1125-92-633   **T.MIhiri M. De Silva*** (`mihiri.de-silva@ttu.edu`), Texas Tech University, Department of Mathematics and Statistics, Broadway and Boston, Lubbock, TX 79409, and **Sophia R Jang** (`sophia.jang@ttu.edu`), Texas Tech University, Department of Mathematics and Statistics, Broadway and Boston, Lubbock, TX 79409. *Stochastic Modeling of Phytoplankton-Zooplankton Interactions.*

To investigate random biological effects on the plankton interactions, we extend a previous well studied deterministic phytoplankton-zooplankton model by considering demographic stochasticity. Specifically, continuous-time Markov chain models and stochastic models of Itô differential equations are investigated. There are two phytoplankton populations where one population is toxin producing (TPP) while the other is not (NTP). The zooplankton prey on both the phytoplankton populations with the growth rate of the zooplankton inhibited by the TPP but not by the NTP. Mutual interference among the predator zooplankton and avoidance of zooplankton on TPP are incorporated into the model. We compare both types of stochastic models with the deterministic system using numerical simulations. It is found that the theoretical results established in the deterministic setting may not be valid in the stochastic models due to random effects of the birth and death process imbedded in the populations. (Received September 08, 2016)