

Identity of *Anthyllis heterophylla* (Loteae-Leguminosae): an obscure name derived from a misinterpretation

P. Pablo Ferrer-Gallego^{1*} & Javier Fabado²

¹Servicio de Vida Silvestre y Red Natura 2000, Centro para la Investigación y Experimentación Forestal (CIEF), Generalitat Valenciana, Avda. Comarques del País Valencià 114, 46930 Quart de Poblet, Valencia, Spain.

²Jardí Botànic, Universitat de València, c. Quart 80, ES-46008 Valencia, España.

*Author for correspondence: flora.cief@gva.es

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Abstract

Anthyllis heterophylla (Loteae-Leguminosae) has been regarded as an enigmatic species since its original description in 1763. Subsequent taxonomic and nomenclatural treatments of the species have been conducted without the designation of the type. We examined the original material of *A. heterophylla* preserved at LINN, and our morphological analysis indicated that *A. heterophylla* is conspecific with *A. barba-jovis*. The typification of *A. heterophylla* is discussed herein, and a lectotype for the name is designated.

Key words: *Anthyllis*, *Fabaceae*, lectotype, morphological examination, syntype, typification.

Resumen

Identidad de *Anthyllis heterophylla* (Loteae-Leguminosae): un nombre oscuro derivado de una interpretación errónea.

Anthyllis heterophylla (Loteae-Leguminosae) ha sido considerada una especie enigmática desde su descripción original en 1763. Los tratamientos taxonómicos y nomenclaturales posteriores de la especie se han llevado a cabo sin la designación de un tipo. Examinamos el material original de *A. heterophylla* conservado en LINN, y nuestro análisis morfológico indicó que *A. heterophylla* es conespecífico con *A. barba-jovis*. En este trabajo se discute la tipificación de *A. heterophylla* y se designa un lectotipo para dicho nombre.

Palabras clave: *Anthyllis*, *Fabaceae*, lectotipo, análisis morfológico, sintipo, tipificación.

Introduction

The genus *Anthyllis* L. (*Loteae-Leguminosae*) comprises 23 species and is distributed across Europe (excluding the Northeastern and Southeastern regions), Madeira, northern and eastern Africa, and western Asia (Sokoloff, 2003; Degtjareva *et al.*, 2006; POWO, 2025). The monophyletic nature of the genus has now been established (including *Hymenocarpus* Savi but excluding *Dorycnopsis* Boiss. and the monotypic *Tripodion* Medik.) following an in-deep phylogenetic revision incorporating new molecular data (Tikhomirov & Sokoloff, 1996; Sokoloff, 2003; Nanni *et al.*, 2004; Degtjareva *et al.*, 2006; Degtjareva *et al.*, 2012).

It is currently accepted that *Anthyllis* is divided into four subgenera (Tikhomirov & Sokoloff, 1996; Sokoloff, 2003): *A. subg. Anthyllis*, *A. subg. Barba-Jovis* V.N. Tikhom. & D.D. Sokoloff, *A. subg. Cornicina* (DC.) Akulova ex Tikhom. & D.D. Sokoloff, and *A. subg. Terniflora* V.N. Tikhom. & D.D. Sokoloff. However, Benedí (1998) adopted a slightly different taxonomic treatment, subdividing the group into sections based on the subgeneric classification proposed by Tikhomirov & Sokoloff (1996).

According to Benedí (2000), the Iberian *Anthyllis* includes 23 taxa: 12 species and 11 subspecies, most of the latter belonging to the *A. vulneraria* L. complex. Several species are prone to natural hybridization (Pau, 1925; Guara & Ferrer-Gallego, 2006; Ferrer-Gallego *et al.*, 2016). Linnaeus published 20 names under *Anthyllis* (see Jarvis, 2007), of which 10 are currently assigned to other genera (i.e., *Aspalathus* L., *Erinacea* Tourn. ex Adans., *Dorycnopsis* Boiss., *Hymenocarpus* Savi, and *Tripodion* Medik.). In the first edition of *Species Plantarum*, Linnaeus (1753) assigned nine species to *Anthyllis* (type: *A. vulneraria* L., see Green, 1929), all of which remain in use today. Within the genus, *A. vulneraria* is one of the most taxonomically complex species; Linnaeus (1755) recognized four varieties under this species, three of which still lack a designated nomenclatural type. In the second edition of *Species Plantarum*, Linnaeus (1763) described only one additional species in the genus, *A. heterophylla*, a name that has remained obscure since its original publication in 1763.

This study represents a further contribution to the nomenclature and taxonomy of *Anthyllis*. The aim of this paper is to clarify the taxonomic identity of the type material associated with the name *Anthyllis heterophylla* and to formalize its use through typification, in accordance with the *International Code of Nomenclature for algae, fungi, and plants* (ICN, Turland *et al.*, 2018).

Material and Methods

This work was carried out based on the study of the protologue of *A. heterophylla* (Linnaeus, 1763). The typification is founded on the examination of original material, specifically a relevant specimen preserved at LINN. The original element used by Linnaeus to describe this species has been carefully evaluated to determine the precise taxonomic application of the name. All ICN Articles cited in the text refer to the *Shenzhen Code* (Turland *et al.*, 2018). Herbarium acronyms follow Thiers (2025 [continuously updated]).

Results and discussion

Anthyllis barba-jovis L., Sp. Pl.: 720. 1753

Lectotype (designated by Jafri in Jafri & El-Gadi (ed.), Fl. Libya 86: 116. 1980): Herb. Linn. No. 897.9 (LINN)

(image of the lectotype available at https://linnean.access.preservica.com/uncategorized/IO_89e29a73-ee35-4be5-bc3e-ed3c17b825b6/)

= *Anthyllis heterophylla* L., Sp. Pl., ed. 2, 2: 1013. 1763 [excl. syn. “*Barba jovis minor lusitanica*, flore minimo variegato” of Tournefort (1719: 651)], syn. nov. Lectotype (designated here): *Alströmer* 103a, Herb. Linn. No. 897.10 (LINN) (Figure 1).



Figure 1. Lectotype of *Anthyllis heterophylla* L.; Alströmer 103a, Herb. Linn. No. 897.10 (LINN). Image courtesy of the herbarium LINN, reproduced with permission.

Figura 1. Lectotipo de *Anthyllis heterophylla* L.; Alströmer 103a, Herb. Linn. No. 897.10 (LINN). Imagen cortesía del herbario LINN, reproducida con permiso.

Linnaeus (1763: 1013) described *Anthyllis heterophylla* providing a brief diagnosis “ANTHYLLIS fruticosa, foliispinnatis, floralibus ternatis”, followed by a synonym: “Barba jovis minor lusitanica, flore minimo variegato” cited from Tournefort (1719: 651). The protologue also included information about the origin of the species, “*Habitat in Lusitania, Hispania, Alstroemer*”, and a description “*Suffrutex procumbens, teres, incanus, subpubescens. Folia pinnata, octojuga cum impari, lanceolata, acuta sericea; Floralia sessilia, ternata, remota, lanceolata, obtusiuscula. Pedunculi breves, apice terminati foliolis tribus floribusque saepius 2, sessilibus, minutis*”.

In the protologue, Linnaeus explicitly cited a probable gathering, as “*Habitat in Lusitania, Hispania, Alstroemer*”, which can be associated with a specimen collected by Clas Alstroemer, currently preserved at LINN: Alströmer 103a, Herb. Linn. No. 897.10 (LINN). Jarvis (2007: 302) noted that *Anthyllis*

heterophylla L. was probably based on this specimen. The sheet No. 897.10 contains a small stem with leaves and an inflorescence, is annotated "*A. heterophylla*" by Linnaeus at the base, and also bears a label marked "103.a" (see Figure 1).

Clas Alstroemer (1736-1794) was a disciple of Linnaeus and send him plants and specimens from his travels abroad, primarily from Spain, where he stayed for fifteen months in the period 1760-1764 (see Jackson, 1923). Some of Alstroemer's specimens are numbered and correspond to entries in his manuscript records (see Jarvis, 2007: 188-189). Two Alstroemer's manuscript specimen lists are known: one from 1761, titled *Plantae Hispanicae Alstömii*, preserved at LINN, and another from 1762, preserved at the Royal University Library, Uppsala (see Savage, 1945: Addendum).

The 1761 list includes "163 *Anthyllis tetraphylla*", but not *Anthyllis heterophylla* (see <https://linnean-online.org/143581/#?s=0&cv=0&z=-0.0713%2C-0.1731%2C0.6801%2C0.9266>). However, Savage (1945: 126) referred to "10 *A. heterophylla* [Alstr.]: 103a. [MS. list 1762. n.103.]". This 1762 manuscript, now held in Uppsala, list *A. heterophylla* with an asterisk, as "103 *Anthyllis heterophylla* *" and "103 *Anthyllis heterophylla* Barba jovis fl. parvis Tournef.". This document also includes other species marked with an asterisk, that were later described by Linnaeus (e.g., *Rhamnus oleoides*, *Phytolacca dioica*, *Statice ferulacea*), based on specimens collected by Alstroemer in Spain (see Figure 2).

We conclude that the specimen collected by Alstroemer was cited by Linnaeus and therefore can be treated as a syntype, according to Art. 9.6 of the ICN (Turland *et al.*, 2018) (see also Jarvis, 2007). As such, it takes precedence in lectotype designation over uncited specimens and cited illustrations that comprise the remainder original material (ICN Art. 9.12). We were unable to locate any additional original material in Linnaean or Linnaean-associated herbaria. Therefore, we designate Alstroemer's specimen No. 897.10 as the lectotype of the name *A. heterophylla* (see e.g., Art. 9. Ex. 2). This typification is consistent with the protologue and should thus be accepted.

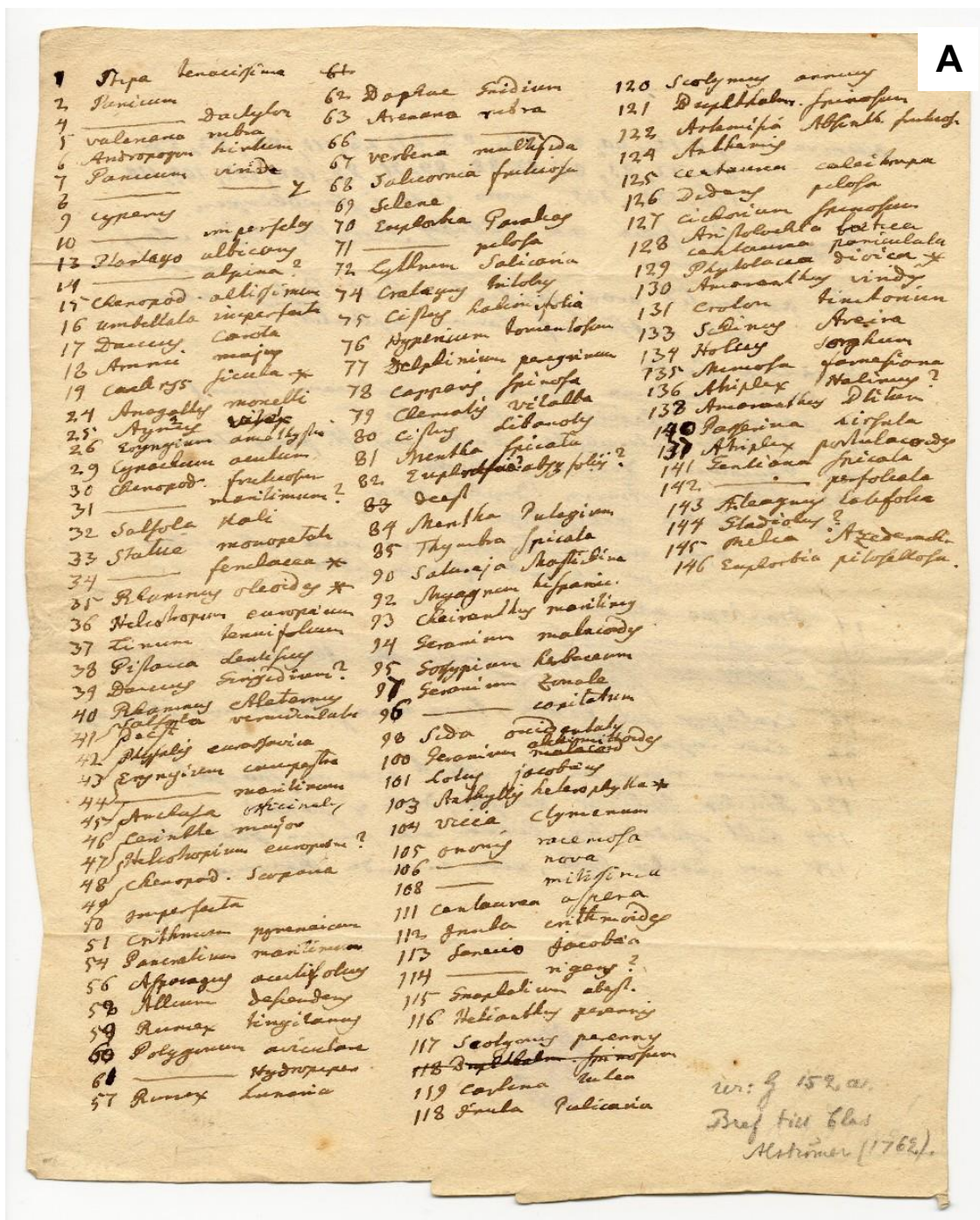
Although *A. heterophylla* was described in detail in 1763, its identity (including its generic placement) has remained obscure since publication, and the name has seen little use in subsequent literature. Regarding its identity, Cosson (1852: 159) noted: "D'après les échantillons de l'herbier de Tournefort du *Barba Jovis minor*, *Lusitanica flore minimo variegato* (inst. rei her. 651) que Linné donne comme un synonyme de son *A. heterophylla* (L. sp. 1013), l'*A. heterophylla* est ma même espèce que l'*A. Gerardi* (L. mant. 1^a 100). – J'ai cru cependant devoir conserver le nom d'*A. Gerardi*, sous lequel la plante est généralement connue, d'autant plus que la description du *Species* est très imparfaite et comprend peut-être une autre espèce" [trans.: According to the specimens of Tournefort's herbarium of *Barba Jovis minor*, *Lusitanica flore minimo variegato* (Inst. Rei Her. 651), which Linnaeus listed as a synonym of his *A. heterophylla* (Sp. Pl. 1013), *A. heterophylla* is the same species as *A. gerardi* (L. Mant. 1st ed.: 100). – However, I believed it appropriate to retain the name *A. gerardi*, under which the plant is generally known, especially since the description in the *Species Plantarum* is very incomplete and may even include another species].

In the Tournefort herbarium at P (P-TOURNEFORT), there is a well-preserved and complete specimen (barcode P00667277). The sheet, numbered 6342, includes several stems with leaves and flowers. The label reads: "Glaux lusitanica flore parvo / glomerato [...] ex albo [...] / [...] variegata / an glaux supine viminalis / Lusitanica [...] legit [...] / Barba Jovis / minor Lusitanica, flore minimo / variegata.". This material can undoubtedly be identified as *Dorycnopsis gerardi* (L.) Boiss.

Conversely, Tikhomirov & Sokoloff (1997: 340) argued that specimen No. 897.10 is dissimilar to *Dorycnopsis gerardi* (L.) Boiss. (*Anthyllis gerardi* L., see Linnaeus, 1767). Indeed, the taxonomic identity of the poorly specimen preserved at LINN No. 897.10 remains uncertain. Plants of the World Online (POWO, 2025) currently accepts *A. heterophylla* as a heterotypic synonym of *A. vulneraria* L. subsp. *vulneraria*, although this synonymy lacks a sound typification, which is addressed in the present study.

An alternative approach to clarifying the identity of Linnaeus's *A. heterophylla* might have been to designate an epitype from a specimen unequivocally belonging to the genus *Anthyllis*. Such a typification would not conflict with the protologue and could have been accepted. However, depending on the specimen chosen for epitype, *A. heterophylla* could become a highly disruptive name in terms of

nomenclatural stability. In this regard, the Tournefort specimen at P, with No. 6342 (P-TOURNEFORT barcode P00667277) (Figure 3), cited by Cosson (1852), would have been a strong candidate. However, it is clear that Linnaeus did not interpret Tournefort's polynomial as its author did, and the specimen itself clearly belongs to *Dorycnopsis gerardi*, as Cosson (1852) correctly observed.



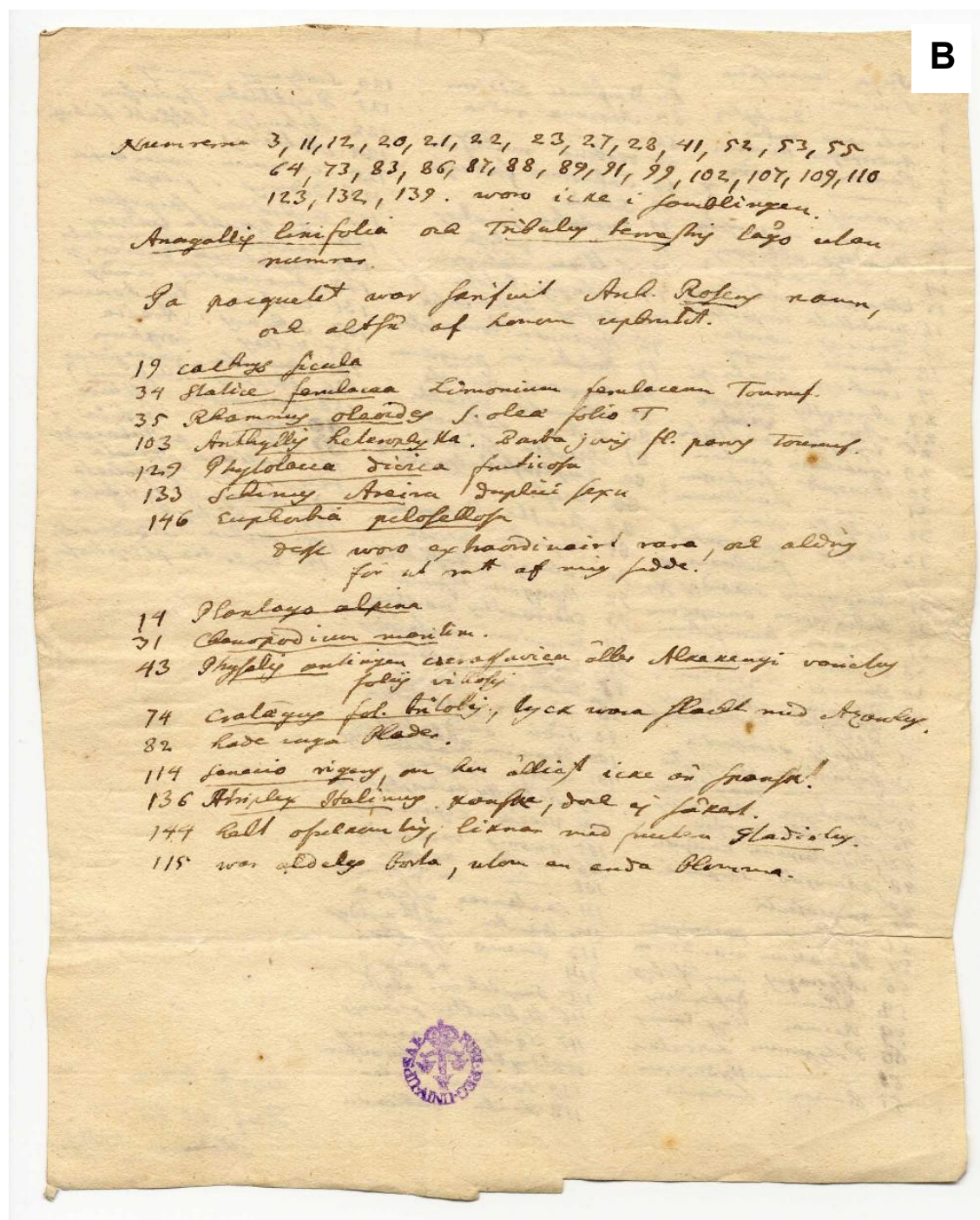


Figure 2. Alstroemer's 1762 manuscript lists of specimens. (A) Front. (B) Back. Manuscript preserved at the Royal University Library, Uppsala. The species *Anthyllis heterophylla* is indicated with an asterisk, as "103 *Anthyllis heterophylla* *" and "103 *Anthyllis heterophylla* Barba jovis fl. parvis Tournef."

Figura 2. Listas manuscritas de los especímenes de Alstroemer de 1762. (A) Anverso. (B) Reverso. Manuscrito conservado en la Biblioteca Real de la Universidad de Upsala. La especie *Anthyllis heterophylla* está indicada con un asterisco, como "103 *Anthyllis heterophylla* *" y "103 *Anthyllis heterophylla* Barba jovis fl. parvis Tournef."

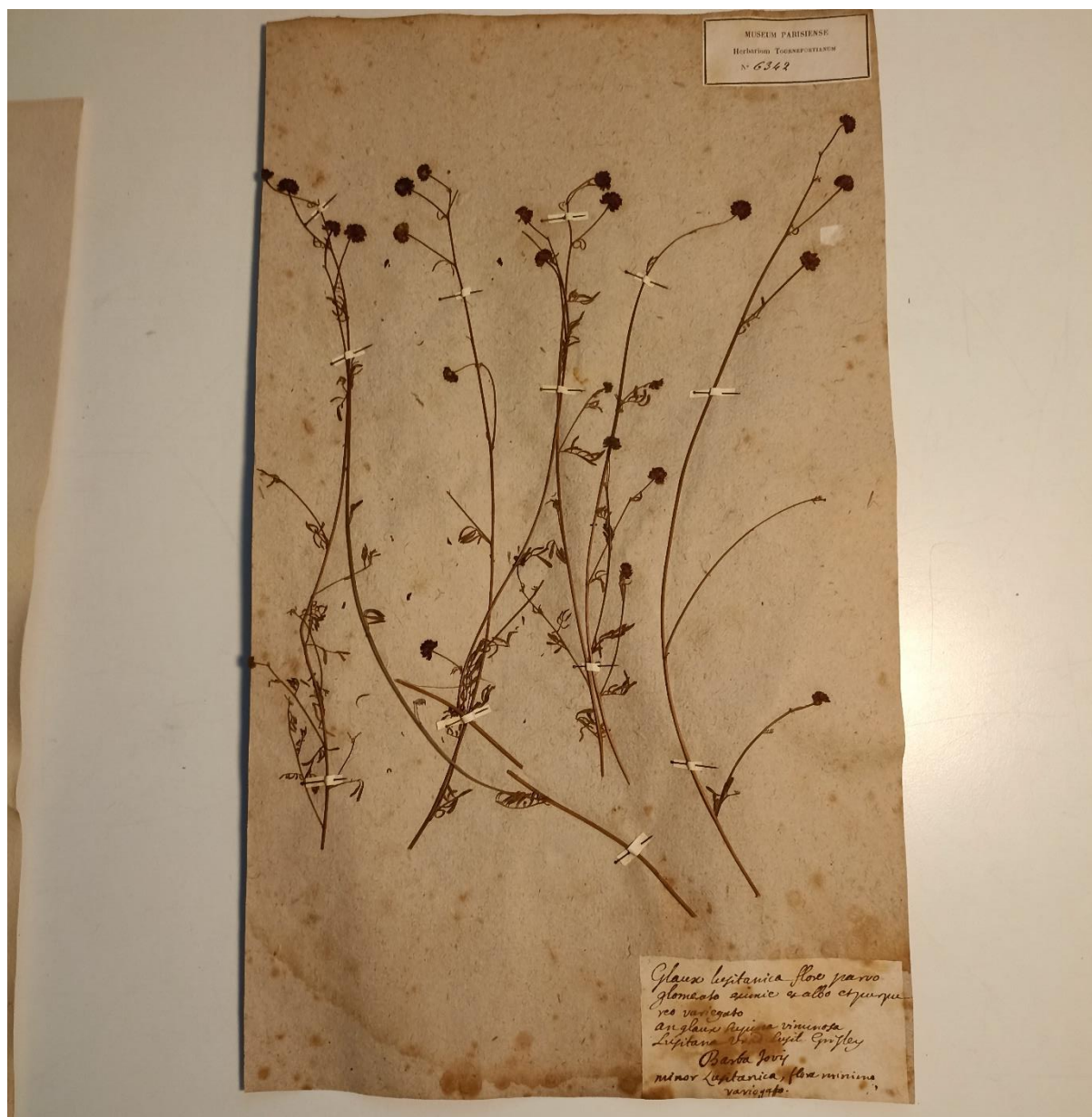
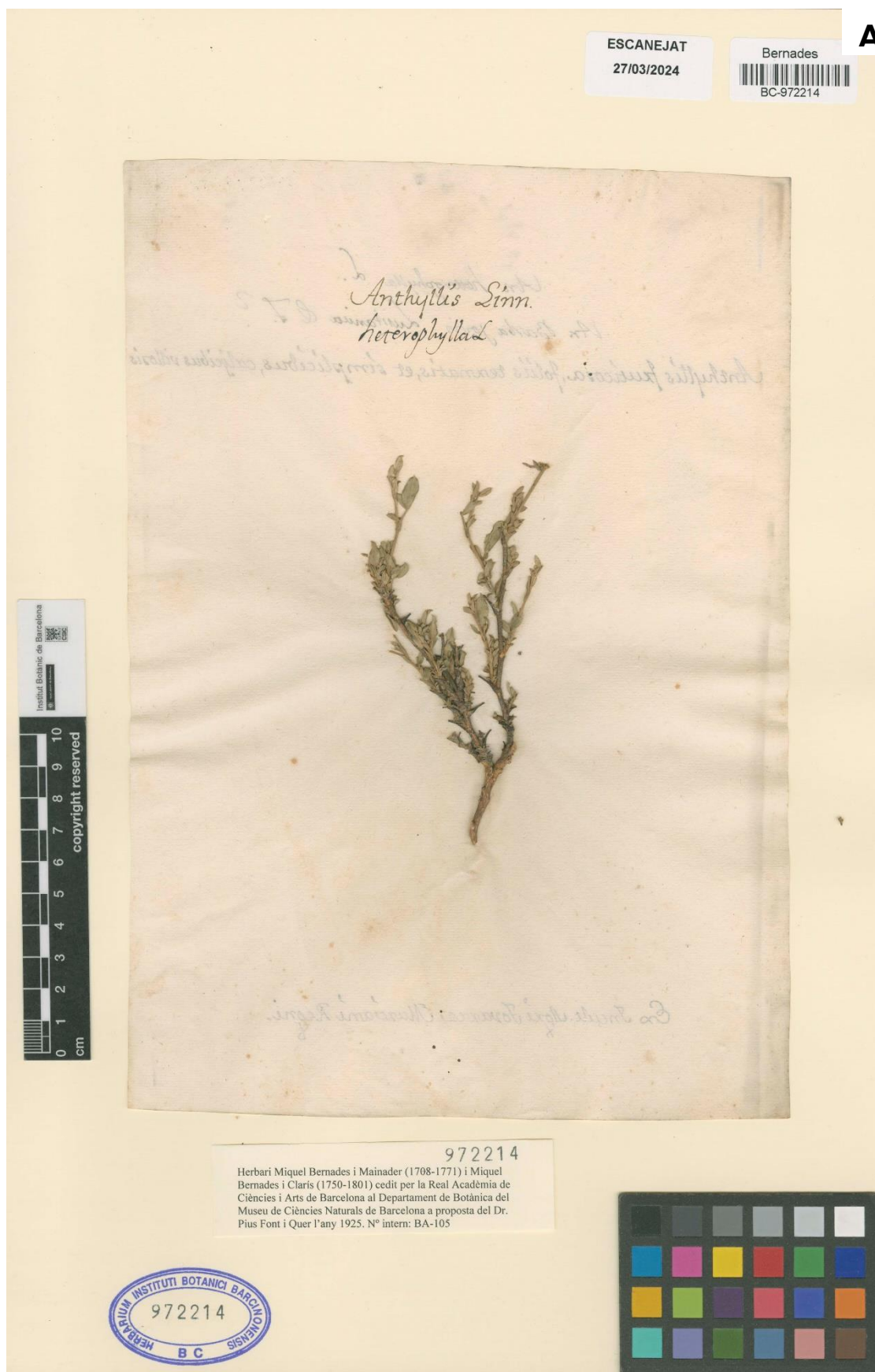


Figure 3. Tournefort's original specimen of *Dorycnopsis gerardi* (L.) Boiss. preserved in the herbarium P-TOURNEFORT (No. 6342; barcode P00667277). Image courtesy of the herbarium P, reproduced with permission.

Figura 3. Ejemplar original de *Dorycnopsis gerardi* (L.) Boiss. de Tournefort, conservado en el herbario P-TOURNEFORT (N.º 6342; código de barras P00667277). Imagen cortesía del herbario P, reproducida con permiso.

Additionally, there is a specimen collected by Miguel Bernades, housed at BC (barcode BC-972214; Ibáñez *et al.*, 2009) and identified as *Anthyllis heterophylla*. This poorly preserved specimen consists of a stem with leaves but no flowers and is annotated on the reverse as “Ex Incult. Agn Tovarro Murciani Regni” (i.e., in Tobarra, Albacete province, Spain) by Bernades (see Figure 4). Miguel Bernades [or Barnades] (1708- 1771) was a Spanish botanist and physician to King Carlos III in Madrid. Correspondence between Bernades and Linnaeus is preserved at LINN; five letters (between 14 Aug 1756 and 26 Mar 1759) (see Jarvis, 2007). Some specimens at LINN have been tentatively associated with Barnades by Savages (1945), including (LINN 775.9; image available at <https://linnean-online.org/7186/#?s=0&cv=0>) original material for the Linnaean name *Digitalis obscura* described in the second edition of *Species Plantarum* (Linnaeus, 1763). However, there is no evidence linking the BC specimen to Linnaeus, and no duplicates exist in the Linnaean herbarium. The specimen BC-972214 can be identified as *A. lagascanica* Benedí (see e.g., Lagasca, 1816; Esteve, 1969; Benedí, 1995, 1998; Ferrer-Gallego *et al.*, 2016).



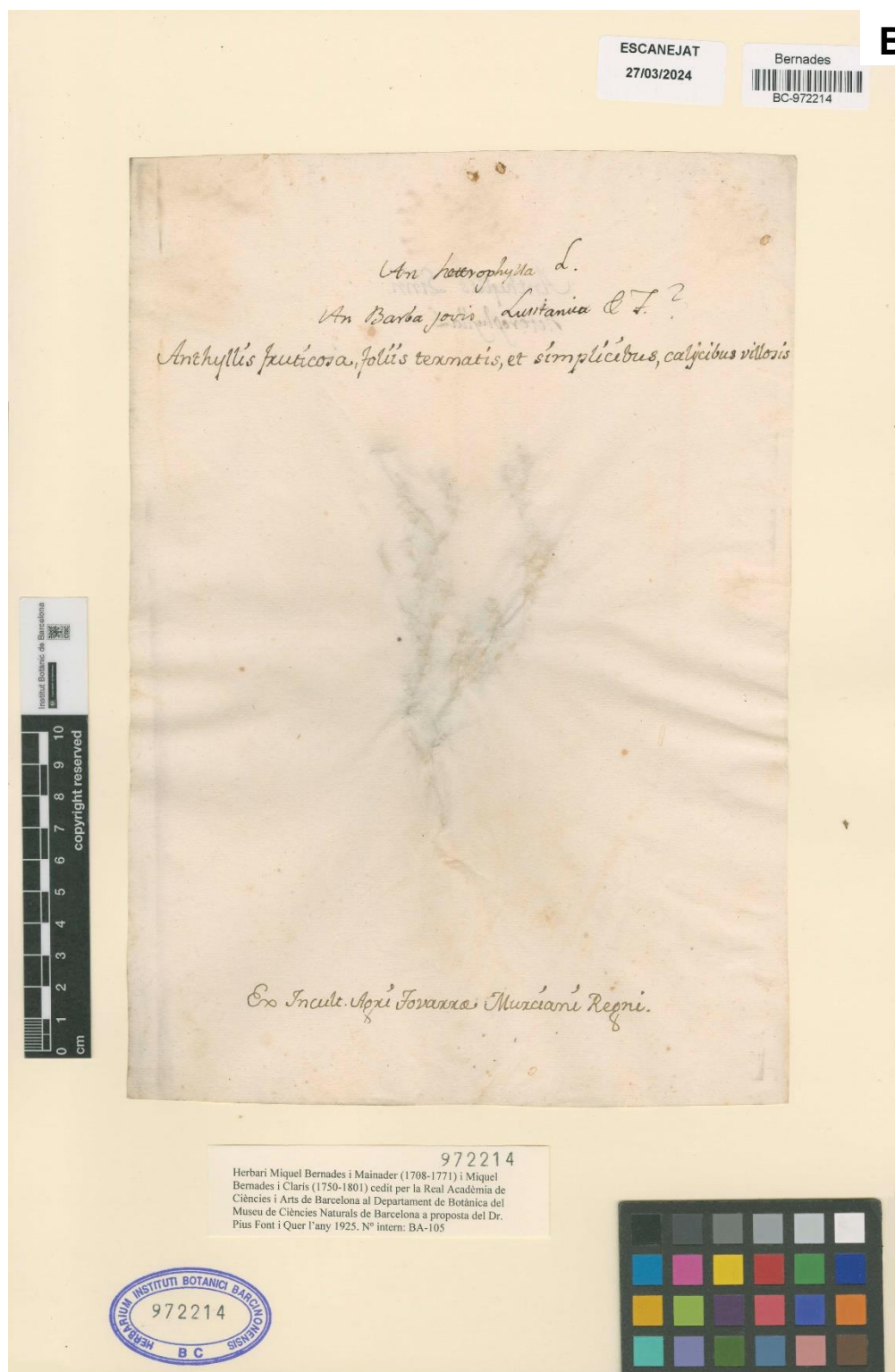


Figure 4. Specimen (A) collected by Miguel Bernades, preserved in the herbarium BC-Bernades, identified as *Anthyllis heterophylla* (BC-972214). The sheet is annotated on the back (B) as “Ex Incult. Agn Tovarro Murciani Regni” by Bernades. The specimen can be identified as belonging to *A. lagascana* Benedí. Image courtesy of the herbarium BC, reproduced with permission.

Figura 4. Ejemplar (A) recolectado por Miguel Bernades, conservado en el herbario BC-Bernades, e identificado como *Anthyllis heterophylla* (BC-972214). La hoja está anotada en el reverso (B) por Bernades como “Ex Incult. Agn Tovarro Murciani Regni”. Este ejemplar puede identificarse como perteneciente a *A. lagascana* Benedí. Imagen cortesía del herbario BC, reproducida con permiso.

The name *Anthyllis heterophylla* has rarely been mentioned in the literature and its identity has remained unresolved. Moench (1794: 146) proposed combining the name in the genus *Vulneraria* Mill., while Gussone (1844: 265) described *Vulneraria heterophylla* var. *albiflora*, now treated as *Anthyllis albiflora* (Guss.) Iamónico, Domina, Guarino & Del Guacchio. In contrast, *Vulneraria heterophylla* var. *parvula* Lojacono-Pojero (1891: 47) is currently treated as a synonym of *Anthyllis vulneraria* var. *rubriflora* (DC.) Arcang. (see Iamónico *et al.*, 2021: 211–219). Only Benedí (2000), in our view, correctly synonymizes *A. heterophylla* L. with *A. barba-jovis*, also noting that Cosson's interpretation of the name more closely refers to *Dorycnopsis gerardi*.

Based on careful consideration of the available evidence, i.e., the sheet *Alströmer 103a*, Herb. Linn. No. 897.10 at LINN, and the morphological and geographical details in the protologue (e.g., “foliis pinnatis, floralibus ternatis” (i.e., with pinnate leaves and ternate flowers) and present in Spain, where this species is cultivated), we conclude, as does Benedí (2000), that *A. heterophylla* is conspecific with *A. barba-jovis* L. This assessment is supported by both the remarks found in the protologue and the limited morphological traits visible on the herbarium sheet, namely, the plant's perennial habit, its overall tomentose indumentum, the absence of stipules, and the uniformity of its leaflets. However, certainly remains elusive. Intriguingly, Linnaeus (1763) lists both species: *A. barba-jovis* as No. “6” and *A. heterophylla* as No. “7”. For *A. barba-jovis*, he repeats the protologue published in 1753 but changes the geographical origin from “*Habitat in Helvetia*” in 1753 to “*Habitat in Italiae, Hispaniae, Orientis, rupibus*” in 1762. For *A. heterophylla*, he notes its distinction by “*floralibus ternatis*” rather than “*floribus capitates*” in *A. barba-jovis*. Could Linnaeus have described the same species twice? It is plausible.

We know that the specimen of *A. heterophylla* was sent by Alstroemer to Linnaeus from Spain, but *A. barba-jovis* is not native to Spain (see Benedí, 2000). *Anthyllis barba-jovis* is distributed in the western Mediterranean region (e.g., Algeria, France (including Corse), the former Yugoslavia, Greece, Italy (including Sardegna and Sicily), and well as Tunisia). It is often cultivated and occasionally naturalized (e.g., in Libya, South Australia, Spain) (see Cullen, 1968; Benedí, 2000; POWO, 2025). Perhaps, the specimen at LINN may have originated from a botanical garden. Alstroemer frequently collected specimens in botanical gardens which were later used by Linnaeus to describe new species, e.g. *Phytolacca dioica* (Linnaeus, 1762: 632. [*“Habitat in - - - Alströmer ex horto Madritensi”*]), whose lectotype (*Alströmer 129a*, Herb. Linn. No. 607.5 (LINN)) was designated by Nowicke (1969), originates from the Madrid botanical garden.

Conclusions

Alstroemer's specimen is the only verified original material for the Linnaeus name *Anthyllis heterophylla*. However, its taxonomic identity remains uncertain due to the fragmentary and poorly preserved nature of the specimen. To avoid potential nomenclatural disruption and in accordance with Art. 56 of the ICN (Turland *et al.*, 2018), the name *Anthyllis heterophylla* could be proposed for rejection. Acceptance of this proposal would eliminate any future instability posed by the name. However, in our opinion, the original specimen and syntype: *Alströmer 103a*, Herb. Linn. No. 897.10 (LINN), can be identified as belonging to *A. barba-jovis*. Therefore, we treat *A. heterophylla* as a heterotypic synonym of *A. barba-jovis*, and no formal proposal for rejection the name is necessary.

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Conflicts of Interest

The authors declare that they have no conflict of interest.

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