



Virginia Commonwealth University
VCU Scholars Compass

Biology and Medicine Through Mathematics
Conference

2018

May 31st, 4:30 PM - 5:00 PM

Effect of Excess Food Nutrient on Producer-Grazer Model under Stoichiometric and Toxicological Constraints

Md Nazmul Hassan

Texas Tech University, md.nazmul.hassan@ttu.edu

Kelsey Thompson


Texas Tech University, Kelsey.Thompson@ttu.edu

Gregory Mayer

Texas Tech University, Gregory.Mayer@ttu.edu

See next page for additional authors

Follow this and additional works at: <https://scholarscompass.vcu.edu/bamm>

 Part of the [Life Sciences Commons](#), [Medicine and Health Sciences Commons](#), and the [Physical Sciences and Mathematics Commons](#)

<https://scholarscompass.vcu.edu/bamm/2018/thursday/38>

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

Presenter Information

Md Nazmul Hassan, Kelsey Thompson, Gregory Mayer, and Angela Peace

Effect of Excess Food Nutrient on Producer-Grazer Model under Stoichiometric and Toxicological Constraints

Md Nazmul Hassan^{1*}, Kelsey Thompson², Gregory Mayer², Angela Peace¹

¹Department of Mathematics and Statistics, Texas Tech University, Lubbock, USA

²Department of Environmental Toxicology, Texas Tech University, Lubbock, USA

*md.nazmul.hassan@ttu.edu

Keywords: Predator-Prey model, Ecological stoichimetry, Ecotoxicology

Abstract: Accurately assessing the risks of contaminants require more than an understanding of the effects of contaminants on individual organism, but requires further understanding of complex ecological interactions, elemental cycling, and the interactive effects of natural stressors, such as resource limitations, and contaminant stressors. There is an increasing evidence that organisms experience interactive effects of contaminant stressors and food conditions, such as resource stoichiometry, availability and excess of nutrient. We are developing and analyzing a series of empirically testable and robust mathematical models of populations dynamics subject to stoichiometric and contaminant stressors. In parallel to developing the models, we will integrate sufficient data from existing and new experiments to parameterize, test, and improve them. The synthesis of the models and experiments will result in the development of a robust theoretical framework appropriate for improved risk assessment applications in ecotoxicology that incorporate the effects of stoichiometric constraints on concurrent ecological and toxicological processes. In particular, we are presenting the consequences of excess food nutrients on grazer population dynamics, a phenomenon called *stoichiometric knife edge*.