



Rapid modification of nutrition-related genes in response to social rank in monomorphic queenless ant.

Author(s): Yasukazu Okada, Haruna Fujioka , Kazuki Tsuji , Alexander S. Mikheyev

Institution(s): Graduate School of Arts & Sciences, University of Tokyo, Japan ; Faculty of Agriculture, University of the Ryukyus, Japan ; Ecology and Evolution Unit, Okinawa Institute of Science & Technology, Japan ; Faculty of Science, Tokyo Metropolitan University, Japan

The differentiation of reproductives and helpers in eusocial organisms is realized by decoupling of maternal care and reproductive behaviors. It seems likely that at the dawn of eusociality morphologically undifferentiated, monomorphic females underwent physiological differentiation towards egg-layer and non-reproductive helpers. By using the morphologically casteless monomorphic ant *Diacamma*, we clarified the genes that immediately respond to the formation of dominance hierarchy and that may account for the physiological dichotomy among monomorphic females. By RNA-seq, striking changes were detected in insulin-signaling genes and storage protein hexamerins, suggesting the rapid modification of nutrition-related genes in response to social rank. Additionally, substantial variations in stored energy I will argue why nutrition-related genes are frequently deployed in various types of caste differentiations, with the reference to the basic idea of caste differentiation via physio-behavioral co-option (ovarian ground plan, West-Eberhard, 1987).