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Note

Branching Burreed (*Sparganium androcladum* (Engelmann) Morong; Typhaceae) rediscovered in Ontario, but conservation status unclear

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Abstract

We report three new records of Branching Burreed (*Sparganium androcladum*), which has not been seen in Ontario in several decades. This species is understudied and has been confused with other taxa, primarily American Burreed (*Sparganium americanum*). It is not known when it was last collected in the province, and its conservation status is unclear. Specimens identified as Branching Burreed are few and do not fully clarify the situation; of the 14 putative *S. androcladum* specimens we examined, five are too immature to verify confidently, and at least seven are misidentified. Previous specimen-based maps are probably not accurate representations of Branching Burreed's provincial distribution, but it is likely more widespread than records indicate. We provide a description of our new records and notes on identification to provide a basis for additional study of this plant.

Key words: Rubanier rameux; Branched Burreed; *Sparganium androcladum*; rediscovery; Canada; Ottawa River

We found three new locations of *Sparganium androcladum* (Engelmann) Morong (Branching Burreed, Rubanier rameux) in eastern Ontario in 2022 and 2023. Two are along the Ottawa River in the City of Ottawa (François Dupont Park and Petrie Island) and one is in a bay of the Rideau River at Murphys Point Provincial Park. Both Ottawa River locations are in emergent riverine marshes (Figure 1) dominated by mostly vegetative *Sparganium* spp., often with *Pontederia cordata* L. (Pickerelweed, Pontédérie cordée), *Sagittaria latifolia* Willdenow (Broad-leaved Arrowhead, Sagittaire à larges feuilles), *Hydrocharis morsus-ranae* L. (European Frog-bit, Hydrocharide grenouillette), and *Nymphaea odorata* Aiton (Fragrant Water-lily, Nymphéa odorant). The *Sparganium* marshes consisted mostly of plants without fruiting stems. Aside from local patches of *Sparganium eurycarpum* Engelmann (Broad-fruited Burreed, Rubanier à gros fruits), almost all vegetative plants were consistent in size with the fruiting plants we confirmed as Branching Burreed. We estimate this could amount to thousands to tens of thousands of Branching Burreed plants. Detailed collection notes were not made for the Murphys Point location.

Branching Burreed is a native species that is noteworthy for being uncommon over a discontinuous range from the Great Lakes, east across southern Quebec and Maine, and south to Oklahoma and Tennessee (Kaul 2000). This North American endemic is of conservation concern in almost all provinces and states within this distribution (NatureServe 2022). Before our discoveries, it had not been reported from Ontario for several decades (Argus *et al.* 1987). However, as we discuss below, it has likely been overlooked because of its morphological similarity to the common and widespread *Sparganium americanum* Nuttall (American Burreed, Rubanier d'Amérique). It may be a legitimately rare plant for reasons not yet understood; its true conservation status in Ontario, and likely elsewhere, remains incompletely known. This is reflected in the current provincial conservation status rank, which has been updated to SU (Unrankable; NHIC 2024) following our discoveries.

Previously, Argus *et al.* (1987) reported Branching

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Figure 1. Branching Burreed (*Sparganium androcladum*) habitat. a. François Dupont Park, Ottawa, Ontario, *Chapman-Lam & Sokoloff 5748.* b. Petrie Island, Ottawa, Ontario, *Chapman-Lam & Sokoloff 5749*. Photos: P.C. Sokoloff.

Burreed as a rare species in Ontario, mapping only nine widespread records in the province, roughly from Casselman, eastern Ontario, southwest to the Niagara Peninsula and the London area. They noted that only three of these localities are represented by collections made since 1935. There have been no other new confirmed Ontario reports since the Argus *et al.* (1987) synopsis, although Étienne Léveillé-Bourret (pers. comm. 2023) has verified several 2021 specimens from the Parc national de Plaisance, on the Quebec side of the Ottawa River, roughly 27 km east of Petrie Island (reported in Garon-Labrecque *et al.* 2022).

We reviewed all Ontario specimens of putative *S. androcladum* and *S. americanum* that are in the major herbaria in Ottawa, the National Herbarium of Canada (CAN) and the National Collection of Vascular Plants (DAO), as well as the Gray Herbarium, Harvard University (GH), the Royal Botanical Gardens Herbarium, Hamilton (HAM), and the University of Guelph Herbarium (OAC). Will Van Hemessen (pers. comm. 2023) examined the American Burreed specimens at the Dr. Laurie L. Consaul Herbarium, University of Western Ontario (UWO). Of the 14 putative Branching Burreed specimens, we found that five were too immature to determine with complete certainty and suspected that at least seven were misidentified. Branching Burreed is typically distinguished by its larger, shiny fruit; however, definitive measurements can only be made when they are mature (Sulman and Smith 2019). We could be confident that the original identifications were correct for only three of the 14 specimens. The most recent of these was collected from Chippewa Creek Conservation Area, Niagara Region, in 1973 (*Putman 123*), 49 years before our 2022 collections.

Reports of Branching Burreed are often based on misidentifications (J. Sulman pers. comm. January 2023), most likely because of its morphological similarity to American Burreed. Scoggan (1978: 193) considered Branching Burreed "scarcely separable" from American Burreed and Fernald and Eames (1907) included the former within the latter. Recent works have treated Branching Burreed as a species (e.g., Crow and Hellquist 2000; Haines 2011; Voss and Reznicek 2012; Sulman and Smith 2019). This similarity has probably also led to Branching Burreed being overlooked. For example, Albert Dugal conducted a botanical inventory of Petrie Island in 1977, reporting only two burreeds: American Burreed and Broad-fruited Burreed (Hanrahan 2003). Unfortunately, we could find no corresponding specimens. We scoured nearly all accessible marshes on Petrie Island (over 4 km) in 2022 and found only Branching Burreed and Broad-fruited Burreed. This suggests that Dugal likely overlooked Branching Burreed on Petrie Island and, perhaps, confused Branching Burreed with American Burreed.

With so few confirmed records and considerable identification issues, it is difficult to reliably assess Branching Burreed's conservation status in Ontario. It seems that existing specimen-based distribution maps (e.g., Hébert 1973; Argus *et al.* 1987) are probably not accurate representations of its provincial distribution. As an overlooked species, it is likely more widespread than current records indicate; however, it is difficult to estimate how common it may be as its presence in suitable habitat is generally sporadic and unpredictable (J. Sulman pers. comm. January 2023). Its river and lakeshore habitat appears relatively abundant, but we cannot predict how much of this habitat it occupies without further search effort. We encourage targetted searches for Branching Burreed along the Ottawa River, at historical sites, elsewhere in Ontario, and beyond.

To support search efforts, we compiled key characters from the literature that distinguish Branching Burreed from American Burreed. We recorded measurements during our specimen review and summarize the characters and our results in Table 1. The characters are also illustrated in Figure 2. Our three Ontario specimens with mature fruit generally fall within the dimensions reported for Branching Burreed (see Table 1). We found that stigma length could be highly variable within a single pistillate head, but examination of many achenes yielded several with stigmas that exceeded the range reported for American Burreed. Hébert (1973) and É. Léveillé-Bourret (pers. comm. 2023) note that Branching Burreed has red flecks at the base of its achenes, which we also observed on mature Ontario specimens (Figure 3). We have not seen this character reported elsewhere, although Voss and Reznicek (2012) have noted basal red flecks on *Sparganium emersum* Rehmann (Green-fruited Burreed, Rubanier à fruits verts). Even immature

TABLE 1. Morphological characters distinguishing Branching Burreed (*Sparganium androcladum*) from American Burreed (*Sparganium americanum*)*.

Morphological feature	*Sparganium androcladum*	*Sparganium americanum*
Mature fruit	Glossy apically; dull, pitted, and with red flecks basally	Dull throughout
Head diameter	2.5–3.5 cm (2.4–2.6 cm)†	1.5–2.5 cm (2.0–2.5 cm)
Beak length	4.0–7.0 mm (5.0+ mm)	1.5–5.0 mm (3.0–5.0 mm)
Stigma length	2.0–3.2 mm (2.2–2.8 mm)	0.8–1.5 mm (0.7–1.5 mm)
Anther length	1.1–1.4 mm (1.1–1.3 mm)	0.6–1.1 mm (0.8–1.2 mm)
Inflorescence branches	Staminate heads only (rarely with a pistillate head)	Usually 1–3 pistillate heads each

*Sources: Compiled from Sulman and Smith (2019), Haines (2011), Hébert (1973), and Kaul (2000).
†Note: Measurements in parentheses are from mature Ontario specimens (three *S. androcladum* and nine *S. americanum*).

Figure 2. Branching Burreed (*Sparganium androcladum*) a. habitat at Petrie Island, Ottawa, Ontario, *Chapman-Lam & Sokoloff 5749*; b. staminate heads; and c. fruiting pistillate heads, François Dupont Park, Ottawa, Ontario, *Chapman-Lam & Sokoloff 5748*. Photos: P.C. Sokoloff.

Green-fruited Burreed material is typically readily distinguished from Branching Burreed by its supra-axillary pistillate heads. However, Voss and Reznicek (2012) note that rarely, Green-fruited Burreed may have entirely axillary pistillate heads. These should be distinguishable from Branching Burreed by their unbranched inflorescences and typically smaller fruit (see references in Table 1 for measurements).

Specimens Examined

Sparganium americanum Nuttall—CANADA, Ontario. Note all Ontario specimens in CAN, DAO, HAM, and OAC were examined. The following is a list of specimens from which measurements were taken: **Frontenac Co.**, 7258 m (4.5 miles) in Arab Lake Loop, very abundant around beaver pond, 26 July 1977, *S. Wiesenberg s.n.* (DAO); Frontenac

FIGURE 3. Mature achenes of Branching Burreed (*Sparganium androcladum*: a. *Chapman-Lam & Sokoloff 5748,* b. *Macoun 28051*, and c. *Gillett 14657*) and d. American Burreed (*Sparganium americanum*, *Brunton 2677*). Scale bars are 1 mm for a–c and 750 µm for d. Photos: P.C. Sokoloff.

Park, S shore of Salmon Lake, floating bog margin, 5 August 1968, *Hainault & MacDonald 4607* (DAO); **Haliburton Co.**, Wren Lake, at Highway 35, sheltered (from waves) on sand, 13 August 1975, *H.M. Dale s.n.* (OAC); **Hastings Co.**, Westemakoon Lake Road, Bancroft area, 13 August 1979, *E. Woodley & L. Alex s.n.* (OAC); **Middlesex Co.**, 10 miles [16 km] SW of London, shallow water, few–scarce, 21 June 1952, *L.E. James 1571* (DAO); **Muskoka District Municipality**, Sparrow Lake, muck, water depth 1–2

m, 16 September 1978, *B.S. Bullock s.n.* (OAC); **Peterborough Co.**, Lake Kasshabog east edge half way along lake, pond near shoreline, 9 July 1978, *Wildeman s.n.* (OAC); **Renfrew Co.**, Barrys Bay. Concession I, Chippawa Lodge. Barrys Bay, juncture of Highways 60 and 62, 4.3 miles [6.9 km] SE on 62, Chippawa Road, 2 miles [3.2 km] SW, marina SE corner of property, small population in shallow water with pickerel weed, 4 August 1977, *J. Vermeer 132* (OAC); Petawawa Forest Experiment Station, Chalk River, in Young's Creek at Racehorse Road, 9 September 1960, *T.C. Brayshaw s.n.* (CAN).

Sparganium androcladum (Engelmann) Morong—CANADA, Ontario. **Lanark Co.**, Murphys Point Provincial Park, mucky edge of bay, in mono-specific stands, 12 September 2023, *C.J. Chapman-Lam 5897* (CAN); **Regional Municipality of Niagara**, Chippewa Creek Conservation Area, shallow water, 11 September 1973, *W.L. Putman 123* (DAO); **City of Ottawa**, François Dupont Park, organic marsh dominated by *Sparganium* spp., with *P. cordata*, *S. latifolia*, and *H. morsus-ranae*, 45.491246°N, 75.52087317°W, ±10 m, 11 September 2022, *C.J. Chapman-Lam and P.C. Sokoloff 5747* (CAN); same location, 45.491253°N, 75.520797°W, ±10 m, 11 September 2022, *C.J. Chapman-Lam and P.C. Sokoloff 5748* (CAN); Petrie Island, *Sparganium* marsh, with *S. latifolia* and *N. odorata*, 45.49978183°N, 75.4843805°W, ±10 m, 11 September 2022, *C.J. Chapman-Lam and P.C. Sokoloff 5749* (CAN); Billings Bridge, Rideau River, 9 August 1894, *Macoun 7369* (CAN); **Prescott & Russell Co.**, Nation River at Casselman, wet places, 21 August 1884, *Macoun 28.051* (CAN).

Additional S. androcladum*, not verifiable or misidentified*—CANADA, Ontario. **Bruce Co**., Spring Creek, shallow water, 14 August 1934, *P.V. Krotkov 8622* (GH); **Grey Co.**, Eugenia, Artemisia Township Conc. IX. Lot 34, 2 miles [3.2 km] E of Eugenia, up to "21 m" (unclear if this is the depth) water over peat of marshy bay, 22 July 1976, *R.S.W. Bobbette 4791* (CAN); **Haliburton Co.**, Wilberforce, stream edge – water 4" [10 cm], *D.A. Smith s.n.* (DAO); **Muskoka District Municipality**, Morrison Lake, bogs, mud, 12 August 1940, *D.W. Kirk 445* (CAN); **City of Ottawa**, Britannia Village, dried marsh, part of deciduous woods, 4 July 1953, *E. Truman 1121* (DAO); **Renfrew Co.**, Petawawa, Forks Island, in mouth of River Petawawa into Lac du Bois Dur, abundant in swamp, 11 October 1961, *T.C. Brayshaw s.n.* (CAN); Petawawa, Lagoon along the Ottawa River, 20 July 1948, *A.J. Breitung 6854* (DAO); **Thunder Bay District**, mouth of Shadow Creek at Orient Bay, 4 miles [6.4 km] S of MacDiarmid, in shallow water up to 80 cm deep at creek mouth rooted in mud, 29 July 1960, *C.E. Garton 7893* (DAO); logging road to Postagoni Lake, 2 miles [3.2 km] E of Highway 11, mucky shore of beaver pond in water up to 30 cm deep, 27 July 1960, *C.E. Garton 7874* (DAO).

Author Contributions

Writing — Original Draft: C.J.C.-L.; Writing — Review & Editing: C.J.C.-L. and P.C.S.; Conceptualization: C.J.C.-L.; Investigation: C.J.C.-L. and P.C.S.; Funding Acquisition: C.J.C.-L. and P.C.S.

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