MetaCon Protocol & Proposal

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Call for Proposals:

"Dispersal, along with speciation and extinction, is one of three fundamental processes that underlie the diversity and distribution of life on Earth. Local interactions directly affecting performance are typically linked to local coexistence (modern coexistence theory), but such interactions may also impact species' dispersal rates, and therefore mediate species coexistence at larger spatial scales (e.g., the metacommunity) and mediate structural dynamics. Whilst mechanistic understanding of dispersal dynamics has progressed rapidly over the last decade, the inclusion of biotic interspecific interactions as mediators of the process over ecological and evolutionary time scales is a largely missing, and potentially a critical, piece of the puzzle. Despite their clear importance, explicit attempts to reveal how interspecific interactions can dampen, augment or redistribute dispersal processes are rare. Historically, dispersal is traditionally explored in single non-interacting species metapopulations to achieve broad spatial understanding, whereas species interactions research tends to focus on single locations to pursue in-depth understanding of trophic, competitive and mutualistic interactions. So far, there is a large body of research on vector-based dispersal, where usually larger species act as a transport medium for smaller species, often belonging to other kingdoms, but such research usually lacks a mechanistic perspective. This mismatch in question-framing and methods has led to missed opportunities to reap the benefits that could be gained by linking dispersal with biotic interactions explicitly.

In order to integrate interspecific interactions as potentially important drivers of dispersal in (evolving) metacommunity dynamics, Emanuel A. Fronhofer, Sally Keith and I are exploring the possibility of editing a special issue for Philosophical Transactions of the Royal Society of London. We hope to bring together reviews and perspectives, as well as primary research, in three topical sections on the relationship between dispersal and species interactions and/or community structure.

1. Causes (mechanisms, information use)
2. Consequences (stability of metacommunities, coevolution, local adaptation of interactions)
3. "Upscaling" (macroecology, macroevolution, speciation, evolutionary geomorphology)

And along 5 transversal axes:

1. Biotic interactions / species diversity: from metapopulations to metafoodwebs
2. Spatial scale: from regional to global / macroecological
3. Temporal scale: from ecology to evolution, microevolution and macroevolution
4. Systems / biomes: terrestrial, freshwater marine
5. Approaches methods: theoretical models, lab / field experiments and comparative studies

Special issues in Philosophical transactions rely on the evaluation of a proposal. We are currently developing such a proposal and would like to submit a realistic plan with balanced contributions into these fields. We honestly are not even sure whether it will be possible at this time to continue with this plan as there might simply not be enough research going on in the field, let alone new results and insights available except for some general perspectives on the topic. We therefore send this email to you – researchers and experts in the fields of dispersal and metacommunity ecology - to inquire whether you or someone that you know would be able to contribute to such a special issue. We are aware that this list remains very thin and that we have missed many other potential contributors. We aim to maximise diversity of contributors in terms of geographical origin, gender and career stage. As you will notice, we have kept the list of emailed people visible in the header of this email. Please, do not respond to all when replying to us, but use this list to seek whether we have missed potential contributors. We kindly ask you to forward this email to anyone potentially missing, adding Emanuel, Sally and me in cc-only. Based on your responses we will hopefully be able to come-up with a final, balanced proposal to be shared to all potential contributors in advance of submission. Please get back to us as soon as possible. We will close our 'exploration round' in two months from now (September 30th). We thank you a lot for your assistance and, hopefully, contributions. If you have further remarks or comments, do not hesitate to get in touch with us. Best wishes Dries, Emanuel and Sally"

Research Questions

1. Does environmental heterogeneity across a landscape allow for the persistance of generalist pollinators or plants at parameter values where they may otherwise be excluded?

2. Can we use measures of connectedness and centrality of patches to predict whether they may be generalism "hotspots" or "coldspots"?

3. Dispersal

Model