

THE RETURN OF THE TROPHIC CHAIN: FUNDAMENTAL VS REALIZED INTERACTIONS IN A SIMPLE ARTHROPOD FOOD WEB

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The mathematical exploration of small assemblages of interacting species (community modules) has proven key to understand emergent properties of ecological communities. These models use differential equations to study pairwise relations between species. However, as community modules become more complex one may wonder whether all potential interactions are effectively realized. Here, we use community modules to experimentally explore whether the number of trophic links among species increases as another aspect of complexity increases; i.e., the number of species that are known to feed on each other in pairwise trials. To this aim we use a simple mite community present in avocado orchards [*Persea americana* (Lauraceae)] composed of two predators [*Euseius stipulatus* (Athias-Henriot) and *Neoseiulus californicus* (McGregor) (Mesostigmata: Phytoseiidae)], one herbivore as shared prey [*Oligonychus perseae* Tuttle, Baker & Abbatiello (Acari: Tetranychidae)], and pollen of *Carpobrotus edulis* (Aizoaceae) as alternative food, with the potential for (intraguild) predation and (apparent) competition to be expressed. Using a series of controls, we could assess whether the presence of one species affected the numbers of another, or its conversion of food into offspring. We found that increasing the number of potential interactions did not result in realized more complex community modules. Instead, all communities were reduced to one or two linear trophic chains. Our results show that trophic links assumed to occur when species are confronted in pairs do not necessarily occur when other components of the community are present. Consequently, food web complexity in terms of connectance may be erroneously over-estimated in theoretical community modules that are parameterized based on pair-wise interactions observed when alternative prey is not present.

Keywords: community modules, intraguild predation, apparent competition, *Oligonychus perseae*, Phytoseiidae.

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