DEVELOPING A MACROSCOPIC FUNGAL GROWTH MODEL

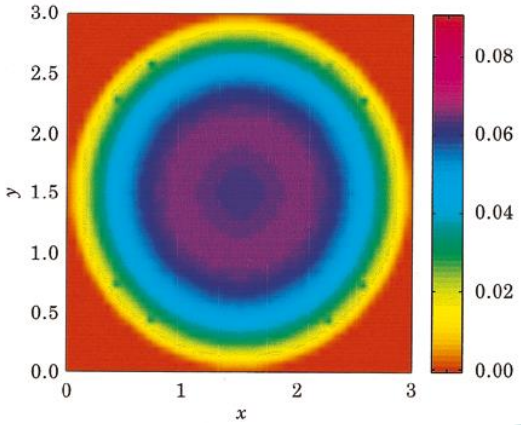
Background

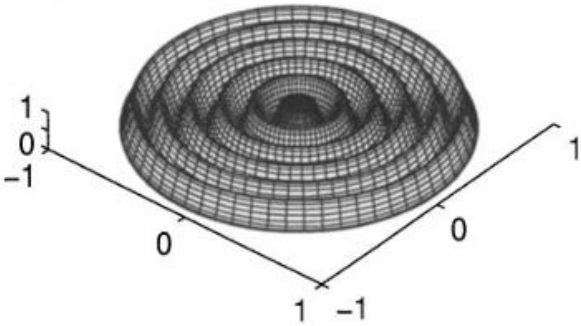
Fungi are present in and affect all kinds of ecosystems on planet Earth. They are the primary decomposers of litter in forests and can be used for bioremediation as an alternative to chemical pesticides. On the other hand, they also give rise to huge economic losses as a consequence of the yield loss they frequently cause and the damage to buildings.

Many efforts have been spent to fully comprehend the processes steering fungal growth and the underlying mathematics in order to build fungal growth models. Among those models, many researchers have favoured macroscopic approaches, which give a better picture of the interaction between fungi and their environment. Growth is a continuous process, hence it is through continuous models that fungi have mostly been analyzed.

Goal of the thesis

The macroscopic continuous models that have been relied upon to this day to mimic fungal growth are either too complex or too simple. Based upon an extensive literature review of the existing fungal growth models, the aim of this thesis is to develop a simple continuous model, relying on partial differential equations, which is able to replicate some of the main features of fungal growth. Hereto, the prospective student will address each of the steps in the modelling cycle, which is a prerequisite to arrive at a reliable and sound mathematical model of a natural process.





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