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Records of Slug mites /Riccardoella spec./ from terrestrial gastropods in Israel - Adatok a házatlan csigák atkáinak előfordulásához /Riccardoella spec./ izraeli szárazföldi csigákban

ABSTRACT: Mites of the genus Riccardoella BERLESE, 1923, have been encountered in twelve samples of terrestrial gastropods collected in Israel. According to this material at least five species of snails and six of slugs serve as hosts for these parasites. A follow-up study has to show the exact identity of the Riccardoella species occurring in Israel.

Terrestrial snails, but especially those without external shells i.e. slugs, are often infested by tiny, white mites. RÉAMUR /1710/ was the first to publish observations concerning such mites under the title "Insecte des limacons" or "Pou des limacons". It lasted, however, still another 66 years before they were validly described as Acarus limacum by SCHRANK /1776/. SCHRANK obtained his original material from Helix pomatia L. 1758. Today it is known as Riccardoella limacum /SCHRANK, 1776/ /Acari-Trombidiformes-Ereynetidae/ and by the somewhat misleading common name: Slug mite.

Until recently Riccardoella limacum has been considered as having a rather wide range of host species among terrestrial snails and slugs, and as having an almost cosmopolitan distribution /TURK & PHILLIPS, 1946; BAKER, 1970a/. List of host species have recently been published by TURK & PHILLIPS /1946/, WHITE /1959/ and BADIE & RONDELAUD /1985/. From Israel it has been briefly mentioned by MIENIS /1988/.

These Slug mites are living for the greater part of their life in the mantle cavity of their hosts where they feed on amoebocytes /BAKER, 1970b; BAKER, 1973/. From time to time they leave the mantle cavity by means of the respiratory pore and move very quickly over the snail's body. But as soon as there is any "danger", they retreat through that same pore into the mantle cavity. It is during such "excursions" that Slug mites are most easily detected.

When Slug mites invade cultures of snails, they may become a real nuisance /DEGNER, 1952/ and may cause even considerable

damage /GODAN, 1983/. These mites might therefore be of economic importance in two ways: negative and positive. On one hand they may influence or even destroy cultures of land snails /especially Helix aspersa MÜLLER, 1774/, at the other hand they can be turned into a means of biological control of pest slugs and snails.

With this background information we started to record the presence of Slug mites on terrestrial gastropods in Israel since 1979, although we observed the first mites on Limacum flavus in the garden of the former Department of Zoology of the Hebrew University on the Russian Compound in Jerusalem as early as Spring 1971.

### Material and Methods

Since 1979 samples of terrestrial gastropods collected in Israel have been checked in the field for the presence of Slug mites: Riccardoella species. When infected snails and/or slugs were detected, the material was transported immediately to separate collecting vials per species. This method was used throughout the years since observations showed that Slug mites move easily from one specimen to another, even when different species are involved, when kept in crowded conditions in a single collecting box. The collected material was rechecked at home and the snails and slugs were prepared for permanent storage in the Mollusc collection of the Zoological Museum, Hebrew University of Jerusalem. The snails were usually stored as empty shells, the slugs were preserved in 70 % methylalcohol /in the latter specimens the mantle cavity may harbour still some mites/.

Conforming the opinions of TURK & PHILLIPS /1946/ and BAKER /1970a/ all the Slug mites were identified as belonging to Riccardoella limacum. However, we did not preserve the mites! This is most unfortunate because recently we received a publication by FAIN & van GOETHEM /1986/ in which they pointed out that the so-called Slug mite is in reality a composite species consisting of at least four different species with each of them their own host snails and/or slugs. In the wake of that study we have changed our identification of the mites into Riccardoella species.

### Results and Discussion

Twelve samples of terrestrial gastropods collected in Israel since 1979 turned out, in part, to be infected by Slug mites: Riccardoella species. The parasitized snails and slugs present in these samples are enumerated in table 1. According to these data at least eleven species: five

snails and six slugs, serve as host species for Slug mites in Israel /table 2/.

It is most unfortunate that we received the revision of the Riccardoella-complex by FAIN & van GOETHEM /1986/ only recently. Since we did not preserve the mites, we are unable to establish the exact identity of the Riccardoella species involved. According to FAIN & van GOETHEM it is impossible to predict the parasite involved if we know the host. The true Slug mite: Riccardoella limacum, has so far been encountered on snails belonging to the Helicidae. Riccardoella oudemansi /THOR, 1932/ is the parasite of slugs but has also been found on Oxychilus draparnaudi /BECK, 1837/ and Cepaea nemoralis /L. 1758/: two Helicid snails! Arianta arbustorum /L. 1758/ : another Helicid species, may serve as host for Riccardoella limacum and Riccardoella reamuri FAIN & van GOETHEM, 1986! Of a fourth species: Riccardoella canadensis the true host is not known since it was collected in humus from a botanical garden, while Riccardoella concolor /HALDEMAN, 1851/, originally described from Mesodon pennsylvanicus /GREEN, 1827/, a Polygyrid landsnail, remained a species inquirenda.

#### Conclusion

From the available data it is clear that so far we were only able to prove the presence of Riccardoella species on eleven host species in Israel. A study of additional, new material has to show the exact identity of the mites which function as parasites of slugs and snails in Israel.

#### Összefoglalás

A szerző az Izraelben előforduló házatlan csigákat vizsgálta atkával való fertőzöttség szempontjából. Több fajnál kimutatta a Riccardoella fajba tartozó egyedekkel való fertőzöttséget.

#### References

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Table 1: Samples of terrestrial gastropods found to be infected with Slug mites: Riccardoella species, in Israel

No.	Species	Locality	Date
1.	<u>Limacus flavus</u>	Netzer Sereni	22 Febr. 1979
2.	<u>Lehmannia valentiana</u>	Jerusalem, Yehuda Str., Nursery Ben-Gad	24 Oct. 1979
3.	<u>Buliminus labrosus labrosus</u> <u>Cristataria genezerethana Kharbatensis</u> <u>Eonolita protensa jebusitica</u> <u>Milax aff. barypus</u> <u>Prolimax cecconii</u> <u>Levantina spiriplana weneri</u>	Migdal Zedek	13 Jan. 1981
4.	<u>Limacus flavus</u>	Kiryat Ata	March 1981
5.	<u>Limacus flavus</u>	Jerusalem, Russian Compound, garden	4 Nov. 1981
6.	<u>Oxychilus translucidus</u> <u>Deroceras berytensis</u>	Jerusalem, Givat Ram Campus, Botanical garden	17 Nov. 1981
7.	<u>Prolimax cecconii</u>	Jerusalem, Russian Compound, garden	11 Jan. 1982
8.	<u>Limacus flavus</u>	Jerusalem, Russian Compound, garden	26 April 1982
9.	<u>Lehmannia valentiana</u>	Kfar Shemaryahu, Derech HaSadot, nursery Johanan	11 Nov. 1982

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|-----|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 10. | <u>Buliminus labrosus labrosus</u><br><u>Eopolita protensa jebusitica</u><br><u>Prolimax eustrictus</u><br><u>Deroceras berytensis</u> | Nahal Oren, exit<br>30 Dec. 1983            |
| 11. | <u>Limacus flavus</u>                                                                                                                  | Jerusalem, Ha'Or 4,<br>kitchen<br>Dec. 1987 |
| 12. | <u>Eopolita protensa jebusitica</u>                                                                                                    | Jerusalem, Ha'Or 4,<br>garden<br>Febr. 1988 |

Table 2: Terrestrial Gastropods serving as hosts for Slug mites of the genus Riccardoella in Israel

Family Buliminidae

1. Buliminus labrosus labrosus (Olivier, 1804)

Family Clausiliidae

2. Cristataria genezerethana kharbatensis Nordsieck, 1971

Family Zonitidae

3. Oxychilus (Ortizius) translucidus (Mortillet, 1854)

4. Eopolita protensa jebusitica (Roth, 1855)

Family Milacidae

5. Milax aff. barypus<sup>+</sup>

Family Limacidae

6. Limacus flavus (Linnaeus, 1758)

7. Lehmannia valentiana (Férussac, 1821)

8. Prolimax eustrictus (Bourguignat, 1866)

9. Prolimax ceconii (Simroth, 1906)

Family Agriolimacidae

10. Deroceras berytensis (Bourguignat, 1852)

Family Helicidae

11. Levantina spiriplana wernerii (Kobelt, 1889)

<sup>+</sup> The specimens from Migdal Zedek differ from true Milax barypus (Bourguignat, 1866) from the extreme north of Israel by the colours of the body, the foot fringe and the foot slime.

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