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**Peter Hinow\*** ([hinow@uwm.edu](mailto:hinow@uwm.edu)), Department of Mathematical Sciences, University of Wisconsin - Milwaukee, P.O. Box 413, Milwaukee, WI 53201-0413. *Semigroup Analysis of Structured Parasite Populations.*

Motivated by structured parasite populations in aquaculture we consider a class of size-structured population models, where individuals may be recruited into the population with distributed states at birth. The mathematical model which describes the evolution of such a population is a first-order nonlinear partial integro-differential equation of hyperbolic type. First, we use positive perturbation arguments and results from the spectral theory of semigroups to establish conditions for the existence of a positive equilibrium solution of our model. Then, we formulate conditions that guarantee that the linearised system is governed by a positive quasicontraction semigroup on the biologically relevant state space. We also show that the governing linear semigroup is eventually compact, hence growth properties of the semi-group are determined by the spectrum of its generator. In the case of a separable fertility function, we deduce a characteristic equation, and investigate the stability of equilibrium solutions in the general case using positive perturbation arguments.

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