第 13 回　昆虫学格致セミナー
日時：**2014 年 11 月 28 日（金）　午後 13 時 30 分～15 時 30 分**
場所：京都大学農学部 **1 階 E-103 号室**

タイトル： *Loss of sexual reproduction by ant queens avoids costs of inbreeding, facilitating biological invasions*
講演者： **Misato O. Miyakawa and Alexander S. Mikheyev (Okinawa Institute of Science and Technology)**

　Sex is a ubiquitous, successful reproductive strategy. Although asexuality has a number of potential advantages, why some species secondarily lose sex remains poorly understood. Recently, several bizarre reproductive systems have been found in ants, sharing the common feature of clonal queen reproduction. Some species also carry an unrelated, seemingly parasitic, clonal male lineage produced by androgenesis. These males mate with the queens to produce sterile workers; however, these asexual queens don't reap key advantages of clonal reproduction, such as reproductive monopoly. Using a combination of controlled laboratory crosses, QTL mapping to a de novo sequenced genome, and population genetics, we show that clonal reproduction and maintenance of an independent male lineage assist queens in overcoming an ancient hymenopteran constraint on inbreeding. Clonal queens maintain heterozygous complementary sex determination loci, thereby eliminating the cost of sterile diploid males, which result from homozygosity at these loci caused by mating between relatives. Diploid male load can quickly lead a small population into an extinction vortex. Consequently, queen clonal reproduction pre-adapts a species to become invasive, as many clonal ants are. However, because populations consist of a single dominant clonal couple, queens cannot produce sons without increasing the diploid male load. Instead, they must rely on an unrelated male lineage to maintain genetic diversity of their worker force. Our findings show that ancestral constraints can drive the evolution of extreme reproductive systems, and explain how apparently selfish features, such as clonal reproduction with unrelated males, are paradoxically maintained by kin selection acting on queens.