

1080-35-276

rana parshad* (rana.parshad@kaust.edu.sa), applied mathematics and scientific computation, thuwal, western 23955, Saudi Arabia, and **folashade agusto**, clarksville, TN 37044. *Mosquito management in the face of natural selection.*

In this paper we study the long time dynamics of a reaction diffusion system, describing the spread of *Aedes aegypti* mosquitoes, which are the primary cause of dengue infection. The system incorporates a control attempt via the sterile insect technique. The model incorporates female mosquitoes sexual preference for wild males over sterile males. We show the existence of a global attractor for the system in L^2 . The attractor is shown to possess state of extinction, if the injection of sterile males is large enough. We then apply optimal control theory to our model and show how natural selection for female choosiness, fundamentally alters management strategies. (Received January 30, 2012)