Adoption of Polygyne-Derived Newly Mated Queens by Queenless
Monogyne and Polygyne Solenopsis invicta Colonies

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We reported earlier that queens, either monogyne or polygyne of the fire ant, Solenopsis
invicta, have a remarkable affect on conspecific recognition. After removal of their
colony queen(s) workers quickly become non-aggressive toward non-nestmate workers
and to introduced newly mated queens. We demonstrate here that queenless workers
readily adopt multiple monogyne-or polygyne-derived newly mated queens, although
usually over time the number of maintained queens is reduced to one. However,
sometimes-orphaned colonies will adopt and maintain more than one queen, thus creating
a “polygyne” colony. Newly mated queens adopted by workers have a distinct advantage
over their clausstrally founding cohorts in biomass production and a ready-made worker
force to shield them from negative outside forces. A complex genetic scenario dictates
that monogyne workers should execute all monogyne and polygyne-derived newly mated
queens and that polygyne workers should execute all monogyne derived newly mated
queens, but accept a proportion of polygyne-derived queens. We demonstrate here that
the genetic rules do not apply to queenless worker groups, since workers from both social
forms readily accept monogyne-derived newly mated queens. Polygyne workers adopting
polygyne-derived newly mated queens have a greater probability of adopting additional
polygyne-derived newly mated queens, than the other possibilities. We suggest that the
behavioral/adoption phenomenon we report here opens the door to alternative
explanations of some of the events that have led to the widespread occurrence of
polygyny in the United States.