

Gamasina mites (*Acari, Gamasina*) of Kurzeme coast of the Baltic sea

Ineta Salmane

Institute of Biology, 3 Miera Str., Salaspils, LV-2169, Latvia

Abstract

An investigation of fauna of *Gamasina* mites of coastal dune soil and drift line was carried out along the Kurzeme coast of the Baltic sea in August 1994. There were stated 20 species of *Gamasina* in the material extracted from 64 soil samples taken at 6 different places. Ten species are new for Latvia. Five species could be regarded as typical for coastal habitats, but other 15 species are characteristic to different sites (deciduous and coniferous forests, meadows, gardens etc.).

Key words: *Gamasina* mites, coastal dunes, drift line, soil fauna.

Introduction

There are very few data (Soil ..., 1976) concerning soil fauna of the coastal area of Latvia. The soil animals could be a bioindicators of soil stabilization on coastal dunes, because of close relation with formation of soil structure and decomposition of organic material. Therefore it is important to investigate soil fauna of dunes and drift line of Baltic sea in Latvia. In August 15-17, 1994 a joint Latvian-German scientific expedition was organized on the grounds of co-operation programm between University of Bremen, Latvian University and the Institute of Biology of Academy of Sciences of Latvia. The participants were two soil zoologists S. Heldt and D. Hendelmann from the University of Bremen and the author.

Material and methods

During this expedition 64 soil samples were collected on 6 places: Roja (site No 1), Kolkasrags (2), Lúýða (3), Ventspils (4), Pávilosta (5), Liepája (6). On each place 11 samples were taken (except Liepája - 9 samples) according to following scheem: 3 samples from drift line, 4 samples - primary dune, 4 samples - white dune. Soil samples were collected by hand-digging of soil mainly from the rhizosphere of selected plants of dunes and from the drift line. Each

sample contained approximately 500-700 g of substrate. The greatest part of each sample consisted of the dry sand. After the prolonged period of midsummer drought the moisture has been left only in the plant rhizosphere. The material was transported in plastic bags to the laboratory of Institute of Biology in Salaspils where the extraction of soil animals has been performed on Tullgren funnels. Extraction lasted 14 days in the temperature of 25°C under 40 W bulbs. Mites were sorted out under the stereo-microscope, permanent slides were mounted in Fora-Berleze medium. The *Gamasina* mites were determined after N. Bregetova (1977), G. Shcherbak (1980) and W. Karg (1993).

Results

Totally 323 specimens of *Gamasina* mites belonging to 20 species have been found only in 28 samples of total 64 (table 1). The number of mites was not high in the samples from dunes. That was due to dry weather conditions in summer 1994. *Gamasina* mites were numerous only in samples from drift line, because there were better conditions of moisture and food. Typical sites were referred according to Lapiņa (1988) and Bregetova (1977).

Table 1

Distribution and abundance of *Gamasina* mites along the coastal sites of Kurzeme (biotope: 0 - drift line; 1 - primary dune; 2 - white dune)

No of site and sample	Biotope	Dominant vegetation	Species of <i>Gamasina</i>	No of specimens	Typical site
1	2	3	4	5	6
1. 2.	0	no vegetation	<i>Cheiroseius curtipes</i> (Halbert, 1923), <i>Dendrolaelaps trapezoides</i> Hirschmann, 1960 <i>Gamasina</i> gen. sp.	19 1 2	in fields, meadows, gardens rotting stumps
1. 3.	0	<i>Chenopodium rubrum</i> L.	<i>Parasitus halophilus</i> (Sellnick, 1957) <i>Leioseius (Arctoseius) halophilus</i> , (Willmann, 1949) <i>Cheiroseius curtipes</i> (Halbert, 1923)	1 1 5	coastal sites banks of ditches in fields, meadows, gardens
1. 6.	1	<i>Juncus balticus</i> Willd.,	<i>Leioseius bicolor</i> (Berlese, 1918), <i>Prozercon tragardhi</i>	1 1	meadows, fields, forests gardens, fir -

		<i>Festuca arenaria</i> Osbeck, <i>Calamophila baltica</i> Link.	(Halbert, 1923)		groves
--	--	---	-----------------	--	--------

1	2	3	4	5	6
1. 8.	2	<i>Hieracium umbellatum</i> , L.	<i>Rhodacarus reconditus</i> Athias - Henriot, 1961	1	rotting stumps, agrocoenoses
1. 10.	2	<i>Festuca arenaria</i> Osbeck	<i>Dendrolaelaps bregetovae</i> Shcherbak, 1977 <i>Amblyseius bicaudus</i> Wainstein, 1962	1 1	moses, rotting leaf litter meadows
1. 11.	2	<i>Ammodenia peploides</i> (L.) Rupr.	<i>Amblyseius bicaudus</i> Wainstein, 1962	1	meadows
2. 13.	0	<i>Chenopodium rubrum</i> L., <i>Juncus ranarius</i> Song. et Perier	<i>Halolaelaps incisus</i> Hyatt, 1956 <i>Cheiroseius curtipes</i> (Halbert, 1923) <i>Gamasina</i> gen. sp.	28 5 1	washed ashore algae fields, meadows, gardens
2. 14.	0	<i>Chenopodium rubrum</i> L.	<i>Thinoseius spinosus</i> (Willmann, 1939)	1	washed ashore algae
2. 16.	1	<i>Leymus arenarius</i> (L.) Hochst.	<i>Leioseius bicolor</i> (Berlese, 1918)	1	meadows, fields, forests
2. 18.	1	<i>Calamophila baltica</i> Link	<i>Thinoseius spinosus</i> (Willmann, 1939)	1	washed ashore algae
3. 29.	0	no vegetation	<i>Thinoseius spinosus</i> (Willmann, 1939)	1	washed ashore algae
3. 32.	2	<i>Calamophila baltica</i> Link	<i>Hypoaspis aculeifer</i> (Canestrini, 1883) <i>Hypoaspis similisetae</i> Karg, 1965 <i>Leioseius bicolor</i> (Berlese, 1918) <i>Thinoseius spinosus</i> (Willmann, 1939)	1 5 3 1	forests, meadows, fields, forests meadows, fields, forests washed ashore algae
4. 35.	1	<i>Ammodenia peploides</i> (L.) Rupr.	<i>Dendrolaelaps arenarius</i> Karg, 1971 <i>Leioseius insignis</i> Hirschmann, 1963	3 2	coastal sands, washed ashore algae, forests

1	2	3	4	5	6
4. 38.	1	<i>Cakile maritima</i> Scop.	<i>Pergamasus vagabundus</i> Karg, 1968	1	forests, meadows, fields, bogs
4. 40	0	no vegetation	<i>Thinoseius spinosus</i> (Willmann, 1939) <i>Amblyseius bicaudus</i> Wainstein, 1962	1 2	washed ashore algae, meadows
4. 42.	2	<i>Calamophila baltica</i> Link	<i>Pergamasus vagabundus</i> Karg, 1968	1	forests, meadows, fields, bogs
4. 44.	2	<i>Festuca arenaria</i> Osbeck	<i>Leioseius insignis</i> Hirschmann, 1963	1	forests
5. 47.	1	<i>Amophila arenaria</i> Roth	<i>Amblyseius</i> sp.	1	
5. 49.	0	<i>Cakile maritima</i> Scop	<i>Cheiroseius curtipes</i> (Halbert, 1923) <i>Halolaelaps balticus</i> Willmann, 1954 <i>Halolaelaps incisus</i> Hyatt, 1956 <i>Thinoseius spinosus</i> (Willmann, 1939)	24 13 21 2	fields, meadows washed ashore algae washed ashore algae washed ashore algae
5. 50.	0	no vegetation	<i>Thinoseius spinosus</i> (Willmann, 1939) <i>Cheiroseius curtipes</i> (Halbert, 1923) <i>Halolaelaps incisus</i> Hyatt, 1956 <i>Halolaelaps balticus</i> Willmann, 1954 <i>Leioseius (Arctoseius) halophilus</i> (Willmann, 1949) <i>Aceoseidae</i> gen. sp. <i>Parasitidae</i> gen. sp.	61 47 31 1 1 1 1	washed ashore algae fields, meadows, gardens washed ashore algae washed ashore algae banks of a ditches
5. 52.	2	<i>Lathyrus maritimus</i> Bigelov, <i>Amophila arenaria</i> Roth	<i>Amblyseius bicaudus</i> Wainstein, 1962 <i>Leioseius insignis</i> Hirschmann, 1963	2 1	meadows forests, humus

1	2	3	4	5	6
5. 53.	2	<i>Festuca arenaria</i> Osbeck	<i>Thinoseius spinosus</i> (Willmann, 1939)	1	washed ashore algae
5. 54.	2	<i>Festuca arenaria</i> Osbeck	<i>Hypoaspis kargi</i> Costa, 1968 <i>Leioseius</i> sp.	4 1	various biotops
5. 55.	2	<i>Calamophila baltica</i> Link, <i>Festuca arenaria</i> Osbeck	<i>Leioseius bicolor</i> (Berlese, 1918)	1	meadows, fields
6. 56.	1	<i>Calamophila baltica</i> Link	<i>Thinoseius spinosus</i> (Willmann, 1939) <i>Dendrolaelaps oudemansi</i> Halbert, 1915 <i>Parazercon saracensis</i> Willmann, 1939 <i>Parasitus</i> sp.	1 1 1 1	washed ashore algae forests, agro- cenoses forests, bogs, meadows
6. 57.	2	<i>Calamophila baltica</i> Link	<i>Dendrolaelaps oudemansi</i> Halbert, 1915	2	forests, humus, agrocenoses
6. 59.	2	<i>Ammodenia peplodes</i> (L.) Rupr.	<i>Parasitus halophilus</i> (Sellnick, 1957)	2	washed ashore algae
6. 60.	0	<i>Amophila arenaria</i> Roth	<i>Thinoseius spinosus</i> (Willmann, 1939) <i>Leioseius insignis</i> Hirschmann, 1963 <i>Leioseius</i> sp.	3 2 3	washed ashore algae forests, humus

Discussion

From 20 species of *Gamasina* mites in our material ten are new for Latvia: *Parasitus halophilus*, *Leioseius insignis*, *Dendrolaelaps trapezoides*, *D. bregetovae*, *D. arenarius*, *D. oudemansi*, *Halolaelaps balticus*, *H. incisus*, *Thinoseius spinosus*, *Hypoaspis similisetae*. Such a large number of new faunistical records could be explained only by the fact that previously there were no investigations made in the similar biotopes. Two species namely *Leioseius (Arctoseius) halophilus* (2 individuals in 2 samples) and *Cheiroseius curtipes* (90 individuals in 5 samples) according to the investigations of I. Lapiņa (1988) are rare.

Five *Gamasina* species are typical for coastal sites, namely *Parasitus halophilus*, *Halolaelaps balticus*, *H. incisus*, *Thinoseius spinosus*, *Dendrolaelaps arenarius* (after N. Bregetova (1977) and W. Karg (1993)). The most numerous of them were *Halolaelaps incisus* - 80 specimens in 3 samples and makes 24% of total, *Thinoseius spinosus* - 73, 10 and 22% respectively. Other species had low abundance. *Halolaelaps balticus* was found in 2 samples (4 individuals), *Dendrolaelaps arenarius* - in 1 sample (3 individuals) and *Parasitus halophilus* - in 1 sample (1 individual).

According to N. Bregetova (1977) mosses, soil and nests of rodents are characteristic locations for *Cheiroseius curtipes*. I. Lapiņa (1988) has found them in the fields and gardens in Latvia. We found 100 specimens in 5 samples in the drift line area and it makes 31% from the total number of individuals. All the rest 15 species were typical for different sites and were not numerous, for example, *Leioseius bicolor* (commonly occur in the forests, meadows, humus) was found in 4 samples (6 individuals), *Leioseius insignis* - (in the forests, meadows, humus) - in 4 samples (5 individuals), *Amblyseius bicaudus* (in the meadows) - in 4 samples (6 individuals).

It must be pointed out that we can not make conclusions on the whole fauna of gamasina mites of coastal sites in Latvia, due to the insufficient material. It is necessary to continue these investigations.

Conclusions

20 species of *Gamasina* were found on the coastal dunes and drift line of Kurzeme Coast of the Baltic sea, 10 species are new for the fauna of Latvia, 5 species are typical for the habitats of coastal area, 15 species are more distributed.

Kopsavilkums

1994. gada vasarā veikti pētījumi par kāpu un jūras izskalojumu gamazīnu faunu Baltijas jūras Kurzemes piekrastē. Kopumā ievākti 64 paraugi, kuros noteiktas 20 gamazīnu sugas, 10 no tām ir jaunas Latvijas faunai. Piecas no ievāktajām sugām ir raksturīgas piekrastes biotopiem (*Parasitus halophilus*, *Halolaelaps balticus*, *H. incisus*, *Thinoseius spinosus*, *Dendrolaelaps arenarius*), pārējās sugas raksturīgas citiem biotopiem - lapkoku un skujkoku mežiem, dārziem, pļavām u.c.). Pētījuma materiāla pārskatītas ar nelielu īpatņu skaitu.

Acknowledgements

The scientific expedition was supported by the University of Bremen (Germany) and was carried out in cooperation with soil zoologists of research group

of Ecosystems and soil biology leaded by Prof. Weidemann. I am very grateful also to Dr. V. Melecis the head of the Laboratory of Bioindication of Institute of Biology in Latvia for ensuring an expedition and assistance in preparation of this article.

References

- Karg W. 1993. *Acari (Acarina)*, Milben *Parasitiformes (Anactinochaeta)* Cohors *Gamasina* Leach. Raubmilben. 2. Auflage. Gustav Fischer Verlag, Jena, Stuttgart, New York : 1-524.
- Bregetova N.G. (Áðããòîâà Í.Ã.) 1977. [Identification key of soil inhabiting mites *Mesostigmata*]. - Nauka, Leningrad: 1-717 (in Russian).
- Lapina I. (Ëàïëÿ È.Ì.) 1988. Gamasin mites of Latvia. Zinâtne, Rìga: 1-198. (in Russian, English abstract).
- Shcherbak G.I. (Ùãðáâê Ã.È.) 1980. [*Gamasina* mites from familie *Rhodacari-dae* of Palearctic]. Naukova dumka, Kiev: 1-216 (in Russian).
- [Soil invertibrate fauna of the coastal area of the East Baltic region]. 1976. Eit-minavichute I. (Ýéòìèíâê÷òå È.) (ed.). Vilnius, 1-172 (in Russian).

Received: March, 1995.