



Typification of *Gagea lacaitae* (Liliaceae) revisited

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Abstract

The typification of the name *Gagea lacaitae* (Liliaceae) is revised. A lectotypification had previously been proposed by Peruzzi and Tison in 2004 from a specimen kept at NAP (Herbarium A. Terracciano, now with barcode NAP0001973) and collected by Parlatore in 1848. However, Terracciano cited in the protologue gatherings collected by Juan Isern and Gaetano Leone Durando. Specimens of these gatherings are kept at NAP, MA, P, and PAL. Therefore, this material has preference in the lectotype designation and must be chosen according to the International Code of Nomenclature for algae, fungi, and plants (Art. 9.12 of the *Shenzhen Code* of 2018).

Key words: Lectotype, nomenclature, original material, Parlatore, syntype

Introduction

Gagea lacaitae A. Terracciano (1904: 36) (sect. *Didymobulbos* (K. Koch) W.D.J. Koch ex Boiss.; Liliaceae) is a highly polymorphic species distributed across the temperate parts of western Mediterranean: Algeria, Morocco, France, Italy (included Sardinia and Sicily), and Spain (López González 2013, Tison *et al.*, 2013, 2014; POWO 2023).

As part of taxonomic and nomenclatural studies on the genus *Gagea* Salisb. for the Valencian flora (see Ferrer-Gallego & Guara 2007, Ferrer-Gallego *et al.* 2007, Ferrer-Gallego & Oltra Benavent 2009), the name *Gagea lacaitae* has been studied. The nomenclatural type of this name was discussed by Peruzzi & Tison (2004). However, a new interpretation of the original material and protologue induced to revise that proposal for effective typification of the name.

Materials and methods

The protologue of *Gagea lacaitae* is analyzed to identify original material pertinent to the typification of the name. The taxonomic identity of the proposed type was carefully verified against the traditional concept and the current usage of the name. The herbaria acronyms (BC, FI, NAP, MA, P, PAL) are according to Thiers (2023 [continuously updated]).

Background and Typification of the name *Gagea lacaitae*

Terracciano (1904: 36) described *Gagea lacaitae* providing a complete description in Latin “Bulbi duo, subaequales, tunicati et extus fibris radicalibus induratis cincti. Folia radicalia duo, linearia, viridia, exquisite nervosa, longe flores superantia; caulina numerosa, alterna, lanceolata, basi latiora, dein sensim attenuata. Scapus nunc simplex et uniflorus, nunc apice ramosus et pluriflorus, ramulis glabrescentibus v. pilis albidis haud numerosis praeditis. Flores potius parvuli, perigonii segmentis obovatis v. late ovato-lanceolatis, staminibus vix dimidio tepalis brevioribus, antheris subrotundatis, ovario oblongo”; followed by the comment “La specie fa parte della polimorfa stirpe *G. Granatelli*, nel gruppo con foglie cauline alterne; quindi si collega a *G. Durieui*, descritta da Trabut e Battandier assai prima che l’avesse fatto il Pascher. L’ho dedicata all’illustre botanico C. Lacaita, mecenate generoso e cui sono legato da riconoscente amicizia” [The species belongs to the polymorphic lineage *G. Granatelli*, in the group with alternate stem

leaves: therefore it is related to *G. Durieui*, described by Trabut and Battandier long before Pascher. I dedicated it to the illustrious botanist C. Lacaita, a generous patron and to whom I am bound by a grateful friendship”. The protologue also includes “Habitat: Sicilia, alle Sciare di Marsala. Altri esemplari se ne trovano distribuiti da Durando col nome di *G. mauritanica*, e quindi spettano all’Algeria. Vive anche in Spagna, ove Isern la raccolse alla sierra de Bacares, e di cui ho veduti numerosi saggi negli erbarii di Madrid, Escorial, Lazaro y Ibisa, apponendovi io il nome provvisorio di *G. laevibulbos*” [“Habitat: Sicily, at the Sciare di Marsala. Other specimens are found distributed by Durando with the name *G. mauritanica*, and therefore belong to Algeria. It also lives in Spain, where Isern collected it in the sierra de Bacares, and of which I have seen numerous specimens in the herbariums of Madrid, Escorial, Lazaro and Ibisa [Blas Lázaro Ibiza], giving it the provisional name of *G. laevibulbos*”]. No illustration was included in the protologue.

A “lectotype” was designated by Peruzzi & Tison (2004) from a specimen collected in 1848 by Parlatore in “Sciarre di Mazzara” [“Sciare di Marsala” in the protologue] (Sicily, Italy), and preserved in the Collection “Achille Terracciano” at NAP (now with barcode NAP0001973), as: “Lectotypus (here designated): ITALY, SICILY: un altro esemplare identico è alle Sciarre di Mazzara, I.1848, *Parlatore s. n.* (Herb. Terracciano, NAP!)” (Fig. 1). These authors also included in their work a specimen treated as syntype, and preserved in the same collection at NAP (now with barcode NAP0002062), as “Syntypus: n° 108 sub *G. polymorpha* var. *nevadensis* in herb. Espanol (Madrid), Sierra de Bacares, 6.III.1870 (Herb. Terracciano, NAP!)” (see Peruzzi & Tison 2004).

This viewpoint was subsequently adopted by Tison *et al.* (2013) and López González (2013), but the latter author observed that the “lectotype” designated by Peruzzi & Tison (2004) had to be considered as “neotype”.

In fact, Terracciano (1904) mentioned in the protologue “Sciare di Marsala” but without any collector, date, concrete specimen or herbarium sheet, i.e., only a geographical indication, making it not acceptable as indication of the type. It is highly probable that the material collected in “Sciarre di Mazzara” was actually used by the author for the description of the species, as was mentioned by Peruzzi & Tison (2004), and therefore original material for the name, despite the statement by López González (2013). Nevertheless, no syntype coming from this locality was cited by Terracciano (1904), who, on the other hand, explicitly cited some gatherings in the protologue, with specific localities and authors (e.g., “[...] Isern la raccolse alla sierra de Bacares [...]”, occurring in several collections and moreover labelled by him as “*Gagea laevibulbos*”, or “[...] Altri esemplari se ne trovano distribuiti da Durando col nome di *G. mauritanica*, e quindi spettano all’Algeria [...]”).

Juan Isern Batlló y Carrera was a Spanish botanist (1821–1866) (Ametller 1866, 1881, Blanco *et al.* 2006). Isern collected plants in Sierra Bacares (Almería province, Spain) in March 1861. In a letter sent by Isern to José Hereter on March 19, 1861, this author mentioned that “[...] Hace dos días que bajé de la Sierra de Bacares; es uno de los sitios más elevados del país, como que es una ramificación de Sierra Nevada [...]” [two days ago I came down from the Sierra de Bacares; It is one of the highest places in the country, as it is a branch of the Sierra Nevada] (see Ametller 1866: 160, Blanco *et al.* 2006: 50–51).

The herbarium of Juan Isern is currently preserved in the Royal Botanical Garden of Madrid (MA), in the herbarium of Mariano de la Paz Graells preserved in San Lorenzo de El Escorial (Madrid, Spain) (see below), in the herbarium of the Botanical Institute of Barcelona (BC), and in the herbarium of Philip Barker Webb at FI (Florence, Italy) (Colmeiro 1875, Steinberg 1977, Carrasco *et al.* 1997).

At MA there are specimens collected by Isern mainly from Madrid, Ávila, Segovia, Guadalajara, Asturias, Catalonia, Málaga and Almería (1850–1862). In the herbarium of Mariano de la Paz Graells preserved in the Gabinete of natural sciences of the Real Colegio Alfonso XII in San Lorenzo de El Escorial (Madrid) there are 1,634 vascular plants collected by Juan Isern (Carrasco *et al.* 1997). In August 2004, a collection of duplicates from this Graells herbarium was delivered to MA, including more than 170 sheets with labels handwritten by Isern of plants collected in several localities, including Sierra de Bacares in Almería, with dates between 1850 and June 1862 (Blanco *et al.* 2006).

There are two relevant specimens for the lectotype of *G. lacaitae* collected by Isern that are currently preserved at NAP (Herbarium A. Terracciano, barcode NAP0002062 [two herbarium sheets]) and MA (barcode MA-01-00155903). This material can be treated as part of the gathering cited by Terracciano in the protologue as “Vive anche in Spagna, ove Isern la raccolse all sierra de Bacares, e di cui ho veduti numeri saggi negli erbarii di Madrid, Escorial, Lazaro y Ibisa”.

The sheet NAP0002062 bears a specimen mounted on two sheets. One sheet bears poorly preserved material, including several bulbs and only a stem with three flowers. This sheet bears also three labels: 1) “n1 108 / sub *G. polymorpha* var. *nevadensis* in / herb. Español (Madrid) / Sierra de Bacares. 6 de marzo 1870”; 2) “Sierra de Bacares. 6 de marzo. / In herb. Colmeiro, Escorial. Valencia”; and 3) “*G. lacaitae*”. The second sheet bears also poorly preserved material, including fragments of stems and flowers, and no labels. This material is relevant and compatible with the

material mentioned by Terracciano himself one year after the publication of the protologue of *G. lacaitae* “Sierra de Bacares (leg. Isern!; exsicc. n. 108 in herb. españ.)” and “Sierra de Bacares, 16.III.1878 leg. Isern! (n° 108 ex herb. matritensi, et n° 53 ex herb. Valencia)” (Terracciano 1905: 197, 248).



FIGURE 1. Specimen of *Gagea lacaitae* A. Terracciano collected in 1848 by Parlatore in “Sciarre de Mazzara” [“Sciare di Marsala” in the protologue] (Sicily, Italy), and preserved in the Collection “Achille Terracciano” at NAP (barcode NAP0001973). This specimen was designated as the “lectotype” of the name by Peruzzi and Tison in 2004. Image reproduced with permission of the herbarium NAP.

On the other hand, the sheet at MA (with barcode MA-01-00155903) bears a specimen, two complete plants well-preserved, and an original label annotated as “*Gagea polymorpha* Boiss. / Sierra de Bacares. / Marzo [1861]” in the handwriting of the Spanish botanist Juan Isern (see <http://www.floraiberica.es/caligrafia/index.php>) (Fig. 2). This material can be identified as belonging to *G. durieui*. This material is compatible with the comment published by Terracciano (1905) “Nella Sierra de Bacares, per ora endemica, abbiamo *G. Lacaitae* Terr. A., che da un lato si collega a *G. iberica* ed dall’ altro a *G. guadarramica*, contraddistinta però dall’abito generale (forma e colore delle foglie cauline, bulbi circondati da numerose fibre crasse ed ascendente) e dalla struttura dei fiori. È senza alcun dubbio una forma geografica, ma occorre maggior copia di materiale per stabilirne in modo preciso le origini ed i rapporti genetici”.



FIGURE 2. Probable syntype of *Gagea lacitae* A. Terracciano. Material collected in Sierra de Bacares in 1861 probably by Juan Isern, MA (barcode MA-01-00155903). This material belong to *G. durieui*. Image reproduced with permission of the herbarium MA.

There are other specimens at MA that were collected by Isern, MA-01-00155904 and MA-01-00020513. The sheet MA-01-00155904 bears three plants and an original label handwritten by Isern “*Gagea polymorpha* / Boiss. / Macael. Marzo”. Macael is a locality of Almeria province (Spain). This material can be identified as belonging to *G. durieui* Parlato (1857: 426) (basal leaves subcylindrical, no more than 1 mm wide, pedicels glabrous, perianth 5–11 mm long). The sheet MA-01-00020513 bears two plants and a label annotated as “*Gagea lutea* Schult / Isern / Aranjuez 28 Marzo 1852”. The sheet also bears an original label handwritten by Terracciano, annotated as “*Gagea Granatelli* Parl!! / IX.1904 / Terracciano”. This specimen can be identified as *G. lacaitae*. However, although this material, at least the specimen MA-01-00020513, could have been used by Terracciano to describe his *G. lacaitae*, it cannot be considered as a syntype.

In the herbarium of Mariano de la Paz Graells, preserved in the Gabinete of natural sciences of the Real Colegio Alfonso XII in San Lorenzo de El Escorial, there are several specimens of *Gagea*, but none related to the taxon of our interest. The sheet coded as RCAXII 5241 bears a specimen accompanied by a label annotated as “Herbarium Graelsianum / Plantae Castellanae / *Gagea arvensis* Schultz / Crescit in Pradera de Sⁿ Juan prope / el Escorial. / Mense Mayo”. This material can be identified as belonging to *G. arvensis* Schultz. This material could have been collected by Isern. However, it cannot be proven to be part of the gathering mentioned in the protologue and therefore cannot be treated as a syntype.

Finally, another gathering was cited in the protologue, as “Altri esemplari se en trovano distribuiti da Durando col nome di *G. mauritanica*, e quindi spettano all’Algeria” [transl.: “Other specimens are found distributed by Durando under the name of *G. mauritanica*, and therefore belong to Algeria”]. We have found a specimen at P that could be part of this gathering. The specimen with barcode P00751880 contains three plants, with flowers, and is accompanied by a label annotated as “Union du Sig. Prov. d’Oran. 1850 / 162. *Gagea mauritanica* Dur. / M de S^o Cruz à Oran / 21 fevrier / G. L. Durando” (image available at <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00751880>). This specimen can be identified as belonging to *G. mauritanica* Durieu (1849: t. 45bis, f. 4) and could be treated as part of a gathering cited in the protologue and therefore a syntype or isosyntype of the name *G. lacaitae*.

In addition, other material collected in Oran is preserved at NAP. The sheet NAP0001989 bears two plants and a label “*Gagea Durieui* Parl. / Oran avril 1885 / trans des rachers / (signed by Balansa?)”. The sheet NAP0001991 bears a plant and a label “*Gagea Durieui* (Parl) / Oran. mars 1884 / G.”. Finally, the sheet NAP0001990 bears a plant and a label “(Legato [a title] Todaro) / (Copia) / Herbarium Horti Pisani. / Legit: prope Oran. Loco dict. Sig. / Communicavit Durando / 18 / (sub *Gagea mauritanica*) / Savi, 15 Agosto 1852” (Fig. 3). The specimen NAP0001990, was gathered by Durando in Algeria near Oran (Sig) and, as far as we know preserved as a duplicate at PI, from where it was sent by Savi in 1852 to Todaro (PAL), then finally to Terracciano. It is a good choice for lectotype because the specimen can be identified as belonging to *G. lacaitae* (see below).

In conclusion, because Durando and Isern’s material, now surviving at P, PAL, NAP and MA, has been cited in the protologue by Terracciano, and both (protologue and specimens) are linked, they are certainly syntypes (according to *Shenzhen Code* Art. 9.6; Turland *et al.* 2018: hereafter reported as *ICN*) and have precedence in lectotype designation over unmentioned specimens and cited illustrations according to Art. 9.12 of the *ICN*. Article 9.12 of *ICN* mentioned that “in lectotype designation, an isotype must be chosen if such exists, or otherwise a syntype or isosyntype if such exists. If no isotype, syntype or isosyntype is extant, the lectotype must be chosen from among the paratypes if such exist. If none of the above specimens exists, the lectotype must be chosen from among the uncited specimens and cited and uncited illustrations that comprise the remaining original material, if such exist”. A syntype is always a specimen explicitly cited in the protologue (*ICN* Art. 9.6 and Art. 40 Note 1) or a specimen that is part of a gathering cited in the protologue (*ICN* Art. 40 Note 2). Therefore, in conformity with *ICN* Art. 9.12 and Art. 9.11 (i.e., “if the name was published without a holotype, or when the holotype or previously designated lectotype has been lost or destroyed”) (see *ICN* Art. 9.3), a specimen from the two gatherings cited in the protologue and preserved at P, PAL, NAP and MA is therefore the obligate choice as lectotype and accordingly designated here as such. Unfortunately, a careful examination of the two plants on sheet MA (MA-01-00155903) has shown that they do not correspond to the current concept and usage of the name *G. lacaitae*. Certainly, this specimen can be identified as *G. durieui*. On the other hand, the specimen collected by Durando and preserved at P (barcode P00751880) can be identified as belonging to *G. mauritanica*. Therefore a lectotypification of the name *G. lacaitae* using one of these specimens would be undesirable in terms of nomenclatural stability.

Fortunately, the syntype specimen at NAP0001990 is well-preserved and complete material, and shows important diagnostic features of *G. lacaitae* (e.g., bulbous perennial plant, very thick ageotropic roots, broad ribbon-like, bulb densely surrounded by recurved fibrous roots, basal leaves 2.5–3 mm, cauline leaves with underground basis, bulbiferous -plants with a cluster of suprabasal bulbils-, inflorescence elongated with often alternate leaves, tepals obovate, obtuse; see Fig. 3) (see Richardson 1980, López González 2013, Tison 2009, Tison *et al.* 2013, 2014, Pignatti

2018, Pavon & Tison 2021), and represents the traditional concept and current application of the name. This specimen is designated as the lectotype of the name *Gagea lacaitae*.

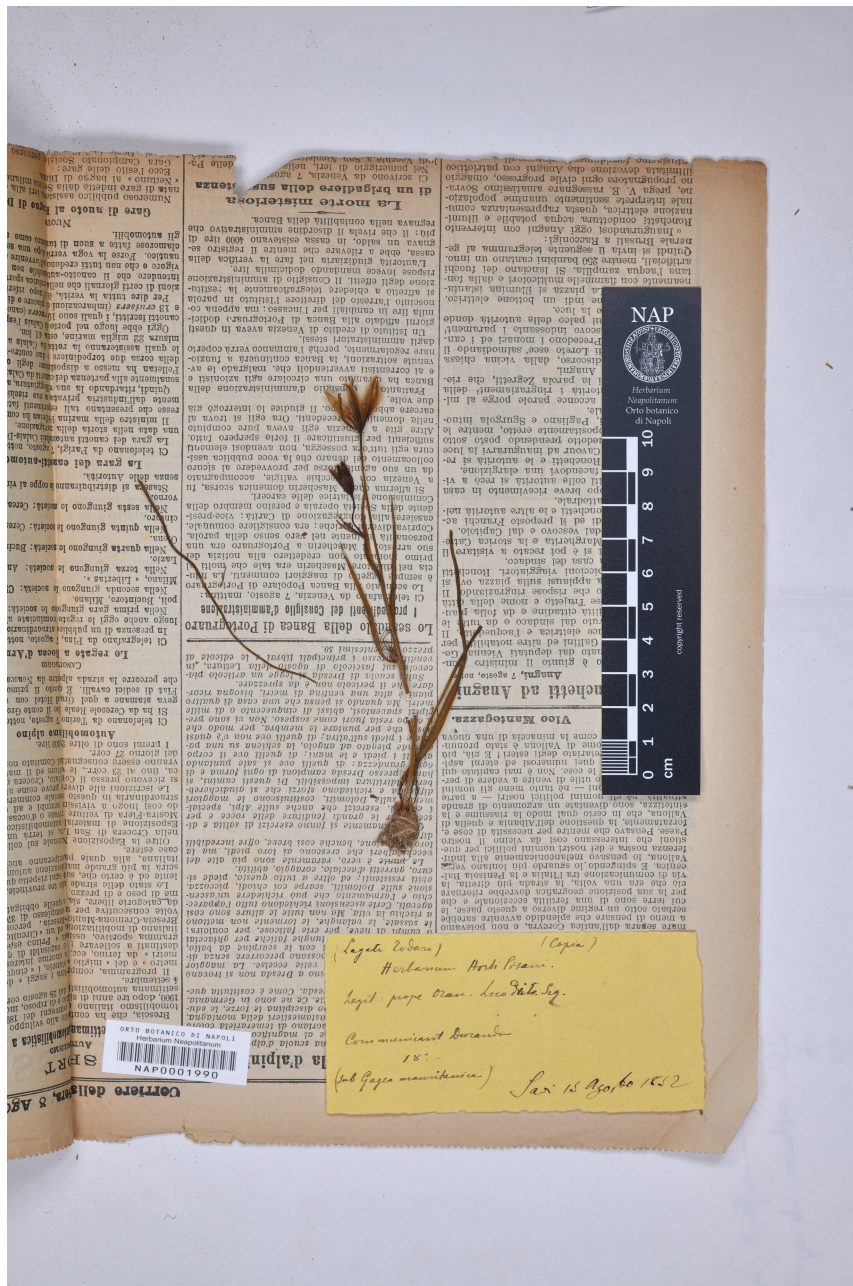


FIGURE 3. Designated lectotype of *Gagea lacaitae* A. Terracciano, preserved in the Collection “Achille Terracciano” at NAP (barcode NAP0001990). Image reproduced with permission of the herbarium NAP.

Gagea lacaitae Terracciano (1904: 36)

Lectotype (designated here): [ALGERIA. “prope Oran, Loco dicto Sig., s.d., Durando n.18 (sub *Gagea mauritanica*) (NAP, barcode NAP0001990) (Fig. 3). **Isolectotype**: PAL (no. 82744).

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