



**Invertebrate Learning and Memory: Chapter 42.  
Individual Recognition and the Evolution of  
Learning and Memory in Polistes Paper Wasps  
(Handbook of Behavioral Neuroscience)**

*Elizabeth A. Tibbetts, Michael J. Sheehan*

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Individual recognition is often considered a cognitively challenging form of recognition because it requires flexible learning and memory. Because *Polistes* paper wasps are one of the few invertebrates known to have individual recognition, they provide a good model for exploring how individual recognition shapes cognitive evolution. Here, we review previous work on individual recognition in paper wasps with a particular focus on learning and memory. In this review, we (1) explore the evolution of individual recognition in paper wasps, including the selective pressures thought to shape the origin and maintenance of individual recognition; (2) discuss the extent of memory for specific individuals during paper wasp social interactions; (3) describe a negative reinforcement training method that can be used for comparative learning research in wasps and other invertebrates; and (4) explain how individual recognition has shaped the evolution of specialized visual learning in paper wasps.

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