REDISCOVERY OF RHYNCHOSPORA (PSILOCARYA) NITENS (CYPERACEAE) IN INDIANA

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ABSTRACT

In 2012 the authors rediscovered Rhynchospora (Psilocarya) nitens in Porter County at its only known site of occurrence in Indiana, providing the first documentation of the species for the site and the state in over 50 years. Prior to the 2012 discovery, the species had been collected in the state only twice since 1899. An Atlantic and Gulf Coastal Plain disjunct, this sedge is represented by only two occurrences in the Great Lakes region: Allegan County, Michigan and Porter County, Indiana.

INTRODUCTION

Rhynchospora nitens (Vahl) A. Gray is an Atlantic and Gulf Coastal Plain sedge that ranges in the U.S. from Texas to Massachusetts and that has disjunct occurrences in Indiana and Michigan. Farther south it occurs in the West Indies and Central America (Kral 2002). In the Atlantic Coastal Plain states in the U.S. the species is listed as “vulnerable” to “critically imperiled” in 8 of the 14 states where it occurs, namely Texas, Georgia, North Carolina, Delaware, Maryland, New Jersey, New York, and Massachusetts, and as “possibly extirpated” in Virginia (NatureServe 2014). It is listed as “apparently secure” in Louisiana and Mississippi (NatureServe 2014). Although NatureServe (2014) indicates that the species has not been ranked or is still under review in Alabama, Florida, South Carolina, and Michigan Rothrock (2009) states it is “deemed secure from extirpation in Florida and Mississippi” and Reznicek (1999) notes that it is primarily a southern coastal plain plant that is very rare in the northern parts of its range.

In the Great Lakes region, R. nitens was known only from Porter County, Indiana, until its discovery in 1999 in Allegan County, Michigan (Reznicek 1999). The Michigan record represented the only extant occurrence in the Great Lakes region at the time of its discovery, since the species was considered long extirpated in Indiana (Indiana Natural Heritage Data Center 2013). On September 27, 2012, however, the authors found R. nitens while conducting a botanical survey of wetlands in the Dune Acres Unit of the Indiana Dunes National Lakeshore in Porter County, Indiana.
Rhynchospora nitens is strikingly similar to R. scirpoidea (Torr.) Griseb. As noted by Reznicek (1999), R. nitens has a greyish cast to the spikelets in contrast to the brown spikelets of R. scirpoidea. The grey spikelet color in R. nitens is due to the scale apices possessing wider hyaline margins (Figure 1). Although this character may be helpful in searching for this species in the field, it can be very subtle. The achene body of R. nitens has a pronounced cross rugulose pattern, whereas the achenes of R. scirpoidea are smooth to only slightly rough. Reznicek (1999) also notes that the nearly mature achenes of R. scirpoidea have a conspicuous pale border that is lacking in those of R. nitens. The tubercles, however, are quite diagnostic and easily separate the two species. In R. nitens the tubercle is noticeably short (less than 0.5 mm), crescent-shaped, and distinctly wider than tall. The tubercle of R. scirpoidea is at least as tall or taller than wide (0.5 mm or greater) and triangular (Figure 2). Reznicek (1999) also states that the longer tubercle of R. scirpoidea gradually tapers “into the more or less persistent style”, whereas that of R. nitens is deciduous. Rhynchospora scirpoidea is a state-threatened species in Indiana (Indiana Natural Heritage Data Center 2013). Rhynchospora nitens and R. scirpoidea, along with the primarily tropical R. eximia (Nees) Boeck., are annual species that were formerly included in the genus Psilocarya. They can be separated from other Rhynchospora species by their lack of perianth bristles and the presence of several achenes per spikelet.
Rhynchospora nitens and R. scirpoides superficially resemble Fimbristylis autumnalis (L.) Roem. & Schult. and are typical associates of that species in the field. In contrast to the two Rhynchospora species, F. autumnalis has achenes that lack distinct tubercles and is generally a smaller plant overall, having smaller inflorescences and spikelets (Rothrock 2009).

**LOCATIONS AND HABITAT**

The general area of all known historical records of *Rhynchospora nitens* in Indiana is within approximately one mile of Lake Michigan near the common boundary of the Portage and Dune Acres USGS quadrangles in the Lake Michigan Border Section of the Northwestern Morainal Natural Region (Homoya et al. 1985). In the broader context, this area lies within the Eastern Broadleaf Forest (Continental) Province (Bailey 1995). Our 2012 discovery is approximately 1300 meters east of historic Goose Lake where some earlier collections were made. Dune Park, also mentioned as an early collecting site for this species, was farther west, approximately two miles beyond Goose Lake. It is possible that
some botanists may have ascribed this name to the general area that includes Goose Lake, since they contained similar wetland communities (Pavlovic, pers. comm.). Dune Park was also the site of an historic train stop along the Chicago South Shore and South Bend Railroad in the Indiana Dunes, and it, along with Goose Lake, has long been lost to industrial development.

The extant wetlands occupied by *R. nitens* are shallow and relatively flat-bottomed with sandy and peaty substrates (Figure 3). These features align closely with those ascribed to the Michigan site by Reznicek (1999). When water levels are low, such wetlands may support a diverse flora that includes a variety of annuals and short-lived perennials, many of which are Atlantic and Gulf Coastal Plain disjuncts. In addition to *Rhynchospora nitens*, other rare coastal plain species known or previously reported from the area include *Ludwigia sphaero-carpa* Elliott, *Rhynchospora macrostachya* Torr. Ex A. Gray, *Rhynchospora scirpoides* (Torr.) Griseb., *Scleria reticularis* Michx., *Schoenoplectus purshianus* (Fernald) M. T. Strong, *Juncus pelocarpus*, *Juncus scirpoides* L., *Panicum verrucosum* Muhl., *Polygonella articulata* (L.) Meisn., *Utricularia purpurea* Walter, *Eleocharis melanocarpa* Torr., and *Fuirena pumila* (Torr.) Spreng. (Reznicek 1994, Lamerson 1950, Indiana Natural Heritage Data Center 2013). Many of the species persist in permanent seed banks and germinate when water levels drop and mud and sand flats are exposed (Keddy and Reznicek 1982).

Indiana experienced widespread heat and drought in 2012, and the wetlands...
surveyed in the target area were completely dry with the exception of a single, small ponded area. On September 27, 2012, a locally abundant population of *R. scirpoides* was closely scrutinized, revealing a single clump of *R. nitens* in a small unnamed wetland just north of Little Lake (Figure 4). On October 2, additional plants, perhaps hundreds were found in this small wetland and Little Lake. *Rhynchospora nitens* associates included *Rhynchospora scirpoides*, *Rhynchospora macrostachya* A. Gray, *Panicum verrucosum* Muhl., *Scleria reticularis* Michx., *Dichanthelium spretum* (Schult.) Freckmann, *Dulichium arundinaceum* (L.) Britton, *Fimbristyliis autumnalis*, *Hypericum boreale* (Britton) E. P. Bicknell, *Proserpinaca palustris* L., *Eupatorium serotinum* Michx., and *Cephalanthus occidentalis* L. These wetlands also contain stands of the non-native invasive grass *Phragmites australis* (Cav.) Steud. Further encroachment of this species and *Cephalanthus occidentalis* potentially threatens *R. nitens* and associated coastal plain flora. Following this discovery, although additional sites believed to have potential for *R. nitens* were checked elsewhere in Porter County as well as in Elkhart, Jasper, and St. Joseph counties, Indiana, no additional populations of *R. nitens* were found.

**NOTES ON HISTORIC RECORDS**

The earliest collections of *Rhynchospora nitens* in Indiana and the Great Lakes region appear to have been on October 20, 1897 in Porter County by
Agnes Chase and E. J. Hill. Although Hill’s collections were from Dune Park and/or Goose Pond [Lake] and Chase’s reads “Northwest of Porter,” these locations likely pertain to the same general area, and it seems plausible that the two botanists were together on that date. The greatest number of collections ever taken in Indiana was in 1898, and all were from the same area(s) described above on the respective dates August 4 (Hill), August 18 (A. Chase, Hill), August 29 (Hill), and September 19 (Virginius H. Chase). A single collection was made in 1899 on September 12 by L. M. Umbach, also from Dune Park, in a habitat described as “slough.” This collection had been believed to have been the last time the species was seen in Indiana (Deam 1940; Swink and Wilhelm 1994; Rothrock 2009).

However, following our 2012 discovery, the authors learned about two additional unpublished records of *R. nitens* in Indiana, both taken in the twentieth century and from the same location as the records referenced above from the late 1800s. On August 8, 1953, F. A. Swink unknowingly collected a single specimen of *R. nitens*. This specimen attached to the same collection sheet as a specimen of *R. scirpoides* is at the Field Museum herbarium in Chicago (F). The label on the sheet reads “Porter Co.: In moist open ground near Goose Lake NW of Baileytown” (Niezgoda, pers. comm.). This specimen was annotated by A. A. Reznicek in 2002 as *R. nitens* (Reznicek, pers. comm.). Another collection was made on “wet ground on border of Mud [Goose] Lake marsh, Baileytown, Porter County” on September 19, 1959 by H. R. Bennett (ILL) and indentified on the label as *Fimbristylis caroliniana* (Lambert) Fernald forma *pycnostachya* Fernald. It was annotated by R. Kral in 1967 as *Psilocarya [Rhynchospora] nitens* (Phillippe, pers. comm.).

**DOCUMENTATION**

Although the authors did not examine any additional collections of *Rhynchospora nitens*, personnel from the following herbaria were contacted regarding this species’ occurrence in Indiana: BUT, F, GH, ILL, ILLS, IND, MICH, MO, MOR, NY, PUL, US, and WIS. Herbarium abbreviations are those of Holmgren et al. (1990). All known Indiana collections of *R. nitens* are cited below. All collections are from Porter County, Indiana. Note that E. J. Hill sometimes assigned the same collection number to specimens collected on different dates during the same year.

**INDIANA:** PORTER CO. Northwest of Porter, drying slough, 20 Oct 1897, Agnes Chase 686 (ILL – 2 sheets); Goose Pond or Dune Park, wet or damp sands, 20 Oct 1897, E. J. Hill 195, 1897 (GH, ILL); 4 Aug 1898, E. J. Hill 154, 1898 (ILL); 18 Aug 1898, Agnes Chase 920 (F, ILL – 2 sheets, MICH, US), E. J. Hill 154(2), 1898 (F – 2 sheets [2nd sheet an apparent duplicate, but lacks a collection number and has habitat information as sand], ILL); 18, 29 Aug 1898, E. J. Hill 154, 1898 (GH), [Note 2 separate dates as per label on sheet]; 29 Aug 1898, E. J. Hill 154(3) 98 (F), E. J. Hill 154, 1898 (ILL); East of Dune Park, sandy swamp, 19 Sept 1898, Virginius H. Chase 292 (ILL); Dune Park, slough, 12 Sept 1899, L. M. Umbach s.n. (F, GH, IND, NY, US, WIS); Near Goose Lake NW of Baileytown, moist open ground, 8 Aug 1953, Floyd A. Swink 2542 (F); On border of Mud [Goose] Lake marsh, Baileytown, wet
ground, 19 Sept 1959, H. R. Bennett 6940 (ILL); Dune Acres Unit, Indiana Dunes National Lakeshore, at unnamed wetland, N ½ of NE ¼ of SW ¼ of Section 22, T 37N, R6W, 1-10 plants growing in sand flat with Rhynchospora scirpoides, Sclerina reticularis, Dulichium arundinaceum, Proserpinaca palustris, Dichanthelium spretum, Hypericum boreale, Panicum verrucosum, Rhynchospora macrostachya, Fimbrystylis autumnalis, Cephalaria occidentalis, Eupatorium serotinum, 27 Sept 2012, R L. Hedge & E. Stork 12-09-27-101 (F, Hedge personal collection), 2 Oct 2012, R L. Hedge et al. 12-10-02-127 (NY, WIS);
At Little Lake, 101-1000 plants estimated growing in sand flat with Rhynchospora scirpoides, Rhynchospora macrostachya, Panicum verrucosum, Fimbrystylis autumnalis, Cepha lambthus occidentalis, 2 Oct 2012, R L. Hedge et al. 12-10-02-135 (MO, MOR, MICH).

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LITERATURE CITED