

Adaptive dynamics of mutualistic network in a changing world

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Earth planet is an active and alive planet adapted for Human species. Human's activity controls the speed of our planet to change. Humans could be described as cheaters in a mutualistic community. Like us, nature needs a stable and feasible environment where multiple species could coexist, like mutualistic communities, and also given that species coevolution should be essential to species survival.

In the present thesis, I simulated the eco-evolutionary dynamics a mutualistic network composed by generalist and specialist interactions in a changing world. I used adaptive dynamics framework to study plant-pollinators species coevolution with plant attractiveness β_i as the phenotypic trait under selection. I simulated environmental degradation by decreasing pollinators intrinsic growth rate, while plants intrinsic growth rate are in trade-off with their attractiveness.

Through simulations four different evolutionary strategies were identified (from the most favorable to the less favorable): stable coexistence, evolutionary restoration, alternative stable evolutionary state, and evolutionary murder. More the pollinators are threaten, less favorable is the issue of the eco-evolutionary dynamics. In general plant attractiveness evolution accelerates pollinators decline, with some subtleties depending if the species is a generalist or a specialist.

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