

Recalcitrance – dead and buried?

In the peer-review process, editors often must decide between opposing views from author and reviewer. In some cases, particularly with contentious issues, both sides might put forward convincing arguments that demand equal consideration. The Concept article in this issue by Markus Kleber^[1] on recalcitrance in soil organic matter has resulted in such a situation, leading to a feisty debate in the accompanying two articles.^[2,3]

The Kleber Concept article challenges the long-accepted notion that inherent recalcitrant properties of chemicals can be used to describe the stabilisation and turnover of soil organic matter. He presents alternative explanations for the observation that various types of compounds in soils decompose at dramatically differing rates. Kleber dismisses theories based on intrinsic chemical properties of the soil organic matter; indeed, he describes the operationally defined term recalcitrance as qualitative, unnecessary and misleading. Instead, Kleber argues strongly in favour of explanations based on microbial ecology, i.e. that environmental constraints acting on the decomposer community govern substrate preferences and decomposition rates of organic matter in soils.

Strong views invite strong comments, and these were quickly forthcoming from Margit von Lützow and Ingrid Kögel-Knabner,^[2]

who vigorously argue for the retention of the concept of recalcitrance. In their view, recalcitrant properties link the initial pathway of decomposition and the stabilisation of soil organic matter, and thus the concept of recalcitrance is integral to our understanding of organic matter turnover in soils.

Concept articles, unique to *Environmental Chemistry*, give authors the opportunity to put forward speculative and sometimes controversial hypotheses. Such articles can generate lively debate among the relevant research communities, as demonstrated in the following three papers opening this journal issue.

Kevin A. Francesconi and Jon Chorover

- [1] M. Kleber, What is recalcitrant soil organic matter? *Environ. Chem.* **2010**, *7*, 320. doi:10.1071/EN10006
- [2] M. von Lützow, I. Kögel-Knabner, Response to the Concept paper: 'What is recalcitrant soil organic matter?' by Markus Kleber. *Environ. Chem.* **2010**, *7*, 333. doi:10.1071/EN10085
- [3] M. Kleber, Response to the Opinion paper by Margit von Lützow and Ingrid Kögel-Knabner on 'What is recalcitrant soil organic matter?' by Markus Kleber. *Environ. Chem.* **2010**, *7*, 336. doi:10.1071/EN10086