

第29回 MEE seminar

Mathematical Ecology & Evolution

2011年5月19日(木) 16:30~17:30

明治大学生田キャンパス第二校舎A館 : A207

May 19, 2011. 16:30~17:30 Meiji Univ. Ikuta campus A207

小田急小田原線 「生田駅」から徒歩10分
又は「向ヶ丘遊園」駅北口から「明治大学正門前」行きバスで15分終点下車
詳しくは、http://www.meiji.ac.jp/koho/campus_guide/ をご覧下さい

Mathematical expression of inclusive fitness theory

Joe Yuichiro Wakano (Meiji University)

Abstract: Recent developments have revealed that, by means of the inclusive fitness theory, the direction of evolution can be analytically predicted in a wider class of models than previously thought, such as those models dealing with network structure. However, understanding the inclusive fitness theory requires a deep intuition and hence mathematically explicit expression of the theory is required. We provide a general framework based on a Markov chain that can implement basic models of inclusive fitness. We show that key concepts of the theory, such as fitness, relatedness and inclusive fitness, are all derived from the probability distribution of an "offspring-to-parent map" in a straightforward manner. We prove theorems showing that inclusive fitness provides a correct prediction on which of two competing genes more frequently appears in the long run in the Markov chain. As an application of the theorems, we prove a general formula of the optimal dispersal rate in Wright's island model. We also show the existence of the critical mutation rate, that does not depend on the number of islands, below which a positive dispersal rate evolves.

•This talk is prepared for the audience who are not familiar with inclusive fitness.

参加自由です。皆様のお越しをお待ちしております。

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