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PROCEEDINGS AND ABSTRACTS

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Studies on The Endoparasitic Yeasts of Fire Ants, Solenopsis spp.

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At least four distinct species of parasitic budding yeasts occur in the haemolymph of fire ants. A total of five strains of three of these species, representing two genera, are in culture; the fourth species is known only from preserved S. invicta from Brazil.

The species in culture have been transmitted per os to healthy colonies of S. invicta; however, the rate of transmission is low (ca one percent), apparently due to loss of invasive ability during in vitro culture. They appear to be only nutritional burdens to their hosts, producing no gross pathology, histopathology, or behavioral changes, and are best described as endoparasites. Elevated mortality occurs in infected colonies under conditions of stress.

These yeasts are prime candidates for genetic engineering. They can be mass-produced, transmitted, and may well prove genus specific for fire ants. Since they produce no toxins or histopathology, it may be possible to transform them to produce toxins of our choice, insect hormones, or even semiochemicals to disrupt colony organization. Ways to preserve the invasive ability of mass-cultured cells must be developed through genetic modification or cultural techniques, or both.

The morphology, physiological characteristics, and taxonomic status of these endoparasitic yeasts will be presented. Progress in defining the conditions for genetic transformation using an antibiotic resistance gene as a model system may also be reported.