NotesonSERC\_SLAstatistics2021113.docx

Statistics of the Specific Leaf Area values at the Smithsonian Environmental Research Center (SERC) given in datafile **SERCSLAbyspecies4.25.21.xlsx**

Background on the sample collections

The samples are of two sorts. First are those collected at the forest floor soon after falling in the Autumn. These were whole leaves collected during the entire Fall period over several years in many plots of the SERC chronosequence of tulip poplar forests (project described in Brown and Parker (2004) and McMahon et al. (2010)) – these samples are labeled ‘fallen’ in the origin column. We consider these to be the most spatially and temporally representative. The other samples, labelled ‘attached,’ are of fresh, whole leaves collected within the canopy of the mature forest in the central section of SERC (for a description of this stand see Parker et al. 1988, Parker and Tibbs 2004 and Coble at el. 2017). These are tabled when fallen samples were not available or when the sample size of the ‘fallen’ type was small. Only entire leaves with minimal insect damage were used.

Background on the sample processing

Leaves were dried to a constant weight at 60 C and weighed. Leaf areas were measured with a LI-COR model 3100 Leaf Area Meter, calibrated with standard area disks. Some outliers were excluded from the data (1.25 % of the entire dataset). Leaf-based SLA (cm2 g-1) is calculated as leaf area (cm2)/leaf dry mass (g). Note that the SLA is not constant, but tends to decline increasing leaf mass. In, fact the majority of species showed a significantly negative relation between SLA and mass. We suspect this effect relates to change in the relative contribution of supportive structure (much mass and little area) and lamina (more area and less mass) with increasing leaf mass. Therefore we also provide the integral mean SLA, which is the mean area/mean mass. Cases where the integral mean is very different from the mean ratio are where the SLA-mass relation is markedly non-linear.

Meaning of the columns in file **SERCSLAbyspecies4.25.21.xlsx**

SERC numerical code

Standard taxonomic codes

Species binomial name

Origin (attached or fallen)

N - number of samples

Mean leaf area, cm2

Standard deviation of leaf area

Mean leaf mass, g

Standard deviation of leaf mass

Mean SLA, cm2 g-1

Standard deviation of SLA

Integral mean SLA, cm2 g-1

Some references

Parker GG, O’Neill JP, Higman D. 1989. Vertical Profile and canopy organization in a mixed deciduous forest. Vegetatio 89:1-2.

Brown MJ, Parker GG. 1994. Canopy light transmittance in a chronosequence of mixed-species forests. Canadian Journal of Forest Research 24:1694-1703

Parker GG, Tibbs DJ. 2004. Structural phenology of the leaf community in the canopy of a Liriodendron tulipifera L. forest in Maryland, USA. Forest Science. 50:387–397.

McMahon SM, Parker GG, Miller DR. 2010. Evidence for a recent increase in forest growth. Proceedings of the National Academy of Sciences of the United States of America. 107:3611–3615. DOI: <https://doi.org/10.1073/pnas.0912376107>

Coble AP, Fogel ML, Parker GG. 2017. Canopy gradients in leaf functional traits for species that differ in growth strategies and shade tolerance. Tree Physiology 37:1415–1425, https://doi.org/10.1093/treephys/tpx048