

Research highlights the importance of 'self-DNA' for maintaining diversity among species

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In natural plant communities, diversity is maintained by limits set on each plant by itself. This involves a detrimental effect of self-DNA (DNA from the same species released during decomposition) on the plant's and its offspring's growth. New research finds that this process not only regulates plant populations but may also be generalized to a range of additional organisms including algae, protozoa, fungi, and animals.

The findings indicate that self-DNA is involved in the regulation of species coexistence and competition, and it might be harnessed for new pharmacological applications in both agriculture and medicine.

"The discovery of an unknown inhibitory effect by extracellular self-DNA has been like adding the last piece to a difficult jigsaw puzzle. Surprisingly, it appeared to be a natural and simple explanation for many cases of negative plant-soil feedback, including the well-known phenomenon of soil sickness in agriculture," said Dr. Stefano Mazzoleni, lead investigator of the *New Phytologist* research. "The general occurrence of such inhibition in all tested organisms other than [plants](#) raises the question of whether this could be a new paradigm for biology."

An accompanying editorial letter notes that there are currently a lot of open questions with regards to the ecological significance of self-DNA effects.

More information: Mazzoleni, S., Bonanomi, G., Incerti, G., Chiusano, M. L., Termolino, P., Mingo, A., Senatore, M., Giannino, F., Cartenì, F., Rietkerk, M. and Lanzotti, V. (2015), Inhibitory and toxic effects of extracellular self-DNA in litter: a mechanism for negative plant-soil feedbacks?. *New Phytologist*, 205: 1195-1210. [DOI: 10.1111/nph.13121](https://doi.org/10.1111/nph.13121)

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