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FOR IMMEDIATE RELEASE: December 22, 2023

NYBG Scientist and Colleague Discover New Plant Species Believed to Be Growing at Only Six Sites in the U.S. Mid-Atlantic Coastal Region and Call for It to Be Protected under the Endangered Species Act

The Mid-Atlantic Beaksedge Is at Risk of Extinction Because of Its Isolated Populations and Threats to Its Wetland Habitat, the Researchers Say in New Publication

Left: The Mid-Atlantic Beaksedge (*Rhynchospora mesoatlantica*), a new species discovered by an NYBG scientist and colleague, is a slender plant with small, cinnamon-brown flower clusters called spikelets. Right: The new species grows in sunny, wet soil on the margins of seasonal ponds such as this one at Assawoman Wildlife Area near Bayard, Delaware, photographed when the pond was dry. With isolated populations and threats to its habitat, the new species is at high risk of extinction, the researchers say.

Bronx, NY—Imperiled from the moment of its discovery, a new plant species that is found in only six locations in the Mid-Atlantic region of the United States has been formally described by a New York Botanical Garden (NYBG) scientist and a colleague, who also present evidence that the species should be considered at high risk of extinction because of its small, isolated populations and threats to its wetland habitat. They call for the new species to be protected under the Endangered Species Act.

Robert F. C. Naczi, Ph.D., the Botanical Garden's Arthur J. Cronquist Curator of North American Botany, and Amanda Treher Eberly, a Research Botanist at NatureServe, a non-profit conservation data and services organization, name and describe the new species in "*Rhynchospora mesoatlantica* (Cyperaceae), an imperiled new species of beaksedge from eastern U.S.A.," published online recently by the peer-reviewed, open-access botanical journal *PhytoKeys*. Publication of the paper establishes the species as new to science.

Rhynchospora mesoatlantica, or the Mid-Atlantic Beaksedge, is a slender plant with small, cinnamon-brown flower clusters called spikelets. It grows to a height of about two feet in sunny, wet soil on the margins of shallow, seasonal ponds of the Mid-Atlantic Coastal Plain in southern Delaware, southeastern Maryland, and southern New Jersey. Many of these ponds, which are home to other rare plant and wildlife species, have been drained or otherwise altered for agriculture or pine plantations, making them one of the most threatened habitats on the Delmarva Penisula, the land between Delaware Bay and Chesapeake Bay that encompasses parts of Delaware, Maryland, and Virginia.

"Due to the severity of conservation threats, few known extant populations, small population sizes, and apparent necessity of human-mediated intervention to maintain habitats, we recommend *Rhynchospora mesoatlantica* for protection under the U.S.A. Endangered Species Act," Dr. Naczi and Ms. Eberly write. Passed in 1973, the Endangered Species Act is the primary law in the United States for protecting and conserving imperiled species.

To establish *Rhynchospora mesoatlantica* as a new species, the researchers compared plant parts of similar species, some measuring less than one millimeter. Shown are the mature fruits of (left to right) *Rhynchospora filifolia*, *Rhynchospora harperi*, and *Rhynchospora mesoatlantica*. The white scale bar at far right represents one millimeter.

Several previous researchers have included Delaware, Maryland and, in one case, New Jersey within the range of *Rhynchospora harperi*, another plant in the same genus as the new species that is typically found in the southeastern United States. Dr. Naczi and Ms. Eberly, however, noted substantial differences between plants of the Mid-Atlantic and those from farther south, leading them to suspect that the former constituted a distinct species.

They tested their hypothesis by conducting field work to gather geographic and ecological data, studying preserved plant specimens in eight research collections—including the Garden's William and Lynda Steere Herbarium—and painstakingly measuring many minute parts of plant specimens identified as *Rhynchospora harperi* and a similar plant, *Rhynchospora filifolia*. All of the measured plant parts were only a few millimeters at most, and some were less than one millimeter. Among the most important ones they measured were the length of the specimens' spikelets and the width of their fruits. Their analysis showed that the differences between specimens from the Mid-Atlantic and the other two species were statistically significant.

"Now that we have presented support for species status for [*Rhynchospora*] *mesoatlantica*, we name and describe this species in order to clarify its status and bring attention to it as a species of conservation concern," the authors write, noting that *mesoatlantica* is Latin for Mid-Atlantic.

There are only 12 recorded locations where the species has ever been observed, and the plant has not been seen at six of those sites for more than 20 years. At the six sites where the plant can still be found, their populations are typically small. The authors estimate that the number of mature plants at the six sites totals only about 700. Applying the criteria of the Red List of Endangered Species—the authoritative ranking of the world's threatened and endangered species by the International Union for Conservation of Nature (IUCN)—Dr. Naczi and Ms. Eberly make the assessment that *Rhynchospora mesoatlantica* qualifies as endangered, one of the Red List categories most at risk of extinction.

Further compromising the Mid-Atlantic Beaksedge's long-term prospects, the seasonal ponds where it grows have been severely degraded. These wetlands, whose water levels are typically highest in winter and spring and then gradually subside in summer and early fall, provide habitat for a wide range of rare or endangered plants and animals such as the Pink Tickseed, a type of sunflower; the endangered Canby's Dropwort, a member of the carrot family; the Eastern Tiger Salamander; and a type of water beetle found only in coastal seasonal ponds. The natural fluctuation in water levels at most of the sites Dr. Naczi and Ms. Eberly visited, however, have been disrupted by extensive ditches that have been dug to drain the ponds, apparently lowering the water table and disrupting the sites' ecosystems. Five of the six populations of *Rhynchospora mesoatlantica* are in protected areas, but most are in state forests that allow logging and other types of resource extraction, and, consequently, result in habitat alteration.

In addition to protecting the new species under the Endangered Species List and considering it for IUCN's Red List, the authors call for increased efforts to restore Mid-Atlantic coastal seasonal ponds to preserve not only the Mid-Atlantic Beaksedge but all of the wetlands' rare and endangered plants and animals.

"Habitat restoration with ongoing maintenance, especially for natural hydrologic cycles, appears to be warranted at most sites, including those on public lands," Dr. Naczi and Ms. Eberly write.

"*Rhynchospora mesoatlantica* (Cyperaceae), an imperiled new species of beaksedge from eastern U.S.A." is available at this link: https://doi.org/10.3897/phytokeys.236.111271

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