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Asymptotic behavior for nonlocal dispersal equations. (English) [Zbl 1191.35065]

Summary: This paper is concerned with the existence and asymptotic behavior of solutions of a nonlocal dispersal equation. By means of super-subsolution method and monotone iteration, we first study the existence and asymptotic behavior of solutions for a general nonlocal dispersal equation. Then, we apply these results to our equation and show that the nonnegative solution is unique, and the behavior of this solution depends on parameter $\lambda$ in equation. For $\lambda \leq \lambda_1(\Omega)$, the solution decays to zero as $t \to \infty$; while for $\lambda > \lambda_1(\Omega)$, the solution converges to the unique positive stationary solution as $t \to \infty$. In addition, we show that the solution blows up under some conditions.

MSC:
35B40 Asymptotic behavior of solutions to PDEs
92D25 Population dynamics (general)
35K20 Initial-boundary value problems for second-order parabolic equations
35B44 Blow-up in context of PDEs
35R09 Integro-partial differential equations

Keywords: refuge place; principal eigenvalue; stationary solution; super-subsolution; monotone iteration; nonnegative solution

Full Text: DOI

References:


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