Li, Jai. 2008. Differential equations models for interacting wild and transgenic mosquito populations. *Journal of Biological Dynamics*. 2(3): 241-258.

See https://www.tandfonline.com/doi/full/10.1080/17513750701779633 . Accessed on 27 March 2023.

Abstract: We formulate and study continuous-time models, based on systems of ordinary differential equations, for interacting wild and transgenic mosquito populations. We assume that the mosquito mating rate is either constant, proportional to total mosquito population size, or has a Holling-II-type functional form. The focus is on the model with the Holling-II-type functional mating rate that incorporates Allee effects, in order to account for mating difficulty when the size of the total mosquito populations is small. We investigate the existence and stability of both boundary and positive equilibria. We show that the Holling-II-type model is the more realistic and, by means of numerical simulations, that it exhibits richer dynamics.

Keywords: population models; Holling-II-type mating rates; transgenic mosquitoes; stability; nonhyperbolic equilibrium; mosquito-borne diseases.