A FIRST REPORT OF *XERANTHEMUM ANNUUM* (ASTERACEAE: CARDUEAE) IN MONTANA AND NORTH AMERICA (U.S.A.)

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ABSTRACT

We report the first North American naturalized occurrence of the genus *Xeranthemum* L., represented by the occurrence of *X. annuum* L. on an airstrip in Troy, Montana. We discuss the locality in detail, the number of plants found, include commonly accepted synonyms, and discuss the species' use in the dried floral industry. An atypical character of the species is the relatively elongated inner phyllary bracts, which are suggestive of ray flowers. Scans of digitized herbarium specimens, including one from the University of Moscow, and one from our novel North American occurrence, are included to show variation in phyllary color.

RESUMEN

Informamos de la primera aparición naturalizada en América del Norte del género *Xeranthemum* L., representada por la especie de *X. annuum* L. en una pista de aterrizaje en Troy, Montana. Analizamos la localidad en detalle, el número de plantas encontradas, incluimos sinónimos comúnmente aceptados y analizamos el uso de la especie en la industria de las flores secas. Una característica atípica de la especie son las brácteas filarias internas relativamente alargadas, que sugieren flores radiales. Se incluyen escaneos de especímenes de herbario digitalizados, incluido uno de la Universidad de Moscú y uno de nuestra nueva aparición en América del Norte, para mostrar la variación en el color floral.

Whereas this journal and several others report new state records, significant range extensions, and in some cases county records (Daines et al. 2022), reports of the first confirmed occurrence of a genus in North America are relatively infrequent (e.g., Carnahan et al. 2022). During fieldwork in northwestern Montana in July 2024 the first author noticed a species of Asteraceae growing along the edges of a narrow, paved (blacktop) pathway that borders the edges of an airstrip operated by the United States Forest Service in Troy, Montana. The observation was during field work for the second author's floristic inventory of the Kootenai National Forest (Trost, in prep.), who collected from the same population again two days later for more comparative material and a more thorough description of associated species.

The distinctive appearance of the plants did not match any genera of Asteraceae known to the first two authors and initial searches through state and regional sources were unable to identify the material to genus (Dorn 2001; Lesica 2022; Hitchcock & Cronquist 2018; Baldwin et al. 2012, Barkley et al. 2006). As such, the third author, as a specialist of Asteraceae, was invited to assist with its identification. Library and herbarium collections at the Missouri Botanical Garden enabled us to match confidently the specimen and determine its correct identity.

Voucher specimens. *Xeranthemum annuum* L. **U.S.A. MONTANA: Lincoln Co.:** Kootenai National Forest, Three Rivers District, airstrip across US Hwy 2 from District Ranger Office, just N of Troy, 48.478151, –115.903250 ± 5 m, 612 m, edge of paved walking path around airstrip; with *Symphoricarpos* and some *Ceanothus*, 23 Jul 2024 (bud, fl. imm.), *Neil Snow 12289* (KSP [KSP047074], MO [MO-3466067], RM); ibid loco; with *Juniperus scopulorum, Amelanchier alnifolia, Prunus virginiana, Erodium cicutarium, Conyza canadensis, Sisymbrium altissimum, Erigeron strigosus,* and *Epilobium brachycarpum,* 25 Jul 2024 (bud, fl.), *M. Trost 3193* (RM accession 1052938; [RM0332171]) (Fig. 1).

About 15 plants were growing in a cluster along the outer edge of a blacktop walking path in gravel with no evidence of recent disturbance. The path, built between 2000–2003, was prepped and paved by the county

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Fig. 1. Specimen of *Xeranthemum annuum* L. from Montana (*Trost 3193*, at RM), with typically colored inner phyllaries not yet developed.

with a skid steer that brought in gravel. The path connects another mile to downtown Troy, includes a small parking lot, and has traffic throughout the year for locals from the town as well as district office employees to walk, run, and bike the ca. 1 mile loop around the airport field. The landing strip around which the path occurs is mowed and maintained primarily for aircraft involved in fire management but is seldom used.

Significance.—Exhaustive searches through February 2025 on SEINet (2025), SERNEC (2025), BONAP (Kartesz 2025) and GBIF (2025) suggest this is the first naturalized report of *Xeranthemum* L. in North America. Herbarium searches by curatorial colleagues at NY and BH likewise revealed no naturalized collections. However, the species has been planted ornamentally in other areas (see specimen citations below). A small commercial greenhouse ca. 0.75 km south of the airstrip opens for a few months in the Spring and sells annual ornamentals and edibles, although the greenhouse owners have no records or memory of carrying *Xeranthemum*. It is unknown whether seeds or living material of *X. annuum* are sold or grown elsewhere in Troy or nearby. Whatever the source of its origin, there was no evidence of intentional planting. The collection from Montana represents its first localized naturalization in North America.

Taxonomy of the genus and species.—*Xeranthemum* is a member of Tribe Cardueae Cassini despite its lack of armature (spines) common to most genera of the tribe (e.g., *Arctium* L., *Carduus* L., *Centaurea* L., *Cirsium* P. Mill.), although *Flora of North America* (Barkley et al. 2006) used the tribal name Cynareae L. & DC. According to Mabberley (2017: 984), *Xeranthemum* comprises five species native from Europe to SW Asia, and specifically mentions *X. annuum* as a cultivated species. However, the third authors' recent review of the genus suggests that the illegitimate name *X. squarrosum* Boiss. should be synonymized under *X. annuum*. Commonly called Immortelle or Everlasting Flower (e.g., Everett 1982: 3569–3570), *Xeranthemum annuum* is widely cultivated. As with many polymorphic species, it has many heterotypic synonyms (WFO 2025), including: *Centaurea dubia* S.G. Gmel. ex Steud.; *X. annettae* Kalen.; *X. inodorum* Moench; *X. oleifolium* Cav., *X. radiatum* Lam.; *X. r.* var. *pictum* Boiss.; *X. squarrosum* Boiss., nom. ill.; and *X. s.* var. *unicolor* Boiss.

The taxonomic history of *Xeranthemum annuum* L. is somewhat tortuous. Linnaeus (1753) published the name in *Species Plantarum* 2:875 (Jarvis 2007). Hillard and Burtt (1981) sought to lectotypify *X. annuum* from sheet no. 400 Clifford Herbarium at Museum of Natural History (BM; Jarvis 2007) but did not specify which of the two relevant elements on the sheet, which Burtt (1993) later specified as being in the Clifford Herbarium no. 400 (see Jarvis (2007). Two varieties also published by Linnaeus (1753) have been raised to specific rank (now treated as *Xeranthemum inapertum* (L.) Mill. and *Chardinia orientalis* (L.) Kuntz. [Jarvis 2007]).

Flora Europaea (Webb 1976) differentiates *X. annuum* from *X. cylindricum* Spreng. by the lack of appressed hairs on the outer involucre bracts and with obtuse or emarginate apices in the former, and from *X. inapertum* Mill. by inner involucre bracts of *X. annuum* being at least twice as long as the intermediate bracts and with a capitulum of 70–120 florets (v. bracts no more than 1.5x the length of the intermediate bracts and less than 50 florets in *X. inapertum*). The long, whitish, and narrow inner phyllary bracts of *X. annuum* are much longer than the outer bracts and deceptively similar at a casual glance to ray flowers (HT 1976; Sutton 2001). However, its inner phyllaries typically are lavender to purplish (Fig. 2), although whitish inner phyllaries can be seen in addition to the purplish ones on one of the specimens from the Denver Botanic Gardens (*Wingate 3183*; see below). TPB (2001) also indicates the inner phyllaries vary between white, pink and mauve and can retain their color for many years.

TPB (2001) further indicates the species is suitable for cultivation in the USA in Plant Zones 7–10. Everett (1982) indicated that the related species *X. cylindraceum* Sm. is sometimes cultivated. Webb (1976: 212) indicated that the native range of *X. annuum* included southeast and east-central Europe to eastern Austria north into Russia to 52° North, typically in arid habitats. More recent digital sources (GBIF 2025) indicate a native range from France to Kazakhstan and south to Jordan and Iran, with non-native range extensions in Spain, Norway, Germany, Poland, Switzerland, Austria, and Kyrgyzstan.

Ornamental interest and uses.—*Xeranthemum annuum* is valued as an ornamental. Its appeal derives from variation in floral color and the ability of the inner phyllaries to hold their color for long periods after drying, making them attractive in floral arrangements (Everett 1982; TPB 2001). (For information regarding

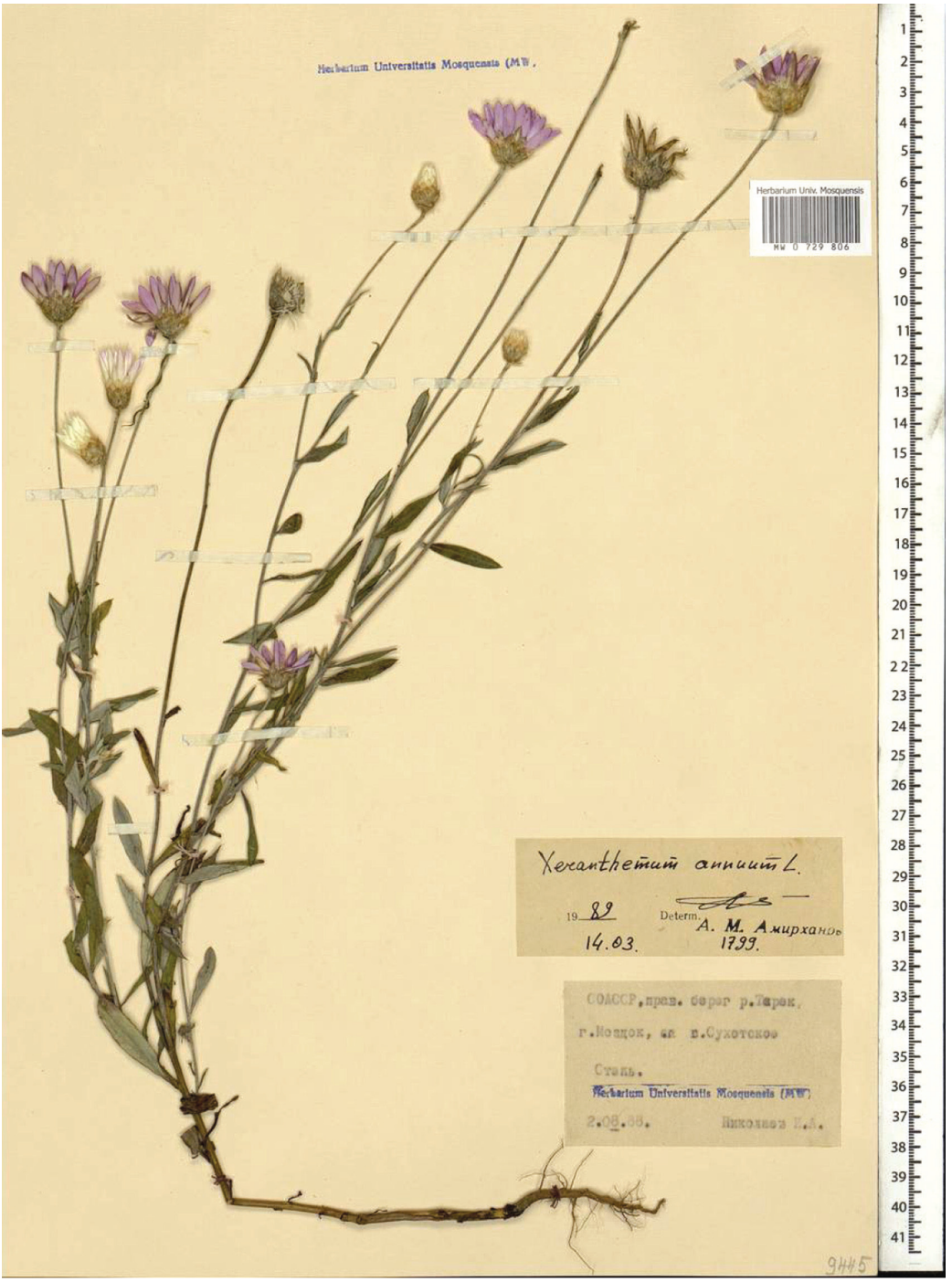

Fig. 2. Herbarium specimen of *Xeranthemum annuum* L. from the University of Moscow, showing the colored inner phyllaries (open source).

cultivation and gardening, see also Everett [1982], Brickell and Zuk [1997: 1065], Sutton [2001], Tenenbaum [2003].) The earliest cultivated specimen known to us in North America is from 1882 (cited below). It is possible that vouchered, cultivated specimens of *Xeranthemum* may be misidentified as *Helichrysum bracteatum* Andrews, which was the case initially with the specimen of Bro. Hyacinth (*1997*; cited below), a species also widely available and planted as an ornamental. The vouchered cultivated occurrences we found for North America are cited below; the specimen cited for Pennsylvania may have been naturalized, but if so, then it probably was for a short period of time, and we know of no previous reports.

Vouchered cultivated records.—**CANADA. BRITISH COLUMBIA:** UBC Botanical Garden, (year) 1988, *Gerald B. Straley 5054* (accession V194963). **UNITED STATES. COLORADO.** [**Denver Co.**]: Denver Botanic Gardens, 1983, *J. Wingate 2701* (KHD00034316) and 1984, *J. Wingate 3183* (KHD00034315). **ILLINOIS.** [**St. Clair Co.**]: Mascouthah, 9 Jun 1882, *Engelmann s.n.* (MO-5491660). **LOUISIANA.** [**East Baton Rouge Parish**]: grown from seed supplied from Burpee Seed Co., voucher for E.M. Harris' research, 28 Sep 1986, *Elizabeth M. Harris 605* (LSU [LSU00053866]). **MARYLAND.** [**Prince George Co.**]: Ammendale, 1919, *Bro. Hyacinth 1997* (US 00304397). **NEW YORK:** New York Botanical Garden Nursery, "Original from Leiden sd-1903," 9 Sep 1904, *George V. Nash 18649* (NY, no barcode or accession). **PENNSYLVANIA. Lan**[**caster**] **Co.:** Wakefield, 16 Jul 1906, *Joel J. Carter 3* (NY 05154329). **WISCONSIN.** [**Brown Co.**]: Green Bay, 5 Sep 1887, *J.H. Schuetter s.n.* (US accession 751760; image no. 02153744).

The authors plan to search the locality in 2025 to better assess whether the plant is still naturalized locally, which will be summarized later (Trost, in prep.). Further monitoring and management implications are under discussion with the USFS Kootenai National Forest botanist. Unexpected discoveries such as this one remain an impetus for ongoing, recursive floristic research, especially in corners of the world relatively overlooked and underrepresented in herbaria.

Note added in proof.—M.T. repeatedly revisited the site of the small population of *Xeranthemum annuum* in 2025 but was unable to locate any plants in the general vicinity.

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