Networks of interactions in ecology

François Massol*†[1]

[1]Evolution-Ecologie-Paléontologie (EEP) – CNRS : UMR8198, Université Lille I - Sciences et technologies – Batiment SN2 59655 VILLENEUVE D ASCQ CEDEX, France

Abstract

Interactions between individuals, populations or species are a central pillar of ecology: all organisms interact, in various forms, with others, and these interactions in turn define the functioning of ecosystems. The past twenty years have seen a tremendous surge of interest in assessing and quantifying such interactions using networks, with numerous empirical studies reporting food webs, plant-pollination, seed disperser, host-parasite, metapopulation, epidemiological contact and other types of networks, and almost as numerous methodological papers advocating the use of this or that network metrics to understand ecological patterns and processes. To the neophyte, the diversity of methods and metrics used can be both a boon and a curse as there is little guidance over which methods have proved their worth to tackle a particular question. My talk will skim through this vast amount of literature in an attempt to categorize methodological issues, ecological questions and modeling approaches that have been proposed to deal with questions arising from ecological networks. I will try and connect methods used to analyze empirical data with the latest advances from theoretical models, and thus identify gaps to bridge in the coming years. Finally, I will introduce methods that are more widely used in fields other than ecology and explain their potential usefulness for the study of ecological networks.

Keywords: interactions, networks, ecosystem functioning

*Speaker

†Corresponding author: francois.massol@univ-lille1.fr