

# STUDIES ON ANTS AND THEIR COMMENSAL INSECTS

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*Paraschivescu, D. (1993): Ecological studies on ants and their commensal insects. - Tiscia 27, 29-31.*

**Abstract.** In Dobrudja (Roumania, South-West Europe) *Atelura formicaria* Heyder and *A. pseudolepisma* Grassi (Tisanura) were found in the nest of *Messor structor* Latr. *Formica pratensis* Retz. was proved to be the host species of *Lepisma aurea* Dufour (Tisanura) and *Lomechusa strumosa* F. (Coleoptera: Staphilinidae). *Atropos formicaria* Hagen (Psocoptera) was present in the nest of *Lasius fuliginosus* (Latr.). Experimental laboratory researches were carried out on behavioural and ecological aspects of the relations between *M. structor* and *A. formicaria*.

**Key words:** commensal insects.

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## Introduction

Among the papers dealing with myrmecophily, Jannet (1897), Halifman (1964), Hölldobler (1967) and Gösswald (1989) gave summarizations and reviews. Bernard (1968) enumerated 241 commensal insect species from the nests of 193 ant species in Western and Southern Europe. Our previous studies described the trophic relations between Lachnidae and Formicidae (Paraschivescu, 1973; 1975; 1976a, c).

This paper presents the results of the field and laboratory studies on commensal insect of ants in Dobrudja, Rumania, from the period of 1968-1991, focused mainly onto the first part of it.

## Material and Methods

The observations were carried out in South-Western Dorudja (Rumania) in the localities of Valului Traian and Palas-Constanta Agigea. The nest populations of ants and their commensal insect guests were collected in the field by excavating the nests and preserved in 70 % ethanol. The commensal insects were studied from the nests of *Messor structor* (Latr.), *Formica pratensis* Retz. and *Lasius fuliginosus* Latr. Altogether ten nests of these species were sorted and the guest insects were identi-

fied. Field observations were compared with the results of laboratory studies.

Artificial nests (Jannet, 1897; Paraschivescu, 1972) were used to maintain ant colonies with their guest insects in laboratory conditions. The nest walls were made of plexiglass and paraffin oil was employed to prevent ants to leave the nest.

## Results

### (1) Field observations

*Atelura formicaria* Heyder was found in the nests of *Messor structor* (Table 1) together the ant workers, usually in the oval chambers with the remnants of Gramineae plants, the seeds of which are collected by *Messor*. Its flattened body helps to disappear very rapidly among ant workers if the nest is disturbed as well as to approach regurgitating ants to collect food drops from them during trophallaxis. The other species collected from *Messor* nests was *A. pseudolepisma* Grassi and Roseli.

The other three species of commensal insects (*Lepisma aurea* Dufour, *Lomechusa strumosa* F. and *Atropos formicaria* Hagen) were found in the nests of *Formica pratensis* and *Lasius fuliginosus* (Table 1) in a number much less than in the case of *Atelura formicaria*.

Table 1. Number of individuals of commensal insects found in nests of different ant species.

species	date		commensal species	individual number of commensal species
<i>Messor structor</i> Latr.	15.06.1979	1*	<i>Atelura formicaria</i> Heyder	14
"	"	2*	"	13
<i>Messor structor</i> Latr.	17.06.1979	1*	"	9
"	"	2*	"	6
"	"	3*	"	15
"	"	4*	"	7
"	"	5*	<i>Atelura pseudolepisma</i>	3
			Grassi and Roselli	
<i>Formica pratensis</i> Retz.	17.06.1979	1**	<i>Lepisma aurea</i> Dufor	2
"	"	2**	<i>Lomechusa strumosa</i> F.	9
<i>Lasius fuliginosus</i> Latr.	17.06.1979	1**	<i>Atropos formicaria</i> Hagen	3
Total 3 species			5 commensal insect species	81 individuals

\* nest built in the soil; \*\* nest with middle mound

## (2) Laboratory experiments

In each of the three artificial nests of *Messor*, there were particular chambers, where *Atelura formicaria* individuals were seen. Since the total number of *Atelura* specimens was 49 with 589 ants, their appearance and activity rates were high in these chambers, therefore a tendency of aggregation is established. All the pairs of food changing ants were surrounded by two or three *Atelura* as a rule, and the ratio of food taken from the ants is high. Their high efficiency is explained by the high speed of *Atelura* movement.

## Acknowledgment.

Commensal insects were identified in the Taxonomic Laboratory of Institute of Biology, Jassy University. Author would like to thank for this courtesy.

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