New Records of Alien Species in the Ohio Vascular Flora

Vincent, Michael A.; Cusick, Allison W.

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New Records of Alien Species in the Ohio Vascular Flora

MICHAEL A. VINCENT AND ALLISON W. CUSICK, Department of Botany, Miami University, Oxford, OH 45056, and Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Fountain Square, Columbus, OH 43224

ABSTRACT. Examination of specimens of vascular plants from various herbaria, as well as field collections, have revealed 70 taxa not previously reported for Ohio, or previously reported without documentation. This paper documents these new taxa, 44% of which are escapes of woody landscape plants. The specimens cited represent 55 genera in 30 families. Of these, the following genera are first reports for the state: Achyranthes, Albizia, Carthamus, Cercidiphyllum, Cotoneaster, Dactyloctenium, Fontanesia, Gaillardia, Guizotia, Gypsophila, Stenosiphon, Tripsacum, and Zinnia. Cercidiphyllaceae is the only family reported as new for the state. Some taxa cited in this paper represent first reports as escapes for North America. These are Cotoneaster divaricatus (Rosaceae), Fontanesia fortunei (Oleaceae), Magnolia x soulangeana (Magnoliaceae), Magnolia stellata (Magnoliaceae), Viburnum buddleifolium (Caprifoliaceae), and Viburnum x rhytidiphylloides (Caprifoliaceae).

INTRODUCTION

The alien element in the Ohio vascular flora is dynamic. Taxa appear, flourish, and, occasionally, disappear on waves of disturbance. Agriculture, transportation, urbanization and a host of anthropogenic factors constantly alter habitats and introduce novelities into our flora. The term “biological pollution” has been coined for this process (Mack 1985). In light of more rapid transport of alien species from place to place and increased rates of disturbance in formerly natural areas, now, more than ever before, biological pollution is becoming a much greater threat to biological diversity. Invasive plant species are a threat to native plant diversity in several ways, especially replacement of a natural flora and diversity with a lower diversity stand of introduced species, replacement of native plant species necessary for the survival of native animal species, and potential extinction of native plant species (Cronk and Fuller 1995). It has been estimated that about 25% of the Ohio vascular flora is not indigenous to the state (Schaffner 1932, Stuckey 1991), and it is very likely that this percentage is increasing and will continue to increase (Reichard and Hamilton 1997), as evidenced by the species listed in this paper. We are defining “alien” as not occurring in Ohio at the time of substantial European presence in the present state boundaries, about 1750 (Schwartz 1997).

During the last few years, we have discovered many more unexpected species during the course of other research projects, and as a consequence, we began a concerted search for new non-native species in Ohio.

MATERIALS AND METHODS

Searches were conducted in the field by both authors for species previously not seen outside cultivation. In addition, herbarium specimens were presented to both authors for identification by many people, and some of these proved to be new to the state. Specimens were also examined at the following herbaria: BAYLU, BHO, BGSU, CINC, CLM, CM, DAO, F, GA, GB, GH, ISC, KE, MICH, MO, MU, NA, NLI, NY, OS, OSH, UAM, UC, US, VDB, and VPI (herbarium acronyms from Holmgren and others 1990). No attempts were made in this study to relocate populations of species identified from herbarium specimens.


RESULTS

Seventy taxa not previously reported for Ohio were found during this study (Table 1), representing 55 genera in 30 families. One new family (Cercidiphyllaceae) was found for Ohio, as were 13 new genera: Achyranthes, Albizia, Carthamus, Cercidiphyllum, Cotoneaster, Dactyloctenium, Fontanesia, Gaillardia, Guizotia, Gypsophila, Stenosiphon, Tripsacum, and Zinnia. In a few cases, the species listed was previously described for Ohio only incidentally, and voucher specimens documenting its occurrence are included in this list.

Six of the taxa are new reports for North America, based on literature searches, and comparisons with the checklist of North American taxa published by Kartesz (1994). These are Cotoneaster divaricatus (Rosaceae), Fontanesia fortunei (Oleaceae), Magnolia x soulangeana (Magnoliaceae), Magnolia stellata (Magnoliaceae), Viburnum buddleifolium (Caprifoliaceae), and Viburnum x rhytidiphylloides (Caprifoliaceae).

The taxa are listed in alphabetical order by genus. Specimen citations are condensed; full information is available from the authors.

1Manuscript received 22 December 1997 and in revised form 28 May 1998 (*97-25).
Anemone blanda (CM, MO, Cusick 33953 Turtle Creek Twp, 23 Jul 1997, (MU, OS).

Bromus erectus

Naturalist (Anonymous 1900), but the collection cited is not in Turkestan, and many cultivars have been introduced (Griffiths 1994).


This species was reported previously in a note in the OSU old limestone quarry S of Ward Rd, Kelley’s Island, 25 Sep 1996, Cusick 33479A & OldBam (MU).

Ohio is included by Pavlik (1995) in the range of this Eurasian brome. The entire state is shaded in Pavlik’s map, though this species has been found in Ohio only on Kelley’s Island. Bromus erectus rapidly has become locally abundant in well-drained, limy habitats throughout the northern and central parts of the island. The species is reported from Kentucky (Brown and Athey 1992).

Calamovilfa longifolia (Hook.) Scribn. var. magna Scribn. & Merr. (Poaceae) - Greater prairie sandreed

Cuyahoga Co: piles of sand from Oheara Co, MI, Whiskey Island, city of Cleveland, 12 Sep 1980, Hissold 80.177 (CLM); LUCAS CO: sand dune, Monclova Rd, Swanton Twp, 5 Sep 1972, Easterly 48085 (BGSU), sand behind seawall, Maumee River, city of Toledo, 5 Sep 1979, Carr 22415 (OS).

This grass may have been introduced into Ohio with shipments of sand from the upper Great Lakes, as documented by the Cuyahoga County specimen.

Carthamus tinctorius L. (Asteraceae) - Safflower

FRANKLIN CO: weedy edge along buildings, Spruce St, W of Park St, Columbus, 25 Oct 1996, Cusick 33544 & Gardner (OS); LUCAS CO: weedy ground, Irwin Prairie Preserve, Spencer Twp, 10 Jul 1988, O’Meira s.n. (OS).

Safflower is native to western Asia, and is cultivated as a garden plant and as a substitute for saffron (Griffiths 1994). It has also been grown as an oil plant (Reader’s Digest Association 1985), and is sometimes included in bird seed mixes.

Centella asiatica (L.) Urb. (Aptaceae) - Spadefoot


A wail which apparently grew from seed in potting soil used to start bedding plants, the species did not persist. The specimen is the true C. asiatica with nearly sessile inflorescences, not C. erecta (L.) Fernald as described in Gleason and Cronquist (1991). It is listed in Kartesz (1994) as occurring outside cultivation in North America.

Cerastium dubium (Bast.) Guépin (Caryophyllaceae) - Doubtful chickweed


Rabeler and Cusick (1994) discuss the occurrence of this species in states adjacent to Ohio.

Cercidiphyllum japonicum Siebold & Zucc.(Cercidiphyllaceae) - Katsura tree


Katsura tree has not previously been reported as an escape in

\begin{tabular}{|l|}
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\textbf{TABLE 1 (Cont.)} \\
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North America, although it is listed in Kartesz (1994). This dioecious species reproduces readily from seed, and is hardy north into USDA Zone 4 (Greech 1985).

*Chenopodium rubrum* L. (Chenopodiaceae) - Alkaline-blite


This annual species is not reported for Ohio in Arizk and Blackwell (1982). Gleason and Cronquist (1991) list this species as "native from Indiana and Iowa to Washington and California, and occasionally adventive elsewhere." The cited collection is of *C. rubrum var. humile* (Hook.) S. Watson.

*Cotoneaster divaricatus* Rehder & E.H. Wilson (Rosaceae) - Spreading cotoneaster


This species is not listed by Kartesz (1994) as occurring outside cultivation in North America, though the following species is listed. It is native to central and western China, and produces prolific bright red fruits (Rehder 1947).

*Cotoneaster simonsii* Baker (Rosaceae) - Simmons' cotoneaster


Native to the Himalayas, Nepal, and Sikkim, this shrub is hardy in USDA Zone 5 (Gleason and Cronquist 1991).

*Cyperus microiria* Steud. (Cyperaceae) - Asian flatsedge


This Asian sedge recently was reported from western Kentucky (Mears and Libby 1995). It otherwise is known only from Long Island and eastern Pennsylvania (Gleason and Cronquist 1991).

*Dactylolentum aegyptium* (L.) P. Beauv. (Poaceae) - Crowfoot-grass

GHIBERIAN ISLAND: Gypsophila scorzonerifolia (L.) Cass. (Caryophyllaceae) - Garden baby's breath

OTTAWA CO: Ashurbah Harbor, 6 Sep 1931, *Hicks s.n.* (KE).

This grass is introduced from the Old World tropics and is found commonly on the coastal plain from North Carolina to Texas, and occasionally at more northern sites (Hitchcock 1950). It has been reported in Kentucky (Brown and Athey 1992).

*Distichis spicata* (L.) Greene (Poaceae) - Seashore saltgrass

LAKE CO: open, bare flats, adjacent land has been filled during past years, Townline Rd, Perry Twp, 20 Sep 1991, *Bissell 91.242* (CLM).

Seashore saltgrass is found in mostly coastal areas, and sometimes more at interior sites (Hitchcock 1950).

*Echinocloa weigandii* (Fissett) McNeill & Dore (Poaceae) - Western barnyard grass


This native species is easily confused with the introduced *E. crusgalli* (L.) Beauv., from which it can be separated by having only a few or no pubescent hairs on the spikelets (Dore and McNeill 1980, McNeill and Dore 1976).

*Eragrostis hirsuta* (Michx.) Nees (Poaceae) - Bigtop lovegrass


This annual species is not reported for Ohio in Arizk and Blackwell (1982). Gleason and Cronquist (1991) list this species as "native from Indiana and Iowa to Washington and California, and occasionally adventive elsewhere." The cited collection is of *E. hirsuta* var. humile (Hook.) S. Watson.

*Eragrostis trichodes* (Nutt.) A.W. Wood (Poaceae) - Sand lovegrass


This species is not listed by Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).

*Eragrostis trichodes* var. pallescens (C. Koch) Carrière (Poaceae) - Medusahead


This grass is introduced from the Old World tropics and is found commonly on the coastal plain from North Carolina to Texas, and occasionally at more northern sites (Hitchcock 1950). It has been reported in Kentucky (Brown and Athey 1992).

*Fagus sylvatica* L. (Fagaceae) - European beech


This specimen is an escape of the widely cultivated cutleaf beech (var. *laciniate* Vignet). European beech is not listed in Gleason and Cronquist (1991) but is included in Kartesz (1994).

*Festuca trachyphylla* Hack. (Poaceae) - Hard fescue


Gleason and Cronquist (1991) describe this European species as weedy and widely introduced.

*Gaillardia pulchella* Fong. (Asteraceae) - Rosering blanket-flower


Gleason and Cronquist (1991) list this species as occurring in the manual range, but list no states in which it has been found. It is a commonly cultivated annual or short-lived perennial (Gleason and Cronquist 1991, Griffiths 1994).

*Guzotia abyssinica* (L.f.) Cass. (Caryophyllaceae) - Nigerseed


This genus is not listed in Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).

*Guizotia abyssinica* (L.) Cass. (Caryophyllaceae) - Nigerseed


This genus is not listed in Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).

*Guizotia abyssinica* (L.) Cass. (Caryophyllaceae) - Nigerseed


This genus is not listed in Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).

*Gypsophila scorzonerifolia* Ser. (Caryophyllaceae) - Garden baby's breath


This genus is not listed in Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).

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*Guizotia abyssinica* (L.) Cass. (Caryophyllaceae) - Nigerseed


This genus is not listed in Kartesz (1994) as occurring outside cultivation in North America. It is native to China, and hardy to USDA Zone 4 (Rehder 1947).
Russian species is occasionally introduced. It was first reported for North America by Seymermark and others (1957). Pringle (1976) discusses the spread of the species in the Great Lakes area.

Juncus compressus Jacq. (Juncaceae) - Roundfruit rush

This Mediterranean species is commonly introduced in the western United States, and only occasionally found in the east (Gleason and Cronquist 1991).

Malus sieboldii (Regel) Rehder (Rosaceae) - Toringo crabapple
CUYAHOGA CO: weedy edges, upland woods, NASA Lewis Research Center, city of Brook Park, 8 Aug 1995, Cusick 52628 (MU, OS); LAKE CO: old fields, E of Big Creek, Concord Twp, 25 May 1989, Bissell 553-68 (CLM).

Native to Korea and Japan, Toringo crab is a shrub to small tree, hardly in USDA Zones 5-7; it is sometimes called M. toering Nakai (Eye-witness Handbooks 1996, Griffiths 1994, Rehder 1947).

Malus x zumi (Mats.) Rehder (Rosaceae) - Seibold's crabapple

All four of these crab apple species are listed by Kartesz (1994) as occurring outside cultivation in North America.

Medicago sativa L. ssp. falcata (L.) Arcang. (Fabaceae) - Yellow alfalfa
CIUYAHOGA CO: weedy ground by railroad, W 3rd St, Cleveland, 12 Jul 1990, Cusick 29039 (MICH, OS); DARKE CO: along New Garden Road, Harrison Twp, 29 May 1993, Bissell 83-69 (CLM); VENICE CO: weedy ground by railroad, county fairgrounds, E of Oak Harbor, Salem Twp, 28 Aug 1996, Cusick 53440 (MICH, OS); SANDUSKY CO: Miller Blue Hole stream, Townsend Twp, 10 Aug 1989, Pinkava s.n. (OS).

The Darke County collection was made with typical alfalfa, which may have been planted on this roadside. Smith (1997) describes the introduction of yellow alfalfa into South Dakota.

Nicotiana glauca Graham (Solanaceae) - Tree tobacco

Tree tobacco, native to South America, is widely naturalized in the southwestern US, and is known to be extremely toxic to livestock and humans (Castorena and others 1987).

Parthenocissus tricuspidata (Siebold & Zucc.) Planch. (Vitaceae) - Boston ivy

Braun (1961) mentions Boston ivy as a cultivated species, giving no indication that it escapes, while Gleason and Cronquist (1991) state that it has escaped locally "here and there in our range."

Philadelphus tormentosus Wall. (Hydrangeaceae) - Downy mockorange
ALLEN CO: disturbed woods by old quarry, Bluffton, Richland Twp, 6 Oct 1997, Cusick 34148 (OS); PAULDING CO: disturbed woods, terrace of Auglaize River, SE of Charloe, Brown Twp, 10 Jul 1996, Cusick 33217 (MU, OS).

Griffiths (1994) states that this species is native to northern India and the Himalayas.

Pinus resinosa Aiton (Pinaceae) - Red Pine

Braun (1961) states that this species is extensively planted for...
TABLE 1 (Cont.)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Location</th>
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<tbody>
<tr>
<td>ASHTABULA CO:</td>
<td>weedy thickets between railroad yard &amp; 15th St, Ashtabula, 4 May 1993, Cusick 30777 (CM, MICH, OS); CUYAHOGA CO: thickets, mouth of Cuyahoga River, Whiskey Island, Cleveland, 9 May 1990, Russell 80-14 (ICLM); LAKE CO: base of disturbed slope facing Lake Erie, SW of Mentor Headlands, Mentor Twp, 6 May 1993, Cusick 308607 (CM, OS); OTTAWA CO: thickets, W of Catawba Rd, SW, dead-end of St Rt 53, Catawba Island, 8 May 1995, Cusick 322325 (CM, MU, OS). The plum, a commonly cultivated fruit tree, is listed in Gleason and Cronquist (1991) as occasionally escaping along roadsides and fencerows. It is probably native to western Asia and southern Europe and may be of hybrid origin (Griffiths 1994, Rehder 1947).</td>
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<tr>
<td>Prunus domestica L. (Rosaceae) - Plum</td>
<td>Prunus domestica L. (Rosaceae) - Plains bluegrass</td>
<td>CUYAHOGA CO: berm of I-71, Strongsville, 22 May 1995, Cusick 32392 (F, MU); DELAWARE CO: berm of I-71, S of Co Rt 72, Berkshire Twp, 28 May 1997, Cusick 33800 &amp; Schmidt (MU, OS); HAMILTON CO: berm, I-75 at I-275, Sharonville, 30 April 1986, Cusick 25117 (MICH, OS); MEDINA CO: berm of I-71, NE of Medina, 22 May 1995, Cusick 32393 (CM, KE, MU, OS); OTTAWA CO: berm of St Rt 53, at Paulsen Rd, Bay Twp sect 19, 29 May 1996, Cusick 33086 (CM, MICH, OS); WAYNE CO: median of I-71, S of West Salem, Conger Twp, 16 May 1994, Cusick 37628 (CM, KE, MICH, MU, NY, OS); WILLIAMS CO: berm of US Rt 127, N of Bryan, Pulaski Twp, 21 May 1996, Cusick 33952 (MO, MU, OS). Plains bluegrass has spread rapidly along interstate highways in northern Ohio where salt is liberally applied in winter. Its colonization of this habitat parallels that of Carex praeceps W. Boott (Retz.:Cusick &amp; Cating 1987) and Puccinellia distans (Jacq.) Parl. (Cusick 1983). The leaves are more intensely blue than those of any other wild-growing grass in Ohio. Despite its conspicuous coloration, this species is under-represented in herbaria due to the difficulty of collecting in areas of high vehicular traffic. Oldham (2001) discuss the problem. It is very common in Michigan.</td>
</tr>
</tbody>
</table>
This species, widespread in cultivation, is native to Mexico (Griffiths Aug 1979, Metcalf). 

Salsola collina Pall. (Chenopodiaceae) - Slender Russian thistle 

MUSKINGUM CO: old railroad yards, foot of Market St, Zanesville, 23 Sep 1982, Cusick 221/95 (OS); STARK CO: cinders in Conrail yard, between Hamilton and Broadview Aves, Canton, 15 Aug 1979, Carr 19/70 (KE).

This Asian species and its distribution are discussed by Mosyakin (1996). It is reported from Kentucky (Brown and Alley 1992).

Salvia farinacea Benth. (Lamiaceae) - Mealycup sage 

FRANKLIN CO: weedy edge between railroad and shopping center, Indianola Ave, Columbus, 10 Nov 1997, Cusick 34166 (MU).

Mealycup sage is not reported by Gleason and Cronquist (1991). This species, widespread in cultivation, is native to Mexico (Griffiths 1994), and is listed by Kartesz (1994) as occurring in North America.

Stachysylvatica L. (Lamiaceae) - Whitespots 


This species is not mentioned by Gleason and Cronquist (1991), but is listed by Kartesz (1994).

Stenosiphon linifolius (Nutt.) Heynh. (Onagraceae) - False gaura 


This western variety grew mixed with the common variety peregrina at both these sites, but was much less frequent. No Ohio specimens were cited by Pennell (1935).

Suaeda calceoliformis (Conl.) Moq. (Chenopodiaceae) - Plains sea-bright 


This western variety grew mixed with the common variety peregrina at both these sites, but was much less frequent. No Ohio specimens were cited by Pennell (1935).

Suaedacalceoliformis (Hook.) Moq. (Chenopodiaceae) - Plains sea-bright 

ASHTABULA CO: pavement edge, St Rt 535, N of St Rt 307 Harpersfield Twp, 16 Sep 1982, Bissell 82/320 (CLM). CUYAHOGA CO: median of St Rt 2 W of county line, Euclid, 29 Sep 1982, Bissell 82/341 (CLM), open gravel along entrance ramp, Brainard Rd to Rte 1-271, Lyndhurst, 21 Sep 1985, Bissell 85/361 (CLM); GEauga CO: gravel, St Rt 44, 1 mi S of county line, Chardon Twp, 29 Sep 1984, Bissell 84/168 (CLM); LAKE CO: saline soil along railroad, St Rt 306, Mentor, 20 Aug 1979, Carr 2211 (KE, OS), moist, weedy ground by salt mine, St Rt 44, town of Grand River, Painesville Twp, 18 Oct 1990, Cusick 29301 & Baird (CM, KE, NY, MU); MEDINA CO: median berm, Rte 1-71, N of US Rte 224, Guilford Twp, 4 Aug 1988, Bissell 88/320 (CLM).

This species is locally common in northeast Ohio along highways heavily salted in winter. It was treated as synonymous with S. depressa (Pursh) S. Watson by Hopkins and Blackwell (1977), but Gleason and Cronquist recognize the species as distinct. Neither source lists it as occurring in Ohio.

Taxus cuspidata Siebold & Zucc. (Taxaceae) - Japanese yew 


Drecy (1996) states that this species has the potential to become a serious weed, due to its widespread use as a landscape plant. It is listed in Kartesz (1994).

Tilia europea L. (Tiliaceae) - European linden 


This species is listed as Tilia x vulgaris Hayne in Kartesz (1994).

Trifolium resupinatum L. (Fabaceae) - Persian clover 

HAMILTON CO: Anderson Twp, 27 May 1935, Braun 1250 (OS).

Gleason and Cronquist (1991) describe this European native clover as introduced in grass seed, and widely scattered. It is widely cultivated in southern US, and found as a lawn or roadside weed (Gillet 1985).

Tripasacum dactyloides (L.) L. (Poaceae) - Eastern gamagrass 

CLERMONT CO: US Rte 52, ca 2 mi E of Chilo, 14 Jul 1985, Baird 129 (CINC, KE, MU); roadbank and ditch, US Rte 52, 1.5 mi NW of Rural, Franklin Twp, 27 Aug 1985, Cusick 24174 (MU, KE); GALLIA CO: grassy roadside, St Rt 7 along Ohio River, S of Clipper Mills, 30 Sep 1993, Cusick 31376 (MICH, MU).

Eastern gamagrass is found in moist places, such as stream banks, in much of the eastern United States (Hitchcock 1950), and is sometimes cultivated as a forage crop (Hardin 1994).

Veronica peregrina L. var. xalapensis (H.B.K.) H. St John & J.R. Warren (Scrophulariaceae) - Hairy purslane speedwell 

FRANKLIN CO: spontaneous in topsoil about ornamental plantings, Fountain Square, Morse Rd, Columbus, 5 Jun 1993, Cusick 30980 (KE, OS), topsoil in flowerbed, 246 Piedmont Rd, Columbus, 20 Jul 1995, Cusick 32607 (OS).

This western variety grew mixed with the common variety peregrina at both these sites, but was much less frequent. No Ohio specimens were cited by Pennell (1935).

Veronica verna L. (Scrophulariaceae) - Spring speedwell 


Veronica verna is widespread in Ontario in parks, picnic areas, and other disturbed sites on sandy soil (Grins and others 1987). It was not included by Pennell (1935) as occurring in North America, but Gleason and Cronquist (1991) state that it is established in more or less open, disturbed areas.

Viburnum buxifolium C.H. Wright (Caprifoliaceae) - Buddleia viburnum 


Buddleia viburnum is native to central China (Griffiths 1994).

Viburnum plicatum Thunb. (V. tomentosum Thunb.) (Caprifoliaceae) - Doublefile viburnum 


Kartesz (1994) lists this species as naturalized in North America.

Viburnum X rhytidophyllodes J.V. Sturring (Caprifoliaceae) - Lantanaphyllum viburnum 

BUTLER CO: weedy under trees known to be starling roosts,
TABLE 1 (Cont.)


This garden hybrid between *V. rhodophyllum* Hemsl. and *V. lantana* L. is commonly cultivated on the Miami University campus and elsewhere in Ohio. Over 30 plants were seen in a quick survey of the Bishop Woods in 1996.

*Zinnia elegans* L. (Asteraceae) - Zinnia


The common garden zinnia occasionally escapes from cultivation (Gleason and Cronquist 1991). It was not reported from Ohio by Fisher (1988).

**DISCUSSION**

Many of the taxa in this compilation are of horticultural origin, reflecting a continuing process of introduction which threatens native species and plant communities (Luken and Thieret 1996, Randall and Marinelli 1996). Woody plants of horticultural origin (31 of 70) make up 44% of the list. Other species are nursery weeds, and were probably conveyed in topsoil around nursery operations and were probably conveyed in topsoil around nursery operations and were probably conveyed in topsoil around nursery operations and were probably conveyed in topsoil around nursery operations.

Predicting whether any of these species will become an invasive weed is problematic. Reichard and Hamilton (1997) present characteristics of potentially invasive woody species, as well as a flow diagram to be used in deciding whether a new woody plant species should be introduced. Using their criteria (such as invasive relatives, early reproductive maturity, lack of seed pretreatment requirements), several of the woody plants on our list may likely become problems, such as the *Malus*, *Prunus*, and *Viburnum* species.

In conclusion, we present evidence that many new non-native species are being introduced into the Ohio flora. While some of these may not persist, many may, and could become problem weeds. This paper also presents evidence of the dangers of introduction of new plant taxa (especially via horticultural practices) when the results of those introductions are untested. In the future, attempts should be made to relocate populations of taxa cited in this paper, as well as to document the degree to which each has spread from cultivation.

**ACKNOWLEDGMENTS.** A.A. Reznicek, University of Michigan, determined numerous specimens cited in this study. Michael J. Oldham, Natural Heritage Information Centre, Ontario Ministry of Natural Resources, alerted us to the possible occurrence of *Bromus erectus* and *Salsola collina* in Ohio. We thank the curators of the herbaria listed above for their courtesy and hospitality during visits, or for loans of specimens. We also thank the Ohio Department of Natural Resources and the W.S. Turrell Herbarium Fund for support for this research. Tom Cooperrider, John Thieret, and an anonymous reviewer provided many important suggestions for improvement of the paper.

**LITERATURE CITED**


