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Embryonic learning of chemical cues via the parents' host in Anemonefish (*Amphiprion ocellaris*)

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It is known that each anemonefish inhabits species-specific symbiotic anemone(s) in the Indo-Pacific Ocean, and has been demonstrated that each anemonefish juveniles reach their hosts by recognizing chemicals emitted from symbiotic anemone(s). We studied this species-specific host-recognition system of anemonefish experimentally, with a particular focus on the function of imprinting using naive *Amphiprion ocellaris* juveniles. They demonstrated the embryonic and immediate post-hatching learning of chemical cues via the parents' host in *A. ocellaris* through a host-exchange experiment with egg batches during hatching. This is why anemonefish parents lay their eggs very close to their host anemone, the eggs almost always touching the host's body or tentacles. The memory obtained from such imprinting operates at the time when juveniles first search for their hosts. Unexpectedly, innate recognition was found to exist not only in the symbiotic host species but also weakly in two non-partner species. Innate recognition alone is not sufficient. Imprinting via the parents' host complements innate recognition, leading to rigid species-specific host recognition. Imprinting by the parents' single host provides a sufficient cue for reaching the two host species. Furthermore, when combined with imprinting, innate recognition of non-partners serves to supplement the recognition of those species, leading to substitute partnerships that are only observed in some localities. In short, innate non-partner recognition is considered to be a type of spare recognition. Further will discuss potential functions of imprinting in the host-recognition system.

Biography

Kazuko Miyagawa-Kohshima completed her PhD from Kyoto University and Postdoctoral studies from the Suntory Institute for Bioorganic Research. She along with colleagues succeeded to identify some attractants which functions in anemonefish-sea anemone partnerships. She has taught biology and ethology as a part-time Lecturer in Kyoto Institute of Technology, Tokyo Institute of Technology, Komazawa University, and Atomi University. Currently, she is working as a Researcher in the Wildlife Research Center of Kyoto University. Her main research interest lies in solving problems of the fascinating symbiosis between anemonefish and sea.

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