

NYBG

New York City EcoFlora

What are Lichens?



Speckled Shield Lichen (*Punctelia rudecta*), Inwood Hill Park. [iNaturalist observation 6773181](#), Photo 8609685, (c) Nova Patch, some rights reserved (CC BY-SA).

Lichens are formed by two organisms, algae and fungi, growing together and cooperating in a symbiotic relationship. The fungi form most of the structure of the lichen, providing a sheltered space for the algae to grow. In return the algae photosynthesize and provide sugars for the fungus. This unique relationship is highly successful. There are a total of 20,000 species of lichens worldwide, and they grow on every continent.

Lichens are important members of global ecosystems. They cover ~8% of the land mass on Earth. Animals of all sizes use lichens. Small insects and spiders use them for shelter and camouflage. Birds and small mammals often use them as nesting material. Lichens are a major food source for caribou, and are also frequently eaten by deer, squirrels, and slugs. Lichens also contribute nutrients and function in basic geological processes, providing an important nitrogen source to forests, breaking down rocks, and stabilizing soils.

abundance decreases as air pollution increases. They are particularly sensitive to sulphur dioxide which affects the larger, foliose and fruticose lichens the most. By examining the historical lichen record of New York City, we can track the decline in air quality from the early 1800's until the 1960's. Since then, air quality has improved and many lichens have returned, especially crustose lichens which are most tolerant of pollution. Paris and London have seen increases in lichen abundance, but data is lacking for most American cities with the exception of New York, where over 100 species are documented .

One of the most directly useful ways people use lichens are as bio-indicators of air quality. Studies worldwide prove that lichen

In 2015, four new lichens for New York City were discovered colonizing the newly-created habitat at Fresh Kills Park, the former landfill capped in 1997 and transitioning to parkland. Lichenologists Jessi Allen, Natalie Howe and lead park scientist Cait Fields surveyed the lichens with students from the Macaulay Honors College participating in the 2015 BioBlitz. In the first published [lichen list for Staten Island](#), the researchers cataloged a total of seventeen species, including several not commonly found in urban areas. Comparison of the list to previous floras and checklists for New York City suggests that even the densely urbanized area of New York City likely hosts a surprisingly heterogeneous and diverse lichen flora. Citizen scientist observations showing the type of lichen and a scale (like a metrocard) will enable researchers to build on existing studies to assess lichen diversity and density throughout the City.

How to Identify Lichen Growth Forms

Lichens can be found on rocks, trees, soil and even buildings. They are divided into three major growth forms:

Foliose: leaf-like with a distinct upper and lower surface.



Fruticose: Shrubby, branching, and usually attaching to surfaces at a single or few points.



Crustose: Flat and completely stuck to surfaces so it is not possible to peel or pick them off of what they're growing on.

