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Data S1

  Script files for plant trait analyses.

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File list (files found within DataS1.zip)

Final AMF Colonization Analysis.R

Plant Height and Nectar Volume Analysis.R

Interactive Flowering Phenology.R

Final Pollen Nicotine Negbin.R

Final Pollen Anabasine Negbin.R

Chemistry Plots.R

First and second sampling dates pollen.R

Relative pollen chemistry weights.R

amfcol.csv

Tobacco.master4.csv

pollen.firstdates.csv

Pollen.first.and.second.dates.csv

Description

The Supplemental Data included with this paper contains CSV files from which the R scripts read in data to be analyzed.

These CSV files were extracted from original data files in XLS or XLSX format.

The CSV files are included in the archive so that the R scripts will run to replicate analyses in the paper.

(I) General comments on the R scripts

Many of the R scripts include a "set working directory" command at the beginning, which will need to be modified.

The scripts are written so that they all work if all R scripts and CSV data files are put into one folder, and the working directory is set to that folder. This has only been tested under macOS but should also be true in Windows and Linux.

`Final AMF Colonization Analysis.R`

This script tests likelihood of AMF colonization across all four treatment groups, and calculates the mean % colonization for each treatment group. It uses the CSV files amfcol.csv and tobaccomaster4.csv

`Plant Height and Nectar Volume Analysis.R`

This script tests whether AMF or fertilizer treatment affects plant growth (measured as leaves/cm) or nectar volume (measured in microliters). It uses the file tobaccomaster4.csv.

`Interactive Flowering Phenology.R`

This script tests whether AMF or fertilizer treatment affects days to first flower using a survival analysis. It uses the file tobaccomaster4.csv.

`Final Pollen Nicotine Negbin.R`

This script carries out analysis of how AMF and fertilizer treatment affect concentration of nicotine in pollen, including data exploration and model selection. It uses the files tobaccomaster4.csv and pollen.firstdates.csv.

`Final Pollen Anabasine Negbin.R`

This script carries out analysis of how AMF and fertilizer treatment affect concentration of anabasine in pollen, including data exploration and model selection. It uses the files tobaccomaster4.csv and pollen.firstdates.csv.

`Chemistry Plots.R`

This script produces the graph for pollen anabasine and nicotine plots using top model outputs from analyses in 'Final Pollen Anabasine Negbin.R' and 'Final Pollen Nicotine Negbin.R'.

`First and second sampling dates pollen.R`

This script conducts the analysis testing for a correlation between early- and late-season nicotine and anabasine concentrations. This was conducted on a subset of plants ($n = 52$).

`Relative pollen chemistry weights.R`

This script conducts analysis of anabasine and nicotine concentrations using post-extraction pollen weights, rather than the estimated value of 6 mg.

Associated CSV files for these scripts:

`amfcol.csv`

id: unique number identifying each individual plant

fert: Refers to whether replicate was treated with high or low fertilizer

amf: Refers to whether replicated was inoculated with AMF (arbuscular mycorrhizal fungi) or not inoculated (1= inoculated, 0=not inoculated).

P: refers to the number of observations along the transect that had no fungal structures

Q: refers to the number of observations along the transect that had arbuscules

R: refers to the number of observations along the transect that had vesicles

S: refers to the number of observations along the transect that had arbuscules and vesicles

T: refers to the number of observations along the transect that had fungal coils

U: refers to the number of observations along the transect that had hyphae connected to a vesicle or arbuscule

V: refers to the number of observations along the transect that had hyphae not connected to a vesicle or arbuscule

Arb.col: Binary variable indicating whether there were any arbuscules found in the transect

n.arb: Refers to the number of observations that had an arbuscule

no.arb: Refers to the number of observations for that replicate except those that were arbuscules

initials: refers to observer

`Tobacco.master4.csv`

id: unique number identifying each individual plant

fert: Refers to whether replicate was treated with high or low fertilizer

amf: Refers to whether replicated was inoculated with AMF (arbuscular mycorrhizal fungi) or not inoculated (1= inoculated, 0=not inoculated.

Treat: refers to AMF and fertilizer treatment

Blk: Refers to spatial block, one of five benches in a greenhouse

Blkintable: Refers to spatial block within greenhouse bench

Vflow1: Refers to the volume (in microliters) of nectar produced by the first flower

 Vflow2: Refers to the volume (in microliters) of nectar produced by the second flower

Phen: refers to whether the plant flowered during the course of the experiment (1= flowered, 0= did not flower)

Dflow: Indicates the date of first flower

Jul.flow: Indicates date of first flower in Julian days

N flow: Refers to the number of flowers collected throughout the experiment, not including flowers deemed unsuitable for collection

Aph.flow: Indicates whether aphids were found on the flower or not (1= on flower, 0= not on flower)

Mold1: refers to the level of aphid honeydew-related mold on the plant

Jul.ht: Refers to the date final plant height was measured

Aphids47: refers to level of aphid presence on the first sampling date

Aphids418: refers to level of aphid presence on the second sampling date

Aphidlevel: refers to overall aphid presence rank (0=never present, 1=present at first sampling date, 2=present at second sampling date, 3 = present at both sampling dates)

Nleafmain: refers to the number of leaves produced by the main stalk of the plant at the end of the experiment

nleafsec: refers to the number of leaves produced by the secondary stalk of the plant at the end of the experiment

leaf.length.cm: refers to the length (cm) of the first fully expanded leaf at the end of the experiment

leaf.width.cm: refers to the width (cm) of the first fully expanded leaf at the end of the experiment

leaf.leaf.area.cm: refers to the are (cm) of the first fully expanded leaf at the end of the experiment

relana: re-calculated value of anabasine concentration using post-extraction weight

relnic: re-calculated value of nicotine concentration using post-extraction weight

pollen.firstdates.csv

id: unique number identifying each individual plant

ana.ng.mg.6: Refers to anabasine concentration (ng/mg) found in pollen

nic.ng.mg.6: Refers to nicotine concentration (ng/mg) found in pollen

week: Refers to latest date for which samples were pooled

julian.week: Refers to latest date for which samples were pooled in Julian day. This was included as a covariate in analyses to control for ontogeny of plant chemistry.

`Pollen.first.and.second.dates.csv`

id: unique number identifying each individual plant

first.date.ana: Refers to anabasine concentration (ng/mg) found in pollen for the early-season sampling date

first.date.nic: Refers to nicotine concentration (ng/mg) found in pollen for the early-season sampling date

second.date.ana: Refers to anabasine concentration (ng/mg) found in pollen for the late-season sampling date

second.date.nic: Refers to nicotine concentration (ng/mg) found in pollen for the late-season sampling date

julian.first.week: Refers to latest date for which samples were pooled in Julian day **on the first sampling date**. This was included as a covariate in analyses to control for ontogeny of plant chemistry.

julian.second.week: Refers to latest date for which samples were pooled in Julian day **on the second sampling date**. This was included as a covariate in analyses to control for ontogeny of plant chemistry.

amf: Refers to presence/absence of mycorrhizal fungi treatment. 0= no AMF; 1= AMF

fert: Refers to fertilizer treatment. H= high fertilizer; L=low fertilizer