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Trophic controls of jellyfish blooms and links with fisheries in the East China Sea

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Large jellyfish blooms have occurred in the East China Sea (ECS) during the last decade, a period also characterized by increasing fishing pressure, eutrophication, and changing climatic conditions. As large jellyfish blooms may have detrimental effects on fishery resources and ecosystem functioning it is desirable to understand the factors leading to jellyfish blooms. Therefore an Ecopath model covering the whole territorial waters of the ECS has been developed to address a number of questions about the impact and control mechanism of large jellyfish blooms on trophic structure and energy flows in the ECS. Model data collection for the ECS is based on records from 1997 to 2000. Forty-five functional groups are defined in the model including 32 fish (19 single species and 10 multispecies), 2 benthic and 1 for each of the following: mammals, sea birds, sea turtles, primary producers, large jellyfish, cephalopods, shrimp, crabs, zooplankton, heterotrophic bacteria and detritus. The average trophic level of fishery catch in the ECS ecosystem for the period 1997-2000 was 2.71 while the mean value for all groups was 2.87. Analysis of the trophic interactions has identified a possible positive pelagic feedback loop allowing large jellyfish blooms to develop as a result of mutual competition and predation between large jellyfish and Stromateoidae. This could be initiated by exploitation of Stromatidae. The pelagic pathway of the ecosystem will be disrupted at the initial stage of a large jellyfish bloom

Palabras clave: The East China Sea, Ecopath modelling, Jellyfish bloom, Trophic control, Feedback loop

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