

1135-37-1432

Gunog Seo* (gseo@colgate.edu) and **Gail S.K. Wolkowicz** (wolkowic@mcmaster.ca). *Pest Control by Generalist Parasitoids: a Bifurcation Theory Approach*.

Megal et al. (Math. Med. Biol. 25, 1-20; 2008) studied a spatial and non-spatial host-parasitoid model motivated by biological control of horse-chestnut leaf miners, microlepidoptera (micro moths) which have spread through Europe. Here we focus on the non-spatial model. They considered predation of leaf miners by a generalist parasitoid with Holling type II functional response. They showed that there can be at most six equilibrium points and discussed local stability. In my talk, I revisit their non-spatial model identifying cases missed in their investigation and discuss the possible consequences with respect to pest control strategies. I study both the local stability of equilibria and global properties. I use a bifurcation theoretical approach and provide analytical expressions for transcritical, fold, and Hopf bifurcations. My numerical results show very interesting dynamics, which include multiple limit cycles, homoclinic orbits, and codimension one bifurcations including: transcritical, fold, Hopf, and cyclic-fold bifurcations as well as codimension two bifurcations including: Bautin and Bogdanov-Takens bifurcations. (Received September 22, 2017)