



Comparative genomics of 65 ant species, covering all subfamilies

Author(s): Laurent Keller, Jonathan Romiguier , Marek Borowiec , Brian Fisher , Christian Rabeling , Philip Ward , Laurent Keller

Institution(s): Department of Ecology and Evolution, University of Lausanne, Lausanne, Switzerland ; Arizona State University, School of Life Sciences, Tempe, AZ, USA ; Department of Entomology, California Academy of Sciences, San Francisco, CA, USA ; Arizona State University, School of Life Sciences, Tempe, AZ, USA ; Department of Entomology and Nematology, University of California at Davis, Davis, CA, USA ; Department of Ecology and Evolution, University of Lausanne, Lausanne, Switzerland ; Department of Ecology and Evolution, University of Lausanne, Lausanne, Switzerland

The ants are the most diverse and successful clade of eusocial insects. The phylogenetic relationships among some of the 16 subfamilies is still controversial, in particular for the deepest nodes of the tree, which varies largely depending on the few phylogenetic markers available in a sufficient number of species. While genomic resources are abundant for ants, most of the species sequenced belong to the formicoid clade, which contains ~90% of known species spread in only 9 out of the 16 ant subfamilies. To fill this gap, we sequenced 65 genomes including at least one species per subfamily and 22 non-formicoid outgroup species. The resulting phylogenomic dataset allowed to resolve most of the deepest nodes and provides a new reference tree. In particular, we confirm (i) the sister group relationship of the Martialinae to all other ants, and (ii) the monophyly of a poneroid clade grouping of most non-formicoid subfamilies. These genomic data of multiple species also provide a powerful tool to test hypotheses on the association between social organization (e.g., colony size, number of queens per colony) and patterns of evolution of genomic sequences and gene expression (e.g., efficiency of natural selection and caste-biased genes variations).