *H. murorum* L. subsp. *nemorense* (Jord.) Zahn (L.3441654). Material from the herbarium of the first author of the plants from Geulhem was sent to T. Tyler (Lund) and G. Gottschlich (Tübingen), but neither of these two *Hieracium* specialists could identify the material, although the latter could state with certainty that the plants don't belong to *H. nemorense* Jord. We have therefore come to the conclusion that the plants from Geulhem and Valkenburg belong to a yet unknown species (Fig. 2), which we describe in this article.

MATERIALS AND METHODS

In accordance with the Nordic school of Hieraciology (see Haveman 2013), we consider the apomictic *Hieracium* lineages as species. The *Hieracium* specimens examined for this study are preserved in L, MAAS, and the private herbarium of the first author (Herb. R. Haveman). The description of the species is based on the plants in the herbarium of the first author. All measurements were done on dried plant material; given are the 20–80-percentiles, with the outliers between brackets. The holotype will be deposited in the herbarium of [Naturalis Biodiversity Center](#), Leiden (L).

Hieracium gulianum Haveman & De Ronde, spec. nov. — Fig. 2 & 3.

Holotype: The Netherlands: R. Haveman (Herb. R. Haveman 2662, sheets a–c), Province of Limburg, Berg-en-Terblijt, t.o. grotwoning, 182.886 / 319.914, in Origanitalia, 2 June 2003.

Rosette forming erect hemicryptophyte; plant (31–)49–60(–77) cm tall from base to top (including accladium). Stem (yellowish) green or rarely suffused with red in the lower half, (1.9–)2.4–3.7(–4.1) mm in diameter at base, (1.5–)2.0–2.3–2.8) mm in diameter just below the inflorescence (the rarely formed lowered branch not taken into account), with few pale eglandular hairs at the base and scarce eglandular hairs with a short dark base in the upper part, in the upper half with increasing stellate hairs and few to numerous fine dark glands with a brown head (–0.5 mm long). Basal leaves pale green to yellowish green, (2–)5–9(–10), forming a rosette, ovate to ovate-lanceolate (2:1–2.5–1), inner ones sometimes lanceolate, (7.5–)8–10(–13) × (3.5–)3.6–4.8(–5.5) cm, often with conspicuously asymmetrical leaves; base rounded to cuneate or rarely slightly cordate; margin irregularly (often densely) denticulate-sinuate with sharp teeth along 60–80(–90)% of length of the leaf, the lower teeth pointing side- or forwards; leaf apex acute; abaxial side of leaf with few very short (c. 0.5 mm long) eglandular hairs especially towards the margins, and very sparse stellate hairs; adaxial side of leaf with few to numerous short (c. 1.0 mm long) eglandular hairs, without stellate hairs; midrib densely hairy with somewhat longer (c. 2 mm long) eglandular hairs; petiole densely hairy



Fig. 1. Original material of *Hieracium tenuiflorum* Arv.-Touv. var. *subcinerascens* Arv.-Touv. from Arvet-Touvet's Hieraciotheca Gallica. Collection of the Museum d'Histoire Naturelle de Grenoble (GRM), No. MHNGr 1914.37187. Photo: M. Lefebvre, Museum d'Histoire Naturelle de Grenoble, 2015.

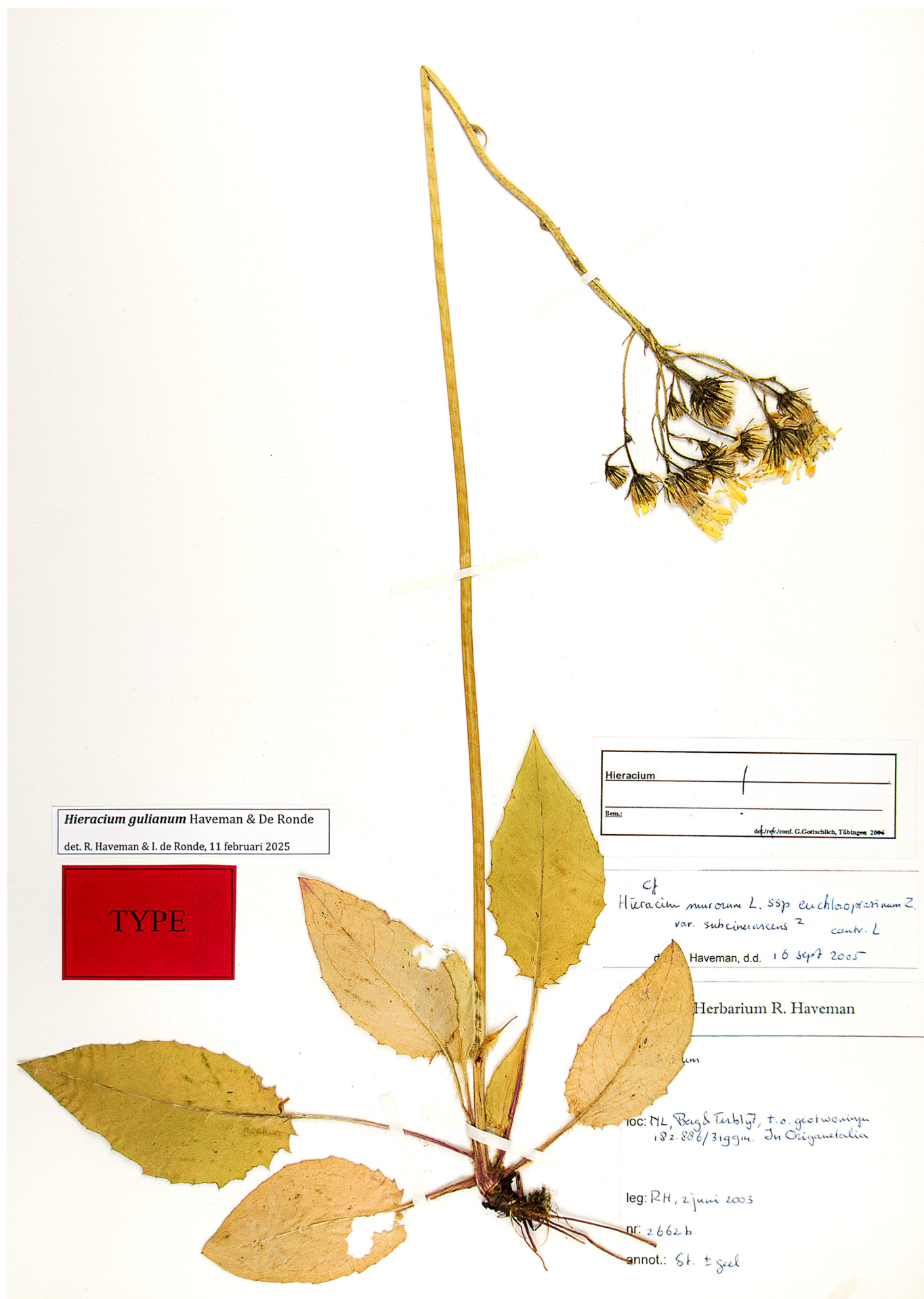


Fig. 2. Holotype of *Hieracium gulianum* Haveman & De Ronde spec. nov., collected at 2 June 2003 at Geulhem (Province of Limburg, the Netherlands) opposite the cave dwellings. Photo: Rense Haveman, 2025.

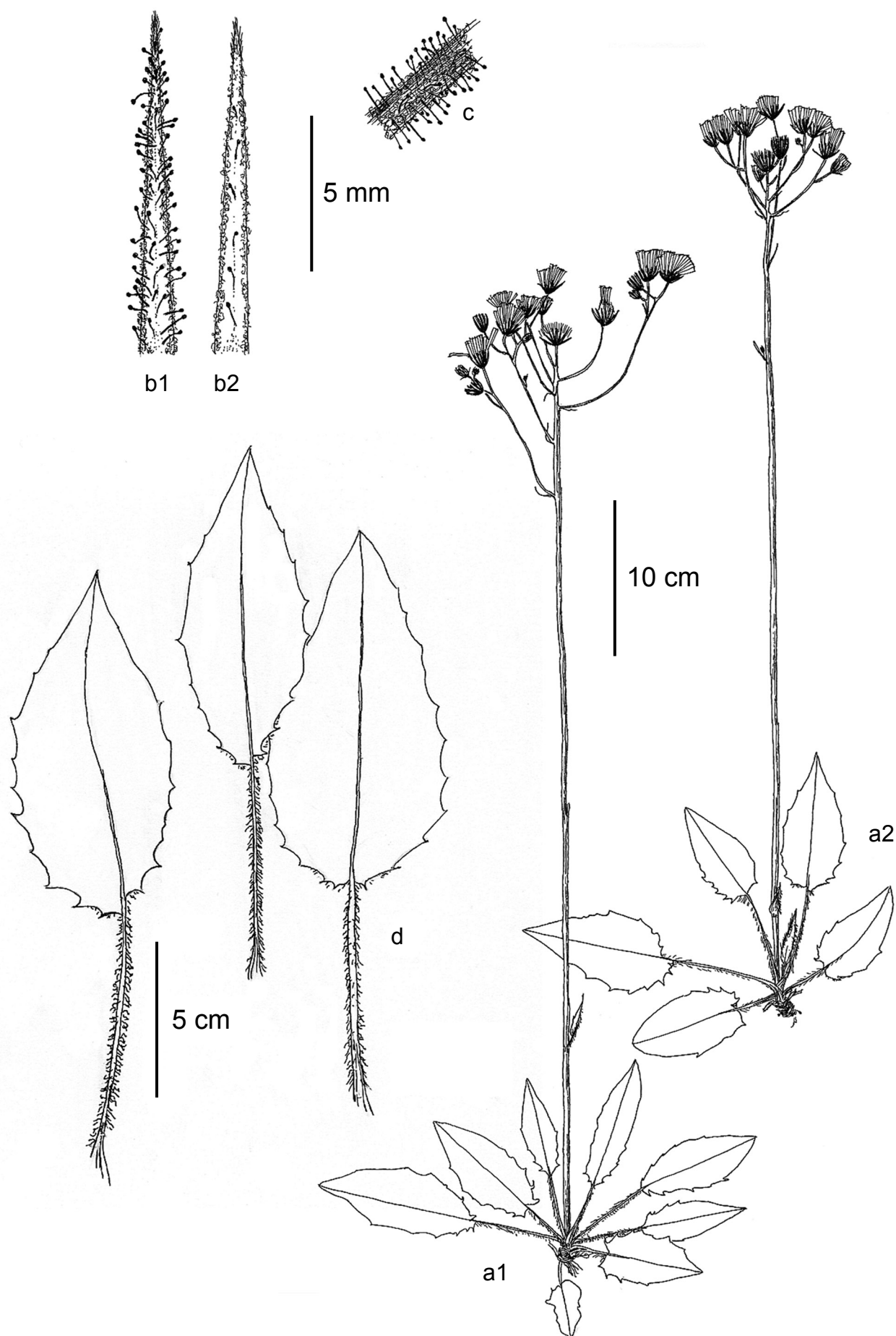


Fig. 3. Holotype of *Hieracium gulianum* Haveman & De Ronde. a. habit (a1 = Herb. R. Haveman 2662a; a2 = Herb. R. Haveman 2662b); b1. outer involucrel bract; b2. inner involucrel bract; c. pedicel; d. leaf shape (b-d = Herb. R. Haveman 2662b). Drawing: Rense Haveman.



Fig. 4. Forest and scrub clearing at the upper edge of the chalk cliffs near Geulhem (Province of Limburg, the Netherlands), one of the locations with *Hieracium gulianum* Haveman & De Ronde. Photo: Iris de Ronde, 2015.

with long (up to 5 mm long) white, wavy, eglandular hairs. Stem leaves often seemingly absent, but mostly 1 (strongly) reduced stem leaf present, rarely well-developed and then ovate, with a rounded base and acute apex, and set with conspicuous teeth. Inflorescence (5–)8–18(–26) % of the total height of the plant, compact corymbose with 5–7 arcuate to almost straight branches which overtop the terminal capitula, the lowest branch (4–)5.5–7(–9) cm, the upper (2–)2.5–3–5.5) cm, sometimes with a long lowered branch; capitula (14–)15–21(–25); accladium short, (5–)6–14(–20) mm long. Peduncles set with numerous stellate hairs and dark glandular hairs with a brownish to yellow head. Involucral bracts 9–11 mm long, acute, outer ones with numerous up to 1 mm long dark glandular hairs with yellow heads and with numerous stellate hairs confined to the margins, forming a more or less conspicuous border; eglandular hairs absent; inner bracts with a dense margin of stellate hairs and few dark glandular hairs at the top. Ligulae glabrous-tipped, but sometimes with very few short cilia. Styles yellow in fresh material, but with dark papilla (covering 25–50 % of the surface) in dried material. Receptacle pits: short-dentate.

Flowering time: (end April–)May–June.

Identification — *Hieracium gulianum* resembles *H. cardiophyllum*, but the later species has clearly cordate leaves with larger teeth at the leaf base and a more or less broad apex, a differently built, lax inflorescence, and usually one well-developed stem-leaf. The indumentum of the involucral bracts also differs by having less conspicuous stellate hairs and a clearly bearded top.

Etymology — The epithet is derived from the Latin 'gulia' and refers to the River Geul as well as to Geulhem, the village where the species was discovered. The word 'gulia' has a Germanic origin, meaning deep hole or gully (Philippa et al. 2005), making it an appropriate name for a species growing preferably on the cliffs formed by the carving River Geul.

Additional specimens

These additional specimens are paratypes and are all preserved in the private herbarium of the first author (Herb. R. Haveman).

Netherlands

Province of Limburg

R. Haveman 2663, Geulhem, 182.994/319.940, 2 June 2003 (sheets a & b); *R. Haveman & I. de Ronde* 12.2405.001, Geulhem, bij de grotwoningen, 182.900/319.900, 23 May 2012 (sheets a–c); *R. Haveman & I. de Ronde* 15.2805.001, Geulhem, boven de grotwoningen, 182.915/319.911, 28 May 2015; *R. Haveman, I. de Ronde & T. Muusse* 15.2805.002, Valkenburg, boven het amfitheater aan de Plenckertweg, 185.940/319.499, 28 May 2015.

ECOLOGY AND DISTRIBUTION AREA

Most plants of *Hieracium gulianum* are found on exposed rocks of brittle 'Geulhem limestone' (Formation of Houthem, Paleogeen (Damien, Paleocene); Felder & Bosch 1984). This chalk has a moderate to very coarse grain and contains dense chalk knolls and banks; its CaCO₃ content lies between 96 %

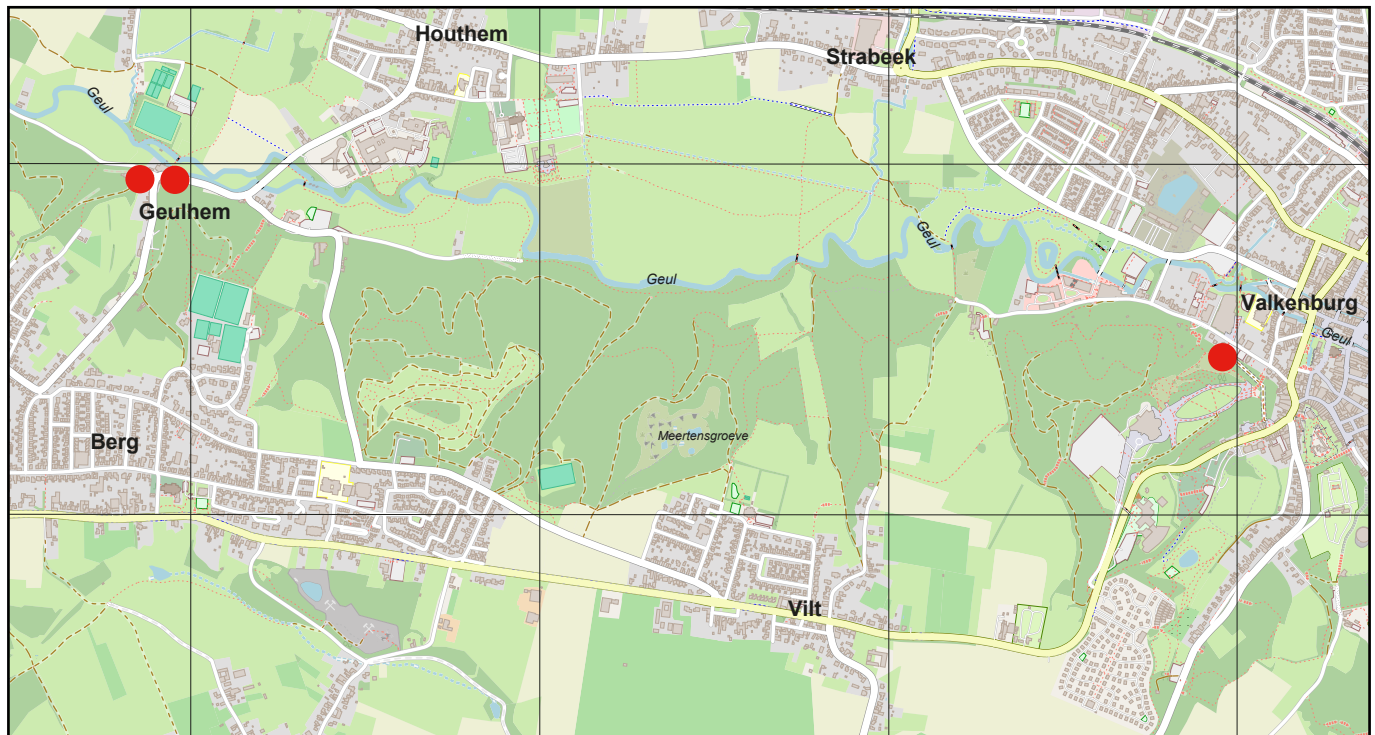


Fig. 5. Known distribution of *Hieracium gulianum* at Geulhem and Valkenburg, Province of Limburg, the Netherlands (red dots). The distribution map is made using STIPT, version 2014 (Frigge 2014; source of the background map: www.openstreetmap.org).

and 97 % (Felder 1989). The limestone faces find their origin in the carving erosion by the River Geul after the River Meuse moved its course to the west in the Early to Mid-Pleistocene as a result of the ongoing rise of the Eifel-Ardenne massif. In the direct surrounding of the limestone valley walls, *H. gulianum* is found at forest clearings on very shallow soils (Fig. 4), and rarely in road verges and on artificial stone walls built from limestone blocks from local origin. The vegetation in which *H. gulianum* is found can be assigned to the *Trifolium medii*-*Geranietaea sanguinei* Müller 1962, an alliance comprising meso-xerophytic heliophilous fringe communities (Haveman & de Ronde 2014). Typical companions of *H. gulianum* are *Solidago virgaurea* L., *Brachypodium sylvaticum* (Huds.) P.Beauv., *Poa nemoralis* L., *Hieracium cardiophyllum*, *Origanum vulgare* L., *Inula conyzae* (Griesseli) Meikle, *Carex digitata* L., *Galium mollugo* L., *Clematis vitalba* L., and *Campanula trachelium* L.

As far as known, *Hieracium gulianum* has a very limited distribution area (Fig. 5): it is only known from a small area in the hills near the village of Geulhem (182.319 and 183.319) and from one small population in Valkenburg (185.319). The estimated number of plants is in total less than 200, although the exact number is difficult to determine because a significant number of the plants grow in inaccessible places. Such limited distribution areas and small population sizes are not unusual in rock dwelling hawkweeds. An example is the recently described *Hieracium bifidum* subsp. *ithanum* Gottschlich (in Gottschlich & Schabelreiter 2025), which grows on limestone cliffs of the Ith ridge in the Weser-Leine-Bergland, Lower Saxony, in Germany. The taxon is only found in two places which are about 6.5 km apart. Other examples include *H. wiesbaurianum* Uechtr. ex Baennitz subsp. *guestphalicum* Gottschlich (in Gottschlich & Raabe 1991), *H. saxifragum* Fr. subsp. *carolipolitanum* Dunkel (2001), *H. argospathum* Wiinstedt (Schou 2001), *H. murorum* L. subsp. *rugianum* Gottschlich (in Gottschlich et al. 1998), *H. attenboroughianum* Rich (2014), and *H. tavense* (W.R.Linton) Ley (1909), growing in a sandstone ravine in the Upper Tawe

Valley, Wales, where only 13 plants could be found in a recent survey (Rich & Houston 2000). In virtually all these cases, the species grow in isolated habitat islands, preventing them to spread easily. Following Clements et al. (2006), who used the term in the context of tropical karst areas characterised by high degrees of endemism, we would also like to use the term 'arks of biodiversity' for such calcareous habitat islands.

CONSERVATION ISSUES

According to IUCN criteria, *Hieracium gulianum* is considered 'critically endangered' (CR) on the basis of its very small population size and known narrow distribution area (IUCN 2001). The main threat for the species appears to be the succession from open, xerophyllous, heliophyllous and thermophyllous pioneer vegetation to shrubs and *Hedera helix* blankets. A similar situation was described by Gottschlich & Schabelreiter (2025) from the Ith ridge: they describe the overgrowing of formerly exposed rocks at the sites with the extremely rare *H. bifidum* subsp. *ithanum*, resulting in less favourable circumstances for this taxon. Excavation of rocks (Haveman & de Ronde 2014) might have caused its decline in the past. Apart from this, the population is facing the cleaning of the cliffs by residents of Geulhem, which try to keep the walls in their backyards completely free of vegetation. None of the known locations of *H. gulianum* is officially designated as a nature reserve. Expansion and reinforcement of the existing population, which is highly desirable, might be possible by the clearance of shrubs and woodland from the limestone cliffs close to the existing population.

Rock faces are a very rare habitat in the Netherlands, and almost limited to the south-eastern part of the country, i.e. in the south of the Province of Limburg. Apart from this, artificial cliffs are found in the large limestone quarry near Winterswijk at the German border in the Province of Gelderland. Despite their rarity – or probably because of their rarity –, rock faces

are largely overlooked in Dutch nature conservation and conservation policy, probably also because they escaped the focus of botanists and phytosociologists. Exemplary is the complete neglect in the *Handboek Natuurdoeltypen*, which claims to give a detailed and systematic description of the target ecosystems in the Netherlands (Bal et al. 2001). In Dutch phytosociological literature, cliff vegetation is only scantily described. Haveman (2006) published some exemplary relevés from Carboniferous rocks in the 'Heimansgroeve' (in the south of South Limburg) in the description of *Hieracium weverianum* (Zahn) Haveman and Haveman & de Ronde (2014) published one relevé of the single location of *H. murorum* subsp. *exotericoides* Zahn in the Netherlands. The sparse existing descriptions give an impression of the value of natural and artificial rock faces in South Limburg. As far as the vascular plant species are considered, several have their last regional strongholds on these cliffs, like *Carex digitata* and *Aquilegia vulgaris* L. The rock faces are important for bryophytes as well, with rare species like *Neckera crispa* Hedw., *Leptobarbula berica* (De Not.) Schimp., *Tortula marginata* (Bruch. & Schimp) Spruce, *Leiocolea badensis* (Gottsche) Jörg., *Leiocolea bantriensis* (Hook.) Jörg., and *Ditrichum flexicaule* (Schwägr.) Hampe var. *sterile* (De Not.) Limpr. (pers. comm. H. Siebel). Recently, *Gymnostomum viridulum* Brid. was found for the first time in the Netherlands at limestone rocks near Bemelen, at only a few kilometers distance from Geulhem (Verboom 2025).

As was shown by Haveman & de Ronde (2014), the cliffs in the lower valley of the River Geul (Beneden-Geuldal) are a hotspot for *Hieracium* diversity. Rocky outcrops in South Limburg harbour at least two narrow endemics, *H. weverianum* (on Carboniferous rocks) and *H. gulanum* (on Tertiary limestone rocks), and several other rare taxa, like *H. murorum* L. subsp. *exotericoides* Zahn (for which no name at species level is available). It is acknowledged that specific conservation measures for taxonomical complex groups and apomicts like *Hieracium* is hampered by insufficient knowledge and identification problems (Ennos et al. 2005, Reisch et al. 2014, Rich et al. 2008), but action is needed to conserve the remaining biodiversity of the cliffs in South Limburg. For regions in which largely unknown groups occur, Ennos et al. (2005) proposed a conservation strategy in which important habitats are secured, guaranteeing hybridisation and introgression causing the constant formation of new biotypes. However, the mentioned processes play no role in *Hieracium*, as Rich et al. (2008) pointed out. *Hieracium* virtually consists completely of apomictic biotypes and their diploid ancestors are absent, which prohibits the formation of new biotypes – the extant biotypes are the result of past reticulate evolution (Štorchová et al. 2002). To ensure the survival of genetically diverse groups, Štorchová et al. (2002) advocate the identification and conservation of biodiversity hotspots. In line with this, we strongly plea for the development of an action plan for the conservation of the natural values found on rock faces in the southern part of Limburg. High priority should be given to restoration measures in the lower valley of the River Geul between Valkenburg and Meerssen, where the loss of biodiversity is significant (Haveman & de Ronde 2014), mainly as result of long overdue management.

In the UK, special monitoring schemes are set up to follow the populations of regionally and locally distributed *Hieracium* species (see, e.g., Rich et al. 2008, Rich & Houston 2000). The main objectives are to bring together all knowledge on the concerning sites, and to describe and follow the populations of the occurring rare hawkweed species. In the Dutch context, this was elaborated for *Hieracium lachenalii* subsp. *warnsbornense* Zahn (in van Soest 1926), a taxon growing in only 5 sites in Gelderland (Haveman & de Ronde 2024). Considering the extreme rareness of *H. gulanum* and the continuous threat of

its growing sites being overgrown or at least shaded by woody vegetation, it might be considered to apply a similar monitoring program for the locations where this species is growing.

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