Title: Derivation of Stochastic Prey-Predator Equations for
Mnemiopsis leidyi and Beroe ovata in Black Sea

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Abstract

Since 1988, Black Sea ecosystem has experienced a huge invasion because of the accidentally introduced comb jellies *Mnemiopsis leidyi & Beore ovata* from Atlantic Ocean. In the present investigation, we observed and studied prey-predator relationship of these comb jellies in Black sea ecosystem. Deterministic and stochastic logistic prey growth and Lotka-Volterra models are derived for these species. To derive these models, the changes with their respective probabilities are carefully studied. A discrete stochastic model is first derived. As the time interval decreases, the discrete prey-predator model leads to a certain Itō stochastic differential equation model. Comparisons between the stochastic models' numerical solutions and real data showed that the models are correct.