

Prevalence of *Thelohania solenopsae* infected *Solenopsis invicta* newly mated queens within areas of differing social form distributions

R.K. Vander Meer^a, and C.A. Preston^a, G.N. Fritz^b

^aCenter for Medical, Agricultural, and Veterinary Entomology, U.S. Department of Agriculture, Agricultural Research Service, 1600 SW 23rd Drive, Gainesville, FL 32608, USA, e-mail: bobvm@ufl.edu

^bDepartment of Biological Sciences, Eastern Illinois University, Charleston, IL 61920, USA

Abstract

Newly mated queens (NMQs) originating from monogyne red imported fire ant (*Solenopsis invicta*) colonies and following a mating flight, initiate new colonies by sealing themselves in a nuptial chamber and using stored food reserves to rear their first workers (claustral colony foundation). This method of colony founding is rarely successful for polygyne-derived NMQs, whose low weight critically limits the number of first workers produced. However, this observation may be confounded by the parasitic microsporidium, *Thelohania solenopsae*, thus far predominately found in association with polygyne colonies. This microsporidium reduces fat reserves within infected queens and may explain why polygyne NMQs are unable to found colonies claustrally. We collected NMQs following mating flights in Gainesville and Ocala, Florida. Newly mated queens were sorted by weight class, then checked for insemination and *T. solenopsae* infection. Insemination levels were greater than 90% for all weight classes at both collection sites and were not related to infection. Infection levels were lower in Gainesville than Ocala, averaging 1.67% and 14.14%, respectively. Polygyne-derived NMQs collected in Ocala, defined here as weighing ≤ 12 mg, had the highest infection levels, 25.37% (17/67) in 2003 and 21.43% (6/28) in 2004. Therefore, infection by *T. solenopsae* cannot be completely responsible for the inability of polygyne NMQs to claustrally establish colonies. This work highlights the need to consider potential parasites and pathogens when collecting fire ant colonies for research.

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