
Is thyme a bouncer ? Analysing the effect of a facilitator on community assembly with presence-absence data.

Fabien Laroche*¹ and Bodil Ehlers²

¹Ecosystèmes forestiers (UR EFNO) – Irstea – Domaine des Barres, F-45290 Nogent-sur-Vernisson, France

²Aarhus University [Aarhus] – Nordre Ringgade 1 DK-8000 Aarhus C, Denmark

Abstract

Facilitation has been shown to strongly impact species composition in some plant communities. However, in many cases, the underlying mechanisms are poorly known. First, a facilitator could locally improve the habitat quality, which would benefit all other plants and increase their likelihood of being found around the facilitator. We call this non-specific facilitation. Second, a facilitator could also increase the local relative abundance of some species while decreasing the relative abundance of others, which get excluded through direct interactions with the facilitator. We call this specific-facilitation. Both mechanisms should result in observed changes in probability of occurrence of species when comparing communities with and without facilitator. Here we propose a model which uses presence-absence data to disentangle non-specific from specific effects. We apply it to a case study of Mediterranean herbaceous plant dominated by wild thyme (*Thymus vulgaris*) previously shown to locally increase plant species richness. Despite a limited statistical power, we retrieve that thyme has a significant effect on the surrounding plant community. Whether the effect of thyme on species richness was due to a non-specific or a specific facilitation effect varied among plant communities and was mildly associated with a variation in the dominant monoterpene produced by thyme: non-phenolic strains tended to show non-specific facilitation only, while others lead to specific facilitation. Future experimental work is now needed to corroborate the contrasted effects of phenolic vs non phenolic thyme plants on surrounding plant communities.

Keywords: facilitation, cooccurrence, thyme, neutrality

*Speaker