Supplementary Material

Carbonates

Although physico-chemical conditions in some soil samples, pH below 7 and high C%, would suggest that carbonates are unlikely to form, in the heterogeneous soil conditions, there are several reasons why we believe that carbonates could be present: (1) Although not definite proof, we have found a positive correlation between increasing pH and increasing total Ca (r=0.513, $p<0.001$) and water-extractable Ca (r=0.651, $p<0.001$) content, suggesting increasing carbonate content as pH increases, (2) bulk sampling and subsequent measurement of pH and C% in those bulk samples provides an estimate of these parameters in soil however, carbonates could be found in isolated soil pockets. Soil conditions in these soil pockets could be conducive to carbonate formation, and finally (3) one sample in particular (Sample 27) would appear to be highly unlikely to form carbonates. This sample is a good example of a potential outlier in our sample set where it is possible that some of the upper thatch layer (which was removed to the best of our abilities before sampling at each location) was accidentally incorporated into the sample, resulting in a very high C% content. Other samples at this sampling location (24, 25 and 28) have an average C content of 6.8%, which is much lower than reported 17% in sample 27. This potential sampling artefact could in fact lead to erroneous data processing but was kept in the dataset as we believe to have accounted for this by using biological replicates and a larger sampling size than typically performed when using CISED and other sequential extraction methodologies. It also demonstrates the robustness and strength of including many replicates when dealing with soil samples, which are inherently heterogeneous in nature. However, we only tentatively ascribe this soil phase as carbonates in this study as we did not confirm their presence using other methodologies in the laboratory.