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A promising cluster of contributions

In March 2004, I was privileged to attend the International Symposium on Dynamical Systems Theory and Its Applications to Biology and Environmental Sciences at Shizuoka University in Hamamatsu, Japan. The symposium took place under the auspices of an unusually large number of professional societies: The Japanese Society for Mathematical Biology; The Society of Population Ecology; the Mathematical Society of Japan; the Japan Society for Industrial and Applied Mathematics; The Society for the Study of Species Biology; The Ecological Society of Japan; and the Society of Evolutionary Studies (Japan). Many of these Japanese societies devote themselves to biomathematics.

Often the beauty that a mathematician sees in biomathematics is quite different to the beauty hoped for by the biologist. The math may be glorious but it seems divorced from what we biologists need to solve our humble puzzles. My own mentor, Robert H. MacArthur, used to call such mathematics 'stainless steel'. But stainless steel characterized a refreshingly small portion of the contributions at this conference. Instead, participants were truly bridging the disciplines, applying their mathematical talents and skills to dynamical questions that resonate with biologists. Of course, many of the contributions were outside the scope of evolutionary ecology. But a number were good fits and I invited their authors to submit them to *Evolutionary Ecology Research*. Thankfully, some authors accepted. A cluster of five of these papers graces our May issue, and its cover honours the land that hosted the symposium.

Geritz and colleagues investigate the fitness of a plant as a function of the fraction of photosynthetic products that it allocates to its mycorrhizal symbiont. Infected roots acquire mineral nutrients faster than uninfected ones but give up organic resources to the mycorrhizae in the process. Sharing of photosynthetic products with a symbiont should evolve if and only if the rate at which infected roots acquire mineral nutrients per unit carbon cost exceeds that of uninfected roots.

Kumazawa and colleagues combine Batesian mimicry with interspecific competition. Using phase-plane analysis, they discover a rich variety of outcomes depending on the benefit of the mimic and the cost of the model.

Takada and colleagues ask what climates favour evergreen leaves. Their model optimizes the net rate at which a leaf produces photosynthate and it predicts what we see in nature: evergreen leaves ought to evolve in warm climates with little difference between seasonal highs and lows; and in cold climates with small rates of photosynthesis and expensive leaves.

Togashi and colleagues examine sexual dimorphism of a marine alga. Its male gametes have no phototactic device and some of its female gametes have pheromonal attraction systems. Using simulation, they find that this dimorphism may be advantageous in species living in shallower water where they are exposed to underwater disturbances.

Yoshimura and colleagues explore the influence of scarce species on dynamic stability. Using a lattice model in which each species preys on another in a cyclic set of interactions, they find that the scarce species may be far more consequential than its abundance might suggest.

I thought that it would be a good idea to bring this symposium, its participants and its output to the attention of the EER reader. The journal thanks Professors Yasuhiro Takeuchi and Jin Yoshimura for their considerable help with this project.

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