Competition, Parasitoids and Coexistence of the Rice Weevil and Indian Meal Moth on Brown Rice

Jung Youn Ji, Mun Il Ryoo and Dong Whan Choe

Division of Environmental Science and Ecological Engineering,
College of Life and Environmental Sciences, Korea University, Seoul, Korea

Interspecific competition between r- and K-strategist, in general, results in displacement of the former. But the competition between rice weevil (K-like strategist) and indian meal moth(r-like strategist) showed that rice weevil has positive effect on indian meal moth, whereas the latter suppress the former by interfering rice weevil activity through webbing, an amensalism-like relationship. To follow long-term effect of the relationship on the two competing populations, a study was conducted in a system composed of 20 brown rice patches in a plastic cage(32×22×13cm). Influence of the parasitoids of the two competitors were also studied.

The rice weevil population without indian meal moth persisted more than 6 months with density peak(replicate 1: 576.4±123.16, replicate 2: 1103.6±94.05, replicate 3: 485.8±73.51, replicate 4: 1205.6±178.31, replicate 5: 894.2±158.95). The indian meal moth population without rice weevil showed a high density peak(replicate 1: 234, replicate 2: 231, replicate 3: 179, replicate 4: 380, replicate 5: 225) and then crashed after 6 months. Both the rice weevil and indian meal moth population coexisted until 6 months after the experiment-start, then crashed. When the parasitoids, *Anisopteromalus calandrae* parasitizing rice weevil or *Bracon hebetor* parasitizing indian meal moth was introduced alone, they did not show any detectable influence on the competition between the two species: coexisting 6 months and then crash. But the two parasitoids were introduced together to the system, a prolonged coexistence of the two competing species was observed.

These results suggest the fact of enhancing population stability induced by community diversity, even the species involved are indirectly and weakly connected each other.