

BRIEF NOTE

Distribution of *Polygonum amphibium* L. (Polygonaceae) in Ohio<sup>1</sup>

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ABSTRACT. The water smartweeds are now considered one species, *Polygonum amphibium* sensu lato, represented in the Ohio flora by two varieties. One, var. *stipulaceum*, occurs mainly in the glaciated portion of Ohio; the other, var. *emersum* and also the intermediates between these two varieties, have an apparent random distribution in the state.

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The Ohio water smartweeds have borne various Latin names such as *Polygonum amphibium* L., *P. natans* Eaton, *P. coccineum* Muhl., *P. fluitans* Eaton, *P. hartwrightii* A. Gray, *P. inundatum* Raf., and *P. mühlenbergii* S. Watson. However, they have generally been placed in two species, as by Fernald (1950), Gleason (1952), and Weishaupt (1971), differentiated primarily by the length and thickness of the inflorescence. Fernald identifies the first species as *P. amphibium* with inflorescences 1-4 cm long and 1-2 cm thick, while the second species is identified as *P. coccineum* with inflorescences 4-18 cm long and 7-15 mm thick. Gleason determines the first species as *P. natans* with inflorescences 1-3 (rarely 4) cm long and 1½ cm thick, while the second species, determined as *P. coccineum*, has inflorescences 4-15 cm long and about 1 cm thick. Weishaupt uses the same nomenclature as Fernald but separates the two species on the basis of inflorescence length only, using 4 cm as the critical dividing point. Specimens are commonly encountered which do not fit well in either species. One problem has been that emergent or terrestrial shoots differ markedly in morphology from aquatic shoots. The three authors referred to above consider that each species has both aquatic and terrestrial forms.

Mitchell (1968, 1978) grouped the whole assemblage into one species, *Polygonum amphibium*, placing the most hydrophytic American plants in var. *stipulaceum* Coleman, and the least hydrophytic plants in var. *emersum* Michx. (*Polygonum amphibium* var. *amphibium* is primarily European). The American plants in this species "appear to represent a cline of phenotypic variability from the most amphibious to the least. This corresponds to a morphological gradient with var. *stipulaceum* at one end, var. *emersum* at the other, and a broad range of intermediates" (Mitchell 1978).

The following key to the varieties delineates the chief morphological differences.

- a. Plants aquatic or terrestrial; inflorescences when present 4 cm long or less; leaves lanceolate or elliptic, acute or obtuse; stipules flanged or not.....  
.....var. *stipulaceum*
- b. Plants aquatic, flowering; leaves glabrous, elliptic, acute or obtuse at apex; stipules not flanged.....  
.....aquatic phase (Fig. 1C)

- bb. Plants terrestrial, not flowering; leaves pubescent, lanceolate, attenuate but not acuminate at apex; stipules flanged..terrestrial phase (Fig. 1B)
- aa. Plants terrestrial; inflorescences 4-15 cm long; leaves ovate-lanceolate, long-acuminate; stipules not flanged..... var. *emersum* (Fig. 1A)

To be placed in Mitchell's third category, "varietal intermediates," plants with attenuate leaves and flanged stipules would have to be flowering. Likewise aquatic plants would have cordate leaves rather than elliptic (Fig. 1D). There are other combinations of characters untypical of the two varieties which would result in the plant's being placed with the varietal intermediates.

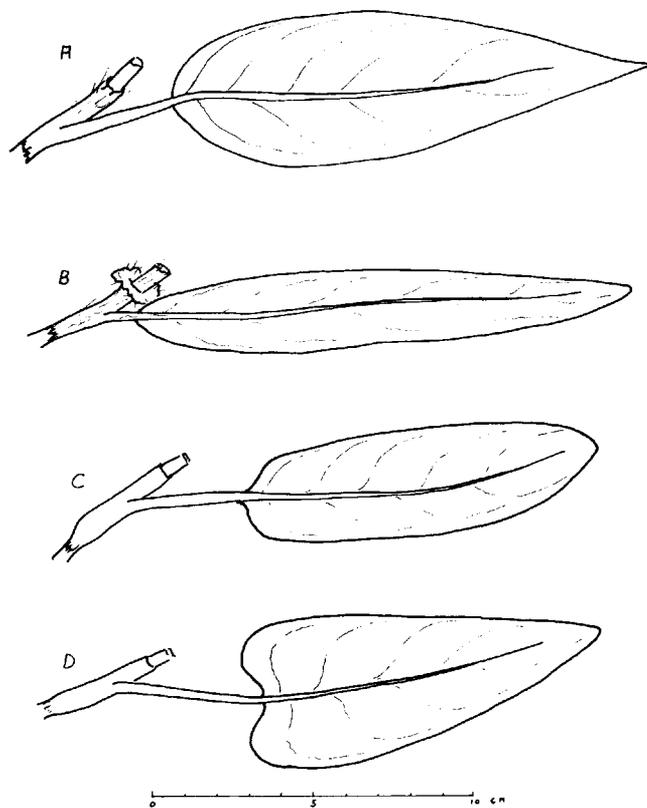


FIGURE 1. Representative leaves of *Polygonum amphibium* L.: A. *P. amphibium* var. *emersum*; B. *P. amphibium* var. *stipulaceum* terrestrial phase; C. *P. amphibium* var. *stipulaceum* aquatic phase; D. one example (aquatic) of "varietal intermediate" between var. *emersum* and var. *stipulaceum*.

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Ohio water smartweeds were studied in herbaria of the following 19 institutions: Baldwin-Wallace College, Bowling Green State University, Cleveland Museum of Natural History, Dayton Museum of Natural History, Denison University, Heidelberg College, Kent State University, Miami University, Muskingum College, Oberlin College, Ohio State University, Ohio University, Ohio Wesleyan University, University of Akron, University of Cincinnati, Urbana University, Wilmington College, Wittenberg University, and Youngstown State University. Using Mitchell's scheme, these specimens were classified in the three taxonomic categories by visual inspection. This was easy to do using the key given above, as the differences were fairly obvious. The county distribution of documented specimens of the three taxonomic categories is listed in Fig. 2.

As may be noted from the map, the variety *stipulaceum* occurs least frequently—in 16 counties, all of them glaciated except Coshocot County. The variety *emersum* in 60 counties and the varietal intermediates in 37 counties appear to have random distribution in the state. In general, *P. amphibium* var. *stipulaceum* has a more northerly range in the United States and Canada, which is the area that was glaciated. *P. amphibium* var. *emersum* (*P. coccineum* in most current manuals), on the other hand, has a more southerly range. Thus, Deam (1940) in Indiana and Wherry et al. (1979) in Pennsylvania show var. *stipulaceum* confined to northern, glaciated counties. Voss (1985) in Michigan shows var. *stipulaceum* occurring farther north in the state than var. *emersum*. Radford et al. (1964) report var. *emersum* occurring, but rare, in North Carolina and South Carolina, while var. *stipulaceum* does not occur in these southern states.

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#### *Polygonum amphibium*

- var. *stipulaceum*
- ◼ var. *emersum*
- ▲ intermediates

FIGURE 2. Documented Ohio distribution of *Polygonum amphibium* varieties and intermediates.

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