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Azmy S Ackleh* (ackleh@louisiana.edu), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504-1010, **Baoling Ma**, Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504-1010, and **Paul Salceanu**, Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504-1010. *Persistence and Global Stability in a Size-Structured Model with Selection and Mutation.*

We analyze a selection-mutation size-structured model with n ecotypes competing for common resources. Uniform persistence and robust uniform persistence are established, when the selection-mutation matrix Γ is irreducible, i.e., individuals of one ecotype may contribute directly or indirectly to individuals of other ecotypes. In the case of pure selection in which offspring of one ecotype belongs to the same ecotype (i.e., $\Gamma = I$, the identity matrix) we prove that the boundary equilibrium that describes competitive exclusion, with the fittest being the winner ecotype, is globally asymptotically stable. We show that small perturbations of the pure selection matrix lead to the existence of globally asymptotically stable interior equilibria. For the case when the selection-mutation matrix is reducible, we establish persistence for a special case and for other cases we discuss the outcome a of numerical simulations (Received August 08, 2010)