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Charles Argue
University of Minnesota

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PELTANDRA VIRGINICA (L.) SCHOTT & ENDL (ARROW ARUM), A NEW SPECIES AND GENUS FOR MINNESOTA†

CHARLES ARGUE

ABSTRACT

Peltandra virginica is reported as a new addition to the flora of Minnesota. Found in Cook County in the northeasternmost part of the state, it is separated by about 400 km from the closest previously reported location for this species on Michigan's upper peninsula.

INTRODUCTION

Peltandra virginica, the arrow arum or tuckahoe (Figs. 1, 2 and 3) is related to jack-in-the-pulpit (*Arisaema triphyllum* (L.) Schott), green dragon (*Arisaema dracontium* (L.) Schott), water-arum (*Calla palustris* L.), sweet flag (*Acorus calamus* L.), and skunk-cabbage (*Symplocarpus foetidus* (L.) Nutt.), members of the Araceae or arum family long known in Minnesota.

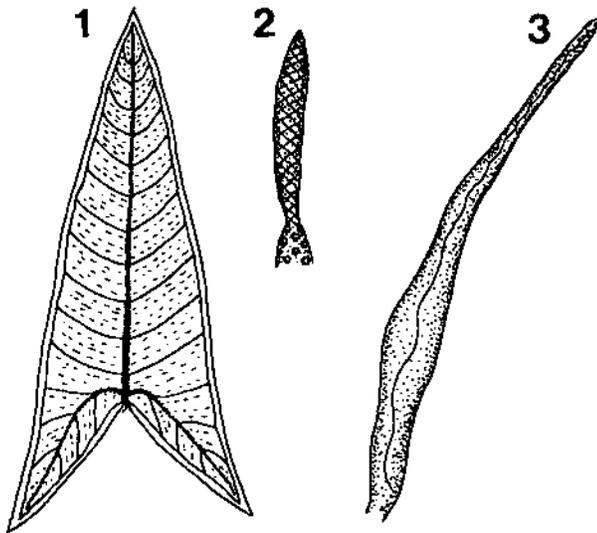


Figure 1. *Peltandra virginica* Leaf showing a common shape; shape variable.

Figure 2. *Peltandra virginica* spadix showing staminate (above) and pistillate (below) parts of inflorescence.

Figure 3. *Peltandra virginica* spathe. Figures 1, 2, and 3 about 0.25 times normal size.

According to Scoggan (1), it is distributed from southern Ontario and southwest Quebec to New York and New Hampshire south to Texas and Florida.

Fernald (2) gives a similar distribution. Fassett (3) says southern Maine to the Gulf of Mexico and north to Missouri, west rarely to Indiana. However, Gleason (4) and Gleason and Cronquist (5) report its range west to Michigan, Missouri, and Louisiana or Texas. It is now also listed from Iowa where it occurs in Greene, Cedar, and Des Moines Counties in the west central, east central, and southeastern parts of the state, respectively, (6) and from Wisconsin where it is present in Ozaukee and Fon du Lac Counties in the southeastern part of the state (7). Voss (8) records it from one county on Michigan's upper peninsula and numerous sites in lower Michigan, and Winterringer and Lopinot (9) report it from the southern two-thirds of Illinois. The known range in Ontario is restricted to Prince Edward, Frontinac, and Welland Counties in the vicinity of Lake Ontario, although Macoun (10) suspected it might be present in western Ontario. It is listed as rare in Canada and Missouri (11).

MATERIALS AND METHODS

Standard methods of collection and preservation of specimens were employed (for example, 12), and a voucher is deposited in the University of Minnesota Herbarium. Species identification was confirmed by Dr. Anita Cholewa, Curator, University of Minnesota Herbarium. The collection site is detailed below.

OBSERVATIONS AND DISCUSSION

An example of a peculiar, apparently disjunct distribution came to light in the summer of 1995 with the discovery of *Peltandra virginica* in a remote bay of Iron Lake in northeastern Minnesota (Cook County; Figs. 4 and 5). A single large plant was rooted in shallow water near the edge of a grounded sedge mat at the end of the south arm of the lake (T65N, R2W, SW 1/4 SE 1/4 Sec. 31). It bore a dozen or so spadices in bud or flower on July 24th. Associated emergent

† Contribution from the Department of Plant Biology, University of Minnesota, College of Biological Sciences, 220 Biological Sciences Center, 1445 Gortner Ave., St. Paul, MN 55108-1095.

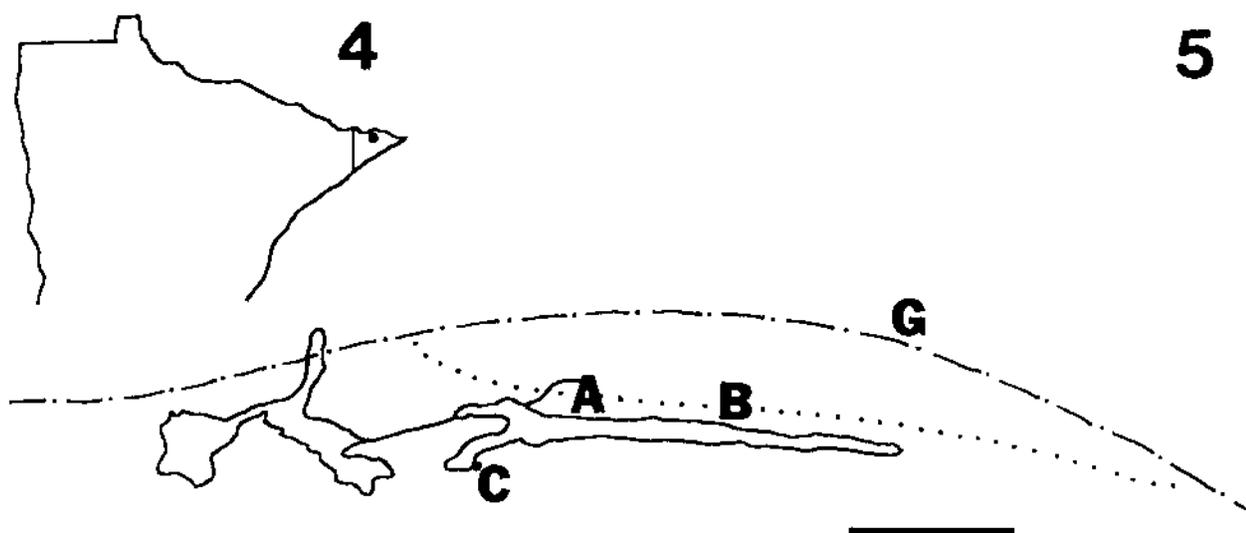


Figure 4. Northern Minnesota showing location of Cook County and the collection site.

Figure 5. Iron Lake and vicinity showing campsite (A), cabins (B), collection site (C), located in the east bay of the south arm, (G) Gunflint Trail about 45 miles northeast of Grand Marais, (dotted line) gravel road. Scale line equals about 1 mile.

aquatics included principally *Sagittaria latifolia* Willd. (duck-potato), *Eleocharis smallii* Britt. (spike-rush), and *Dulichium arundinaceum* (L.) Britt. (three-way-sedge). Neither *Peltandra virginica* nor the genus *Peltandra* have been previously reported for the state.

The nearest earlier recorded location for this species is about 400 km east-southeast of Iron Lake at Seney National Wildlife Refuge in Schoolcraft County on Michigan's upper peninsula (8). The occurrence of this plant in northeastern Minnesota, hundreds of kilometers from any previously known site, is puzzling. Several possible explanations and some difficulties associated with each are briefly considered below.

Recent introduction by man

A campsite is located on the north shore of Iron Lake at the juncture of the southern and east-west arms, and five cabins are present on the north shore of the east arm (Fig. 5). However, the collection site is remote, and human introduction of *Peltandra* at this location would be surprising: it is apparently not currently used either as an aquarium (for example, 13) or food plant, although its starchy rhizomes were once eaten by native Americans (14, 15). It is sometimes used in waterscaping ponds and gardens (for example, 15, 16), but no such gardens are present in the vicinity of Iron Lake. This species is not recommended by horticulturists for any climatic zone in Minnesota.

Recent dispersal by natural agents

Peltandra virginica produces fleshy berries which are eaten by waterfowl, including mallards, wood

ducks, and other marsh birds and shore birds (3, 17, 18). According to Cox (18), 10 to 25 % of the wood duck's diet may consist of the berries of *P. virginica*. Being present in Michigan, Missouri, Illinois, Iowa and Wisconsin, it lies on the migratory route of ducks and other birds which visit Cook County (19). The seeds pass unharmed through the digestive tract, and this is regarded as a significant mechanism of dispersal (3).

Obviously, the migratory movement of birds in spring could effect dispersal of seeds that mature in summer only if fruit from the previous season is available in spring. This appears to be true in the case of *P. virginica* for despite accounts that its autumn fruiting stalks grow downward and submerge the berries (18) or bury them in the bottom mud (for example, 15), Bellrose and Holm (20) report that its floating fruits are an important spring food for wood ducks, are widely distributed, and are present in abundant supply.

There are few data on the length of time the seed is retained by the birds, although Swanson and Bartonek (21) claim that some seeds may be carried for days. Wood ducks probably migrate non-stop through the night (20). They arrive in northern Minnesota throughout the month of April (20), when night lengths range from about 11.8 to 12.2 hours (22). Traveling at an average flight speed of 51 kilometers per hour (20), they might be expected to cover distances of about 600 km a night,

Seed of the current season might also be transported north by post-breeding movements of adult birds. Such movements are well documented. Among wood ducks, for example, data available for

areas closest to those in question (20) indicate that 7 to 9 % of adult and 6 to 9 % of juvenile birds banded at 43 to 44 °N move further northward in summer, 0.58 % by as much as two degrees or more of latitude. Birds banded at 41 to 45 °N were found as far as 640 to 800 km further north (20). In addition to pre-molt movements in June and July (23), current evidence suggests that northward movements also occur in late summer after completion of the wing molt (20) and, in some cases, therefore, may coincide with the development of mature fruit in *P. virginica*. Precise data on the time of fruit maturation are unavailable.

A member of a remnant or continuously distributed population

Peltandra does not show the distribution expected of a peri- or post-glacial or climatic relict. Its association with an undetected, more or less continuous distribution of rare and scattered individuals or with a population having a once continuous but now disrupted range cannot be excluded, but any long-term past presence in Cook County seems unlikely given the conspicuousness of the plant and the fact that it was undetected in Butters and Abbe's (24) extensive and careful examination of the flora published in 1953. Other parts of Iron Lake were examined for additional specimens without success, but adjacent lakes were not investigated. Although there is perhaps suitable habitat scattered in the area between Iron Lake and the main range of the species which could support undiscovered populations, the site in question is north of the localities in Ontario and Quebec (about 48 versus about 44 °N) where, depending on the author, *P. virginica* is said to bloom from spring into July (for example, 2, 4, 5). No blooming times are available for the population in upper Michigan (about 46 °N). In addition to a strong temporal separation in sexual function (25), the presence of flowers in late July on the Iron Lake specimen casts doubt on its chances for successful sexual reproduction at this location. As a perennial it can and does, however, routinely expand vegetatively by growth of its rhizomes (17).

It is clear that a consideration of the information currently available provides no simple and obvious explanation for the occurrence of *P. virginica* at Iron Lake, except to suggest that it is probably a recent introduction. Its capacity for vegetative propagation and seed production at this site remains a matter of inquiry as does its possible presence in other lakes of the area.

REFERENCES

1. Scoggan, H. J. 1978-1979. The flora of Canada. National Museum of Natural Sciences, Ottawa, Ontario, Canada. 4 parts. 1711 p.
2. Fernald, M. L. 1970. Gray's manual of Botany, 8th ed. Van Nostrand Reinhold Co., New York, NY. 1632 p.
3. Fassett, N. C. 1960 A manual of aquatic plants. University of Wisconsin Press. Madison, WI. 405 p.
4. Gleason, H. A. 1952. The New Britton and Brown illustrated flora of the Northeastern United States and Canada. Vol. 1. Lancaster Press, Inc. Lancaster, PA. 482 p.
5. Gleason, H. A. and A. Cronquist. 1991. Manual of vascular plants of northeastern United States and Canada, second edition. New York Botanical Garden. Brooklyn, NY. 910 p.
6. Eilers, L. J. and I. M. Roosa. 1994. The vascular plants of Iowa: An annotated checklist and natural history. University of Iowa Press. Iowa City, IA. 304 p.
7. Dobberpuhl, J. 1995. Wisconsin Natural Heritage Program, Department of Natural Resources, Madison, WI. Personal communication.
8. Voss, E. G. 1972. Michigan flora; a guide to the identification and occurrence of the native and naturalized seed plants of the state. Cranbrook Institute of Science. Bloomfield Hills, MI. 488 p.
9. Winterringer, G. S. and A. C. Lopinot. 1966. Aquatic plants of Illinois. pub. by Dept. of Registration & Education, Springfield, Ill. State Museum Div. & Dept. Conservation, Div. of Fisheries. 141 p.
10. Macoun, J. 1888. Canadian plants. Vol. II. Dawson Brothers. Montreal, Quebec, Canada. 428 p.
11. Bouchard, A., D. Barabbe, M. Dumais, and S. Hay. 1983. The rare vascular plants of Quebec. *Syllogeus*. 48:1-75.
12. Lawrence, G. H. M. 1951. Taxonomy of vascular plants. Macmillan Co. New York, NY. 823 p.
13. Stodola, J. 1967. Encyclopedia of water plants. N. J. T. F. H. Publins. Neptune City (distributed in USA by Crown Publishers). 368 p.
14. Mabberley, D. J. 1987. The plant-book. Cambridge University Press. New York, NY. 706 p.
15. Glattstein, J. 1994. Waterscaping: Plants and ideas for natural and created water gardens. Garden Way Publishing. Pownal, VT. 184 p.
16. Druse, K. 1993. Water gardening. Prentice Hall. New York, NY. 96 p.
17. Sculthorpe, C. D. 1967. The biology of aquatic vascular plants. St. Martin's Press. New York, NY. 610 p.
18. Cox, D. D. 1985. Common flowering plants of the northeast: their natural history and uses. State University of New York Press. Albany, NY. 418 p.
19. Smith, M. S., R. L. Pederson, and R. M. Kaminski. 1989. Habitat management for migrating and wintering waterfowl in North America. Texas Tech University Press. Lubbock, TX. 560 p.

20. Bellrose, F. C. and D. J. Holm. 1994. Ecology and management of the wood duck. Stackpole Books. Mechanicsburg, PA. 588 p.
21. Swanson, G. A. and J. C. Bartonek. 1970. Bias associated with food analysis in gizzards of blue-wing teal. *J. Wildl. Manage.* 34:739-746.
22. Minnesota weather guide environmental calendars. 1994. Freshwater Foundation Wayzata, Minnesota.
23. Gilmer, D. S., R. E. Kirby, I. J. Ball, and J. H. Reichmann. 1977. Post-breeding activities of mallards and wood ducks in north-central Minnesota. *J. Wildl. Manage.* 41: 345-359.
24. Butters, F. K. and E. C. Abbe. 1953. A floristic study of Cook County, northeastern Minnesota. *Rhodora.* 55:21-55,63-101, 116-154, 161-201.
25. Patt, J. M., J. C. French, C. Schal, J. Lech and T. G. Hartnian. 1995. The pollination biology of tuckahoe, *Peltandra virginica* (Araceae). *Am. J. Bot.* 82: 1230-1240.

ERRATA

In volume 59, issue no. 1, page 30, the following corrections should be noted:

Brandt, B. Supplement to "some conjectures concerning triangular numbers".

In paragraph 2, line 3 should read ... "or $\alpha(t_n)$ is fixed, $\alpha(j)$ being minus" ...
and, in paragraph 4, line 2 should read ... "or ± 1 from this pattern" ...