

Cladonia leporina (Cladoniaceae), a new macrolichen for New York State and northern range extension found in Brooklyn, New York City¹

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Abstract. A sizable population of the jester lichen, *Cladonia leporina* Fr., is here reported from dune habitat in Floyd Bennett Field, Brooklyn, NY. Marking a new record for New York, and the northernmost known record of this species, this study is a reminder that the Atlantic Coast likely still holds hidden diversity in its urban lichen communities.

Key words: biodiversity, lichen, Gateway National Recreation Area, NPS, urban ecology

The jester lichen, *Cladonia leporina* Fr., is a macrolichen common in rocky and sandy habitats in the American Southeast and some Caribbean islands (Brodo, Sharnoff, and Sharnoff 2001; Hammer 2001). Bearing resemblance to the reindeer lichens with which it frequently co-occurs, its common, bright red apothecia and abundantly branching, corticate podetia make the species particularly distinctive (Harris 1990, 1995; Ahti 2000). Although *C. leporina* frequently occurs in glades and sandy exposures from Texas to Florida, it was until recently not known to occur north of Cape May in southern New Jersey (as known from specimens collected by R. H. Torrey and G. Dillman in 1936), the perceived limit to its range.

On November 5, 2017, I took an excursion to sandy, dunelike habitats in Floyd Bennett Field, part of the greater Gateway National Recreation Area. Floyd Bennett Field was an active airfield for 40 yr, seeing both commercial and military use during that time. The field was retired in 1971 and rolled into the Gateway National Recreation Area, a collection of protected lands and public recreation areas in New York and New Jersey, a year

later (NPS 2018; D. Taft, personal communication). With several retired runways, park habitat includes not just native pine barrens and grasslands, but also eroding tarmac flats. Some park lands such as the grasslands are actively managed with prescribed mowing, whereas pine barrens are protected from public recreation, but are otherwise left alone (D. Taft, personal communication).

While searching for *Cladonia submitis* A. Evans, a potentially threatened species endemic



FIG. 1. *Cladonia leporina* observed in Floyd Bennett Field, Brooklyn, NY.

¹ A special thanks is extended to Floyd Bennett Field, part of the Gateway National Recreation Area, for granting permission to sample on their grounds, to David Taft at the National Park Service for revisiting the site with me, and to Dr. James Lendemer for providing advice and assistance while this short project developed.

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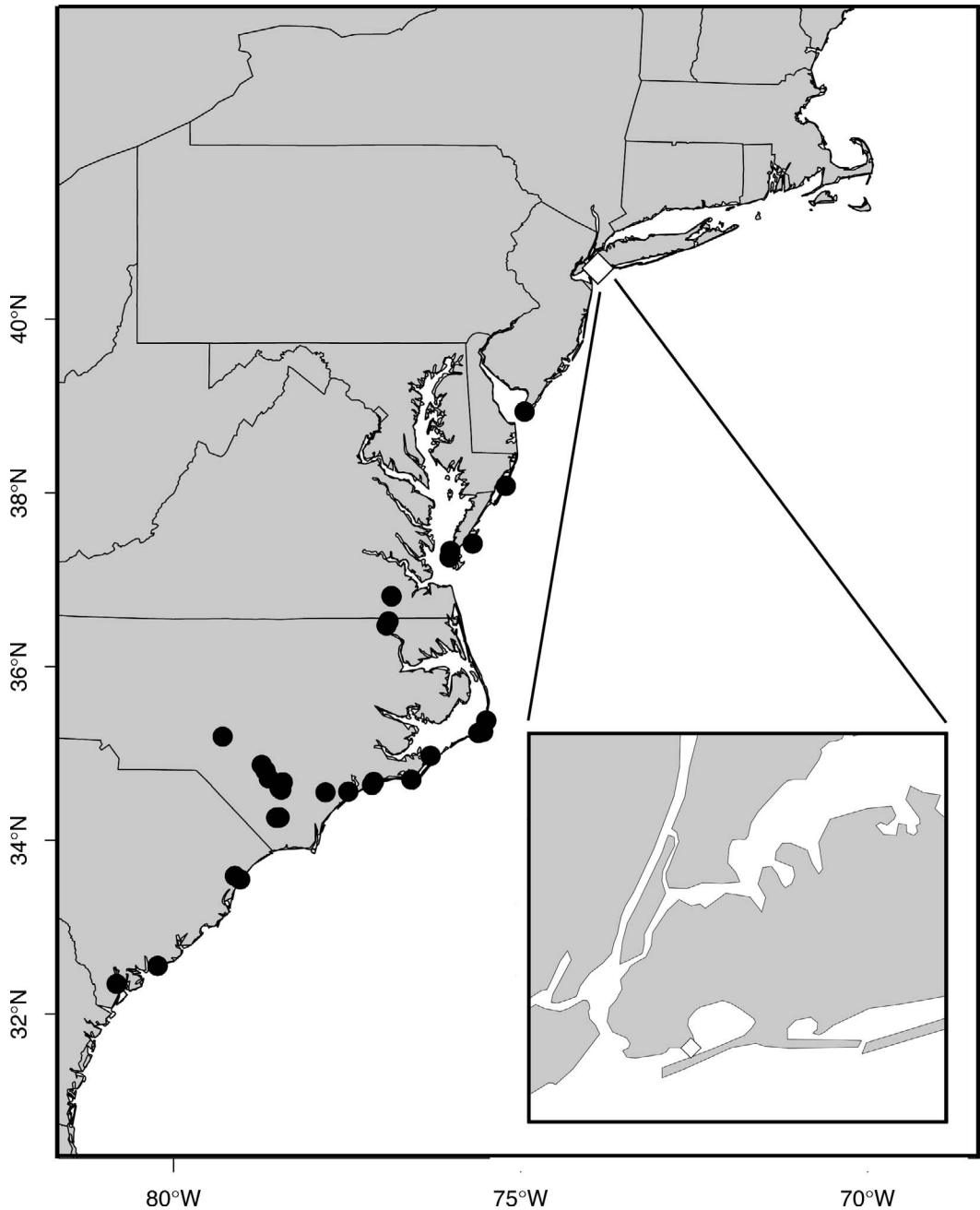


FIG. 2. Distribution map of *Cladonia leporina* in the northern limits of its range, including the recent observation made at Floyd Bennett Field, Brooklyn, NY.

to the region, I was surprised to discover a population of *C. leporina* in pine-barren habitat in the Floyd Bennett Field (Fig. 1). More than 100 thalli were observed in a 0.5-ha area, growing among other *Cladonia* species, including *C. sub-*

tenuis (Abbeyes) Mattick, *C. cristatella* Tuck., *C. macilenta* Hoffm., and *C. polycarpoides* Nyl. The latter species are all common lichens on Long Island, but relatively rare in New York City itself (Brodo 1968). The *C. leporina* thalli were found

patchily distributed within the search area, whereas most other *Cladonia* species in the area were more continuously dispersed through the habitat. Seemingly suitable habitat for the species (*i.e.*, sandy exposed substrate where other *Cladonia* lichens such as *C. subtenuis* are present) extended into the park beyond the survey site, but the survey was limited by the proximity to law enforcement and military infrastructure in the area. A small voucher of *C. leporina* was collected, keyed out in Brodo, Sharnoff, and Sharnoff (2001), and underwent thin-layer chromatography using the modified “peanut butter jar method” (Lendemer 2011) to confirm initial identification. The voucher was then deposited in the herbarium at the New York Botanical Garden to provide a permanent reference.

The discovery of *C. leporina* in New York is the first record of the species in the state. This new population, roughly 200 km north of the Cape May records, expands the known northern distributional limit of this otherwise southern lichen (Fig. 2). Indeed, the species is one of the iconic and charismatic macrolichens that is commonly found in sandy Coastal Plain habitats throughout the southeastern USA (Johnson 1977, Ahti 2000). Further surveys of the park and surrounding areas are needed to determine if the species is more abundant and more thoroughly dispersed in the area than was observed.

That a sizeable population of a previously unrecorded large and highly distinctive macrolichen was found within the limits of New York City is remarkable, given both the breadth of historical study in the region (Torrey 1819, Wood 1914, Brodo 1968, Allen, unpublished data) and the documented effect that pollution and disturbance have had on its lichen communities (Rose and Hawksworth 1981; Munzi, Ravera, and Caneva 2007; Van Natto, Wiersma, and Newmaster 2016). The present contribution serves as a reminder that the biodiversity of sandy dune lichen communities in the Mid-Atlantic is likely still underestimated. Further, dune communities in particular are also among the most threatened by sea-level rise and development (Feagin, Sherman, and Grant 2005; Mendoza-González *et al.* 2013). In fact, Floyd Bennett Field is specifically noted as threatened by sea-level rise by the New York City Department of City Planning (2017), which predicts that most of the park will be in the flood plain by 2050. With the threats facing the species

in this part of its range, it is possible that this population may become extirpated mere decades after its discovery. The previously known northernmost record of *C. leporina* was from dune habitat at Cape May Point in southern New Jersey and collected in 1936. The species no longer occurs at that site, and has likely been extirpated by dune recession, residential construction, or both (J. R. Hoffman, personal Observation).

SPECIMENS EXAMINED. USA. NEW YORK. KINGS CO.: Brooklyn, Floyd Bennett Field, N of unnamed road near aviation road, S of park police station, 40°34'59.88"N 73°53'12.8394"W, November 5, 2017, on sand, J. R. Hoffman 462 (NY).

USA. NEW JERSEY. CAPE MAY CO.: Cape May Point, Witmer Stone Bird Sanctuary, 38, 74, 1936, R. H. Torrey (NY) 975051.

USA. NEW JERSEY. CAPE MAY CO.: Cape May Point, Witmer Stone Bird Sanctuary, 38°56'1.6794"N, 74°56'34.7994"W, 1936, G. Dillman (NY) 975054.

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