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ISTITUTO DI SCIENZE MARINE
Sede Territoriale (U.O.S.) di Bologna
Via Gobetti, 101
40129 Bologna

CICLO DI SEMINARI

Giovedì 21 Gennaio 2016

Sala riunioni terzo piano - ore 11:00
Via Gobetti 101, Bologna

PLANKTON IN THE SEA, PLANKTON IN THE NET, PLANKTON IN THE WALLET

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Plankton is a fundamental component of aquatic ecosystems, as the first step of trophic webs and a main promoter of biogeochemical cycles. The (taxonomical, genetic, functional) diversity of plankton intrigues ecologists since the formulation of Hutchinson's paradox (1961). Though, the role this diversity plays in driving ecological and productive properties of ecosystems is still poorly investigated and understood. In this talk, I will present recent results of integrative studies carried out on the planktonic system of the Gulf of Napoli (Italy), in the frame of the Italian flagship-project Ritmare and the Long Term Ecological Research Station MareChiara. Specifically, a planktonic food-web model including sixty-three functional nodes, representing auto- mixo- and heterotrophs, from bacteria to arrow worms and meroplanktonic larvae, was developed. The model integrated most trophic diversity present in the plankton and put the planktonic food-web in relation to small pelagic planktivorous fish. The model was implemented in two variants - which we named 'green' and 'blue' - characterized by opposite amounts of phytoplankton biomass and representing, respectively, bloom and non-bloom states of the system. Taxonomically disaggregated food-webs allowed us to shed light on how components of the plankton community changed their trophic behavior in the two different conditions, and modified the overall functioning of the plankton food-web. Biologically-mediated switches in food-web structure resulted in relatively small differences in the efficiency of material transfer towards higher trophic levels (i.e. fish). For instance, from green to blue states, a seven-fold decrease in phytoplankton biomass translated into only a two-fold decrease in potential planktivorous fish biomass. Thus, plankton can buffer oscillations in the feeding of small pelagic fish by counteracting oligotrophic states of the system. This fact translates into an important ecosystem service pursued by plankton 'adaptability', which positively affects pelagic system's functionality and also the catching of economically exploitable fish species.