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OCCURRENCE OF EUROPEAN DEWBERRY, *RUBUS CAESIUS* (ROSACEAE), NATURALIZED IN IOWA AND MICHIGAN¹

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INTRODUCTION

In late September, 1998, Jimmie D. Thompson, a plant enthusiast, collected two inflorescences from a vigorous bramble near the North Central Regional Plant Introduction Station farm southwest of Ames, Iowa. The unusually late flowering and the atypically compound, corymbose form of the inflorescences suggested that his collection was not taken from a common North American *Rubus* L. A few weeks later, additional collections were made when the senior author accompanied Mr. Thompson to the site. By using the keys in Flora Europaea (Heslop-Harrison 1968) and Brambles of the British Isles (Edees & Newton 1988) and consulting European *Rubus* specimens held in ISC³ and excellent illustrations in the Czech national flora, Květena České Republiky (Holub 1995), and the Illustrated Companion to Gleason and Cronquist's Manual (Holmgren 1998), the senior author determined the plants to be *Rubus caesius* L., the European dewberry.

In 1990, the junior author observed an unusual bramble in the Waterloo Recreation Area about 32 km WNW of Ann Arbor, Michigan. It displayed certain morphological characteristics that seemed intermediate between blackberries (*Rubus* subgenus *Rubus*) and raspberries (*Rubus* subgenus *Idaeobatus* Focke), such as pruinose, tip-rooting canes resembling *R. occidentalis* L., leafy, corymbose inflorescences, and very sparse fruit set, which might be related to hybrid sterility. During the course of studying the Michigan population, the authors concluded that, rather than being a novel intersubgeneric hybrid, these plants also fit key characteristics of *R. caesius*. *Rubus caesius* is not included in the Flora of Michigan (Voss 1985) and was explicitly excluded from Iowa's flora in a recent revision of *Rubus* for that state (Widrechner 1998). Our recent discoveries, together with this taxon's absence from many pertinent floristic treatments, prompted this report.

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² Deceased 8 January 2000.

³ The abbreviations for herbarium names follow Holmgren et al. (1990).

HISTORICAL ACCOUNT

The introduction of *R. caesius* to the United States from the Old World has been described by Hansen (1937) and Bailey (1941). In 1897, the famous plant explorer, Niels E. Hansen, first formally introduced this species, as "*R. caesius turkestanicus*," from Russia to the United States. Shortly thereafter, it received the number PI 281 from the USDA's Section of Seed and Plant Introduction (USDA 1898). In 1930, Hansen (1937) tested PI 24377, a later (1908) collection from Siberia, in South Dakota, where it was found to be sufficiently hardy but not very fruitful.

Liberty Hyde Bailey noted that the plant was of greatest value as a soil-stabilizer for covering steep embankments. By the time of Bailey's 1941 publication, *R. caesius* was known to be naturalized in the vicinity of Ithaca, New York and Big Rock at Cherokee Park, Louisville, Kentucky. *Rubus caesius* was also discussed in Fernald's (1950) treatment of *Rubus* in Gray's Manual of Botany, 8th ed., wherein he noted that the plant was locally spreading from cultivation.

We know of no local cultivated sources of *R. caesius* in Michigan, but the source of this plant in Iowa may be the same as that hypothesized by Widrlechner and Rabeler (1991) for *R. parvifolius* L. in Iowa. They noted that from the late 1930s until 1947, the USDA's Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service, maintained a Hill Culture Research Station just southwest of Ames, Iowa, on a site now occupied by the farm of the North Central Regional Plant Introduction Station. Although there is no direct evidence that the Hill Culture Research Station was cultivating *R. caesius*, the 1946 Annual Reports of the Department of Agriculture (Bennett 1946) described research conducted by the Hillculture Research Division on the cultivation of cane fruits on eroded lands in Iowa. Considering Bailey's (1941) comment about the use of this bramble as a groundcover for erosion control, it seems quite plausible that the Hill Culture Research Station may have been the Iowa source population. The origin of our Michigan population remains unknown.

KNOWN COLLECTIONS IN IOWA AND MICHIGAN
AND CURRENT STATUS*Iowa*

On 20 September 1998, Jimmie D. Thompson noticed a bramble flowering and fruiting out of season on an abandoned pasture just southwest of Ames, Iowa. On 2 December 1998, Thompson and the senior author returned to this site and noted two large, tangled patches, the larger at least 10 meters in diameter, growing with *Aster pilosus*, *Juniperus virginiana*, and *Tridens flavus*. On this late date, although flowers and fruits were no longer present, the display of attractive red-orange leaf color was quite striking. Attractive autumnal coloration in this species was also noted by Bailey (1945). The following collections have been made:

STORY CO.: SW 1/4 NE 1/4 NW 1/4 Sec. 18, T83N R24W, Ames West Quad, elev. 309 meters, *Thompson s.n.*, 20 September 1998 (ISC and MICH), *Widrechner & Thompson 439*, 2 December 1998 (ISC and MICH).

An earlier, published reference to the occurrence of *R. caesius* in Iowa (Guldner 1960) was erroneous, being based on misidentified collections of *R. roribaccus* (Bailey) Rydb. held at BDI, which represented atypical inflorescences from plants most likely damaged by ice. The absence of any known valid collections of *R. caesius*, as of September, 1998, led the senior author to exclude this taxon from Iowa's flora in his treatment of the *Rubus* of Iowa (Widrechner 1998). It seems ironic that Thompson's initial collection, confirming this species' presence in Iowa, was made within days of the proofing of the galley for that report. In addition, during the 1999 field season, Thompson located three additional populations to the east of the original collection in Sections 16 and 17. And although fruit production is generally poor, we suspect that new sites are slowly being colonized by bird- or mammal-mediated seed dispersal.

Michigan

The Michigan population was first noted by the junior author on 29 September 1990 during a field botany class. The fruits with their few large drupelets seemed very remarkable at the time (Figure 1). Later, summer collections were taken when the plants were observed in full flower. The population grows along the east side of an old road and is 45 m long and up to 4 m wide, with an extension running 35 m into a brushy, open woodland, with *Elaeagnus umbellata*, *Celtis tenuifolia*, *Populus deltoides*, *Quercus velutina*, and *Sassafras albidum*. The following collections from this population have been made:

WASHTENAW CO.: S Border Sec. 5, T12S R3E, NE side of junction of Ridge Road and Glazier Road in Sylvan Township. Waterloo Recreation Area, just N of Cavanaugh Lake, elev. 307 meters, *W.H. Wagner 90044*, *Wagner 93000*, *Robert and Ellen Masta 93007* (MICH).

Other nearby collections

Inquiries to numerous herbaria have produced only two other collections of *R. caesius* from Midwestern states. Through A. Cusick (Ohio Department of Natural Resources) and J. Furlow (OS), the senior author recently received two Ohio collections. The older is from Newberry Township, Miami County: *A.W. Cusick 22093*, 8 September 1982 (OS), and the more recent collection was made near Streetsboro, Portage County: *S.J. Mazzer s.n.*, 27 September 1999 (ISC). The next nearest known collection sites are from Allegheny County, Pennsylvania: *B.L. & J.A. Isaac 11722*, 15 October 1998 (CM, ISC) (which was still in flower on this late date) and from Jefferson County, Kentucky: *M. Slack s.n.*, 23 June 1939, and *M. Slack 3*, 27 May 1941 (BH).



FIGURE 1. European dewberry, *Rubus caesius*, from Washtenaw Co., Michigan (W.H. Wagner 90044). Note the peculiar fruits with few drupelets and evidence of insect damage.

DIAGNOSTIC FEATURES

Rubus caesius has tip-rooting, biennial canes armed with small prickles and bears flowers with broadly ovate, white petals and large, black drupelets that do not separate readily from their fleshy receptacles. Plants with such characteristics are commonly known as dewberries and belong to subgenus *Rubus*. *Rubus caesius* is the type species of the Old World section *Caesii* Lejeune & Courtois (Edees & Newton 1988), and is implicated in the parentage of a diverse array of apomictic Old World taxa placed in section *Corylifolii* Lindley (Weber 1981).

There are close phylogenetic affinities between Old and New World members of subgenus *Rubus* (Alice & Campbell 1999). Of the North American sections of subgenus *Rubus*, *R. caesius* most closely resembles section *Flagellares* Bailey, by reason of its perfect flowers (thus ruling out section *Ursini* Rydb., native to western North America), prickly armature, ovate primocane leaf shape, and low-arching, tip-rooting habit. Section *Flagellares* includes a diverse group of dewberries widespread in the Great Lakes states (Davis et al. 1968).

There are, however, at least four diagnostic features that can be used to distinguish *R. caesius* from members of section *Flagellares*.

1. The first-year canes (primocanes) of *R. caesius* are glaucous and tinged red where exposed to the sun. The coloration and bloom on the canes' surface resemble that of the canes of *R. occidentalis*. The canes of members of section *Flagellares* are not glaucous.

2. The stipules of *R. caesius* are ovate-lanceolate, whereas those of section *Flagellares* are linear-lanceolate to linear.

3. The inflorescences of *R. caesius* are corymbose, and its larger inflorescences are comprised of a short terminal corymb subtended by similar axillary corymbs, presenting a complex, paniculate form. Although some members of section *Flagellares* do bear corymbose inflorescences, such branched, complex corymbs do not regularly occur in any taxon in that section.

4. The mature fruits of *R. caesius*, when they form at all, are composed of 1–few (in Europe up to 20), relatively large (up to 6×4.5 mm if only one or two, but smaller with increasing numbers), drupelets that are black and glaucous (Heslop-Harrison 1968). The junior author examined the remains of 113 flowers from the Michigan population of *R. caesius*; only 27 of these produced fruits, with an average of 3.5 drupelets per aggregate. Typical fruits of section *Flagellares* have 12–50 smaller drupelets that lack a bloom.

There may also be phenological differences between *R. caesius* and North American dewberries. *Rubus caesius* tends to flower throughout much of the growing season (Edees & Newton 1988), making it much less determinate than our native dewberries. This phenomenon may be related to a reproductive strategy of producing small numbers of seeds, resulting from pseudogamy (Weber 1981), over a long period of time. Also, we observed plants of *R. caesius* growing much later into autumn than is typical for native dewberries. This is consistent with our observations that many other European trees and shrubs do not cease growth or develop leaf coloration until late in autumn when cultivated in the north central United States.

SUMMARY

Rubus caesius is a rarely noted member of the flora of the north central United States. It is native from Europe east to Siberia and was probably brought to our region because of its cold hardiness and ability to stabilize eroding sites. It may occur more widely in the region, but few records have been located. These first regional records can serve as a baseline to document the introduction

of this exotic shrub into our flora. Diagnostic, morphological and phenological characteristics for distinguishing *R. caesius* from similar, native dewberries are presented, in the hope that field botanists will now better recognize this species and be alert to its potential expansion.

The senior author would be particularly interested to learn of other occurrences of this species in the Midwestern flora.

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