**Supplementary Document S1. Literature sources for element values in Table 4**

**Eastern North America**

Bennett, J. P. (1995) Abnormal chemical element concentrations in lichens of Isle Royale National Park. *Environmental and Experimental Botany* 35(3): 259-277.

Bennett, J. & Showman, R. (1997) 1996 *Lichen Studies at Lincoln Boyhood National Memorial in Comparison with Lichens at the Rockport Power Plant, Spencer County, Indiana*. Report submitted to National Park Service.

Bennett, J. P. & Wetmore, C. M. (1997) Chemical element concentrations in four lichens on a transect entering Voyageurs National Park. *Environmental and Experimental Botany* 37: 173–185.

Cleavitt, N. L., Hinds, J. W., Poirot, R. L., Geiser, L. H., Dibble, A. C., Leon, B., Perron, R.. & Pardo, L. H. (2015) Epiphytic macrolichen communities correspond to patterns of sulfur and nitrogen deposition in the northeastern United States. *Bryologist* 118: 304-324.

Montero, A., Estévez, J., Padilla, R., & López, D. (2009) Analytical performance of some methods for the determination of trace elements in lichens used as air quality assessment. *Journal of Radioanalytical and Nuclear Chemistry* 281(3): 569-575.

Wetmore, C. (1992) *Lichens and Air Quality in George Washington Carver National Monument*. Report submitted to National Park Service.

Wetmore, C. & Bennett, J. (1997) *Lichens and Air Quality in Three Prairie Parks: Effigy Mounds National Monument - Iowa, Homestead National Monument - Nebraska, and Wilson's Creek National Battlefield - Missouri.* Report submitted to U.S. Geological Survey.

Will-Wolf, S., Nelsen, M. P., Trest, M. T., Rolih, K., Reis, A., & Jovan, S. (2014) *Lichen community indices for response to climate and air quality in the Midatlantic states, U.S.A*. Internal USDA FIA report, October 2014.

Will-Wolf, S., Makholm, M. M., Nelsen, M. P., Trest, M. T., Reis, A., & Jovan, S. (2015) Element analysis of two common macrolichens supports bioindication of air pollution and lichen response in rural midwestern U.S.A. *Bryologist* 118(4): 371-384.

**Europe**

Data cited from European sources include values for *Anaptychia*, *Physcia*, and *Xanthoria* spp. that are generally similar in morphology and ecology to *P. aipolia* and *P. stellaris*.

Boltersdorf, S. H., Pesch, R., & Werner, W. (2014) Comparative use of lichens, mosses and tree bark to evaluate nitrogen deposition in Germany. *Environmental Pollution* 189: 43–53.

Brunialti, G., & Frati, L. (2007). Biomonitoring of nine elements by the lichen Xanthoria parietina in Adriatic Italy: A retrospective study over a 7-year time span. *Science of the Total Environment* 387: 289–300.

Dzubaj, A., Bačkor, M., Tomko, J., Peli, E., & Tuba, Z. (2008) Tolerance of the lichen *Xanthoria parietina* (L.) Th. Fr. to metal stress. *Ecotoxicology and Environmental Safety* 70: 319–326

Godinho, R. M., Verburg, T. G., Freitas, M. C., & Wolterbeek, H. T. (2009) Accumulation of trace elements in the peripheral and central parts of two species of epiphytic lichens transplanted to a polluted site in Portugal. *Environmental Pollution* 157(1): 102-109.

Loppi, S., & Bonini, I. (2000) Lichens and mosses as biomonitors of trace elements in areas with termal springs and fumarole activity (Mt. Amiata, central Italy). *Chemosphere* 41: 1333–1336.

Loppi, S. & Pirintsos, S. A. (2003) Epiphytic lichens as sentinels for heavy metal pollution at forest ecosystems (central Italy). *Environmental Pollution* 121: 327–332.

Loppi, S., Faleri, C., & Paoli, L. (2014). Influence of sample cleaning prior to the analysis on the elemental content of the lichen *Xanthoria parietina* (L.) Th.Fr. *Bulletin of Environmental Contamination and Toxicology* 93(3): 350-353.

Parzych, A., Zduńczyk, A., & Astel, A. 2016. Epiphytic lichens as bioindicators of air pollution by heavy metals in an urban area (Northern Poland). *Journal of Elementology* 21: 781-795.

Purvis, O. W., Chimonides, P. J., Jeffries, T. E., Jones, G. C., Read, H., & Spiro, B. (2005) Investigating biogeochemical signatures in the lichen *Parmelia sulcata* at Burnham Beeches, Buckinghamshire, England. *The Lichenologist* 37: 329–344.

Riga-Karandinos, A.N. & Karandinos, M.G. (1998) Assessment of air pollution from a lignite power plant in the plain of Megalopolis (Greece) using as biomonitors three species of lichens; impacts on some biochemical parameters of lichens. *Science of the Total Environment* 215: 167-183.

Sloof, J. E. (1995) Lichens as quantitative biomonitors for atmospheric trace-element deposition, using transplants. *Atmospheric Environment* 29: 11-20.

Sloof, J. E. & Wolterbeek, B. T. (1993) Interspecies comparison of lichens as biomonitors of trace-element air pollution. *Environmental Monitoring and Assessment* 25: 149–157.

Tsikritzis, L. I., Ganatsios, S. S., Duliu, O. G., & Sawidis, T. D. (2002) Heavy metals distribution in some lichens, mosses, and trees in the vicinity of lignite power plants from West Macedonia, Greece. *Journal of Trace and Microprobe Techniques* 20: 395–413.