
SHORT NOTE

Typification of names in *Bidens* (Coreopsideae, Asteraceae)

Tipificación de nombres en *Bidens* (Coreopsideae, Asteraceae)

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Abstract: The genus *Bidens* comprises 222–301 species widely distributed, and with notable economic importance. This study resolves nomenclatural ambiguities in *Bidens* by designating five lectotypes.

Keywords: Compositae, historical collections, lectotypification, nomenclature, taxonomy.

Resumen: El género *Bidens* incluye 222–301 especies de amplia distribución y notable importancia económica. Este estudio resuelve ambigüedades nomenclaturales en *Bidens* designando cinco lectotipos.

Palabras clave: Compositae, colecciones históricas, lectotipificación, nomenclatura, taxonomía.

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Supplementary information ↓

The genus *Bidens* was established in Species Plantarum (Linnaeus 1753), initially comprising 11 species. Subsequent studies (e.g., Candolle 1836; Baker 1884; Sherff 1937a, 1937b; Tadesse 1993) significantly expanded the number of species of the genus. Currently, *Bidens* is the most representative genus in

the tribe Coreopsideae (Asteraceae), encompassing 222–301 species with a cosmopolitan distribution (POWO 2025; WFO 2025). The genus is economically important due to its medicinal potential and also as weeds in crops and pastures (Pyšek *et al.* 1998; Crawford *et al.* 2009; Bartolome *et al.* 2013).

The comprehensive revision of *Bidens* by Sherff (1937a; 1937b), based on years of meticulous study, was a major contribution to the taxonomy of the group, including the designation of types for many species. However, some of his decisions are inconsistent with the current International Code of Nomenclature for Algae, Fungi and Plants (Turland *et al.* 2025), particularly regarding the improper selection of type specimens and the lack of explicit lectotypifications that were required. These inconsistencies have resulted in taxonomic ambiguities, necessitating further clarification.

Several studies have addressed nomenclatural issues in *Bidens*, including Tadesse (1984) and Rayner (1992) on African species, Wagner *et al.* (2014) on species from the Marquesas Islands, and, more recently, Lizarazu *et al.* (2024) on Bolivian species. Despite these efforts, some species remain untypified.

Considering these challenges, this study aims to improve the taxonomy of *Bidens* by designating five lectotypes, ensuring compliance with Article 9.3 of the Code (Turland *et al.* 2025) and promoting nomenclatural stability for future taxonomic and applied studies.

Protologues of *Bidens* names were studied from sources available in the Biodiversity Heritage Library (BHL 2025), and photographs of type specimens were examined on JSTOR Global Plants (JSTOR 2025), JACQ – Virtual herbarium (JACQ consortium 2004) and digital collections from various herbaria (B, BISH, BM, F, G, GH, HAL, HUH, K, LE, P, UC, US, W, according to Thiers 2024 [continuously updated]). The lectotypifications were proposed following Article 9.3 (Turland *et al.* 2025). To select specimens for lectotypification, we considered those previously cited in the protologues or in Sherff's revision of *Bidens* (Sherff 1937a; 1937b), prioritizing those with more detailed labels, including collection locality and a greater number of leaves.

Lectotypifications

1. *Bidens angustissima* Kunth, Nov. Gen. Sp. ed. fol. 4(17): 183 (1820) – **Lectotype (second-step, designated here)**: Mexico. It grows in cool habitats, near Los Joares and Santa Rosa de la Sierra, at an altitude of 1300 m, Humboldt & Bonpland s.n. (P barcode P02140524 [image!]; isolectotype: P barcode P00322417 [image!]).

Sherff (1937b: 488) designated the type collection, referring to two sheets deposited at the Paris herbarium (P), but he did not indicate one of those as a type. We designate one of these specimens (P02140524), which has more developed leaves, as the lectotype, and the second sheet (P00322417) as isolectotype.

2. *Bidens heterosperma* A.Gray, Smithsonian Contr. Knowl. 5(6): 90 (1853) – **Lectotype (second-step, designated here)**: United States of America. Massachusetts: Cultivated in 1852 at Cambridge, from seed obtained in 1851 near the copper mines in New Mexico, C. Wright s.n. (GH barcode 00004139!; isolectotype: GH barcode 00254872!).

Although Asa Gray (1853) indicated that the description of *Bidens heterosperma* was based on a cultivated specimen obtained by Mr. Wright —“Raised from seeds gathered by Mr. Wright near the copper mines, New Mexico”— he also stated, “There are no dried specimens in the collection”. However, it is likely that this material was later dried and deposited at GH herbarium. Sherff (1937b: 381) designated two sheets at GH herbarium as type material on this collection. Here, we take the second step in the lectotypification process by designating the most representative specimen (GH00004139) as the lectotype and GH00254872 as isolectotype.

3. *Bidens sambucifolia* Cav., Icon. 3(1): 15, t. 229 (1795). **Lectotype (designated here)**: MA barcode MA-01-00475437 [image!]. **Fig. 1.**



Figure 1. Image of the lectotype of *Bidens sambucifolia* (MA-01-00475437).
Photography courtesy of the herbarium MA, reproduced with permission.



Figure 2. Original element of *Bidens sambucifolia* Cav., illustration
“*Bidens sambucifolia*” published by Cavanilles (1795: tab 229).

In the protologue of *Bidens sambucifolia*, Cavanilles (1795) cited the locality as “Peru et Mexico” and noted that the species flowered in November at the Real Jardín Botánico de Madrid. Despite providing an illustration (“tab. 229”, Fig. 2) based on a living plant, he did not cite any examined specimens or designate a type. Sherff (1937b) later remarked that the citation of Peru was “unquestionably erroneous” as no specimens are known from that country. He also noted in the plate explanation (Sherff 1937b: 479) that some characters were “from a sheet of apparently Cavanilles’ original material in hb. Pavón, in Hb. Boiss.” We found in the digital collection of G herbarium five specimens of *B. sambucifolia* with no information about collector, year or locality. Nonetheless, it is highly improbable that collections made by Pavón had been used in the protologue of *B. sambucifolia*, since there is no trustworthy record of the occurrence of this species in South America, where Pavón concentrated his studies and journeys. Besides, it is known that Pavón sold thousands of supposed duplicates of Sessé and Mociño to private collectors between 1814 and 1828 (McVaugh 2000).

The Royal Botanical Expedition of Charles III, directed by Martín de Sessé and José Mariano Mociño and funded by the Spanish Crown, took place between 1787 and 1803, covering Mexico, Central America, the Caribbean, and parts of North America. This project produced one of the most extensive colonial botanical collections, with about 20,000 specimens, more than 2,500 species, and over 1,500 watercolor illustrations. Although intended to culminate in a *Flora Mexicana* comparable to Ruiz and Pavón’s *Flora Peruviana et Chilensis*, political and economic difficulties in Spain prevented full publication, and many species were only described later from duplicates and drawings (McVaugh 1969).

Cavanilles’ personal collection is preserved at the MA herbarium (Garilleti 1993) and, as suggested by Knapp (2007), (Sherff 1937b: 479) lectotypification of Cavanilles species should preferably be based on this material. One specimen from Cavanilles’ collection (MA-01-00475437) is designated here as the lectotype of *B. sambucifolia*. This specimen has already been proposed by Garilleti (1993) as a potential type, who also noted the original label by Cavanilles: “*Coreopsis sambucifolia* mihi // Icon. Tomo 3. Tab. 120 // *Bidens sambucifolia*”. McVaugh (2000) proposed that the description of *B. sambucifolia* was likely based on material from seeds brought from Sinaloa, Mexico, by Cervantes, or more probably by Sessé, following their return to Madrid in 1792. However, McVaugh did not find any specimens from Sessé’s collection bearing the species’ name. One specimen collected by Sessé and Mociño (Sessé & Mociño 2916, MA-01-00605580), nevertheless, had been identified by Sherff under this name. Although both specimens housed in Madrid appear to date from the same period and exhibit similar morphological patterns, we cannot assume that specimen MA-01-00475437 is a duplicate of Sessé & Mociño 2916. Therefore, we prioritize the designation of the former specimen as the lectotype due to the presence of Cavanilles’ handwritten label.

4. *Bidens sandvicensis* Less., *Linnaea* 6(3): 508 (1831) – **Lectotype (designated here)**: United States of America, Hawaiian, Island of Oahu, 1816, A. v. Chamisso s.n. (LE barcode LE01284765 [image!]; isolectotypes: LE barcodes LE01284763 [image!], LE01284764 [image!]).

Lessing (1831), when proposing *Bidens sandvicensis*, referenced only a collection “Ill. de Chamisso in O-Wahu (v. sp. s. plura)”. Sherff (1937a) subsequently clarified this reference by indicating the year of collection (1816) and the Berlin herbarium (B) but mentioned the absence of duplicates. Although no duplicates were known to Sherff, Berger’s (2018) research on Chamisso’s specimens highlighted the possibility of locating additional material in other herbaria that received parts of Chamisso’s collections, especially HAL, W, and LE. Guided by this approach, we examined these herbaria and confirmed that no specimens of *Bidens sandvicensis* were present in HAL or W, but three specimens were located at LE (LE01284763, LE01284764, and LE01284765).

These specimens bear handwritten labels marked with the initials “A.v Ch.”, a characteristic feature of Chamisso’s labels from the Romanzoffian Expedition (1815–1818), also observed in other collections (e.g., HAL0111443), including the locality abbreviation “O. Wahu” and graphic features matching other materials preserved at B, HAL and W. This expedition, conducted aboard the brig *Rurik* under the

command of Otto von Kotzebue and sponsored by Count Nikolai Romanzoff, included two visits to the Hawaiian Islands (1816 and 1817), during which Chamisso carried out pioneering botanical surveys in mountainous regions of Oahu such as Diamond Head and the Koolau Range. These collections represent some of the earliest scientific documentation of endemic Hawaiian flora (Berger 2018).

Based on label data and morphological consistency, the three LE specimens are considered duplicates of the material deposited at B. Among them, specimen LE01284765 is designated here as the lectotype, as it is the best preserved and bears the greatest number of leaves and capitula. The remaining specimens (LE01284763 and LE01284764) are designated as isoelectotypes.

The inscription “Reliq. Ledebour” indicates the specimen’s provenance from the private herbarium of Carl Friedrich von Ledebour, a contemporary of Chamisso, whose collection was acquired by the St. Petersburg Botanical Garden (now LE) in 1857 (Shetler 1967). The species name was subsequently added to the handwriting of Earl E. Sherff, who revised the genus *Bidens* (Sherff 1937a; 1937b). Collectively, these elements provide compelling evidence that the specimen belongs to Chamisso’s original collection and supports its designation as the lectotype of *Bidens sandvicensis*.

5. *Bidens wiebkei* Sherff, Bot. Gaz. 86: 435 (1928) – **Lectotype (designated here)**: United States of America, Hawaiian Island of Molokai, in scrub vegetation, upper part of Halawaiki Gulch, 21 Jun 1928, O. Degener & H. Wiebke 3005 (F barcode V0075352F [image!]; isoelectotypes: F barcodes V0075353F [image!], V0075354F [image!], US barcodes 00517047!, 00124351!, 00517048!, BISH No. 1005738 [image!], K barcode K001065530 [image!], MASS barcode 00319352 [image!], M barcode M-0030073 [image!]).

Sherff (1928) proposed *Bidens wiebkei* based on the collection O. Degener & H. Wiebke 3005, consisting of three sheets deposited at The Field Museum Herbarium (F). We designate as lectotype the most representative specimen, which has more leaves and capitula (V0075352F). The two other remaining duplicates of this collection in herbarium F (V0075353F and V0075354F) are isoelectotypes, as are the duplicates deposited in the herbaria US, BISH, K, MASS, and M.

Supplementary information ↑

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Supplementary material

Not applicable.

Data availability

All the data used is available in the main text, figures and tables.

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Authorship contribution statement

Maria Liris Barbosa: Conceptualization, Investigation, Writing – original draft, Writing – review and editing.
 João Bernardo de Azevedo Bringel Jr.: Investigation, Supervision, Writing – review and editing.
 Alessandra Selbach Schnadelbach: Supervision, Writing – review and editing.

Competing interests

The authors declare that there are no conflicts of interest related to this research.

Statement on the use of Artificial Intelligence

ChatGPT (OpenAI) was used occasionally to clarify translation questions from Portuguese into English during the preparation of this manuscript.

REFERENCES

- Baker JG (1884) Compositae IV: Helianthoideae. In: Martius CP, Eichler AW (eds), *Flora Brasiliensis*, vol. 6: 135–268. Typographia Regia, Monachii [Munich].
- Bartolome AP, Villaseñor IM, Yang WC (2013) *Bidens pilosa* L. (Asteraceae): Botanical properties, traditional uses, phytochemistry, and pharmacology. *Evidence-Based Complementary and Alternative Medicine* 2013: 340215.
- Berger A (2018) Rediscovery of Chamisso's type specimens of Hawaiian *Psychotria* (Rubiaceae, Psychotrieae) in the herbarium of the Natural History Museum, Vienna. *PhytoKeys* 114: 27–42.
- BHL (2025) *Biodiversity Heritage Library*. Website: <https://www.biodiversitylibrary.org/> [accessed: 10 Jan 2025].
- Candolle AP de (1836) *Prodromus systematis naturalis regni vegetabilis*, vol. 5. Treuttel et Würtz, Paris.
- Cavanilles AJ (1795) *Icones et descriptiones plantarum, quae aut sponte in Hispania crescunt, aut in hortis hospitantur* 3. Ex Regia Typographia, Matriti [Madrid].
- Crawford DJ, Tadesse M, Mort ME, Kimball RT, Randle CP (2009) Coreopsideae. In: Funk VA, Susanna A, Stuessy TF, Bayer RJ (eds), *Systematics, Evolution, and Biogeography of Compositae*: 713–730. International Association for Plant Taxonomy (IAPT), Vienna.
- Garilleti R (1993) Herbarium cavanillesianum seu enumeratio plantarum exsiccatarum aliquo modo ad novitates cavanillesianas pertinentium, quae in Horti Regii Matritensis atque Londinensis Societatis Linnaeanae herbariis asservantur. *Fontqueria* 38: 6–248.
- Gray A (1853) *Plantae Wrightianae Texano-Neo-Mexicanae*. Part II. *Smithsonian Contributions to Knowledge* 5 (article VI): 1–119.
- JACQ consortium (2004) Virtual Herbaria. Website: <https://www.jacq.org/> [accessed: 20 Jun 2025].
- JSTOR (2025) Global Plants. Website: <https://plants.jstor.org/> [accessed: 10 Jan 2025].
- Knapp S (2007) Lectotypification of Cavanilles' names in *Solanum* (Solanaceae). *Anales del Jardín Botánico de Madrid* 64: 195–203.
- Kunth CS (1820) *Compositae: Synanthereae*. In: Humboldt A von, Bonpland A (coords), *Nova genera et species plantarum* vol. 4. Apud N. Maze, Lutetiae Parisiorum [Paris].
- Lessing CF (1831) Synanthereae addendae. *Linnaea* 6: 561–602.
- Linnaeus C (1753) *Species plantarum*. Laurentii Salvii, Stockholm.
- Lizarazu MA, Beck SG, Fuentes A, Freire SE (2024) A revision of *Bidens* (Asteraceae: Coreopsideae) from Bolivia. *Annals of the Missouri Botanical Garden* 109: 163–207.
- McVaugh R (1969) El itinerario y las colectas de Sessé y Mociño en México. *Boletín de la Sociedad Botánica de México* 30: 137–142.

- McVaugh R (2000) *Botanical Results of the Sessé & Mociño Expedition (1787–1803). VII. A guide to relevant scientific names of plants*. Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh.
- POWO (2025) *Bidens* L. In: *Plants of the World Online*. Royal Botanic Gardens, Kew. Website: <https://powo.science.kew.org> [accessed: 11 Jan 2025].
- Pyšek P, Prach K, Mandák B (1998) Invasion of alien plants into habitats of Central European landscape: an historical pattern. In: Starfinger U (ed), *Plant Invasions: Ecological Mechanisms and Human Responses*: 23–32. Backhuys Publishers, Leiden.
- Rayner TGJ (1992) Studies on the genus *Bidens* L. (Compositae) from the Eastern Hemisphere. 3. Typification of names of *Bidens*, *Coreopsis* L., *Guizotia* Cass., and *Microlecanium* (Schultz-Bip.) Benth. & Hook.f. from Africa. *Phytologia* 73: 77–97.
- Sherff EE (1928) Studies in the genus *Bidens*. IX. *Botanical Gazette* 86: 435–447.
- Sherff EE (1937a) The genus *Bidens*. Part I. *Field Museum of Natural History, Botanical Series* 16: 1–348.
- Sherff EE (1937b) The genus *Bidens*. Part II. *Field Museum of Natural History, Botanical Series* 16: 349–709.
- Shetler SG (1967) *The Komarov Botanical Institute: 250 years of Russian research*. Smithsonian Institution Press, Washington.
- Tadesse M (1984) The genus *Bidens* (Compositae) in NE tropical Africa. *Symbolae Botanicae Upsalienses* 24: 1–138.
- Tadesse M (1993) An account of *Bidens* (Compositae: Heliantheae) for Africa. *Kew Bulletin* 48: 437–516.
- Thiers B (2024) [continuously updated]. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Website: <https://sweetgum.nybg.org/ih/> [accessed: 10 Jan 2024].
- Turland NJ, Wiersema JH, Barrie FR, Gandhi KN, Gravendyck J, Greuter W, Hawksworth DL, Herendeen PS, Klopfer RR, Knapp S, Kusber WH, Li DZ, May TW, Monro AM, Prado J, Price MJ, Smith GF, Zamora Señoret JC (2025) *International Code of Nomenclature for algae, fungi, and plants (Madrid Code)*. Adopted by the Twentieth International Botanical Congress, Madrid, Spain, July 2024. *Regnum Vegetabile* 162. University of Chicago Press, Chicago.
- Wagner WL, Clark JR, Lorence DH (2014) Revision of endemic Marquesas Islands *Bidens* (Asteraceae, Coreopsideae). *PhytoKeys* 38: 37–67.
- WFO (2025) *Bidens* L. In: *World Flora Online*. Website: <https://wfoplantlist.org> [accessed: 15 Jan 2025].