Influence of predation risk on the sheltering behaviour of the coral-dwelling damselfish, Pomacentrus moluccensis

Predation is a key ecosystem function, especially in high diversity systems such as coral reefs. Not only is predation one of the strongest top-down controls of prey population density, but it also is a strong driver of prey behaviour and function through non-lethal effects. We ask whether predation risk influences sheltering behaviour of damselfish living in mutualism with branching corals. Host corals gain multiple advantages from the mutualistic relationship which are determined by the strength of damselfish sheltering. Distance travelled by the Lemon Damselfish Pomacentrus moluccensis away from their host colony was measured here as a proxy for sheltering strength and was expected to be shortest under highest predation risk. Predation risk, defined as a function of predator abundance and activity, turbidity and habitat complexity, was quantified at four reef slope sites in Kepulauan Seribu, Indonesia. Damselfish sheltering strength was measured using stationary unmanned video cameras. Small damselfish (< 2 cm) increased their sheltering strength under high turbidity. Predator feeding activity, but not abundance, influenced damselfish sheltering strength. Contrary to our expectations, sheltering behaviour of adult damselfish decreased under high predator activity. While these observations are in line with risk-averse behaviour by juvenile P. moluccensis, they may indicate the presence of sentinel behaviour in the adults of this species. Habitat complexity seemed to be less important as a driver of damselfish behaviour. These counterintuitive results may indicate complex social behaviour and age-specific strategies for predator avoidance.
Keywords: Top-down, Predation risk, Behaviour, Damselfish, Mutualism, Pomacentrus moluccensis

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