

Abstract

The red imported fire ant (RIFA), *Solenopsis invicta*, is a serious pest that was introduced into the USA more than 60 years ago and is now found in at least 17 states. Previous research indicates that the microsporidian parasite, *Thelohania solenopsae*, is a promising candidate as a biological control agent against this invasive ant pest. We propose to formulate a bait using purified parasite spores in an appropriate nutrient substrate and to use the bait to experimentally infect *S. invicta* colonies. Toward that end, we will investigate the horizontal transmission of parasites within experimental fire ant colonies by tracking appropriately sized fluorescent microspheres administered in various nutrient substrates simulating the transfer of parasite spores within the colony to determine the appropriate substrate for a bait. Additionally, our preliminary molecular data indicate that multiple strains/genotypes of *Thelohania* parasites exist in naturally infected fire ant colonies in Texas. These parasite strains will be identified and characterized in order to select the most pathogenic parasite strain. Then bait formulations will be developed using purified parasite spores, and experimental infections of RIFA colonies will be attempted. It is also important to determine whether these or closely related parasites are infective to or are naturally found in native fire ant species prior to field application of *T. solenopsae* baits. Therefore we will clarify the status of *Thelohania* spp. in various *Solenopsis* species found in Texas. The proposed outcome of these research objectives is to produce a *T. solenopsis*-containing bait formulation that can be used as a biological control agent to treat and/or augment other forms of control against the red imported fire ant, *Solenopsis invicta*.