

**Further contribution to the Collembola fauna
of the Hiddensee island (Insecta, Collembola)**

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With 1 figure

Zusammenfassung

Ein weiterer Beitrag zur Collembolen-Fauna der Insel Hiddensee (Insecta, Collembola).

Die Determination von 23 unterschiedlich großen Aufsammlungen auf der Insel Hiddensee (1985, 1986, 1989) ergab 67 Collembolen-Arten. Informationen zur Verbreitung und Ökologie dieser Arten werden mitgeteilt. 10 küstenbewohnende Arten wurden nachgewiesen: *Hypogastrura viatica*, *Anurida tullbergi*, *A. thalassophila*, *Onychiurus macfadyeni*, *Folsomia sexoculata*, *F. norvegica*, *Archisotoma besselsi*, *Proisotoma admaritima*, *Isotoma maritima*. Weiterhin konnten 15 hygrophile Arten gesammelt werden. Die Mehrheit der festgestellten Arten ist weit verbreitet.

Introduction

During three short-term Hiddensee excursions (September 1985, May 1986, October 1989) I collected extensively in some habitats of this small island, situated in the Baltic Sea. Only PALISSA (1969) has published results of his findings of the Collembola fauna on Hiddensee. Because nowadays our knowledge of coast areas (East Germany) has not considerably improved, I represent the results of my samples here.

Material and methods

Above all 3499 specimens were collected (23 samples of variable size). The following methods were used:

- a) aspirator to pick up springtails under the bark of trees, bottom side of stones (beach range), under sea-weed;
- b) nylon net and aspirator to get springtails from the water surface of ponds, flood salt-meadows, other water accumulations;
- c) material samples (upper soil layer, wet and dry moss, mixtures of sea-weed, wood pieces and stones).

The material samples were extracted in simple Tullgren funnels heated by light bulbs. These methods (a, b, c) were largely carried out in the northern part of Hiddensee (Enddorn, Dornbusch and environs of Kloster).

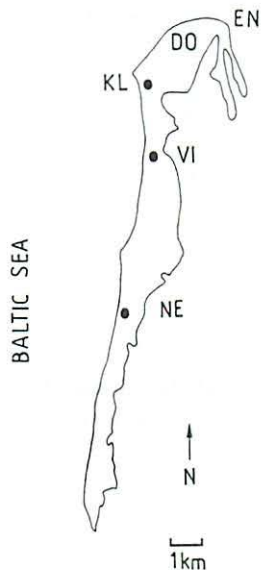


Fig. 1 General map of the Hiddensee island (EN - Enddorn, DO - Dornbusch, KL - Kloster, VI- Vitte, NE - Neuendorf)

Results - species list

Family Poduridae

Podura aquatica (Linné, 1758)

Some records of the holarctic species from water surface (pond Rietsol in Kloster and shore areas influenced by salt-water).

Family Hypogastruridae

Choreutinula inermis (Tullberg, 1871)

A single specimen in soil sample nearby the old stone dam of Neuendorf. Widely distributed species (e. g. litter).

Schoettella ununguiculata (Tullberg, 1869)

Six specimens picked up (aspirator) when they run on the roots of a willow which stood close to the pond Rietsol.

Hypogastrura purpurescens (Lubbock, 1867)

On the surface of the pond Rietsol and in wet moss of willows (same habitat) many specimens were collected and observed.

Hypogastrura viatica (Tullberg, 1872)

A common species along European coasts (FJELLBERG 1988). Here found in enormous number under stones and in accumulations of sea-weed, wood pieces, stones of the beach range from Enddorn to the village Vitte.

Hypogastrura (Ceratophysella) denticulata (Bagnall, 1941)

Few records (moss) - common species.

Willemia intermedia Mills, 1934

Four specimens in wet moss of willows. Rather common, palaeartic species in various habitats.

Family Neanuridae

Friesea mirabilis (Tullberg, 1871)

Many specimens found in moss of the salt meadow near Kloster, but also sporadic in sea-weed and soil samples. Common, predatorily species (palaeartic region).

Friesea claviveta Axelson, 1900

Only two specimens in wet moss of willows. Less frequent than *F. mirabilis* in Europe (similar behaviour ?).

Friesea handschini Kseneman, 1938

One specimen in wet moss of a reed thicket. Characteristic arrangement of anal spines in three rows (4, 2, 1). A rare European species (some records from Spain, Austria, Poland, Yugoslavia).

Anurida tullbergi Schött, 1891

Few specimens of this hygrophilous European species found in wet moss (Neuendorf and salt meadow near Kloster).

Micranurida pygmaea (Börner, 1901)

Bluish and whitish specimens of the common palaeartic species were collected in moss (Dornbusch and Kloster).

Anurida granaria (Nicolet, 1847)

One specimen of this widespread European species were collected in sea-weed.

Anurida thalassophila (Bagnall, 1939)

Identification according to FJELLBERG (1980). Common species in coast ranges. One specimen in accumulation of sea-weed and wood pieces on the beach (Enddorn).

Neanura muscorum (Templeton, 1835)

Cosmopolite species. Here found in moss.

Onychiurus (Protaphorura) furcifer (Börner, 1901)

Many specimens collected in moss of willows near the pond Rietsol. European species recorded from various habitats.

Onychiurus (Protaphorura) procampatus Gisin, 1956

A characteristic species in sandy beach meadows with closed vegetation (FJELLBERG 1988). We found one specimen in the salt meadow near Kloster in the moss layer of reed thicket.

Onychiurus (Protaphorura) tricampatus Gisin, 1956

The species was collected in the salt meadow near Kloster and is recorded from beach meadows too.

Onychiurus (Protaphorura) armatus (Tullberg, 1869)

Cosmopolite species. Collected from a trunk which laid on the beach range of the Enddorn.

Onychiurus macfadyeni Gisin, 1953

Common in beach meadows (FJELLBERG 1988). One specimen found in sea-weed.

Paratullbergia callipygos Börner, 1902

Widespread, European species in various habitats. Here found in upper soil layer near Neuendorf and in dry moss of the Dornbusch.

Mesaphorura macrochaeta Rusek, 1976

Very common in moss layer of the close *Hippophae* vegetation of the Dornbusch. Probably the most common and widespread *Mesaphorura* species in Europe (FJELLBERG 1980).

Mesaphorura krausbaueri Rusek, 1971

Only three specimens in the same habitat where *M. macrochaeta* had dominated.

Family Isotomidae

Folsomia sexoculata (Tullberg, 1871)

Found in many Hiddensee habitats (pond borders, moss, upper soil layer). A marine littoral species (FJELLBERG 1988).

Folsomia norvegica Altner, 1963

A strictly marine littoral species (FJELLBERG 1988). Eighteen specimens were found in the upper soil layer of the shore near Neuendorf.

Folsomia manolachei Bagnall, 1939 sensu Deharveng, 1982

Widespread, European species. Found in moss.

Folsomia quadrioculata (Tullberg, 1871)

Two records from moss. One of the most common European species (euryoecious).

Folsomia candida (Willem, 1902)

One specimen in moss. Cosmopolite species.

Folsomia fimetaria (Linne', 1758)

Two specimens found in soil layer of the shore range near Neuendorf. Widely distributed in the Palaearctic.

Isotomiella minor (Schäffer, 1896)

Six specimens in soil layer near Neuendorf. Cosmopolite species.

Archisotoma besselsi (Packard, 1877)

Most common marine littoral species of the genus *Archisotoma*. Found in sea-weed and under stones (beach ranges).

Isotomina bipunctatus (Axelson, 1903)

More than two hundred specimens found in a soil layer near the old stone dam of Neuendorf. Widely distributed, palaearctic species.

Proisotoma schoetti (Dalla Torre, 1895)

Halophilous and hygrophilous species (Palaearctic).

In October 1989 a »carpet« of specimens were observed on the water surface of the flood parts of the salt meadow near Kloster.

Proisotoma admaritima Murphy, 1953

The species lives in the marine littoral zone (FJELLBERG 1980).

On Hiddensee four specimens were found in the upper soil layer of the shore range near Neuendorf.

Proisotoma minuta (Tullberg, 1871)

Few records in moss and soil layer. Cosmopolite species.

Agrenia bidenticulata (Tullberg, 1976)

Hygrophilous species, two specimens found in the shore range near Neuendorf.

Isotomurus ciliatus Stach, 1947

Some specimens collected from the water surface of the flood parts of the salt meadow near Kloster. European, hygrophilous species.

Isotomurus plumosus Bagnall, 1940

Widely distributed hygrophilous European species. On Hiddensee in the wet moss layer.

Isotomurus palustris (Müller, 1776)

Cosmopolite species. Inhabitant of wet moss on Hiddensee.

Isotoma notabilis Schäffer, 1896

Frequent in moss (e. g. Dornbusch). A common, palaeartic species.

Isotoma maritima Tullberg, 1871

Rather common in beach meadows (FJELLBERG 1988). This marine littoral species was largely found under sea-weed of the shore range of the Enddorn.

Isotoma anglicana Lubbock, 1862

Only collected in wet moss of the salt meadow near Kloster and in soil layer near Neuendorf.

Isotoma viridis Bourlet, 1839

Cosmopolite species. On Hiddensee collected in nearly all investigated habitats.

Isotoma antennalis Bagnall, 1940

One specimen collected from a shore of a small pond near Neuendorf. This European species prefers wet habitats.

Isotoma propinqua Axelson, 1902

Widely distributed, palaeartic species and found in wet moss of the pond shore of the Rietsol.

Vertagopus cinereus (Nicolet, 1871)

Two specimens under the bark of an old oak. A very common corticolous species (Palaeartic).

Family Entomobryidae

Entomobrya muscorum (Tullberg, 1871)

One juvenile specimen in moss. Widespread species in the Palaeartic.

Entomobrya albocincta (Templeton, 1835)

Many specimens were collected under the bark of a pine. Common on tree trunks in Europe.

Entomobrya multifasciata (Tullberg, 1871)

Cosmopolite species. Few records from moss.

Entomobrya nivalis (Linne', 1758)

Collected under the bark of pines and oaks near Kloster.
Cosmopolite species.

Orchesella cincta (Linne', 1758)

Some records from shore ranges of Kloster and Dornbusch. Widespread and epedaphic springtail (Palaeartic).

Heteromurus nitidus (Templeton, 1835)

Two specimens were collected in the upper soil layer of the shore range near Neuendorf. A common, palaeartic species.

Lepidocyrtus paradoxus Uzel, 1890

In October 1989 thirteen juvenile specimens were collected in moss layer of a *Hippophae* thicket (Dornbusch). Both colline and planar palaeartic species (CHRISTIAN 1987).

Lepidocyrtus lignorum (Fabricius, 1781)

A frequent palaeartic species occurring in many habitats. Few specimens in wet moss of the heath near Vitte.

Lepidocyrtus nigrescens Szeptycki, 1967

Some specimen from moss and trunks of willows. A common (?) European species.

Lepidocyrtus cyaneus Tullberg, 1871

An inhabitant of wet habitats, but also in litter, compost and under rotten bark (FLELLBERG 1988). Cosmopolite species (CHRISTIAN 1987). Here collected in wet moss of a reed thicket near Kloster.

Tomocerus minutus (Tullberg, 1871)

Three specimens in moss layer of an overground beech-tree root (Dornbusch). European, litter inhabiting species.

Tomocerus minor (Lubbock, 1862)

Hygrophilous, palaeartic species. Found in sea-weed and under the bark of a willow.

Family Neelidae

Neelus minimus (Willem, 1900)

Cosmopolite species. Many specimens in moss from various habitats.

Family Sminthuridae

Sphaeridia pumilis (Krausbauer, 1898)

Cosmopolite species. Records from the salt meadow near Kloster and in the moss layer of Dornbusch habitats.

Sminthurides aquaticus (Bourlet, 1843)

Some records from water surfaces (pond Rietsol, flood parts of the salt meadow near Kloster) and under sea-weed. Hygrophilous, palaeartic species.

Sminthurides malmgreni (Tullberg, 1876)

Many specimens from the water surface of the flood parts of the salt meadow near Kloster and in sea-weed accumulations of the Dornbusch shore ranges too. Cosmopolite species.

Sminthurides schoetti (Axelson, 1903)

Hygrophilous, European species. Only found in wet moss of a *Hippophae* thicket.

Family Katiannidae

Sminthurinus niger (Lubbock, 1876)

Single specimens collected in many habitats of Hiddensee. Cosmopolite species.

Family Bourletiellidae

Deuteriosminthurus repandus (Agren, 1903)

A common and widely distributed species (Palaeartic). One specimen was found in the mixture of sea-weed, wood pieces and stones of the shore range of the Dornbusch.

Heterosminthurus insignis (Reuter, 1876)

One female in wet moss of the heat near Neuendorf. Palaeartic species preferring wet habitats and bogs.

Heterosminthurus novemlineatus (Tullberg, 1871)

A single juvenile specimen in the same Hiddensee habitat like *H. insignis*. Similar distribution.

Ecological estimation of species

Representatives of 67 Collembola species (17 Cosmopolite, 26 Palaeartic, 24 Europe) were collected on Hiddensee from various habitats. PALISSA (1969) obtained 37 true species. Based on his and our results, 79 Collembola species are recorded for the island until now. It can be supposed that the number of species will be increased by further study (e. g. of the dune areas near Vitte).

Our species list includes 10 (more or less halophilous) species inhabiting shore ranges: *Hypogastrura viatica*, *Anurida tullbergi*, *A. thalassophila*, *Onychiurus macfadyeni*, *Folsomia sexoculata*, *F. norvegica*, *Archisotoma besselsi*, *Proisotoma admaritima*, *Isotoma maritima*. 15 species belong to the hygrophilous: *Proisotoma schoetti*, *Agrenia bidenticulata*, *Isotomurus ciliatus*, *I. plumosus*, *I. palustris*, *Isotoma antennalis*, *Tomocerus minutus*, *T. minor*, *Podura aquatica*, *Sminthurides aquaticus*, *S. malmgreni*, *S. schoetti*, *Heterosminthurus insignis*, *H. novemlineatus*.

Summary

Based on analysis of 23 samples from Hiddensee (1985, 1986, 1989), 67 species of Collembola were found. Information are given about distribution and ecology of these species. Ten coast-bound species are recorded: *Hypogastrura viatica*, *Anurida tullbergi*, *A. thalassophila*, *Onychiurus macfadyeni*, *Folsomia sexoculata*, *F. norvegica*, *Archisotoma besselsi*, *Proisotoma admaritima*, *Isotoma maritima*. Fifteen hygrophilous species were collected too. The majority of species reported are widely distributed.

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