

## *Pilea fontana* (Urticaceae) discovered new to Missouri

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**ABSTRACT.** — *Pilea fontana* is reported new to the flora of Missouri from several small glacial fens in Lafayette County, Missouri, in the central-western part of the state. The habitat, associated flora, and images of the species and its distinctive achenes are provided. A key is provided to distinguish the two species of *Pilea* in Missouri, which are well differentiated by the shape, color, and surface texture of their achenes.

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*Pilea* Lindl. (Urticaceae) is a large cosmopolitan genus comprised of approximately 400 or more species with a worldwide distribution except for Australia and New Zealand (Boufford 1997). In continental North America there are 5–6 species with two, *P. pumila* (L.) A. Gray and *P. fontana* (Lunell) Rydb., occurring across the eastern half of the continent (Boufford 1997, Hermann 1940, Fernald 1936). *Pilea pumila* is the more common of the two species and is found ubiquitously, but as scattered individuals in moist shaded habitats (Boufford 1997, Hermann 1940). In contrast *Pilea fontana* occurs abundantly in marshy to wet habitats, appearing like masses of seedlings or smaller sized plants of *P. pumila* (Hermann 1940). The distribution of *P. fontana* in adjacent states north and east of Missouri is scattered and occurs in several counties in northern Iowa, a few counties in southwestern Illinois, and in eastern Nebraska (Kartesz 2015). *Pilea fontana* is here confirmed for the flora of Missouri from a recent series of collections from three neighboring glacial fens.

The glacial fens of central-western Missouri are a rare habitat confined to lower slopes where water seeps from the hillside and forms small complexes of mucky to well-drained but wet glacial till with prominent rivulets (Missouri Department of Conservation [MDC] 2017, Community rank of S1). In Lafayette County on 3 September 2019 we had an opportunity to visit a series of privately-owned fens that had records of the facultative wetland *Epilobium leptophyllum* (MDC 2017, S1 rank) to make a seed bank collection of this species. In the first fen *E. leptophyllum* was present as a few individuals and co-occurred with *Chelone glabra* var. *linifolia* Coleman, *Impatiens capensis* L., *Geum laciniatum* Murray, *Sagittaria latifolia* Willd., *Solidago gigantea* Aiton and other spp., *Typha* spp., numerous sedges in sterile condition but *Carex frankii* Kunth still with fertile spikes, and numerous Poaceae including *Phragmites*, *Glyceria*, and *Elymus*. Dominant among this association were many *Pilea* that appeared to be different from typical *P. pumila* (Fig. 1). The *Pilea* appeared to be smaller in size, less than 35 cm tall, but many of the plants were found to be branches growing upward from larger plants that had fallen over. The plants were still growing conspicuously dense, with hundreds of plants occurring in small areas of

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the fen. The leaves did not have a lustrous appearance, the maturing achenes were notably and consistently dark on all plants observed, and they were growing in flowing spring water.

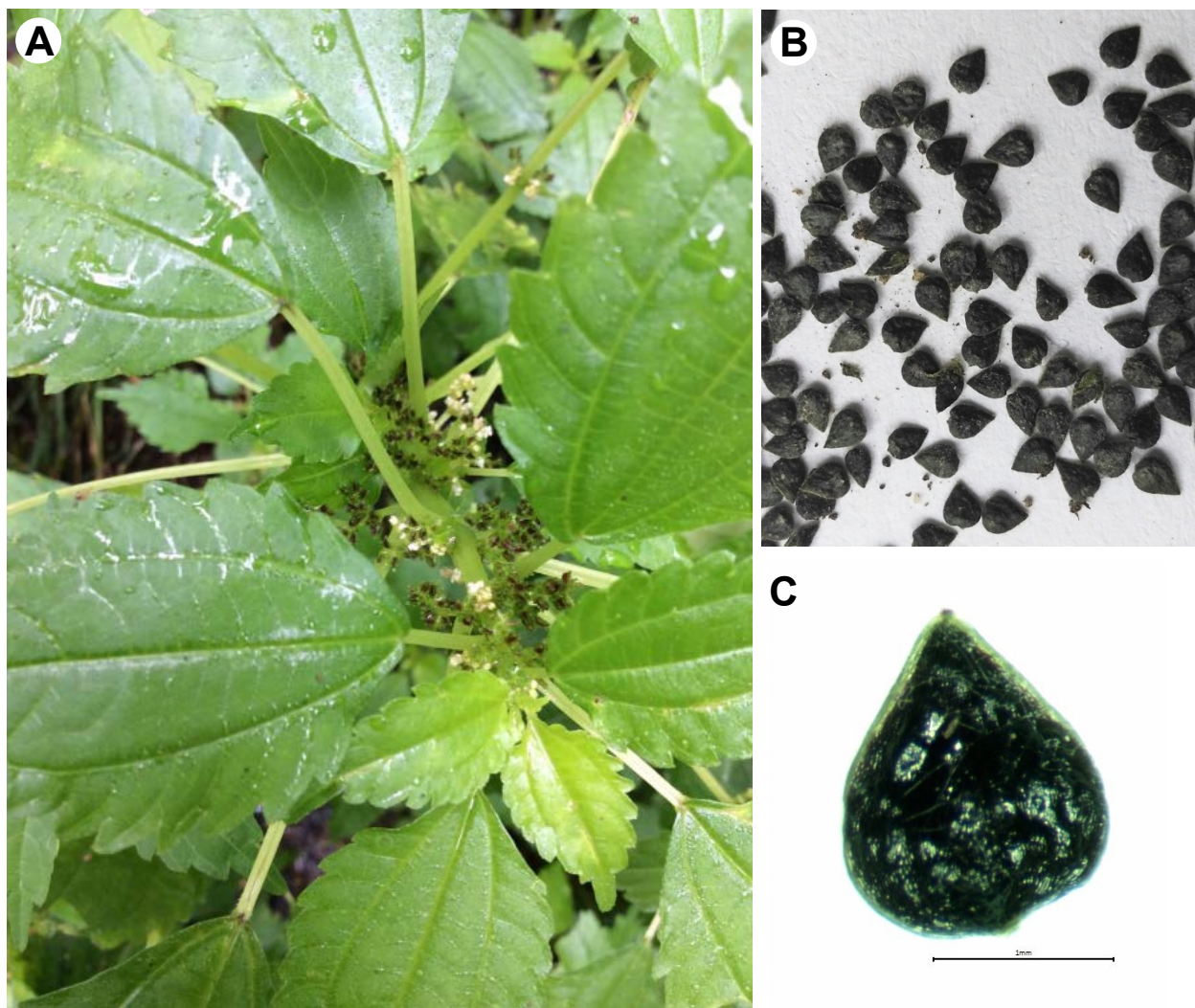


**Figure 1.** *Pilea fontana* in habitat showing the density of individuals growing in running water at the head of one of the glacial fens. Photo by Aaron Floden.

Two adjacent larger fens were also dominated by *Pilea*, but the plants in these fens were smaller than those in the first fen. One part of the second fen consisted of approximately three hundred feet of the lower slope of a hill where water drained and created an expansive mucky fen. *Pilea fontana* dominated the head of the fen. At 5–10 meters from the water source where flowing water on the surface was reduced the *Pilea* was less abundant, grew less densely, and was mixed with *Impatiens capensis* and *Boehmeria cylindrica* (L.) Sw. The third fen was oblong in shape with a prominent rivulet near the source that expanded into a grassy-sedge-*Typha* dominated mucky fen. Immature achenes of the *Pilea* were observed in the field with a 10× hand



lens and were consistently dark and appeared lumpy under low magnification (Fig. 2). Collections were made and identified upon returning from the field. These plants were in fact different from *P. pumila* and represented the first *P. fontana* collections from Missouri. The closest this species occurs to the Missouri site is ca. 390 km northwest in Cuming County, Nebraska (Kartesz 2015). *Pilea fontana* was reported from southwest Illinois, but had not been found in adjacent Missouri. A later visit on 1 October 2019 resulted in collection of fully mature plants as well as seeds for the Missouri Botanical Garden seedbank at Shaw Nature Reserve. In the forest surrounding the fens, *Pilea pumila* occurred as scattered individual plants. No plants of *P. fontana* were observed outside of the fen habitat, and no *P. pumila* were observed within the saturated habitat of the fens.



**Figure 2.** A: *Pilea fontana* showing the infructescences and conspicuous dark achenes; B: near black achenes with rough surfaces; C: a single achene that is black in color, rough textured, and a faint greenish hyaline margin, scale 1 mm. Photos A and C by Megan Engelhardt; photo B by Aaron Floden.

*Pilea fontana* is distinct in its uniformly dark brown to blackish achenes with narrow greenish rims (Hermann 1940, Fernald 1936, Weakley 2015). *Pilea pumila* achenes are reddish brown, stramineous, or green, or nearly an equal proportion of green with dark brown to black maculation and no green margin. *Pilea pumila* achenes are tear-drop shaped and are generally narrower with a length to width ratio greater than that of *P. fontana* achenes, which have broader bases and are larger overall (Weakley 2015). The surfaces of the achenes are distinctly lumpy or pebbled in texture in *P. fontana*, whereas *P. pumila* achenes are smooth to slightly raised where there are maculations on the surface (Fig. 2; see also Fernald 1936).

*Pilea fontana* is currently documented from three small fens in Lafayette County that total no more than 2 acres in area. This species should be ranked S1 given the rarity of the habitat in which it occurs, the rarity of the species in the state, and its disjunct distribution from the closest occurrences. Examination of Missouri collections of *Pilea* at MO did not reveal any additional overlooked occurrences of *P. fontana* in the state. Despite this, the limited number of collections of *P. pumila* at MO, or North American *Pilea* in general, does not reflect the frequency at which *P. pumila* is encountered in the field. The under-collection of such a ubiquitous species suggests also that *P. fontana* may be overlooked in suitable habitats. Other fens across the northern portion of the state should be examined for the possibility of additional populations of this species.

#### KEY TO *PILEA* IN MISSOURI

- 1 Seeds ovoid and the widest point nearly as wide as the total length of the seed, black or dark brown throughout except for pale to greenish margin, surface pebbled in appearance; leaves generally less lustrous ..... ***P. fontana***
- 1 Seeds ovoid and the widest point 3/4 to 1/2 as wide as total length of the seed, light colored green to yellowish-brown with darker red-brown maculation, surfaces smooth or raised only on maculate areas of surface; leaves generally lustrous..... ***P. pumila***

*Specimens cited:* **U.S.A. MISSOURI:** LAFAYETTE CO.: Glacial fens on south side of Hicklin Lake, north of Hwy 24, at base of slope; first fen approximately 39.184656°, -93.793193°; additional fens west along base of slope, 3 September 2019, Floden & Engelhardt s.n. (MO); *ibidem*, 1 October 2019, Floden, Engelhardt & Turner s.n. (MO).

#### LITERATURE CITED

- Boufford, D.E. 1997. *Pilea*. In: Flora of North America Editorial Committee, eds. Flora of North America North of Mexico. New York and Oxford: Oxford University Press. Vol. 3, pp. 408-411.
- Fernald, M.L. 1936. *Pilea* in eastern North America. Contributions from the Gray Herbarium 113: 169-170.
- Hermann, F.J. 1940. The geographic distribution of *Pilea fontana*. Torreya 40: 118-120.

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Kartesz, J.T. 2015. The Biota of North America Program (BONAP). *North American Plant Atlas*. (<http://bonap.net/napa>). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)].

Missouri Department of Conservation. 2017. Missouri Species and Communities of Conservation Concern. Jefferson City: Missouri Department of Conservation.

Weakley, A.S. 2015. *Flora of the Southern and Mid-Atlantic States*. Chapel Hill: University of North Carolina. 1320 pp.