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TWO UNKNOWN MALES OF GENUS AMBLYSEIUS BERLESE
AND THEIR KARYOTYPES
(MESOSTIGMATA : PHYTOSEIIDAE)

BY

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INTRODUCTION

In the past, females only of the following two species have been described and recorded:
Amblyseius messor (Wainstein) 1960 (ATHIAS-HENRIOT, 1966; SWIRSKI and AMITAI, 1965, 1968;
WYSOKI and SWIRSKI, 1971; LIVSHITZ and KUZNETSOV, 1972) and A. judaicus Swirski and Amitai

Materials and Methods

Specimens were stored in 96% ethyl alcohol, cleared in chloral hydrate, hydrochloric acid
and water (8:0.5:5), and mounted in Hoyer's fluid. Garman's (GARMAN, 1948) system of
setal nomenclature has been followed. Karyotypes were examined by the smear method (WYSOKI,
1968). Eggs of A. judaicus Swirski and Amitai were collected in the forest of Zaharya on leaves
of Ballota undulata heavily infested by this phytoseiid only. Eggs of A. messor were removed
from laboratory breedings. Specimens were examined under a Wild phase-microscope.

Description of males

Amblyseius messor (Wainstein) 1960.

Male (12 males). Dorsal shield (Fig. 1) 294-318 µ long, smooth with light symmetric spots,
leaving 16 pairs of setae. Setae L1, L4, and M4 are long, L9 very long, D2, D3, D4, D5, M, L5, L7,
and S2 short, setae S1 and S2 on the dorsal shield; setae L5 and M4 are serrated; D4 absent. Pores
and minute structures on dorsal shield: lateral to L1, mesad L3, posterior L4, anterior M2, mesad L9,
and nine pairs minute structures between D4 and D6. Apex of peritreme reaches anterior to D1.

Sternal shield normal and bearing four pairs of setae. Ventrianal shield (Fig. 2) 127-139 µ
long, 158-172 µ wide; it carries three pairs of preanal setae. Setae VL1 48-53 µ long. Hind
leg carries three macrosetae, on genu (50-58 µ), tibia (43-50 µ), and basitarsus (61-69 µ). For
spermatophoral process, see Fig. 3.

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Figs. 1-3. — *Amblyseius messor* (Wainstein), male:
1) dorsal shield; 2) ventrianal shield; 3) chelicera.
TABLE 1. — *Amblyseius messor* (Wainstein), six males (measurements of setae in µ).

|   | D₁ | D₂ | D₃ | D₄ | D₅ | L₁  | L₂  | L₃  | L₄  | L₅  | L₆  | L₇  | L₈  | L₉  | L₁₀ | M₁  | M₂  |
|---|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 26 | 4  | 4  | 8  | 9  | 48  | 25  | 25  | 71  | 12  | 11  | 18  | 129 | 5  | 91  |
| 2 | 25 | 5  | 4  | 7  | 10 | 49  | 25  | 22  | 76  | 12  | 10  | 20  | 132 | 5  | 84  |
| 3 | 25 | 4  | 4  | 7  | 22 | 48  | 25  | 23  | 76  | /  | /   | 11  | 10  | 20  | 133 | 4  | 91  |
| 4 | 28 | 6  | 5  | 8  | 9  | 50  | 28  | 24  | 78  | 12  | 11  | 20  | 131 | 4  | 92  |
| 5 | 29 | 5  | 5  | 7  | 10 | 48  | 28  | 22  | 78  | 11  | 11  | 9   | 18  | 129 | 4  | 94  |
| 6 | 27 | 4  | 4  | 8  | 11 | 50  | 28  | 22  | 78  | /  | /   | 10  | 20  | 21  | 135 | 4  | 78  |

/ bent setae

1. allotype

Type locality and habitat: On Gramineae, E. Georgia (U.S.S.R.), in May and June, 1955 (WAINSTEIN, 1960), and in Crimea on alfa-alfa in July (Livshitz and Kuznetzov, 1972). Found also in Algeria, Spain, South Africa (Athias-Henriot, 1966), and Israel (Swirski and Amitai, 1965, 1968; Wysoki and Swirski, 1971), females only. Male: only twice was discovered outdoors: once, on Feb. 19, 1970, on *Solanum nigrum* at Nahal Poleg; and once on March, 19, 1970, on *Artemisia monosperma* at Ashqelon; others have been removed from laboratory breedings.

Location of types: In the Division of Entomology, Institute of Plant Protection, A.R.O. Volcani Center, Bet Dagan, Israel.

*Amblyseius judaicus* Swirski and Amitai, 1961.

TABLE 2. — *Amblyseius judaicus* Swirski and Amitai, seven males (measurements of setae in µ).

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</table>

1. allotype

/ bent setae
Figs. 4-6. — Amblyseius judaicus Swirski and Amitai, male:
4) dorsal shield; 5) ventrianal shield; 6) chelicera.
Male (10 males). Dorsal shield (Fig. 4) 265-282 μ long, reticulated, setae S₁ and S₂ on the dorsal shield: S₁ 36-42 μ, S₂ 20-22 μ. All setae are serrated; D₁, D₂, D₃, D₄ and D₅ 23-28 μ long, D₆ 8-10 μ, M₁ 22-26 μ, M₂ 30-36 μ, L₁, L₂ and L₃ 28-32 μ, L₄ 32-36 μ, L₅ 33-40 μ, apex of peritreme reaches mesad L₃. Pores and minute structure: between L₃-D₃, D₄-L₅, and mesad L₇.

Ventrianal shield (Fig. 5) slightly reticulated, 103-106 μ long, 154-182 μ wide; it carries four pairs of preanal setae. Setae VL₁ 26-30 μ. No macrosetae on hind leg. For spermato- phoral process, see Fig. 6.

Type locality and habitat: 5 females (holotype No. 373d and paratypes) were collected on *Salvia* sp., at 'En Hemed (Judean Hills), Israel, April 5, 1961; Males (allotype m. 2368a and paratypes) were collected on *Ballota undulata* at Zaharya (Judean Hills) on April 2, 1970.

The first male was found on May 16, 1964, and after that during Nov. 1968 in the same place. The population of *A. judaicus* in that month consisted almost exclusively of females (219 females and 1 male). The males were absent in Israel from November to March (Wysocki and Swirski, 1971).

Location of types: In the Division of Entomology, Institute of Plant Protection, A.R.O., Volcani Center, Bet Dagan, Israel.

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**Figs. 7-10.** — Photomicrographs of chromosome complements from egg smears of: 7-8) *Amblyseius messor* (Wainstein), 7-n, 8-2n; 9-10) *Amblyseius judaicus* Swirski and Amitai, 9-n, 10-2n.

*Acarologia*, t. XVI, fasc. 1, 1974.
Karyotypes

The results of the chromosome analyses are given in Table 3.

<table>
<thead>
<tr>
<th>Species</th>
<th>Numer of</th>
<th>Abnormal chromosomes count : (No. of cells)</th>
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</thead>
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<tr>
<td></td>
<td>2n = 8</td>
<td>26</td>
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</tbody>
</table>

Eggs of two examined species contained chromosome numbers of both the haploid and diploid complements (Figs. 7-10); all chromosomes were acrocentric. Mites belonging to the genus *Amblyseius* Berlese were found to have a haploid number of 4 and a diploid number of 8 chromosomes, all of them being acrocentric, the homologous chromosomes differing from each other in size only (Hansell, Mollison and Putman, 1964; Treat, 1965; Wysoki and Swirski, 1968; Wysoki, 1973). In histological section of females of *A. judaicus*, we found three metaphases with eight chromosomes in somatic tissue. It is evident that the sex-determining mechanism in the two species under discussion is of the haplo-diploid (arrhenotokous) type.

ACKNOWLEDGMENTS

The authors are indebted to Prof. E. Swirski for his advice.

SUMMARY

The descriptions of two unknown males and karyotypes of *Amblyseius messor* (Wainstein) and *A. judaicus* Swirski and Amitai are given.

RÉSUMÉ

La description et les karyotypes de deux mâle inconnus d' *Amblyseius messor* (Wainstein) et d' *Amblyseius judaicus* Swirski et Amitai y sont donnés.

REFERENCES

Amitai (S.) and Swirski (E.), 1966. — Illustrations of spermathecae in several previously described phytoseiid mites (Acarina) from Hong Kong and Israel. — Israel J. agric. Res., 16 : 19-24.


