



Recent evolution of increased social intelligence via strong selection

Author(s): Michael Sheehan, Sara Miller , Michael Sheehan

Institution(s): Cornell University, Ithaca, NY, USA ; Cornell University, Ithaca, NY, USA ; Neurobiology and Behavior, Cornell University, Ithaca, NY, USA

We demonstrate that selection for enhanced social intelligence has been an unusually strong selective pressure in the evolutionary history of *Polistes fuscatus*, a paper wasp that recently evolved individual facial recognition. Unlike closely related species lacking individual recognition, *P. fuscatus* possesses enhanced learning and memory abilities for visually recognizing individuals. We find that the regions under recent, strong selection are over-represented for genes involved in visual learning in *P. fuscatus*, but not in close relatives. High recombination rates in social insects allow us to identify the putative targets of selection to individual base pairs. These data indicate that the evolution of novel social intelligence capabilities can have large fitness consequences leading to strong and rapid multi-genic selection for enhanced cognition.