

## PRELIMINARY DATA REGARDING INTERSPECIFIC RELATIONSHIPS BEETLE SPECIES COLLECTED FROM DIFFERENT ECOSYSTEMS MET IN DOLJ COUNTY IN 2017. NOTE 2

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**Abstract.** The research studies on the diversity of interspecific relationships from Dolj County exposed in this paper were achieved in 2017. The beetle biological material (6 specimens, one with mites) was collected from terrestrial ecosystem – Bucovăț. The host, from the systematic viewpoint, belong to the order Coleoptera, respectively to family Scarabaeidae. The interspecific relationship identified is transport or spread, respectively forezy. The species on which mites were found are *Onthophagus taurus* (Schreber, 1759). From the systematic viewpoint, the identified mites are belong arachnids - *Macrocheles* sp. (Mesostigmata: Macrochelidae). The species by mites identified at *O. taurus* is new for Dolj, Romania.

**Keywords:** interspecific relationships, beetles, mites, ecosystem, foresy.

**Rezumat. Date preliminare privind relații interspecifice la coleoptere din diferite ecosisteme din județul Dolj colectate în 2017. Nota 2.** Cercetările privind diversitatea relațiilor interspecifice la coleoptere din județul Dolj expuse în lucrarea de față au fost realizate în anul 2017. Materialul biologic de coleoptere (6 exemplare, din care 1 exemplar prezintă acarieni) au fost colectate din ecosistemul terestru, satul Bucovăț. Gazda, din punct de vedere sistematic, aparține ordinului Coleoptera încadrându-se în familia Scarabaeidae. Specia pe care s-au găsit acarieni este *Onthophagus taurus* (Schreber, 1759). Relația interspecifică identificată este de transport sau răspândire, respectiv forezie. Acarienii identificați în urma cercetărilor de specialitate, din punct de vedere sistematic, aparțin genului *Macrocheles* (Mesostigmata: Macrochelidae).

**Cuvinte cheie:** relații interspecifice, coleoptere, acarieni, ecosystem, forezie.

### INTRODUCTION

The purpose of this paper is to present some contributions to the knowledge of the diversity of parasites, analyzing beetle species present in different types of ecosystems in Dolj County.

In recent years, insects have undergone the complex action of ecological factors (climatic, soil and biotic factors) affecting the biological cycles of insects, spread emergence of mass propagation or decrease the number of the specimens of certain species, the emergence of new pests, etc. As a result, the number of beetle specimens found in the studied ecosystems was low.

All the material found on land was identified and analysed; then, the level of infestation was assessed. The beetle biological material (6 specimens, one with mites) was collected from terrestrial ecosystem - Bistreț. The hosts, from the systematic viewpoint, belong to the order Coleoptera, respectively to Scarabaeidae family.

From the systematic viewpoint, the identified mites are *Macrocheles* sp. (Mesostigmata: Macrochelidae).

### MATERIALS AND METHODS

The material used in this paper consisted in 6 specimens found in the field, which were identified, analysed and studied, three species having mites.

The species of beetles are presented in systematic order according to the year they were collected and there are mentioned the species of parasite identified for each of them.

The material was collected in 2017. Collections were made at different dates, each year in May. Collection date is mentioned for this species. Moreover, for every locality, there are rendered the geographical coordinates, flora and fauna information. Collection methods were different according to the analysed host species.

#### 1. Collection methods for *Onthophagus taurus*.

The insect was sampled from the ground with a pair of tweezers and put in a jar containing filter paper soaked in alcohol 4%. There were taken photos and the material was transported to the museum, entomology laboratory, where the specialists took samples from the surface of the insect-body. To analyze the mites, after taking photos, they were placed in a solution of paraffin and sent to the expert for determination.

#### 2. Collection and research methods for mites.

Using tweezers, mites were collected from *Onthophagus taurus*, more precisely from the feet and the ventral side of the abdomen. For identification, the mites were prepared in paraffin that was stored at room temperature until they were transported and examined carefully under the microscope.

To determine the collected material, there were used the works of PANIN (1955; 1957), the determination of the species of beetles in the entomology laboratory of the Department of Natural Sciences of the Museum of Oltenia Craiova. Some of the photos were taken with DMC-FZ62 Panasonic FullHD digital camera by Lila Gima and another category was taken by Mrs. Cristian Boicea, by means of the stereomicroscope OLYMPUS 3D.

The taxonomy and nomenclature of the identified species is made according to Fauna Europea.

## RESULTS AND DISCUSSION

The analysed material was represented by 44 specimens of which 7 specimens had parasites. The material was collected in 2017 from Bistreț village. There are rendered the collection sites, the species of collected beetles and the identified mites on legs.

**Host:** *Onthophagus taurus* (Schreber, 1759)

**Parasite:** *Macrocheles* sp.

**Collection site:** Bistreț

**Date of collection:** May 17, 2017

### *Onthophagus taurus* (Schreber, 1759)

Scarabaeoidea: Scarabaeidae: Scarabaeinae: Onthophagini: *Onthophagus*

It is a coprophagous species common in all climatic conditions except for the alpine steppes (PANIN, 1955; 1957). It is frequent in cow and horse dung and human excreta, under which it digs galleries.

*O. taurus* can reach a length of 5.5-11 millimeters. These small beetles are an almost oval shape and their color is black or reddish. Sometimes, the pronotum has a faint metallic sheen. Males have a pair of long protrusions or horns (hence the name of the species) that they use to fight each other and gain access to the female.

Flight activity is during the day and seasonal activity is from spring to autumn.

The development from egg to adult takes 8-10 weeks, depending on the soil temperature. There are at least two generations per year (Fig. 1).



Figure 1. Deuteronymph fixed with uropod on the leg of *O. taurus* (original).

The abundance of beetles depends on many criteria, but the most important ones are the available fresh manure amount and the manure quality. Chemical residues from animals can be harmful, but not essential, for the population growth.

This species is present in Europe, Morocco, Algeria, Tunisia, Syria, Iraq, Transcaucasia, Asia Minor, Iran, Afghanistan, Central Asia and the USA (Texas).

### *Macrocheles* sp. (Fig. 1)

Arachnida: Micrura: Acari: Anactinotrichida: Mesostigmata: Dermanyssina: Eviphidoidea: Macrochelidae:

#### *Macrocheles*

Macrochelidae are a cosmopolitan family of predatory mesostigmatic mites, many of which occupy specialized and often unstable habitats. Phoresy on co-occurring flying insects and Choleoptera plays a vital role in assuring niche continuity for macrochelids (KRANTZ, 1999).

As it regards their presence at Choleoptera, the specialized literature provides brief information. In the country, there were reports for the presence of *Macrocheles punctillatus* (Willm.), *Macrocheles plumiventris* Hull and *Anoetus ferroniarum* (Duf.) at the species of the genus *Onthophagus* Latr.; *Macrocheles glaber* Müll and *Anoetus ferroniarum* (Duf.) at *Aphodius* Illig. (BALTHASAR, 1963).

The olfactory receptors on the tarsi allow mites to find their hosts, while the receptors on the top are involved in the localization and attachment to the host and in the perception of the substrate during motion (FARISH & AXTELL, 1966; WICHT *et al.*, 1971; COONS & AXTELL, 1973; HUNTER & ROSARIO, 1988 - *In*: TATYANA SACCHI & PIRES DO PRADO, 2004).

**Mites** (Animalia: Arthropoda: Chelicerata: Arachnida: Acari) continuously reproduce in an appropriate environment, but they disperse when certain environmental factors adversely affect their presence in the habitat (KRANTZ, 1999). The specialization of the dispersed behaviour reveals the variability that contributes to the distribution and diversity of mites (MITCHELL, 1970 - *In*: TATYANA SACCHI & PIRES DO PRADO, 2004).

The particularities of phoresy (transport of mites from one place to another with the help of another organism) include active host search, recognition of attachment signs and host specificity, tranquility, recognition of host abandonment signs and, if necessary, synchronization with the life cycle of the host. The recognition of the ideal host is fundamental for transportation to a new location and is often based on chemical or olfactory stimuli produced by the host. *Phoresy* may be an adaptation for survival or it may be a parasitic manifestation as it involves displacement through interactions within the ecosystems.

Environmental variations, with their effect on intra and interspecific relationships, lead to displacement and persistence in different habitats. The difficulty in defining phoresy reflects the diversity of behavioral and ecological parameters of the involved species.

*Phoresy* is important for the maintenance of the species that may act as predators or parasites during different development stages and it serves to define the survival strategy of the mutualistic predatory and parasitic species (TATYANA SACCHI & PIRES DO PRADO, 2004).

In the present study, mites are represented by one species belonging to one order (Mesostigmata) and the family Macrochelidae.

## CONCLUSIONS

The work joins the efforts of specialists who contribute to the knowledge of entomofauna diversity.

Locality for collection, Bistreț village, represent new collection site for species *Onthophagus taurus*.

This study only signals the presence of the mite *Macrocheles* sp. at the choleoptera. The mite identified in the studied beetle are specie reported by foreign authors, but there are no mentions of them in the Romanian specialized literature. On the other hand, it is difficult to draw firm conclusions about the specificity of the host, because the studies performed on them so far are brief.

The present study, for the time being, signals the presence of the mite in this species of choleoptera. We will continue to collect beetles and make observations.

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