PL02 - Beyond communities: Linking environmental and spatial drivers to the metacommunity structures using ponds as model systems

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Why the organisms are where they are is still a paramount question in ecology. Several approaches to this question have been done, starting from population and community ecology and ending with metacommunity approaches, in which spatial, and dispersal-related dynamics at regional scale are incorporated.

Within the metacommunity framework, multiple idealized non-random patterns of species distributions have been described: checkerboard, nested, evenly spaced, Clementsian and Gleasonian distributions. These idealized structures are the result of the ecologists' efforts to typify the observed patterns of species distributions among sites. The identification of such structures is popularly made analysing the Elements of Metacommunity Structure (EMS). However, and although EMS allow distinguishing the observed structures, they did not inform about the drivers shaping such structures. In fact, both environmental and spatial drivers could lead to similar metacommunity structures through species sorting or/and dispersal limitation.

Here, we introduce a theoretical framework that links the drivers to the observed structures. To do so, we will start with the fundamentals, and give an overview to the actual "state of the art", to introduce thereafter the new framework that links drivers to metacommunity structures. Finally we will point out recent developments in this topic for future studies and applications, using ponds as model systems.