1046-92-1269 **M Wilhelm*** (mewilhel@uncg.edu), 20031 Mulberry Street, Cornelius, NC 28031, and **J Rychtar**, **O Rueppell** and **M Chhetri**. *The Mating Game: A Game Theoretic Analysis of the Mating Sign Behavior in the Honeybee.*

The honeybee, Apis mellifera, exhibits extreme polyandry. After insemination, the male (drone) plugs the queen's genital opening with his endophallus, known as the mating sign. This leads to his immediate death and has been shown to promote additional mating of the queen, casting doubt on the adaptiveness of this behavior: the drone forgoes the chance of future mating and effectively dilutes his genetic contribution to the next generation. On the other hand, the mating sign may be beneficial because it increases the genetic variability of the queen's offspring and greater genetic variability increases colony fitness. With the analysis of this phenomena in mind, we constructed a game theoretic model in order to describe this situation. Using this model, the evolutionary stability of the drone's choice "to plug" or "not to plug" was investigated. Finally, we conclude that the drone's behavior is not adaptive based on data obtained from recent studies. (Received September 15, 2008)