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MODELLING COMPETITIVE INTERACTIONS AND PLANT-SOIL FEEDBACK IN VEGETATION DYNAMICS

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Plant-soil feedback has been proved to play an important role in the formation of vegetation patterns for a single species [1]. In real-life, however, plants rarely grow in monoculture; hence multi-species scenarios are more realistic. In these cases, additional effects between different species - such as competition and interaction - must be considered. Moreover, plant-soil feedback is recognised as a causal mechanism for plant-species coexistence [2].

Using a mathematical model consisting of four PDEs, we investigate mechanisms of *inter-* and *intra-specific* plant-soil feedback on the coexistence of two competing plant species. In particular, the model takes into account both negative and positive feedback influencing the growth of the same and the other plant species. Both the coexistence of the plant species and the dominance of a particular plant species are examined with respect to all model parameters. Analytical and numerical results reveal the emergence of spatio-temporal patterns.

References

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