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Crowdsourcing data on decomposition with the help of schools - Tea4Science

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Decay of organic material, decomposition, is a critical process for life on earth. Through decomposition, food becomes available for plants and soil organisms that they use in their growth and maintenance. When plant material decomposes, it loses weight and releases the greenhouse gas carbon dioxide (CO_2) into the atmosphere. Commercial nylon teabags containing plant material can provide vital information on the global carbon cycle, if we study their decomposition in soils. Terrestrial soils contain three times more carbon than the atmosphere and therefore changes in the balance of soil carbon storage and release can significantly amplify or attenuate global warming. Many factors affecting the global carbon cycle are already known and archived; however, an index for decomposition rate is still missing. It would be a great improvement if we could measure decomposition (rate and degree) globally instead of estimating it from small scale experiments and lab incubations.

We developed a cost-effective and standardised method to investigate decomposition rate and carbon stabilisation; by using commercially available teabags as standardised test-kits for simplified litter bag experiments. In order to make it easy for schools to take part through crowdsourcing (i.e. volunteer-assisted data collection by means of Internet applications), a lesson plan has been written to teachers. The so acquired Tea Bag Index (TBI) provides process-driven information on soil functions at local, regional and global scales essential for future climate modelling; and it is sensitive enough to discriminate data between different ecosystems and soil types. The lesson plan will enable students to understand the concept of decomposition and its relevance for soil fertility and our climate.

TBI requires only little means and knowledge, making data collection by crowdsourcing possible. Successful results have already been attained by scout groups in Austria. Engaging schools classes as co-researchers would enlarge the crowdsourcing potential of the TBI. Subsequently, it will increase awareness of soils and provide essential development in including soils more frequently into the natural sciences and environmental classes at schools. The numerous data points collected will allow for a great leap forward in mapping decomposition, as well as understanding and modelling the global carbon cycle.