

CIESM Congress Session : Food webs and trophic dynamics

Moderator : Ulrich Sommer, GEOMAR, Kiel, Germany

Moderator's Synthesis

The discussion concentrated on three issues: the role of pathogens and parasites, food chain length and a potential role of neutral models.

Pathogens and parasites: One participant asked whether food web studies consider the role of parasites. The discussion quickly expanded to pathogens and parasites in general. While their role is widely acknowledged in present day evolutionary biology, they still play an (almost) neglected role in empirical and modeling studies of food webs and biogeochemical cycles. A fundamental difference to classic predator-prey relationships was seen in the fact, that there is no 1:1 relationship between mortality of the prey and biomass consumption by the consumer, like in the case of big fish eating small fish. It was pointed out, that the same applies to some benthic resource-consumer relationship, e.g. when a sea urchin consumes only the holdfast of a kelp, while the entire plant is lost from the system.

Food chain length: We had an intense discussion about the conspicuous length difference between terrestrial and aquatic, in particular, pelagic food chains and the factors which control food chain length. Besides the classic hypotheses productivity, ecosystem size, productive space (the product of ecosystem size and productivity) also the issues predator-prey size ratios, role of unicellular vs. macro-organismic primary producers (and the subsequent differences in the renewal rate of consumed biomass) and the role of structural, hard to digest polymers in higher plants (cellulose, lignin, which reduce energy transfer in terrestrial herbivory) were discussed.

Neutral models: There was a discussion whether neutral models with species having randomly assigned traits could help to understand food web assembly, at least as a null hypothesis to which real food webs could be contrasted. This idea was counter-balanced by the argument that traits of organisms are not randomly assembled but shaped by foregoing natural selection.

