1053-92-360   **Andrew L Nevai*** (`anevai@math.ucf.edu`), Department of Mathematics, University of Central Florida, Orlando, FL 32816, **Kevin M Passino**, Department of Electrical and Computer Engin, The Ohio State University, Columbus, OH 43210, and **Parthasarathy Srinivasan**, Department of Mathematics, Cleveland State University, Cleveland, OH 44115. *Stability of choice in the honey bee nest-site selection process.*

A pair of compartment models for the honey bee nest-site selection process is introduced. The first model represents a swarm of bees deciding whether a site is viable, and the second characterizes its ability to select between two viable sites. The one-site assessment process has two equilibrium states: a disinterested equilibrium (DE) in which the bees show no interest in the site and an interested equilibrium (IE) in which bees show interest. In analogy with epidemic models, basic and absolute recruitment numbers (R_0 and B_0) are defined as measures of the swarm's sensitivity to dancing by a single bee. If R_0 is less than one then the DE is locally stable, and if B_0 is less than one then it is globally stable. If R_0 is greater than one then the DE is unstable and the IE is stable under realistic conditions. In addition, there exists a critical site quality threshold Q* above which the site can attract some interest (at equilibrium) and below which it can not. There also exists a second critical site quality threshold Q** above which the site can attract a quorum (at equilibrium) and below which it cannot. The two-site discrimination process has a stable DE if and only if both sites' individual basic recruitment numbers are less than one. (Received September 10, 2009)

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