Chapman-Lam, C.J. 2022. First North American records of *Geum ×spurium* and noteworthy records of three additional *Geum* taxa. Phytoneuron 2022-46: 1–8. Published 17 October 2022. ISSN 2153 733X

FIRST NORTH AMERICAN RECORDS OF *GEUM ×SPURIUM* AND NOTEWORTHY RECORDS OF THREE ADDITIONAL *GEUM* TAXA

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ABSTRACT

This note reports the first North American records of *Geum ×spurium*, documented in New Brunswick and Ontario, as well as of three *Geum* taxa that are additions to the flora of Canada or provincial floras in Atlantic Canada.

Geum L. is a cosmopolitan genus of perennial herbs with ca. 51 species, including 20 that are native to North America (including *Waldsteinia*; Chaoluan et al. 2003; Smedmark 2006; Rohrer 2014). *Geum* species are known for their propensity to hybridize: experimental hybrids have been produced between most species in subg. *Eugeum* (Gajewski 1957), and many naturally occurring hybrids have been documented in North America (Bernard & Gauthier 1986; Rohrer 2014; Hough 2018; Hough et al. 2021). Field surveys in eastern Canada from 2020 to 2022 led to the discovery of three *Geum* hybrids and one orthospecies that represent additions to continental, national, and provincial floras. The records are described below in alphabetical order. Observation numbers are provided for iNaturalist records (GBIF 2022).

Geum ×cortlandicum M. Hough [*G. canadense* Jacq. × *G. laciniatum* Murray]

The collections below represent the first published specimen records for Nova Scotia and Canada. A probable iNaturalist record from Ontario (record number *28970521*) has been determined by M. Hough, but no specimen was collected.

The hybrids were detected occasionally in floodplain forests of the Baddeck and Middle River systems. The parents were common and widespread in both areas. Fruiting heads of *Geum ×cortlandicum* usually had some undeveloped, presumably aborted achenes, as described by Hough (2018). The total number of ovaries per head were 112 – 122, within the reported range for the hybrid. See Hough (2018) for a detailed description of the taxon and its diagnostic characters.

Nova Scotia. Victoria Co.: Lower Middle River, floodplain forest, 9 Jul 2021, *Chapman-Lam 4897* (ACAD); Middle River, *Populus balsamifera* mixed floodplain forest, 4 Aug 2021, *Chapman-Lam 5026* (ACAD); Baddeck River, *Populus balsamifera* floodplain forest, 6 Aug 2021, *Chapman-Lam 5051* (ACAD); Peters Brook, margin of floodplain forest, 12 Aug 2021, *Chapman-Lam 5099* (NSPM).

Geum ×macneillii J.-P. Bernard & R. Gauthier [*G. laciniatum* × *G. urbanum* L.]

This represents the first record for New Brunswick and Atlantic Canada. Flowering and fruiting material was collected from plants in Mapleton Park, Moncton. *Geum urbanum* was common and abundant, while *G. laciniatum* was encountered occasionally. The hybrid was noted in a single location. It had yellow petals that were shorter than the sepals. This coloration (as opposed to an intermediate pale yellow) is not atypical for later season flowers of *G. ×macneillii* (M. Hough pers. comm. 2022).

New Brunswick. Westmorland Co.: Mapleton Park, Moncton, shoulder of trail through marsh, 26 Jun 2021, *Chapman-Lam & Stobo 4766* (CAN); same location, 27 Jun 2021, *Chapman-Lam 4767* (NBM); same location, 10 Jul 2021, *Chapman-Lam 4906* (CAN).

Geum ×spurium Fisch. & C.A.Mey. [*G. aleppicum* Jacq. × *G. urbanum*]

The records cited below, from New Brunswick and Ontario, represent the first reports for North America. Hybrids were documented growing with both putative parents or with *G. urbanum* only. It is most similar to the two parent species but has an intermediate number of carpels with very few achenes developing normally (Figs. 1, 2). The latter is particularly noticeable when co-occurring plants of the parent species have at least some heads in full fruit, exhibiting fully developed achenes (Fig. 3). Counts from the collections below indicate *G. ×spurium* has roughly 149–194 carpels, while *G. aleppicum* has 269–363, and *G. urbanum* has 68–121 (latter two reported by Hough et al. 2021). Dry petal length was 4.9–6.5 mm, largely overlapping with, but sometimes exceeding dry petal length in *G. urbanum* (4.0–5.5 mm; Hough et al. 2021). Gajewski (1957) reported a larger, more intermediate petal size for *G. ×spurium* (7.7 mm long), presumably measured with fresh petals. The styles tend to show mixed characters: they are usually conspicuously red, as in *G. urbanum* (sometimes red in *G. aleppicum* but typically more weakly colored) and the terminal, deciduous style segment is pubescent, as in *G. aleppicum*. *Geum ×spurium* is also similar to *G. ×macneillii* but can be distinguished by its longer petals (3.7–4.9 mm in the latter; Hough et al. 2021).

In experimental hybrids between European *Geum aleppicum* and *G. urbanum*, Gajewski (1957) reported that many ovaries developed one to three additional styles. This occurred very rarely in his experimental hybrids between the same *G. urbanum* and North American *G. aleppicum* (discussed as var. *strictum*). This character was not noted in any of the collections below.

New Brunswick. Victoria Co.: Tobique River, Plaster Rock, shrubby floodplain bank, 8 Aug 2022, *Chapman-Lam 5576* (CAN). Westmorland Co.: Mapleton Park, Moncton, shoulder of trail through marsh, 27 Jun 2021, *Chapman-Lam 4770* (CAN, DAO); Mapleton Park, Moncton, trail bank and swamp, 10 Jul 2021, *Chapman-Lam 4907* (CAN, DAO). **Ontario**. Ottawa Regional Municipality: Ottawa River Pathway, Ottawa, edge of trail with *Rubus odoratus*, *Viburnum opulus*, *Ranunculus acris*, *Acer negundo*, *Symphyotrichum lateriflorum*, 7 Jul 2022, *Chapman-Lam 5464* (CAN).

Geum urbanum L.

First record for Newfoundland & Labrador. The author did not have a collection permit while visiting Gros Morne National Park so did not collect a voucher specimen. The species was found to be common at the beginning of the Berry Hill Trail. It grew with *G. macrophyllum* Willd. but no hybrids were detected. Hybrids between *G. macrophyllum* and *G. urbanum* (= *G. ×convallis* M.P.Wilcox) are known from England (Wilcox 2015), and a possible record from Saint John, New Brunswick, has been posted on iNaturalist (record number *52086754*). It seems likely that the hybrid will occur in this location given enough time.

The occurrence is documented with the following iNaturalist record: **Newfoundland.** Division No. 9: Berry Hill Trail, Gros Morne National Park, 30 Jul 2020, *54986800* (iNaturalist).

ACKNOWLEDGEMENTS

Thanks to Michael Hough for providing helpful review of the manuscript. Thanks to Lyndsey Sharp for providing images of specimens at CAN. Most of the New Brunswick and Nova Scotia field work was conducted for the Atlantic Canada Conservation Data Centre, with support from the New Brunswick Wildlife Trust Fund and the Unama'ki Institute of Natural Resources, respectively. Ontario field work was supported in part by an Ottawa Field-Naturalists' Club grant.

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Figure 1. *Geum* ×*spurium* at Plaster Rock, Victoria Co., New Brunswick, 8 August 2022. Left: habit. Note the abundance of flowers. Right: fruiting head with very few achenes enlarging.

Figure 2. *Geum ×spurium. Chapman-Lam 4770* (CAN).

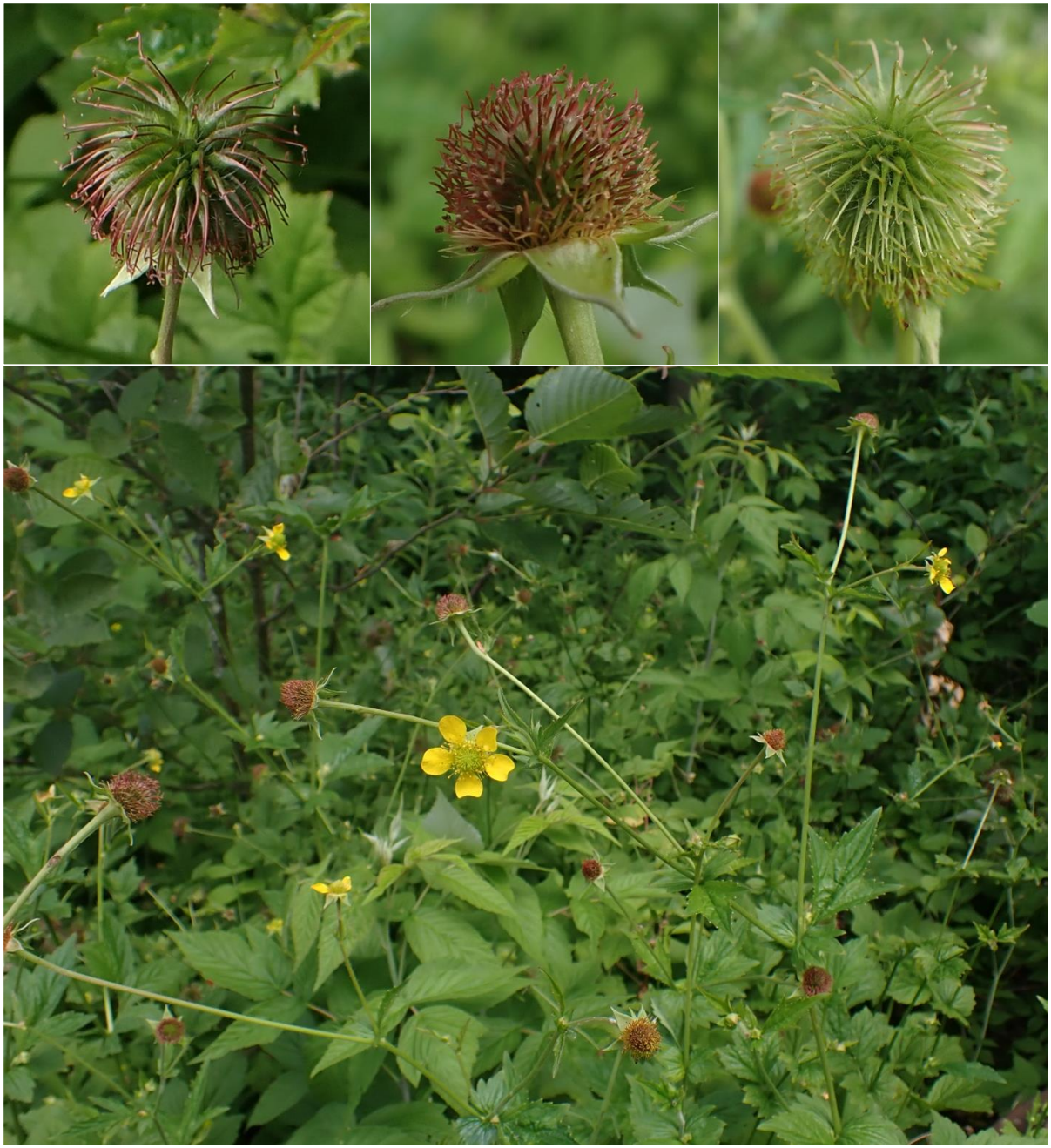

Figure 3. Mapleton Park, Westmorland County, New Brunswick, 27 June 2021. Top left: *Geum urbanum* fruiting head with engorged achenes. Top center: *Geum* ×*spurium*, with achenes not developing. Top right: *Geum aleppicum* fruiting head with achenes developing normally. Bottom: *Geum* ×*spurium* habit.