

# DESTABILIZATION, STABILIZATION, AND MULTIPLE ATTRACTORS IN SATURATED MIXOTROPHIC ENVIRONMENTS

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The ability of mixotrophs to combine phototrophy and phagotrophy is now well recognized and found to have important implications for ecosystem dynamics. In this paper we examine the dynamical consequences of the invasion of mixotrophs in a model that is a limiting case of the chemostat. The model is a hybrid of a competition model describing the competition between populations of autotroph and mixotroph for limiting resources, and a predator-prey type model describing the interaction between populations of autotroph and herbivore. Our results show that mixotrophs are able to invade in both autotrophic environments and environments described by interactions between autotrophs and herbivores. The interaction between autotrophs and herbivores might be in equilibrium or cycle. We find that invading mixotrophs have the ability to both stabilize and destabilize autotroph-herbivore dynamics depending on the competitive ability of mixotrophs. The invasion of mixotrophs can also result in multiple attractors.

## References

- [1] Lindström, T., Cheng, Y., and Chakraborty, S. (2019). *Destabilization, stabilization, and multiple attractors in saturated mixotrophic environments*. <https://arxiv.org/abs/1909.01629>