John McNamara 教授セミナー

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場　所：京都大学理学部セミナーハウス

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タイトル：

Towards a richer game theory in biology

生物学における，より豊かなゲーム理論を目指して

Evolutionary biologists are interesting in understanding how natural selection has shaped the behaviour of organisms, including humans. One approach is to use mathematical and computational models to find behavioural strategies that approximately maximise fitness and compare these with the observed behaviour of organisms. Often the fitness of individuals depends on the behaviour of other population members. When this is the case the model are game theoretical. These models have given us many insights, but are often too simplistic. Models often ignore differences between individuals. Using a series of examples I will demonstrate that such differences are not innocuous noise, but can fundamentally change the nature of a game and model predictions. For example, differences promote the need to have extensive interactions to find out about a partner and can reverse the direction of evolution because individuals take risks that a partner is cooperative. Models also treat traits as one-dimensional, but traits such as the level of parental care may be intrinsically multi-dimensional, and taking this into account may lead to a division of labour changing the level of care given. Furthermore, traits such as the level of cooperative behaviour often co-evolve with the level of choosiness and social sensitivity; factors which are promoted by differences in the population. Finally, models also make strong assumptions about the degree of optimisation that is possible, and tend to ignore learning and development. Overall, I argue that we need a richer evolutionary game theory in biology.

セミナー後の懇親会も企画しております、参加希望の方は下記までご連絡ください。

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