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Cannibalistic interactions between different developmental stages in a population are prevalent among many groups of animals and social insects. Cannibalism plays an important role in the population outcomes and represents an adaptive strategy in which parents consume some offspring to increase their current and/or future reproductive success. To understand how egg cannibalism affects ecological dynamics and evolutionary outcomes, we propose a simple two stage ecological and evolutionary model by using the frame work of evolutionary game theory approach. Our study shows that:

1. When the environment is harsh, egg cannibalism can prevent extinction in the absence of the evolution. Moreover, large egg cannibalism can lead to a forward transcritical bifurcation at which is characterized by the emergence of a globally stable interior equilibrium while small egg cannibalism can lead to a backward subcritical bifurcation which can lead to strong Allee effects.

2. When the environment is harsh, evolution can prevent extinction.

3. Evolution may decrease or increase the fitness of the colony by decreasing or increasing the total population size.

4. The trait function is very important since it can affect the permanence of the system. (Received August 21, 2014)