**Supplementary Methods**

**Arbuscular mycorrhizal fungal communities associated with switchgrass in the acidic, oligotrophic pine barrens ecosystem**

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**Sampling site information.**

*Panicum virgatum* roots and root-abiding soil were collected in the summer months of 2014, 2016, and 2017 from: the pine barrens forests of New Jersey, Wharton State Forest (°39.7557667,  °-74.6947333) and Colliers Mills (°40.0680667, °-74.4449333), pine barrens forests of Long Island, NY, Rocky Point Pine Barrens Preserves (°40.907136, °-72.916676) and David A. Sarnoff Pine Barrens Preserve (°40.8975333, °-72.6586500), forest floors of the Federal Aviation Administration of New Jersey (°39.4443089, °-74.5632541), and 3 switchgrass research plots in New Jersey: Switchgrass research field plot in Somerset (°40.4748833, °-74.5310333), Rutgers Plant Science Research and Extension Farm in Adelphia (°40.2279333, °-74.2517000), and E.A.R.T.H Center at the Rutgers Cooperative Extension of Middlesex County in North Brunswick (°39.8787667, °-74.3767167) were also sampled in order to compare community structure from both natural and managed switchgrass populations. Sampling from the Long Island pine barrens forests was conducted in order to confirm whether or not there are pine barrens specific AM fungi. These forests are similar in plant and soil makeup to the New Jersey pine barrens forests but we noticed more lichen, moss, and wintergreen present on the Long Island pine barrens forest floors during sampling. The Long Island pine barrens forests notably makes up ~105,000 acres of the island 3.

Samples were also collected from Doolittle Prairie State Preserve in Ames, Iowa. This site is a 40-acre preserved prairie wetland with 223 native plant species, no trails, and is prescribed burned every 2-3 years. Sites were considered ‘managed’ if the soil was amended with fertilizers in any way and/or mowed annually. Sites were considered ‘natural’ if not managed, as we define it. Root samples were collected from similarly sized plants. However, the plants at the research farm in Adelphia were much larger than elsewhere, most likely because they were specially cared for when the plot was originally established and because it has full sun exposure. Other grass species were grown adjacent to switchgrass in these research field plots.

**Confirmation of plant host identity.**

In order to confirm our identification of *P. virgatum*, the leaf sheath from one *P. virgatum* plant from each sampled site was used for DNA analysis. Total gDNA was extracted from 0.125g of leaf tissue from each site using a PowerSoil DNA Isolation Kit (MO BIO Laboratories, Inc., Carlsbad, CA) according to manufacturer’s instructions. PCR was carried out with primer pairs MATKF-MATKR and rbcLAF-rbcLAR, using the protocols of Hollingsworth et al. 2009. PCR products were purified with ExoSAP-IT (Affymetrix, California) as per manufacturer’s instructions and sequenced by GenScript (Piscataway, New Jersey). The sequences were manually checked and trimmed for quality using Finch TV (PerkinElmer Inc., Seattle, Washington) and compared against the database of the National Center for Biotechnology Information using the BLASTn function ([http://blast.ncbi.nlm.nih.gov](http://blast.ncbi.nlm.nih.gov/)).

**References**

1 Forman, R. T. T. *Pine Barrens: ecosystems and landscape*. xli-601 (Rutgers University Press, 1998).

2 McCormick, J. & Buell, M. F. Natural Revegetation of a Plowed Field in the New Jersey Pine Barrens. *Botanical Gazette* **118**, 261-264, doi:10.1086/335952 (1957).

3 *Central Pine Barrens Overview*, <<https://pb.state.ny.us/central-pine-barrens/overview/>> (2018).