Detection of cryptic targets in avian vision: A field study

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There are several strategies available to animals to avoid being detected by predators. The most complex is mimicry, where the animal resembles another specific object, such as a twig. Somewhat less demanding is crypsis, in which the animal seeks to resemble its general background. Crypsis makes the animal hard to detect when it is on an appropriate background, but will fail if the background is inappropriate. Finally, the animal may display high-contrast markings designed to disrupt its prototypical shape; this strategy, known as disruptive coloration, was recently investigated by us and found to reduce predation of artificial moths by birds in a natural woodland setting (Cuthill et al, 2005 *Nature* **434** 72 - 74). We investigated the role of crypsis in avian predation, using similar techniques to the earlier study. Photographs of different trees were obtained, and used to produce a series of morphed photographs spanning the range between the trees. Stimuli were made from these photographs on a calibrated laser printer, and cut into triangular 'moths'. A dead mealworm served as bait, and the moths were attached to mature and young trees in natural English woodland. Survival analysis of the worms gave an estimate of the predation rate. Results are presented about the survival probabilities of 'specific' and 'generalist' moths. In general, this methodology allows 'field psychophysics' to be performed in a natural setting on a wild population of birds.