



# Honey Bee Foragers Reduce Starvation Risk by Carrying More Food

According to risk sensitive foraging theory, animals forage in ways that not only maximize net caloric intake, but also minimize their probability of starvation (i.e. minimum food requirement). Previous studies have shown that honey bee foragers prefer constant rewards over variable rewards. Prof. TAN Ken from the Xishuangbanna Tropical Botanical Garden and his collaborators have recently studied the risk sensitivity of honey bees by exploring the risk mitigation strategy as they travel between their nest and a food source.

The amount of food (“fuel load”) taken by a foraging bee on her outward journey may be an objective measure of her perception of the riskiness of the foraging trip she is embarking on. The researchers examined the fuel loads carried on their outward journeys to a familiar food source that provided either a constant reward or a variable reward.

They trained honey bee foragers to a feeder located 1.2 km from each of four colonies. They hypothesized that an individual bee that perceived her foraging trip as being

risk should carry more fuel as she perceived that the energy budget of the trip may place her at risk of starvation before she can return to the nest.

The scientists found that crop concentration and volume were influenced by feeder variability. When a feeder offered variable rewards, honey bees (*Apis cerana*) carried 12.7% greater volume of fuel than that they carried when a feeder offered constant reward.

The results showed that when honey bee foragers were faced with variable rewards at a feeding site, they reduced the risk by increasing the volume, and possibly the concentration of the fuel load they carried. Fuel load volume seemed to provide a direct measure of a forager’s perception of the riskiness of a foraging trip, and may provide a novel experimental tool for determining how foragers rank riskiness.

Their paper, entitled “Individual honey bee (*Apis cerana*) foragers adjust their fuel load to match variability in forage reward”, has been published in Scientific Reports.

