Quality control of the nutrient mass ratio of foliar samples collected at the ICOS Ecosystem stations.

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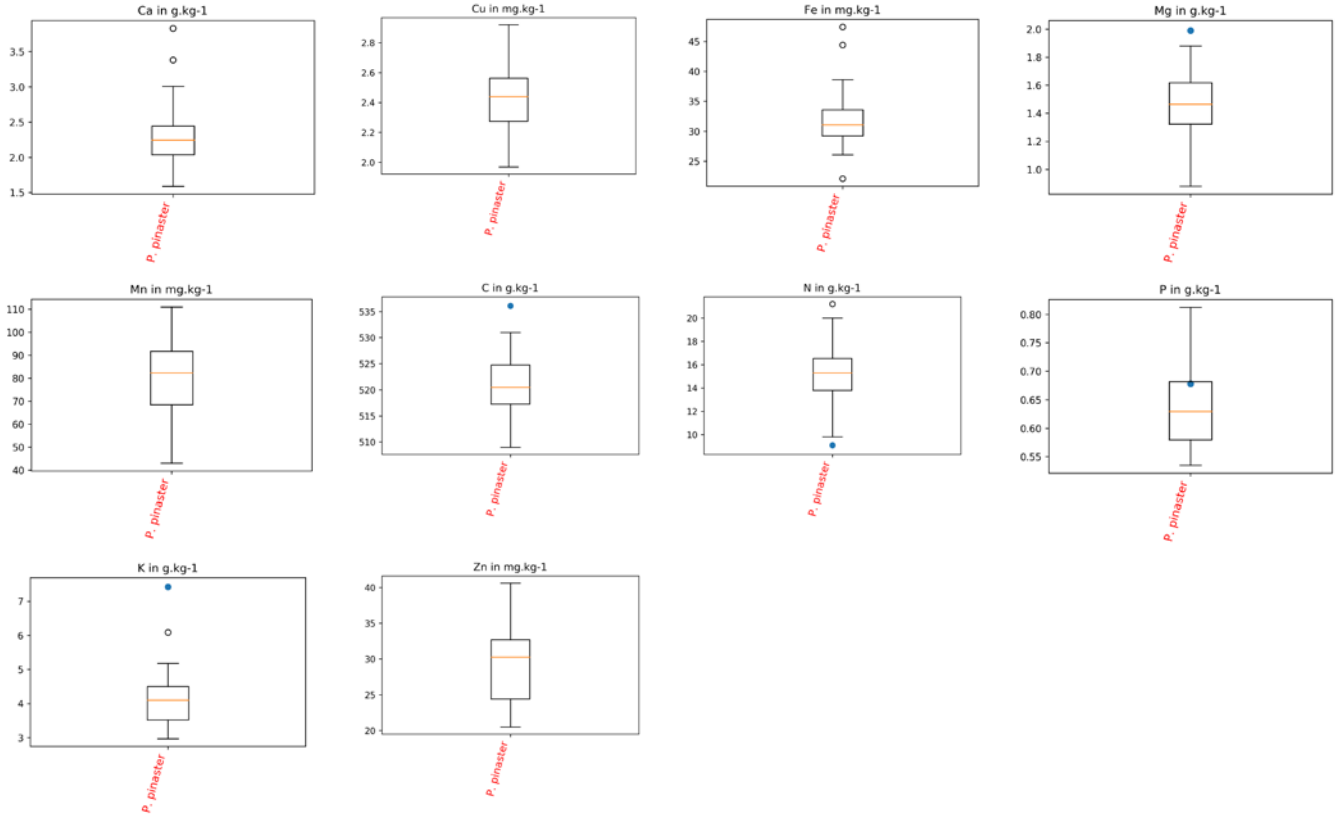
The Ecosystem stations network of ICOS-RI (https://www.icos-ri.eu/) is monitoring the energy, water and greenhouse gas exchanges between 41 terrestrial ecosystems and the atmosphere, from 2018 to 2035, at a half an hour time resolution. A number of ancillary variables are also monitored using standard protocols (http://gaia.agraria.unitus.it/icos/documents/instructions). Among them the nutritional status of the foliage within the target area of each station is particularly relevant in order to detect putative effects of changing nutritional conditions on atmospheric exchanges (Jonard et al. 2009, 2015)[1]. In order to check the values of nutrient mass ratio measured across the ICOS Ecosystem stations network, we are wanting to compare the values obtained with available data obtained from the European ICP – forests and the TRY database for the same species and under similar climate and soil conditions. Mean values and its range will be compared visually according to the figure below where the Try database values are indicated by blue points. However the Try database data is not always documented adequately, with all the necessary metadata and does not allow therefore a transparent and rigorous inter comparison with ICOS values. This is why we think the ICP-Forest values would be much more convenient to this end.

Our present demand is concerning strictly the quality check of ICOS data that is an internal process. Neither ICP or the Try database values will be published but the use of data (not the data themselves) for QA/QC will be duely mentioned in the metadata associated with. We shall eventually come back to ICP-Forest for future co-operation and analysis of ICOS data.

[1] Jonard, M., Andre, F., Dambrine, E., Ponette, Q., and Ulrich, E.: Temporal trends in the foliar nutritional status of the French, Walloon and Luxembourg broad-leaved plots of forest monitoring, Ann For Sci, 66, 10.1051/forest/2009014, 2009.
Mathieu, J., Alfred, F., Arne, V., Anne, T., Volkmar, T., Nenad, P., Peter, W., Sue, B., Karin, H., Päivi, M., Quentin, P., C, C. A., Peter, R., Manuel, N., Luc, C., Morten, I., Giorgio, M., Bruno, D., Marco, B., and Pasi, R.: Tree mineral nutrition is deteriorating in Europe, Global Change Biol., 21, 418-430, doi:10.1111/gcb.12657, 2015.



- Mean value of the **Pinus pinaster** from TRY-db Data when available. (*https://www.try-db.org/TryWeb/Home.php*)

Figure 1. Example of comparison test of the nutrient mass ratio of needle samples collected at the Salles ICOS station (Fr-Bil), January 2018. ICOS values are shown as box plots, the red line is the average value of N=30 samples.