Myrmecologische Nachrichten	6	67 - 76	Wien, Dezember 2004

Novel blend of life history traits in an inquiline ant, *Temnothorax minutissimus*, with description of the male (Hymenoptera: Formicidae)

Alfred BUSCHINGER & Timothy A. LINKSVAYER

Abstract

Forty-five colonies of *Temnothorax curvispinosus* (MAYR, 1866) containing the rare inquiline ant *T. minutissimus* (SMITH, 1942) have been collected near Bloomington, Indiana, USA. The colonies were censused and some were kept in laboratory culture. Dealate and alate females of *T. curvispinosus* and *T. minutissimus* were dissected. The parasite females have a total of six ovarioles. Both, *T. minutissimus* and the host species, are facultatively polygynous, and the parasite is host-queen tolerant. Alate males were found in August and September. High numbers of alate and dealate, mated but not yet reproductive, young females of *T. minutissimus* were present in colonies collected in early spring, a feature which had been known as "Intranidal Mated Offspring Hibernation" (IMOH). Mated young queens of *T. minutissimus* seem to disperse in spring to invade host colonies. Apparently they are accepted quite easily by host colonies. Rearing of colonies collected in the early spring, or hibernated in the laboratory, yielded first a brood of sexuals of *T. curvispinosus*, and subsequently considerable numbers of gyne pupae of *T. minutissimus* appeared. Only very few males were produced (sex ratio about 0.1 ♂/♀). Intranidal mating attempts were observed, and newly mated young females were detected in colonies having reared gynes and males of *T. minutissimus*.

Life history of the species thus is a novel combination of traits found in different other parasitic ant species: Intranidal mating and IMOH as in a few European "degenerate slavemakers" of the genus *Myrmoxenus,* but the parasite is host-queen tolerant, as is the case in two of the three European inquiline species of *Leptothorax* (former *Doronomyrmex*). The development of the parasites after the host species sexuals is a novel trait.

The male of *T. minutissimus* is described. It is characterized by a reduced number of antennomeres (9-11 instead of 12), and a certain "morphological feminization".

Key words: *Temnothorax minutissimus*, *Temnothorax curvispinosus*, inquilinism, intranidal mating, female-biased sex ratio, IMOH, morphological feminization of male

Prof. Dr. Alfred Buschinger, Rossbergring 18, D-64354 Reinheim, Germany.
E-mail: hormigaleon.buschinger@t-online.de (contact author)

Timothy A. Linksvayer, Department of Biology, Indiana University, Bloomington, IN 47405, USA.

Introduction

"Social parasitism" occurs when a parasitic social insect species depends on another, usually closely related social insect species for at least one stage in colony development. A parasite-host relationship between two closely related species may frequently originate through intraspecific parasitism (e.g., BUSCHINGER 1990, BOURKE & FRANKS 1991, SAVOLAINEN & VEPSÄLÄINEN 2003). However, social parasitism in the broad sense also includes the "guest ants" that live together with only distantly related host species (e.g., the myrmicine genus *Formicoxenus* with the other myrmicine genera *Myrmica* and *Manica* or with the formicine genus *Formica*, respectively). Several major types of social parasitism in the strict sense have been described, including temporary social parasitism, dulosis, and inquilinism.

In temporary social parasitism, a young parasite queen penetrates a host nest, replaces the host queen, and rears her first brood with the aid of the remaining host workers. Later, after the natural death of the host workers, such colonies have numerous workers of the parasitic species, living similarly to independent species. A second group of social parasites practice dulosis, and are the slavemakers. Again, the young queen replaces the host colony queen(s), usually by force, and in some species the queen also kills or ejects all host workers, taking over only the host colony brood from which her first "slaves" emerge. Slavemaker workers also develop, but they are specialized on slave raiding and cannot forage or rear the slavemaker's broods. Instead, they attack neighboring nests of the host species from where