



Identities of some names in *Gomphrena* (Amaranthaceae)

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Abstract

The typification of names *Gomphrena decumbens* var. *nana*, *G. filaginoides*, *G. nitida*, and *G. pringlei* are discussed. Specimens from P, GH, US, and Z are designated as lectotypes. The identity of the name *Gomphrena globosa* var. *albiflora* is discussed reaching to the conclusion that it is a synonym of *G. palmeri*.

Key words: lectotype, synonym, typification

Introduction

The genus *Gomphrena* Linnaeus (1753: 224) (Amaranthaceae Juss.) includes about 120–140 species (Stevens 2001 onwards, POWO 2023) of disjunct distribution, mostly native to tropical and subtropical Americas and western Africa, about 30 in Australia; various species are alien in Africa, south-eastern Europe, and south Asia (Palmer 1998, Sánchez-del Pino *et al.* 2009, POWO 2023).

The Mexican flora includes about 15 species (Villaseñor 2016), some of which are considered weeds, others are ornamentals and others are for medicinal use (Calderón de Rzedowski & Rzedowski 2004, García-Regalado 2014, Sandoval-Ortega & Siqueiros-Delgado 2019).

As part of the ongoing study of the flora of Guerrero (Mexico) (see e.g. Bustamante-García & González-Hidalgo 2022, Fonseca 2022) and the taxonomic revision of the family Amaranthaceae (Sandoval-Ortega & Zumaya-Mendoza 2023), we here present a note concerning the names *Gomphrena decumbens* Jacquin (1804: 41–42) var. *nana* Stuehlík (1912: 158), *G. filaginoides* Martens & Galeotti (1843: 350), *G. nitida* Rothrock (1878: 233), and *G. pringlei* Coulter & Fisher (1892: 349).

Previous studies (see e.g., Falatoury *et al.* 2017, Iamónico 2016, 2018, 2019, 2020a, 2020b, 2023, Mestre *et al.* 2021, Raus 2022, Sandoval-Ortega & Zumaya-Mendoza 2023) emphasized the importance of nomenclature analysis as necessary first-step of investigation of Amaranthaceae. In the case of *Gomphrena*, many names have been lectotypified (see e.g., Mears 1980, Ramella 2016, Bena 2017), but the identity of some taxa still need to be clarified.

Material and methods

The material deposited in the Herbaria MEXU, ENCB, FCME, and USON (acronyms follow Thiers 2023 [continuously updated]) was directly observed and examined by us. In addition, online digitalized specimens deposited in the Herbaria B, K, MO, NY, P, and US (Curators Herbarium B 2000 onwards, K herbarium 2023, TROPICOS 2023, P herbarium 2023, NY herbarium 2023, US herbarium 2023), and BM, BR, C, E, F, GH, K, KFTA, LE, LECB, LL, M, MEL, MU, NDG, NA, YU, Z through the SEINet Portal Network (2023) and the Global Plants platform (JSTOR 2023) were examined. Pertinent literature (protologues included) was also considered. The articles of the *International Code of*

Nomenclature for algae, fungi, and plants follow the current edition, i.e. *Shenzhen Code* (hereafter reported as “ICN”; Turland *et al.* 2018).

Results and discussion

Names are given in alphabetical order.

1. *Gomphrena filaginoides* Martens & Galeotti (1843: 350) ≡ *Xeraea filaginoides* (Martens & Galeotti) Kuntze (1891: 545).

Lectotype (here designated):—MEXICO, Oaxaca, dans les champs de la Misteca Alta et de la cordillère de Yavezia, 6000-7500 ft., April 1840, *Galeotti 441* (BR0000006950835!, image available at <https://www.botanicalcollections.be/specimen/BR0000006950835>); isoelectotype P00622630!, image available at <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00622630>).

= *Gomphrena decumbens* Jacquin (1804: 41–42) var. *nana* Stuchlík (1912: 158) ≡ *Gomphrena nana* (Stuchlík) Standley (1917: 150).

Lectotype (here designated):—MEXICO, Manzanillo, 1 to 31 December 1890, *Palmer 911* (Z000000292!, image available at <https://www.digitalis.uzh.ch/media/specimen/0/Z-000000292.jpg>); isoelectotypes: US00102786!, image available at <http://n2t.net/ark:/65665/30cd25a65-9c6c-4a31-8bd1-102acb23fdd6>; US00931477! [two specimens on the left side of the sheet], image available at <http://n2t.net/ark:/65665/3a3cde325-f174-4245-93b6-b0e8377de159>).

Typification of the name *Gomphrena filaginoides*:—Martens & Galeotti (1843: 350) provided, after the description, the provenance (“dans les champs de la Misteca Alta et de la cordillère de Yavezia, de 6,000 à 7,000 pienes”); the citation “Coll. H. Gal. N° 441 bis” (which refers to Galeotti’s collection) is also given. We traced two specimens part of Galeotti’s collection (original material), one deposited at P (barcode P00622630) and another at BR (barcode BR0000006950835); both of these specimens match the protologue. BR0000006950835 (Fig. 1) is here designated as lectotype; P00622630 is an isoelectotype. Note that Galeotti’s collection and types are mainly preserved at BR (HUH-Index of Botanists 2023).

Typification of the name *Gomphrena decumbens* var. *nana*:—The protologue of *Gomphrena decumbens* var. *nana* (Stuchlík 1912: 158) consists of a brief morphological description, the citation of a collector and collection number (“Palmer 911”), as well as the mention of three herbaria, i.e. “Berl., Petr., Zür” (respectively, B, LE, and Z). One specimen is located in Z (barcode Z000000292), whereas duplicates were found at US (barcodes US00102786 and US00931477). The specimen Z000000292 (Fig. 2) is here designated as lectotype being well preserved, showing mature reproductive structures, and matching the protologue.

Moquin-Tandon (1849: 417) includes *Gomphrena filaginoides* in the section “*species non tatis notae*” (= species not sufficiently known). Standley (1917: 153) cites *G. filaginoides* as a doubtful species and stated that it could be *G. nana*. Later, Holzhammer (1956: 196) mentioned that, according to the diagnosis and the original material (*Palmer 911*), the habit of *G. decumbens* var. *nana* is not distinct from *G. filaginoides*; likewise, he reported the inflorescences of “*nana*” as coinciding with those of the type material of *G. filaginoides*. After reviewing the type material of *G. filaginoides* (Fig. 1) and *G. decumbens* var. *nana* (Fig. 2), we agree with Holzhammer (1956) and consider *G. decumbens* var. *nana* as a heterotypic synonym of *G. filaginoides*.

2. *Gomphrena nitida* Rothrock (1878: 233).

Lectotype (here designated):—UNITED STATES OF AMERICA, Southern Arizona: Chiricahua Mountains, on rocky knolls, 1874, *Rothrock 520* (US00102795! Image available at <http://n2t.net/ark:/65665/3e5f1737e-ac05-46db-884a-60524d7f17d1>); isoelectotypes: F-V0047608F image available at <https://collections-botany.fieldmuseum.org/catalogue/253772>; GH00037067! image available at <https://s3.amazonaws.com/huhwebimages/1D5A515B4E6E472/type/full/37067.jpg>; YU068883! [two specimens on the left side of the sheet] image available at <https://collections.peabody.yale.edu/search/Record/YU.068883>).

Typification of the name *Gomphrena nitida*:—The protologue consists of a detailed description and the citation “Chirichaua Mountains, in Southern Arizona, on rocky knolls (520)”, where “520” would refer to a collection number and, therefore, the whole citation being a syntype (Art. 9.6 of ICN). Note, moreover, that at pages XIII–XV of the Introduction of volume no. 6 of Wheeler’s *Report upon United States Geographical surveys west of the one hundredth meridian*, it was published a “Letter of Lieutenant Wheeler to General Humphreys” in which (pag. XIII) J. T. Rothrock was mentioned as “surgeon and botanist to the Expedition of 1873–4–5” and collector in the “years 1871 and 1876”. The

letter continues by saying that “the collections obtained during the several years, ..., have been forwarded through the Smithsonian Institution for final lodgment in the herbarium of the Agricultural Department (now with the acronym NA). However, we verified that no specimen of *Gomphrena nitida* collected by Rothrock is deposited at NA. Fortunately, we traced four specimens (probably duplicates) collected by Rothrock with number 520, located in the herbaria F, GH, US, and YU. All these sheets match the protologue of *G. nitida*. US00102795 (Fig. 3) is here designated as a lectotype of this name since it matches the protologue, is in good condition, has mature reproductive structures, and corresponds to the current concept in *Gomphrena* (e.g., Clemants 2003, Zumaya-Mendoza & Sánchez-del Pino 2015). The other three specimens (F, GH, and YU) are isolectotypes.



FIGURE 1. Lectotype of *Gomphrena filaginoides* (BR0000006950835).

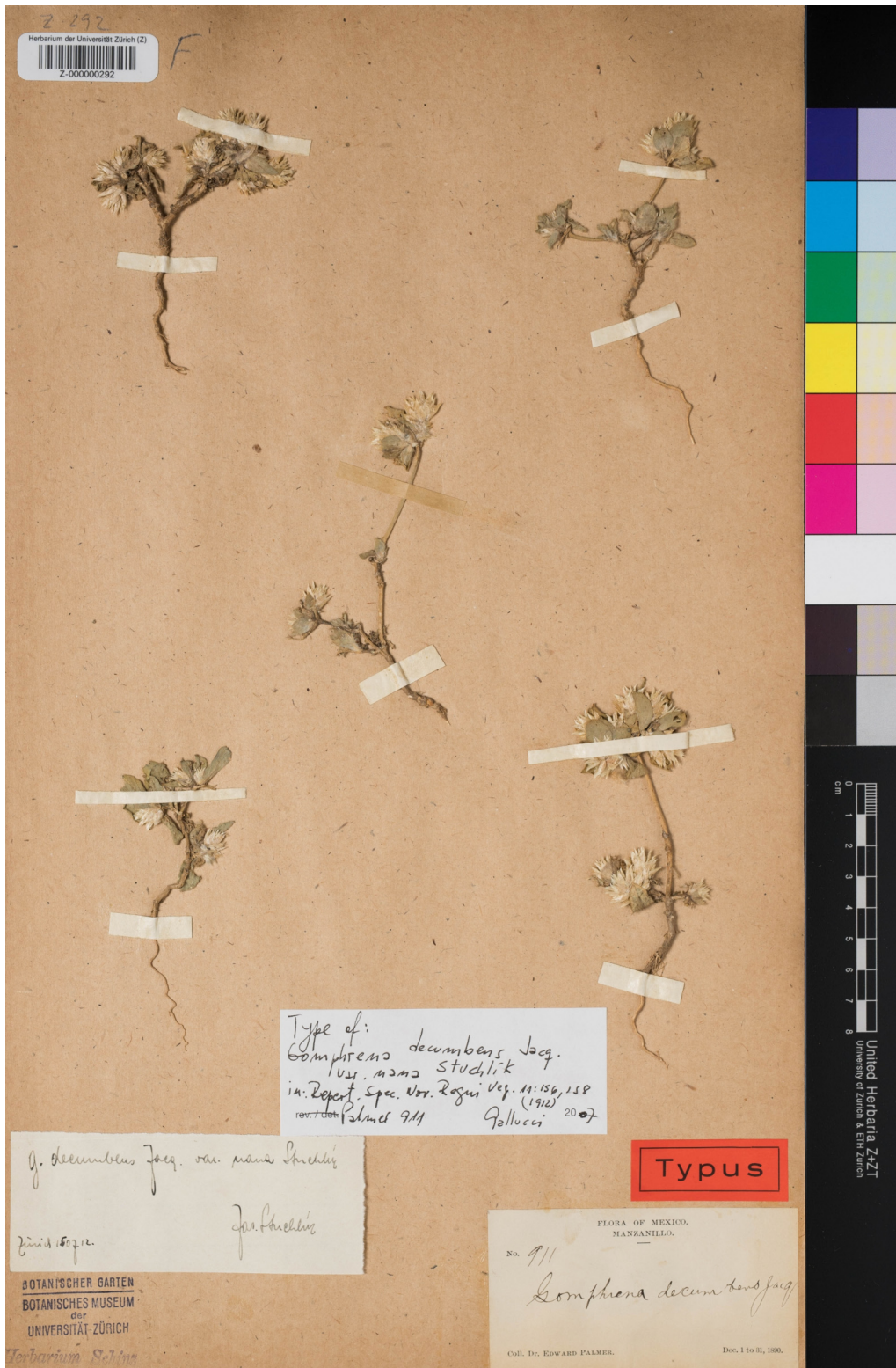


FIGURE 2. Lectotype of *Gomphrena decumbens* var. *nana* (Z000000292 by United Herbaria Z+ZT / CC BY 4.0).

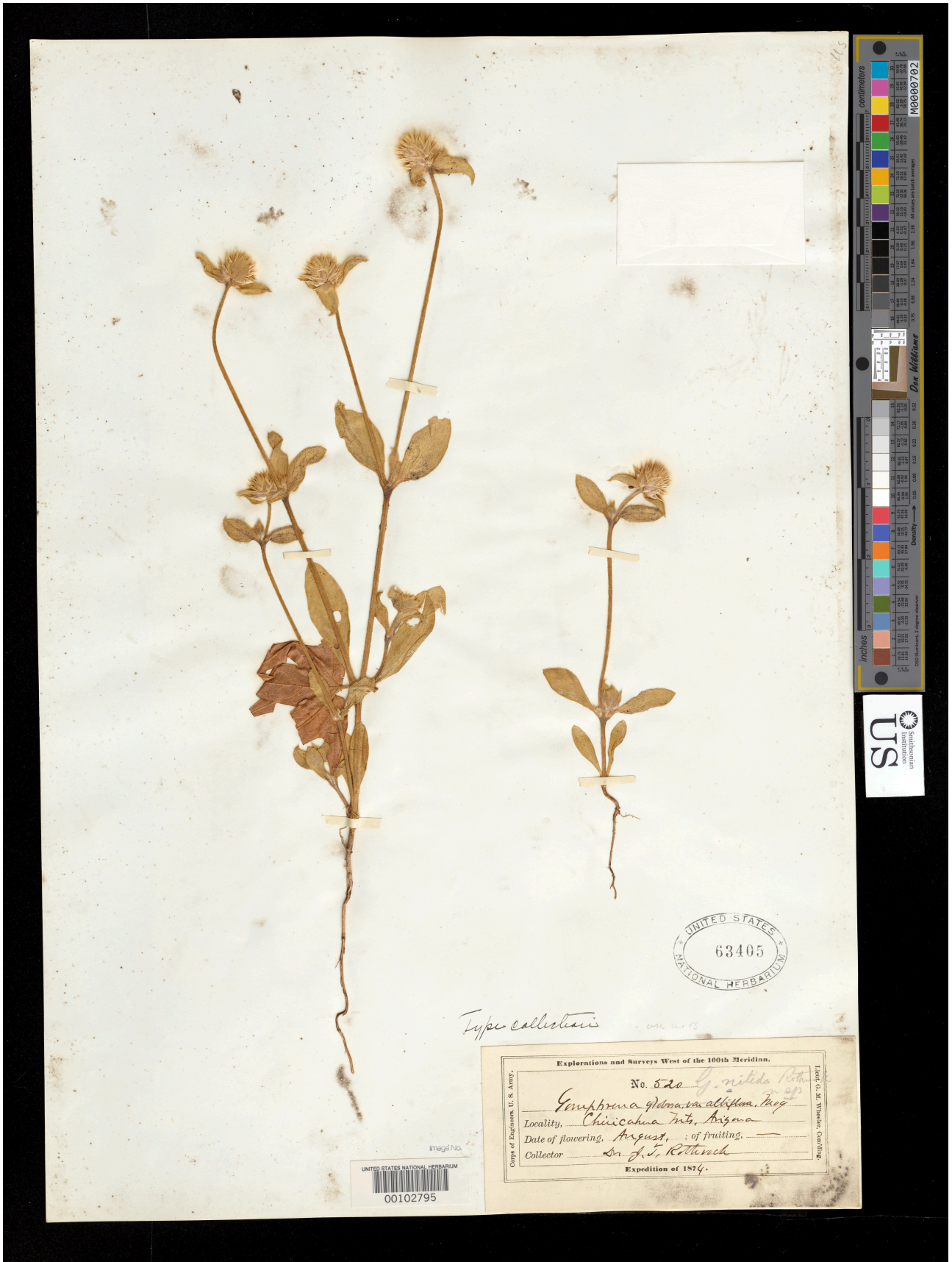


FIGURE 3. Lectotype of *Gomphrena nitida* (US00102795).

3. *Gomphrena palmeri* Standley (1917: 149–150) ≡ *G. globosa* Linnaeus (1753: 224) var. *albiflora* Moquin-Tandon (1849: 409–410).

Lectotype (designated by Holzhammer (1956: 193 [first-step typification]; second-step typification by Bena 2017: 135):—MEXICO. Oaxaca. Plages de l’océan pacifique, *s.d.*, *Galeotti 429* (P00622632, image available at <http://mediaphoto.mnhn.fr/media/1442830899193xGp2dsSd4co2oyCn>).

Notes on *Gomphrena globosa* var. *albiflora* and *G. palmeri*:—*G. globosa* var. *albiflora* was cited as a synonym for various other names in *Gomphrena* that correspond to different species. For example, when Standley (1917: 149) published *G. palmeri* Standl., he cited as synonym *G. globosa* var. *albiflora* and included the legend “*in part*”. Holzhammer (1956: 195–196) considered *G. globosa* var. *albiflora* as a synonym of both *G. palmeri* and *G. filaginoides*. Pedersen (1990: 74) regarded *G. globosa* var. *albiflora* as a synonym of *G. boliviana* Moquin-Tandon (1849: 401). Clemants (2003: 453) accepted *G. globosa* var. *albiflora* as a synonym of *G. nitida*. Finally, Bena (2017: 136) synonymized Moquin-Tandon’s variety as synonym of *G. boliviana*. These different views of variety by Moquin-Tandon (1849: 409–410) are probably related to the protologue of *G. globosa* var. *albiflora*, where the listed specimens (syntypes according to the Art. 9.6 of ICN) correspond to more than one currently accepted species. Moquin-Tandon (1849: 409–410) mentioned some specimens from Mexico, i.e.: “in Regni Mexicani province Oaxaca (*Galeotti* n. 429 et 443)”, “inter Victoria et Tula (*Berlandier* n. 2228)”, “prope Tamaulipas (*Id.*! [= *ibidem*, so refers to *Berlandier* as collector] n. 2130), as well as a collection from South America “prope Mendozam (*Gillies*)”, and even one from Java (“*Zoll. 2944 an culta?*”).

Among the specimens collected in Mexico by *Galeotti* and cited by Moquin-Tandon (1849: 409–410), one was designated by Holzhammer (1956: 193, first-step typification) and Bena (2017: 135, second-step typification) as a lectotype of *Gomphrena globosa* var. *albiflora* (*Galeotti 429*; P00622632, Fig. 4); four duplicates were located (BR0000021450990, BR0000021451003, P00622633, and P00622631); Concerning the collection *Galeotti 443*, we found one duplicate deposited in BR (BR0000027814574). All this material (BR0000021450990, BR0000021451003, BR0000027814574, P00622633, and P00622631) corresponds to the description provided by Standley (1917: 149) for *G. palmeri*. Actually Standley (1917: 149) listed var. *albiflora* by Moquin-Tandon (1849: 409–410) as synonym of his *G. palmeri* and cited a specimen collected by Palmer in Acapulco, Mexico and deposited in the US (*Palmer 269*; US00102797, Fig. 5). The name *G. globosa* var. *albiflora* is, therefore, the basionym of *G. palmeri*. So, Bena’s synonymization (with *G. boliviana*) cannot be retained, unless *G. boliviana* is treated as heterotypic synonym. However, *G. palmeri* and *G. boliviana* are two different species easily distinguished each other by the bracteoles, which are broadly cristate above in *G. palmeri* (see e.g., Standley 1917) and not crested in *G. boliviana* (see e.g., Bena & Acosta 2020). Furthermore, *G. boliviana* is only distributed in South America, in Argentina, Bolivia, and Paraguay (POWO 2023), whereas *G. palmeri* is reported from Mexico to Guatemala (Standley 1917).

Concerning the material collected by J. Gillies, who explored South America, especially Argentina (see Gibbs 1951, HUH-Index of Botanists 2023), a specimen from Mendoza is deposited at E (barcode E00334749, image available at <http://data.rbge.org.uk/herb/E00334749>). This specimen was originally identified as *G. globosa* var. *albiflora* and later revised by Pedersen as *Gomphrena boliviana* in 1973. Probably, this specimen (Fig. 6) is the reason why Pedersen (1990) includes *G. globosa* var. *albiflora* as a synonym of *G. boliviana* and included the legend “*pro minima parte*”. E00334749 has bracteoles without crest and an involucre of, at least, five reduced leaves subtending each inflorescence; these features correspond to *G. boliviana* according to Bena & Acosta (2020) and Pedersen (1997).

Finally, regarding *Berlandier* specimens, collection no. 2228 is deposited at PH (barcode PH00012667; Fig. 7) and is morphologically different from those collected by *Galeotti* in Oaxaca (nos. 429 and 443), matching instead *G. nitida* Rothrock (1878: 233–234) (see e.g. Clemants 2003, Calderón de Rzedowski 2005; Fig. 3).

The specimen from Java (*Zoll. 2944*) was not located.

Gomphrena palmeri has been also considered a synonym of *G. filaginoides* (Borsch 2001, Sánchez-del Pino *et al.* 2013). This could be because Standley (1946: 165) demoted *G. palmeri* to a synonym of *G. nana*, the latter in turn considered a synonym of *G. filaginoides* by Holzhammer (1956: 196). However, if the original material of both *Gomphrena palmeri* and *G. filaginoides* is observed (Fig. 1 and 4), as well as the material that Standley (1917: 149–150) cited in the protologue of *G. palmeri* (Fig. 5), they refer to two different species. *G. filaginoides* is a caespitose plant with short internodes and short crested bracteoles, while *G. palmeri* has procumbent to ascendant stems, with internodes longer than 5 cm, and widely crested bracteoles.

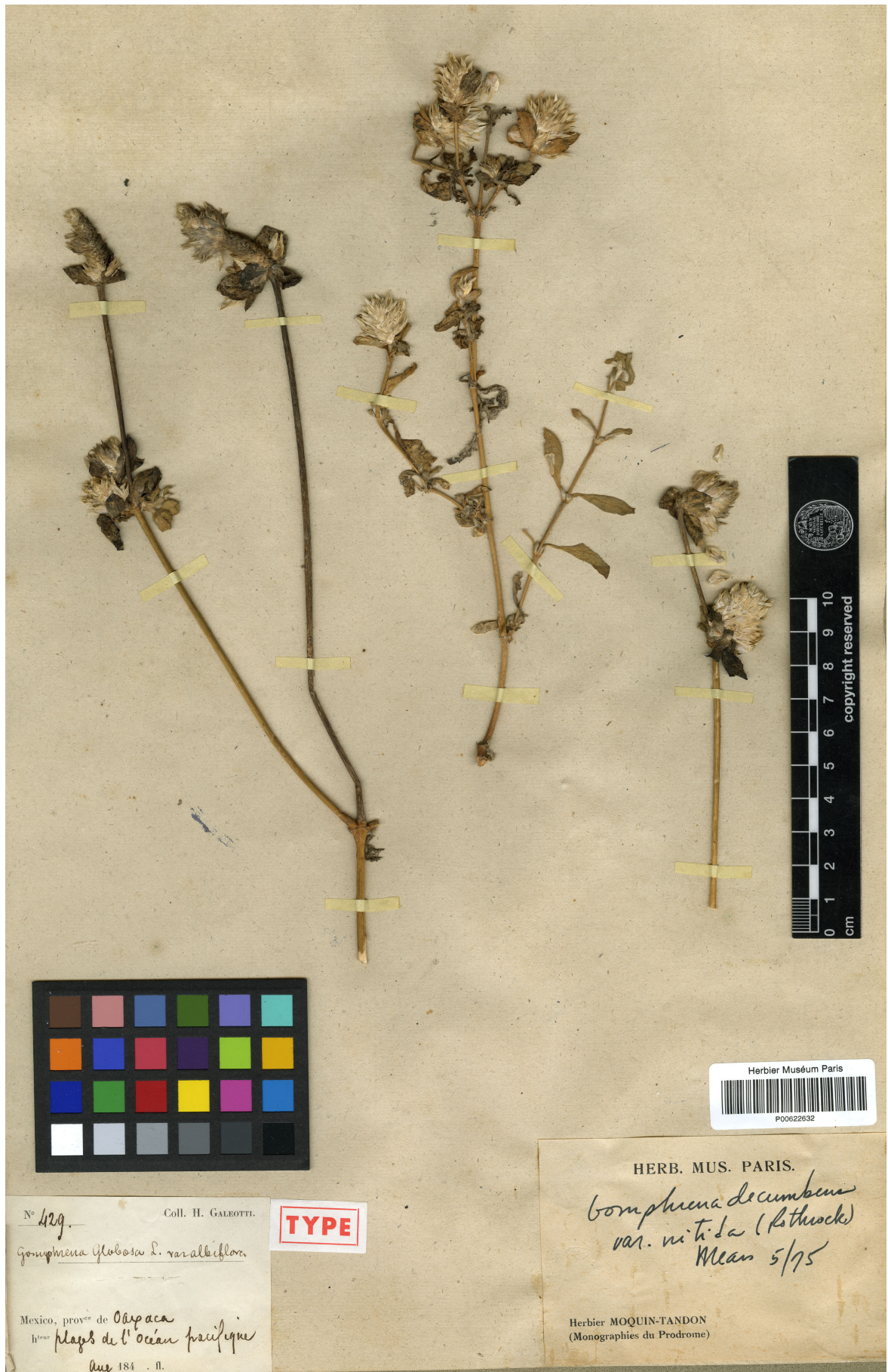


FIGURE 4. Lectotype of *Gomphrena globosa* var. *albiflora* (P00622632).



FIGURE 5. Specimen of *Gomphrena palmeri* (US00102797).

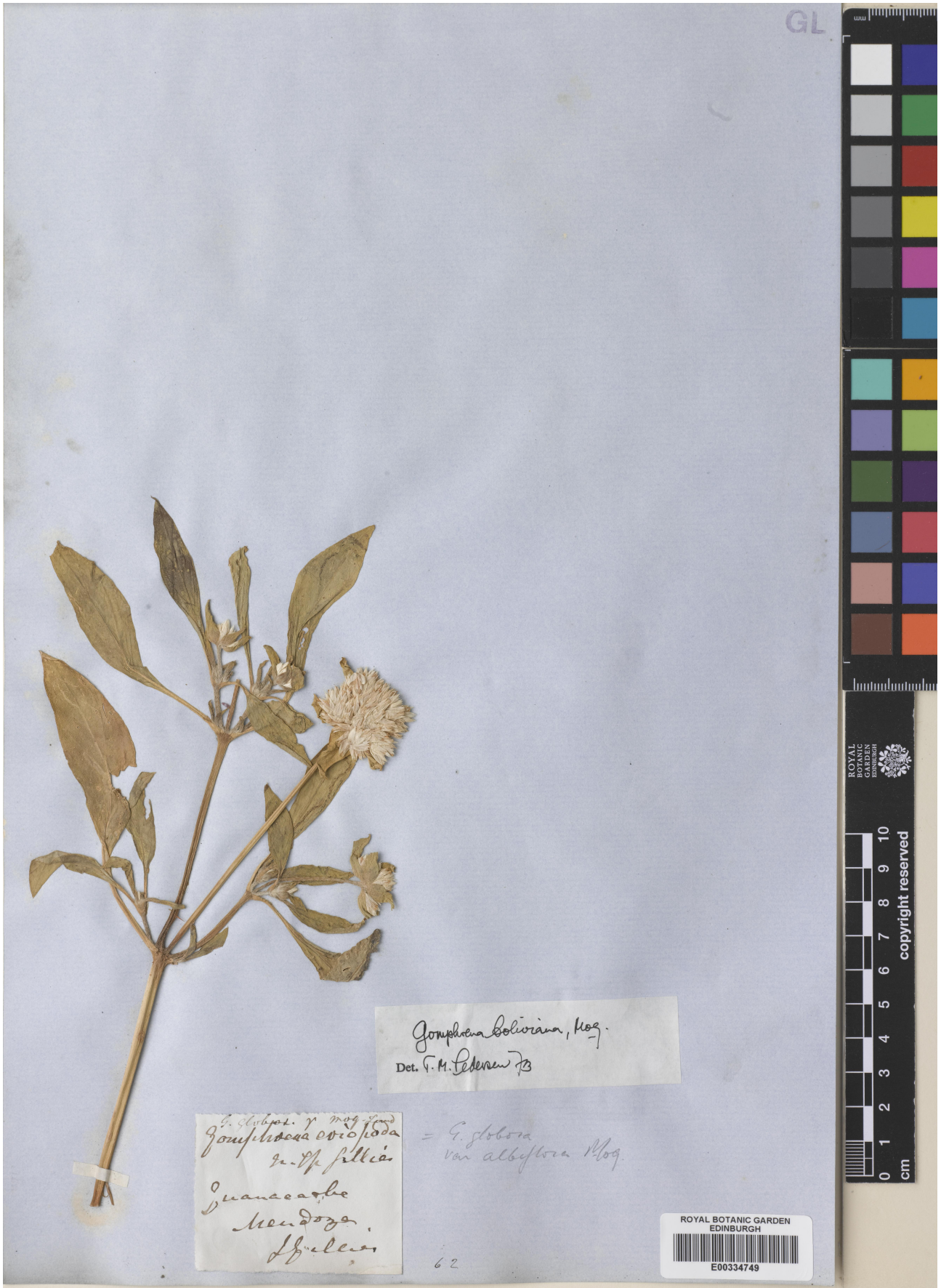


FIGURE 6. Specimen collected by Gillies in Mendoza (E00334749).



FIGURE 7. Specimen collected by Berlandier (no. 2228) in Mexico (PH00012667).



5960-

C. G. PRINGLE,
PLANTÆ MEXICANÆ.
1890.
—STATE OF MEXICO—
3152 Gomphrena decumbens, Jacq.
Thin gravelly soil.
26, August.

UNITED STATES
48553
NATIONAL HERBARIUM

Image No
UNITED STATES NATIONAL HERBARIUM
00102801

Gomphrena pringlei Coult. & Fisch.
Type collection.
HERB. UNITED STATES DEPARTMENT OF AGRICULTURE.

Gomphrena decumbens Jacq.

Locality: *Mexico.*
Collector: *C. G. Pringle,* 1890.

FIGURE 8. Lectotype of *Gomphrena pringlei* (US00102801).

Likewise, when Stuchlík (1912: 158) first described *Gomphrena decumbens* var. *nana*, he refers to a small plant (“planta parva”), and, as it can be observed in the material cited in the protologue [Z000000292 (Fig. 2), US00102786, US00931477], *G. decumbens* var. *nana* corresponds to a small plant, more similar in habit and inflorescence to *G. filaginoides* (Fig. 1) (see also discussion in Holzhammer 1956: 196) than to the material cited by Standley (1917: 149–150) (Fig. 5), and the material designated by Bena (2017) as a lectotype of *G. globosa* var. *albiflora* (Fig. 4), basionym of *G. palmeri*.

Here, we agree with Holzhammer (1956), who includes *G. decumbens* var. *nana* and *G. nana* as synonyms of *G. filaginoides* and treats *G. palmeri* as a different species.

4. *Gomphrena pringlei* Coulter & Fisher (1892: 349).

Lectotype (here designated):—MEXICO, State of Mexico, 26 August 1890, *Pringle 3152* (US00102801!, image available at <http://n2t.net/ark:/65665/3b5fc348e-5f75-4737-89d9-06c126a5d94a>; isolectotypes: BM000993131! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000993131>, BR0000008433695! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.br0000008433695>, C10005414! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.c10005414>, E00296890! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.e00296890>, F0047612F! image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.f0047612f>, GH00037071! Image available at https://data.huh.harvard.edu/databases/specimen_search.php?mode=details&id=9616, K000583062! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000583062>, KFTA0000696 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.kfta0000696>, LECB0001745 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.lecb0001745>, LL00370684 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.ll00370684>, M0241787 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0241787>, M0241788 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0241788>, MEL2462570 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.mel2462570>, MEXU00012331 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.mexu00012331>, MEXU00012330 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.mexu00012330>, MU000000085 ! <https://plants.jstor.org/stable/10.5555/al.ap.specimen.mu000000085>, NDG15578 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.ndg15578>, NY324496 ! Image available at <https://sweetgum.nybg.org/science/vh/specimen-details/?irn=581618>, NY324497 ! Image available at <https://sweetgum.nybg.org/science/vh/specimen-details/?irn=581619>, P00622639 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.p00622639>, P00622640 ! Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.p00622640>, RSA0000620 ! <https://plants.jstor.org/stable/10.5555/al.ap.specimen.rsa0000620>).

Note on the type of *G. pringlei*:—In the protologue *Gomphrena pringlei*, “State of Mexico” is reported as *locus classicus* and a syntype (“*Pringle 3152*”) is cited. 23 specimens (Pringle’s collection no. 3152) were traced in 19 herbaria (BM000993131, BR0000008433695, C10005414, E00296890, F0047612F, GH00037071, K000583062, KFTA0000696, LECB0001745, LL00370684, M0241787, M0241788, MEL2462570, MEXU00012331, MEXU00012330, MU000000085, NDG15578, NY324496, NY324497, P00622639, P00622640, RSA0000620, US00102801). US00102801 (Fig. 8) is here designated as a lectotype since it bears mature reproductive structures, is in good condition, matches the protologue, and corresponds with the current concept in *Gomphrena* (e.g., Calderón de Rzedowski 2005, Standley 1917). The other 22 specimens are isolectotypes.

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