

AQUATIC FLOWERING PLANTS NEW TO THE ERIE ISLANDS^{1, 2}

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ABSTRACT

The aquatic Angiosperm flora of the islands at the western end of Lake Erie was intensively studied by A. J. Pieters and E. L. Moseley 60-70 years ago and 20 years ago by E. L. Core. Since then, additional species have been discovered, of which twenty-four are recorded here. Of these *Phalaris canariensis*, *Scirpus acutus*, *Rorippa sylvestris*, *Hibiscus militaris*, *Ammannia coccinea*, *Epilobium hirsutum*, *Lycopus asper*, *L. europaeus*, and *Mentha gentilis* appear to represent recent invaders. Other species, all of which are native, may have either become established recently or may have been overlooked by past workers.

The flora of the islands at the western end of Lake Erie was intensively studied 60-70 years ago. The earliest records of the island's flora were published in papers from 1892 to 1914 by Claassen, Moseley, Pieters, Schaffner, Kellerman, and Dodge. Claassen's paper (1892), overlooked by all subsequent authors, mentions a few distinctive habitats and plants from South Bass Island and Kelleys Island. Moseley (1899) visited the islands many times and at different seasons. He kept manuscript lists of the plants from each island and incorporated these records into his published *Catalogue*. Pieter's study (1901), as it concerned the islands, was confined to the aquatic plants of Put-in-Bay harbor. The published studies of Schaffner (1902) and Kellerman (1904) were restricted to Little Chicken Island and to the Hen and Chicken Islands, respectively. Dodge's records (1914) for the United States islands were based entirely on Moseley's *Catalogue*. Core (1948) summarized the data from the latter five publications and added subsequent manuscript records, as well as data from his own collections and from those of his students.

During the field season of 1967, I had the opportunity of studying the aquatic angiosperm flora of the islands, as well as that of the marshes at the western end of Lake Erie. During this survey, a number of species were found that had not previously been reported by any of the earlier workers. Dr. T. R. Fisher, his students, and other botanists associated with Stone Laboratory, have also encountered within the past ten years species which were new to the islands' flora. Their records are given in this paper if specimens are preserved in The Ohio State University Herbarium or in the herbarium at Stone Laboratory. A total of twenty-four species of marsh and aquatic flowering plants not previously reported for the islands are now known and are reported here. Some of these species were probably overlooked in the earlier studies. Other species have reached the islands more recently, and therefore it is important to put these species into the record at this time in order to document some of the floristic changes that have occurred over the past 20 years. This paper is a contribution from my continuing research leading to a more thorough study of the total Erie Islands flora and its recent changes, and of the geographical affinities and origins of and the changes in the marsh and aquatic flora at the western end of Lake Erie.

The aquatic habitats studied consisted primarily of bays (Put-in-Bay, Squaw Harbor, and Fishery Bay at South Bass Island), marshes and ponds (Haunck's

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Pond and Fisher's Pond on Middle Bass Island; Smith's Pond, Fox's Marsh, and Honey Point on North Bass Island; Terwilliger's Pond on South Bass Island; Carp Pond on Kelleys Island; and Fox's Pond and the North Lagoon on Pelee Island), limestone quarry pools on Kelleys Island, and low dolomitic ledges around Buckeye Island (sometimes called Buckeye Point) and along the south shore of South Bass Island. The ponds and marshes on the islands in the United States were visited at least two or more times during the summer of 1967; the ponds on Pelee Island, Canada, were visited once each. The records from Pelee Island are from Essex County, Ontario, Canada; all other counties mentioned without reference to state are in Ohio. The collecting localities on the islands are mapped in figure 1, (p. 183).

All of my specimens cited below were obtained during 1967. One specimen representing each number has been deposited in The Ohio State University Herbarium, Columbus. Duplicate specimens have been deposited in other herbaria, whose identities are noted under the name of each species in the list below according to the abbreviations in Lanjouw and Stafleu (1964). The abbreviations (BGSU) and (FTSL) represent, respectively, the herbaria at Bowling Green State University, Bowling Green, Ohio, and The Franz Theodore Stone Laboratory. All species are considered native to North America unless stated otherwise.

ZOSTERACEAE

Potamogeton illinoensis Morong

ERIE CO.: Locally abundant in shallow pool in bottom of east limestone quarry, north-central portion of Kelleys Island, 24 Aug., *R. L. Stuckey 5336* (FTSL, MICH); same locality, 14 Aug. 1967, *J. L. Forsyth s.n.* (OS).

Known from eight counties in northern Ohio (Braun, 1967), but probably more common in the state than her map indicates, especially in artificial ponds and lakes.

Potamogeton obtusifolius Mert. & Koch

ESSEX CO.: Occasional in shallow water along east shore in sandy bottom of Fox's Pond, Pelee Island, 16 Aug., *R. L. Stuckey 5103* (FTSL, MICH).

A species primarily of the northeastern states and the Lake Superior region, with scattered locations as far south as southern Michigan; its occurrence on Pelee Island suggests that it may yet be expected as a member of the Ohio flora.

NAJADACEAE

Najas guadalupensis (Spreng.) Magnus

ESSEX CO.: Rare (one plant seen) in water two feet deep, North Lagoon, Pelee Island, 17 Aug., *R. L. Stuckey 5125*.

HYDROCHARITACEAE

Elodea nuttallii (Planch.) St. John

OTTAWA CO.: Occasional in shallow water along west edge of Fisher's Pond, Middle Bass Island, 30 Jun., *R. L. Stuckey 4162*; same locality, 12 Aug. 1957, *R. Cruden 398* (OS).

Previously known in Ohio from several northeastern and south-central Ohio localities (St. John, 1965; Braun, 1967).

GRAMINEAE

Eragrostis hypnoides (Lam.) BSP.

ERIE CO.: Occasional in wet sand along east end of Carp Pond, Kelleys Island, 22 Aug., *R. L. Stuckey 5326* (MICH).

Phalaris canariensis L.

OTTAWA CO.: Southeast corner of Haunck's Pond, Middle Bass Island, Jul. 1962, *J. McCormick s.n.* (FTSL, OS).

Adventive from Europe and known from along roadsides and in waste places in several scattered localities in Ohio. Not seen at reported locality in 1966 and 1967.

CYPERACEAE

Carex garberi Fern.

ERIE CO.: Locally common in wet soil in bottom of east limestone quarry, north-central portion of Kelleys Island, 5343, locally common in wet soil on floor of limestone quarry, north-west side of Kelleys Island, 5346, both 24 Aug., *R. L. Stuckey*.

Previously known in Ohio from the shores of Lake Erie north of Saybrook in Ashtabula County (30 May 1930, *L. E. Hicks s.n.*, OS; Braun, 1967). This species is also locally abundant in wet soil in the bottom of the limestone quarry on Marblehead Peninsula, Ottawa County, Ohio (*Stuckey 4361, 4391*).

Cyperus engelmanni Steud.

ESSEX CO.: A few plants in sand at water's edge along east shore of Fox's Pond, Pelee Island, 16 Aug., *R. L. Stuckey 5080* (FTSL, MICH).

Cyperus erythrorhizos Muhl.

OTTAWA CO.: Locally common on mud flat in Fox's Marsh, North Bass Island, 14 Aug., *R. L. Stuckey 5011* (MICH); one plant seen on muddy southeast shore of Terwilliger's Pond, South Bass Island, 29 Aug., *R. L. Stuckey 5433*; Starve Island, 26 Aug. 1967, *B. G. Isom s.n.* (OS).

Cyperus esculentus L.

ERIE CO.: Carp Pond, Kelleys Island, 12 Aug. 1963, *P. Daniel 117* (FTSL). OTTAWA CO.: A few plants in dry roadside ditch along main highway near airport, southeast side of South Bass Island, 11 Aug., *R. L. Stuckey 4979* (FTSL, MICH).

Although these species of *Cyperus* may represent invaders to the islands, it is also very possible that these species have been overlooked in the past, because of the rather late times of flowering and fruiting of plants in this genus and because of the general morphological similarity of many of the *Cyperus* species represented.

EXPLANATION OF MAP

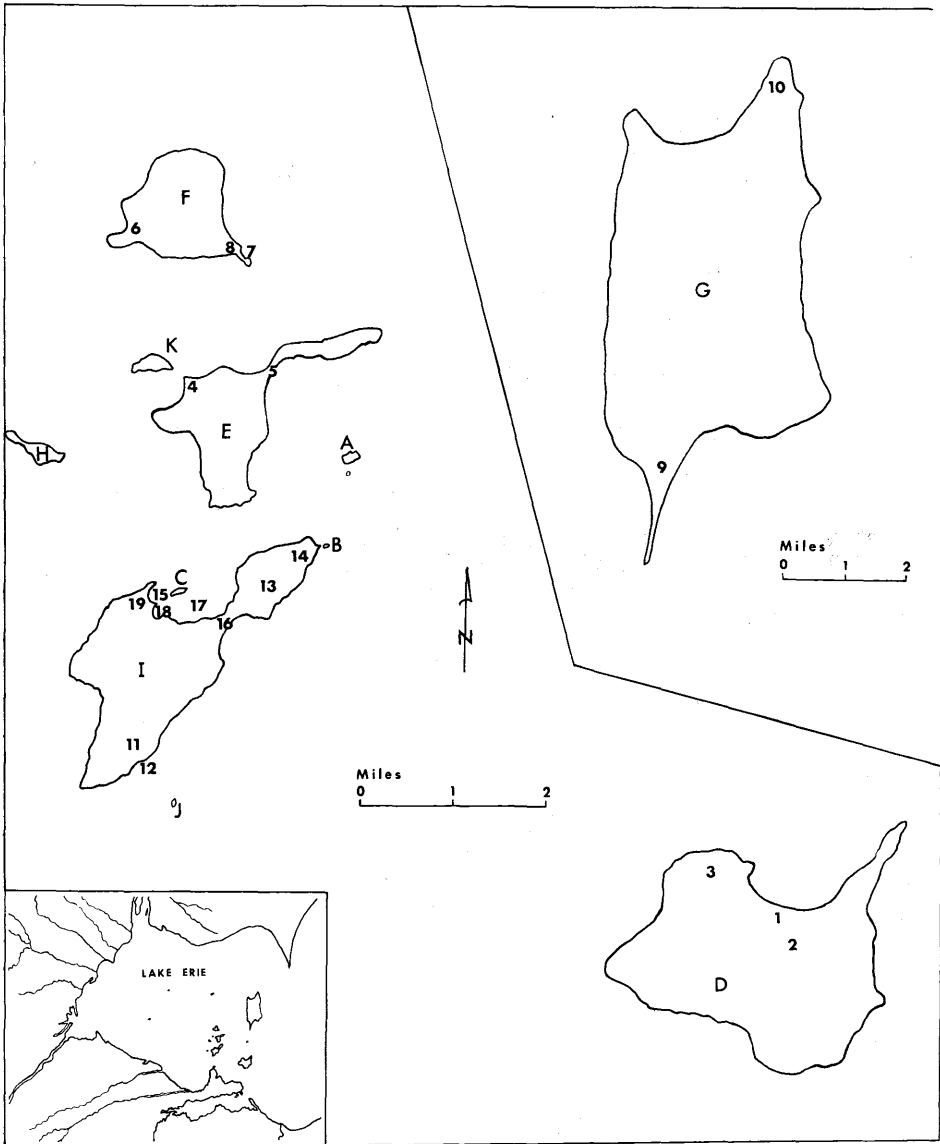
FIGURE 1. Map of the islands in western Lake Erie giving the localities of the plant specimens cited. Place names and localities are shown on the map by letters and numbers as listed below.

- | | |
|-----------------------------------|------------------------|
| A. Ballast Island | H. Rattlesnake Island |
| B. Buckeye Island (Buckeye Point) | I. South Bass Island |
| C. Gibraltar Island | 11. Airport |
| D. Kelleys Island | 12. Airport Point |
| 1. Carp Pond | 13. Burgraff Property |
| 2. Limestone Quarry (east) | 14. East Point |
| 3. Limestone Quarry (northwest) | 15. Fishery Bay |
| E. Middle Bass Island | 16. Perry's Monument |
| 4. Fisher's Pond | 17. Put-in-Bay |
| 5. Haunck's Pond | 18. Squaw Harbor |
| F. North Bass Island | 19. Terwilliger's Pond |
| 6. Fox's Marsh | J. Starve Island |
| 7. Honey Point | K. Sugar Island |
| 8. Smith's Pond | |
| G. Pelee Island | |
| 9. Fox's Pond | |
| 10. North Lagoon | |

Scirpus acutus Muhl.

ESSEX CO.: Pelee Island, 8 Jul. 1958, *J. Hilty 158* (FTSL); a few plants in sand at water's edge along west shore of North Lagoon, Pelee Island, 17 Aug., *R. L. Stuckey 5139* (MICH). OTTAWA CO.: Weed patch, Fox's Marsh, North Bass Island, 31 Jul. 1957, *R. Cruden 292* (FTSL); one small colony in shallow water along sandy shore of Squaw Harbor, South Bass Island, 22 Jul., 4571, 18 Aug., 5195, both *R. L. Stuckey*.

Apparently a newcomer to the islands, for it seems unlikely that the large, stout, robust plants at Squaw Harbor would have been overlooked. *Scirpus validus*, with which it is sometimes confused, is more common throughout the islands and throughout Ohio. *S. acutus* is known from eight scattered Ohio



counties (Braun, 1967). In the western part of the state, it is found in calcareous bogs and wet prairies. A similar habitat apparently exists on the islands where dolomitic bedrock is close to the surface and the pH of the water is moderately alkaline.

Scirpus cyperinus (L.) Kunth

OTTAWA CO.: Haunck's Pond, Middle Bass Island, 29 Jul. 1963, *P. Daniel 33* (FTSL); two plants on wet wave-splashed dolomite rock on southeast shore of Buckeye Island, 27 Aug., *R. L. Stuckey 5404*.

Scleria verticillata Muhl.

ERIE CO.: Locally common in depression of floor of limestone quarry, northwest side of Kelleys Island, 24 Aug., *R. L. Stuckey 5344* (FTSL, MICH); same locality, 14 Aug., 1967, *J. L. Forsyth s.n.* (OS).

NYMPHACEAE

Brasenia schreberi Gmel.

ESSEX CO.: Local in water 3 ft or more deep, North Lagoon, Pelee Island, 17 Aug., *R. L. Stuckey 5170* (FTSL); same locality, 7 Aug. 1963, *P. Daniel 107* (FTSL).

CRUCIFERAE

Rorippa sylvestris (L.) Bess.

Ottawa CO.: Occasional by wall along west edge of lawn at Perry's Monument, South Bass Island, 28 Jun., *R. L. Stuckey 4119* (FTSL, MICH).

R. sylvestris was also seen as vegetative rosettes in the shallow dried ponds on the Burgraff property northeast of Perry's Monument. It was from this location that the fill placed around the monument was obtained some time before 1950. Propagules may have been brought to these sites on the earth-moving machinery.

Naturalized from Europe, *R. sylvestris* has become common in northeastern United States, but is rather local elsewhere in North America (Stuckey, 1966). The first record known from northwestern Ohio is from Perkins [Twp.] in Erie County (13 June 1897, *E. L. Moseley s.n.*, GH, US). In recent years this species has become established in many of the river bottoms of northwestern Ohio, where it is now common.

MALVACEAE

Hibiscus militaris Cav.

ERIE CO.: A few colonies on mud flat along north edge of Carp Pond, Kelleys Island, 22 Aug., *R. L. Stuckey 5324* (FTSL). OTTAWA CO.: Several small colonies on a mud flat in Fox's Marsh, North Bass Island, 14 Aug., *R. L. Stuckey 5014* (FTSL, MICH).

Not found by Moseley (1899, p. 27, 113-114) in the Sandusky region, although *H. militaris* has been known from northwestern Ohio in Paulding and Defiance Counties (*E. L. Fullmer s.n.*, OS) and from Toledo, in Lucas County (*T. H. Burglehaus s.n.*, OS), all before 1900. An unfiled, unmounted specimen lately discovered in The Ohio State University Herbarium was obtained on Pelee Island (27 Aug. 1904, *H. H. Y[ork] s.n.*). This collection probably represents a sample from a short-lived colony, because this species has not been found since on Pelee Island. Recent collections have been obtained from the Portage River (21 Aug. 1961, *D. J. Pinkava 6193*, OS; *Stuckey 5732, 5757A, 5769*). Its occurrence on the islands and also along the shore of Lake Erie (one plant just beyond east limit of Lakeview Park at east edge of Port Clinton, 6 Sep., *Stuckey 5624*) doubtlessly represents a recent northeastward migration and establishment. Deam (1940) pointed out that, in Indiana, *H. militaris* was "rapidly migrating" along the

shores of the Wabash River, probably owing to changes in the river-bottom habitats.

At the Erie Island localities, these plants were growing within a few feet of the more common swamp rose mallow, *Hibiscus palustris* L. Plants of the two species are not known to grow together elsewhere in Ohio.

LYTHRACEAE

Ammannia coccinea Rothb.

OTTAWA CO.: Fox's Marsh, North Bass Island, 31 Aug. 1967, *T. R. Fisher & H. Harlan s.n.* (OS).

Known to Moseley (1899) from one locality in the Sandusky region, this mud-flat-inhabiting plant of southern affinity appears to have become more common in recent years. In northern Ohio it is now known from Winous Point (*R. M. Lowden 1645, 1702*, OS), Muddy Creek (*Stuckey 5653*), Toussaint Creek (*Stuckey 5210, 5582*), and the Maumee River near Waterville, (*Stuckey 5775, 5815*), all records obtained in 1967. Its occurrence on North Bass Island represents the northernmost known extent of the species' range.

ONAGRACEAE

Epilobium hirsutum L.

OTTAWA CO.: Several small colonies in shallow water at Smith's Pond, 4 Jul., *R. L. Stuckey 4191* (FTSL); same locality, 26 Jul. 1963, *J. G. Ondo 14* (FTSL); several small colonies in shallow water along sandy beach at Honey Point, southeast corner of North Bass Island, 1 Aug., *R. L. Stuckey 4742* (MICH); same locality, 29 Jun. 1965, *D. M. Albright 28* (OS).

Naturalized from Europe, *E. hirsutum* is known in the northeastern states and as far west as Illinois (Fernald, 1950; Gleason, 1952). In Ohio, plants of this species were first collected in 1932 in a swamp near Conneaut, Ashtabula County (*L. E. Hicks s.n.*, OS), and, since then, plants have been obtained from eight additional northeastern Ohio stations (based on specimens at OS). Its occurrence westward along Lake Erie is more recent, where, in addition to the island locations, it grows on the southeast side of Sandusky Bay in Neilsen's Marsh, at the intersection of state highways 2 and 269 (*Stuckey 4505*), and in an artificial pond along Sandusky Bay at the North Central Branch of the Ohio Agricultural Research and Development Center in the northwestern corner of Erie County (*Stuckey 4288*). The collections from southeastern Michigan date from as far back as 1952 and come from locations in the counties of Huron (1 Aug. 1952, *F. J. Hermann 11778*, MICH; 10 Jul. 1958, *E. G. Voss 7378*, MICH), Saginaw (11 Aug. 1960, *E. G. Voss 9675*, MICH), Oakland (Aug. 1962, *J. C. Lambert s.n.*, MICH), and Monroe (8 Oct. 1961, *E. G. Voss 10703*, MICH).

PRIMULACEAE

Samolus parviflorus Raf.

ERIE CO.: A few plants on mud flat along north edge of Carp Pond, Kelleys Island, 15 Jul., *4396* (FTSL, MICH), 22 Aug., *5312*, both *R. L. Stuckey*; same locality, 12 Aug. 1963, *J. G. Ondo 115* (FTSL).

LABIATAE

Lycopus asper Greene

OTTAWA CO.: Honey Point, North Bass Island, 26 Jul. 1965, *D. M. Albright 105* (OS); local (three plants) in shallow water along dolomite shore, southeast side of East Point, South Bass Island, ca. ¼ mile south of Buckeye Island, 11 Aug., *R. L. Stuckey 4950* (MICH).

Native to western United States, *L. asper* occurs locally eastward across northern Illinois and about the shores of the Great Lakes where Henderson (1962) implies that it probably was introduced. This species has been known since 1916

from the banks of the Detroit River at Wyandotte (*O. A. Farwell 4384*, MICH) and from damp ground at Grosse Isle (*C. Billington s.n.*, MICH). Later collections from the western shore of Lake Erie in Monroe County, Michigan, come from Toledo Beach (6 Aug. 1920, *E. L. Moseley s.n.*, BGSU), from Monroe Piers (27 May 1924, *O. A. Farwell 7074*, MICH), and from Point Mouillee State Game Area (10 Aug. 1949, *M. McDonald 5386*, MICH). Its occurrence in the Erie Islands represents a southeastern extension of its range and the first records of it for Ohio.

Lycopus europaeus L.

OTTAWA CO.: Occasional in shallow water at Smith's Pond, North Bass Island, 1 Aug., *R. L. Stuckey 4741*; occasional at water's edge along muddy west bank of Terwilliger's Pond, South Bass Island, 18 Aug., *5184*, 29 Aug., *5431*, both *R. L. Stuckey*; occasional on thin, wet soil over dolomite rock at Airport Point (opposite Starve Island), southeast shore of South Bass Island, 27 Aug., *R. L. Stuckey 5422*.

L. europaeus, adventive from Europe, can easily be confused with the native *L. americanus*. The former differs primarily in having slightly longer calyx lobes and leaves ovate or ovate-oblong in general outline. Fernald (1950) and Gleason (1952) report *L. europaeus* as being established in waste places and along roadsides on the east coast of the United States from Massachusetts to Virginia, then in Alabama, Mississippi, Louisiana, but rarely inland. Henderson (1962) gives its distribution as only from Massachusetts to Virginia. I have also found it (*Stuckey 5307*) along the main driveway at the north edge of Magee Marsh at Crane Creek State Park, in the southeastern corner of Lucas County, and in wet sand behind a dune at Sand Point (Bay Point), about 2.5 miles south of the town of Marblehead (*Stuckey 5716*). This locality is also represented by a collection taken 24 July 1966 (*N. W. Easterly s.n.*, BGSU).

Mentha gentilis L.

OTTAWA CO.: One colony at water's edge of Terwilliger's Pond by outlet to Fishery Bay, South Bass Island, 18 Aug., *5188*, 29 Aug., *5430*, both *R. L. Stuckey*.

Adventive from Eurasia and escaped from cultivation. Probably recently established at Terwilliger's Pond.

LENTIBULARIACEAE

Utricularia gibba L.

ESSEX CO.: Occasional in shallow water and deep water, North Lagoon, Pelee Island, 17 Aug., *R. L. Stuckey 5153* (FTSL).

Utricularia resupinata B. D. Greene

ESSEX CO.: Lighthouse Point, North Lagoon, Pelee Island, 18 Aug. 1959, *J. Wells 184* (OS).

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