Adaptive decision makings under foraging ecology: comparison of risk sensitivity among species with different food habitat

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Foragers must make decisions that maximize the foraging efficiency. However, it is questionable whether the foragers' decisions really represent their ecological background such as food habitat. Here we studied behavioral sensitivity to risk, which inevitably arises due to stochastic nature of food. Three closely-related species of the birds of family *Paridae* were compared; g*reat tits* are reported to tend to exploit arthropod whereas *varied* and *marsh tits* depend more on seeds. We examined their preference between an un-risky food option (amount = 1, probability = 1) and a risky food option (amount = 3, probability = 1/3); notice that the expected amount is the same. *Great tits* showed risk-prone choices, whereas *varied tits* showed risk-averse choices, and *Marsh tits* were intermediate between them. We further compared preference to insects (mealworms) *vs.* seeds (sunflower), and found that the preference was correlated with the risk sensitivity at individual level; the higher the preference to seeds, the higher the risk aversion. The present results indicate that the insectivorous birds depend on high-risk food, thus are more tolerant to the risk than the herbivorous species. The evolution of decision making may be tightly linked with the differentiation in food habitat.