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Conservation of *Acacia tortilis* subsp. *raddiana* Populations in Southern Sinai, Egypt. II- Mating System Analysis

M. S. Zaghloul [1*] and J. L. Hamrick [2]
[1]Botany Department, Suez Canal University, Ismailia, Egypt and [2]Department of Plant Biology, University of Georgia, Athens, Georgia, USA.

ACACIA TORTILIS subsp. *raddiana* is a native species of extremely xeric habitats with poor soils in the Middle East and Africa and have experienced decline in population size and number and connectivity due to unmanaged human activities. It's restoration in natural habitats as well as its growth in commercial plantations will be improved by knowledge of its natural history and by applied breeding programs. This manuscript presents an analysis of outcrossing and inbreeding rates in *A. tortilis* subsp. *raddiana* for potential use in establishing an effective restoration and conservation strategy for natural populations from Southern Sinai, Egypt. Open-pollinated seeds from 127 families representing twelve populations were used. Seven polymorphic allozyme loci were used to estimate population outcrossing rates, levels of biparental inbreeding, and the effective number of pollen donors per maternal plant. Mean outcrossing rate (t_m) over all populations was 1.106 ± 0.080. In all populations the effective number of pollen donors per maternal tree was high indicating low correlated mating within individual trees. Biparental inbreeding was not significantly higher than zero in any population. *A.tortilis* could be effectively conserved by maintaining a few populations of sufficiently large size to reduce the loss of genetic diversity and to maintain pollinator communities to facilitate outcrossing and gene flow between populations. Restoration efforts should include many genetically unrelated individuals to prevent increased inbreeding.

Keywords: *Acacia tortilis*, Allozymes, Sinai, Conservation genetics, Mating system, Outcrossing.

Any long-term plant conservation program should conserve the genetic variation present in a species and minimize processes that reduce this variation (*e.g.* Holsinger and Gottlieb 1991). The best way to capture most of the adaptive variation present is to conserve many large populations over the ecological and geographical range of the species (Schemske *et al.* 1994). Often, however, such populations don't exist, especially in arid ecosystems, and even if they do, it is rarely possible to conserve all the populations that are desired due to economic and other factors involved in the decision making process. Thus, populations and areas are selected based on their contribution to the development of an effective

*Corresponding author, E-mail: Zaghloul_mohamed@yahoo.com