

List of invertebrates collected in pitfall traps in hayfields and pastures in Northern-Iceland 1996–1997

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SUMMARY

Surface invertebrates were collected in pitfall traps in 3 hayfields and 3 pastures at the Experimental Farm Möðruvellir, Hörgárdalur, Northern-Iceland, from May 1996 to May 1997. Species list for the summer collection (May 20th to October 7th) is presented indicating that Acari and Collembola are dominating in number. Identified were 44 species of Diptera, 42 of Coleoptera, 21 of Araneae, 13 of Hymenoptera, 5 of Hemiptera, 5 of Lumbricidae, 2 of Pulmonaria and 1 of Opiliones, Plecoptera and Thysanoptera. In addition to those 2 species of Diptera, 2 species of Coleoptera and 1 species of Araneae were identified in winter collection. Analysis of results will be presented elsewhere.

Key words: hayfields, Iceland, management, pastures, surface invertebrates.

YFIRLIT

Tegundir hryggleysingja sem söfnuðust í fallgildrum í túnum og beitilöndum á Norðurlandi 1996–1997

Yfirborðshryggleysingjum var safnað í heilt ár (maí 1996 til maí 1997) á 3 túnum og 3 beitarspildum á landi Rannsóknastofnunar landbúnaðarins á Möðruvöllum í Hörgárdal. Tegundalisti fyrir sumarsöfnunina (20. maí til 7. október) er birtur hér og kemur fram að mest var af mítlum (Acari) og mordýrum (Collembola). Tegundagreindar voru 44 tvívængjutegundir (Diptera), 42 bjöllutegundir (Coleoptera), 21 köngulartegund (Araneae), 13 æðvængjutegundir (Hymenoptera), 5 skortítutegundir (Hemiptera), 5 ánamaðkategundir (Lumbricidae) og 2 landsniglategundir (Pulmonaria) og 1 tegund af langfætlum (Opiliones), steinflugum (Plecoptera) og kögurvængjum (Thysanoptera). Þessu til viðbótar fundust 2 tvívængjutegundir, 2 bjöllu- tegundir og 1 köngulartegund í vetrarsöfnuninni. Uppgjör á gögnum verður birt annars staðar.

INTRODUCTION

Cultivation of permanent hayfields (“tún”) in Iceland mainly consists of draining if needed and tillering followed by annual fertilization, one or two cuttings and sometimes grazing in spring and autumn. This management results in changes in soil and vegetation that may be

expected to influence the invertebrate populations in these fields.

The aim of this study was to investigate the composition and activity of invertebrates in grassland swards in Iceland, and to establish the impact of management on invertebrate

populations. The results of this study will be presented elsewhere, and here only species and families of invertebrates collected in the study are listed.

MATERIALS AND METHODS

The conditions during sampling have been described roughly before (Guðleifsson, 1998). Invertebrates were collected from May 20th 1996 to May 27th 1997 at 6 locations on the Experimental Farm Möðruvellir, Eyjafjörður, Iceland. Areas included 3 hayfields on 3 different soil types, and 3 uncultivated areas (pastures) close to the hayfields and resembling those before cultivation. Location of test areas is illustrated in Figure 1 and basic information on the management is presented in Table 1.

On October 28th soil samples down to 5 cm were taken close to the traps, at least 20 stitches, mixed to one sample for each area. These samples were analyzed chemically by methods traditionally used in the Agricultural Extension Service in Eyjafjörður, minerals in ammonium lactate solution (Guðleifsson, 1984). At the same time one soil sample (12 cm depth,

4.3 cm diameter) was collected from each area for volume weight analysis and that sample was also used for determination of content of organic matter, measured as loss on ignition at 500°C. Volume weight was calculated according to Sigvaldason (1993).

Every time when pitfall traps were renewed during summer 1996, usually weekly, soil samples were taken (12 cm depth, 4 cm diameter) from each area for determination of air volume in soil calculated from the previously determined organic matter content and pore volume. At the same time soil temperature in 2.5 cm depth was registered from previously placed thermometers. This happened 22 times during the summer 1996 and means are included in Table 1.

Botanical composition of plant cover around the traps was evaluated visually on May 30th and August 30th. Results were similar in both cases and means are presented in Table 1.

Air and soil temperatures and precipitation are continuously registered at Möðruvellir. The weather station is located on area 5. Results, monthly means, during the sampling period in 1996 and 1997 are shown in Figure 2.

On May 20th, after a mild winter, six pitfall traps (Barber traps), were placed at 1 m interval in direct line on 6 areas (Figure 1). Traps were 200 ml plastic beakers with 38.5 cm², open-

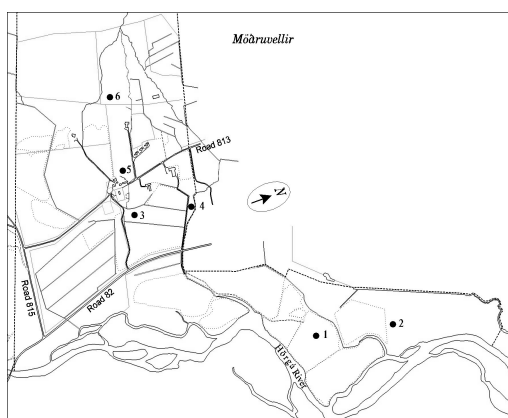


Figure 1. Numbers show location of areas where invertebrates were collected at Möðruvellir 1996–1997.

1. mynd. Númer (1–6) sýna staðsetningu fallgildra til söfnunar á hryggleysingjum á Möðruvöllum 1996–1997.

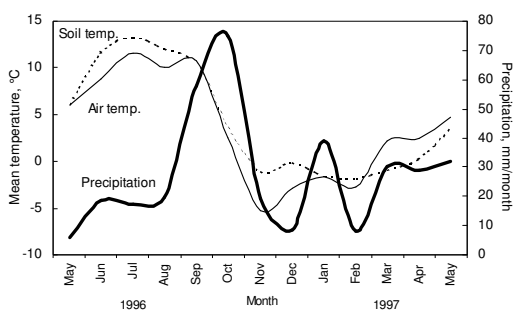


Figure 2. Monthly mean air temperature, soil temperature in 5 cm depth and monthly precipitation in Möðruvellir during collection of invertebrates in 1996–1997.

2. mynd. Mánaðarmeðaltöl lofthita og jarðvegs-hita í 5 cm dýpi, ásamt mánaðarúrkomu á Möðruvöllum 1996–1997.

Table 1. Information on management, soil analysis and plant cover on the studied areas at Möðruvellir.

1. tafla. Upplýsingar um nýtingu, jarðvegsþætti og gróðurfar á rannsóknarsvæðunum á Möðruvöllum.

	Area number					
	1	2	3	4	5	6
Management						
Utilization:	Hayfield	Pasture	Hayfield	Pasture	Hayfield	Pasture
Fertilizing:	Annually	Never	Annually	Never	Annually	Rarely
Manure:	Never	Never	Often	Never	Very often	Rarely
Grazing:	Occasionally	Occasionally	Frequently	Frequently	Occasionally	Always
Soil analysis, 0–5 cm depth						
Soil type	Sandy	Sandy	Peaty	Peaty	Silty	Silty
Organic matter, %	24	32	70	30	40	50
pH	5.5	5.7	5.5	5.5	5.4	5.6
P, mg/100g	10.2	2.2	27.8	6.4	23.4	11.0
K, meq/100g	0.3	1.3	1.5	2.0	1.6	3.4
Ca, meq/100g	13.5	15.0	21.0	11.0	17.0	17.5
Mg, meq/100g	5.8	7.8	8.0	5.6	5.0	8.0
Soil analysis, 0–12 cm depth						
Organic matter, %	12	14	58	14	31	20
Pore volume, %	49	57	59	53	59	57
Air volume May–Oct., %	42±10	39±7	69±19	65±16	71±16	50±11
Soil temp. 2.5 cm May–Oct., °C	10.5±1.8	9.4±2.1	11.4±2.1	10.9±1.8	10.9±1.9	10.5±1.4
Botanical composition, %						
<i>Deschampsia caespitosa</i>	79	73	13	90	27	77
<i>Poa pratensis</i>	3	3	64	5	10	10
<i>Festuca rubra</i>	10	10	3		10	
<i>Agrostis</i> spp.	3	8		5		8
<i>Alpeycurus pratensis</i>	5				42	5
<i>Phleum pratense</i>			20		3	
<i>Poa annua</i>			+		5	
<i>Trifolium repense</i>		3				
<i>Vicia cracca</i>		3				
<i>Rumex longifolius</i>					3	

ing placed at the soil surface, filled with 80 ml water with a drop of detergent. Wider lids were placed about 5 cm above the surface of the beakers to hinder rain from entering the traps. Traps were usually renewed at weekly intervals during summer, but at longer variable intervals during winter, and the content was intact in most cases. Winter collection was only performed in 2 out of 6 traps on each area and then 5% formalin was put into the traps to prevent liquid from freezing. In some occasions during winter the traps were covered with snow. In January water had entered some traps during thaw periods, especially in hayfields 3 and 5, but trapped animals seemed to

stay in traps. After collection the content was stored in 50% isopropanol at 4°C for later sorting and identification under a stereolupe. Invertebrates were mainly identified by the authors, but assistance in identification was given by Erling Ólafsson (mainly Diptera and Hymenoptera), Ingi Agnarsson (Araneae) and Hálfván Björnsson (mainly Coleoptera).

Sampling spots were protected by electrical fences to prevent grazing animals from disturbing the collection. The fences were protruded by calves in few occasions in fall in pasture 4 and 6, but this is not believed to have influenced the results. The continuity of collection was broken when the hayfields were

Table 2. Management (fertilization and cutting) in 1996 on hayfields where invertebrates were collected.

2. tafla. Meðferð rannsóknartúna (áburður og sláttur) sumarið 1996.

Treatment	Area 1	Area 3	Area 5
Spring fertilization, kg/ha N, P, K	120, 26, 50	100, 22, 42	97, 21, 40
Manure in March, kg/ha N, P, K			14, 4, 19
Date of first cutting	July 9	June 21	June 20
Date of hay removal	July 14	June 24	June 23
DM yield, t/ha	3.2	3.4	3.0
Summer fertilization, kg/ha N, P, K		39, 0, 0	30, 0, 0
Date of second cutting		August 8	August 6
Date of hay removal		August 10	August 8
DM yield, t/ha		1.9	1.6

harvested. Hayfield 3 and 5 were cut twice, field 1 once. The management in 1996 is shown in Table 2.

On May 30th 1996 following descriptions were made of the sampling areas:

Area 1: Flat, with sloping depressions where tufted hairgrass (*Deschampsia caespitosa*) dominated. Meadow foxtail (*Alopecurus pratensis*) dominated in higher areas.

Area 2: With big tufts (up to 40 cm) dominated by tufted hairgrass. A lot of withered grass from last summer.

Area 3: Flat. Some withered grass. In depressions grasses are damaged by winter stress, but in higher areas timothy (*Phleum pratense*) dominates.

Area 4: With big tufts, a lot of withered grass. Soil from ditches may have been distributed over the area during draining long time ago.

Area 5: Flat with depressions. In depression sown grasses are killed by winter stress.

Area 6: Flat, sloping to east.

RESULTS

From Table 1 it is obvious that soil and vegetation in the three soil types are different. Roughly the soil can be classified as sandy (area 1 and 2), peaty (area 3 and 4) and silty (area 5 and 6). According to newer terminol-

ogy these soils would be classified as vitrosol, histic andosol and brown andosol respectively (www.rala.is/desert). The soil organic matter content indicates that area 4 is not a good example of undisturbed peat area. The management has considerably influenced the soil status and botanical composition of the hayfields. This is obvious when hayfields and pastures on the same soil type are compared. Generally the pH has decreased by management as well as the soil content of K, Ca and Mg, while the soil P-content, air volume and temperature has increased (Table 1).

Results from collection of invertebrates were divided into summer (May 20th to October 7th 1996) and winter (October 8th 1996 to May 27th 1997). Only summer collection of invertebrates is presented in Table 3 and in addition five species were identified from winter collection, *Porrhomma hebescens* (Araneae), *Lesteva longoelytrada*, *Atheta amicula* (Coleoptera), *Copromyza equina*, *Zaphne frontata* and *Limonia* spp. (Diptera). Because summer collection was disrupted in hayfields after cutting, and therefore number of collection days was different for the areas, figures for total number of collected specimens are not presented, and results are calculated as collected specimens/day. The list (summer and winter collection) contains 46 species of dipterans, 44 species of beetles, 22 species of spiders

and 13 species of hymenopterans. Other orders contain fewer species. Mites and springtails were determined only to family level.

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Table 3. Number of trapped specimens/day in pitfall traps in 6 areas in Möðruvellir in summer 1996 (20/5–7/10; 140 days). Mean of 6 replicates.

3. tafla. Fjöldi hryggleysingja sem veiddust á dag í fallgildirur á athugunarsvæðunum 6 á Möðruvöllum sumarið 1996 (20/5–7/10; 140 dagar). Meðaltal 6 endurtekninga.

CLASS Order Family Species	Number of trapped specimens/day					
	Sandy soil		Peat soil		Silty soil	
	Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
ANNELIDA						
Tubificida						
Enchytraeidae	0.019	0.014	0.001	0.026	0.003	0.038
Lumbricidae (Sum)	0.285	0.109	0.026	0.009	0.018	0.054
<i>Aporrectodea rosea</i>	0.026	0.001	0.003	-	0.001	0.011
<i>A. caliginosa</i>	0.173	0.062	0.023	0.001	-	0.010
<i>A. longa</i>	0.004	-	-	-	-	-
<i>Lumbricus rubellus</i>	0.028	0.007	-	0.004	0.001	0.008
<i>L. terrestris</i>	-	0.013	-	-	0.009	0.001
Juveniles	0.054	0.026	-	0.004	0.007	0.024
GASTROPODA						
Stylommatophora (Sum)	0.001	0.075	-	0.013	-	0.002
<i>Stylommatophora</i> spp.	0.001	0.068	-	0.013	-	0.002
Agriolimacidae						
<i>Deroceras agreste</i>	-	0.004	-	-	-	-
Euconulidae						
<i>Euconulus fulvus</i>	-	0.003	-	-	-	-
ARACHNIDA						
Acari (Sum)	12.709	4.737	44.564	18.453	5.656	4.257
Prostigmata	11.365	2.504	8.013	2.630	4.200	1.010
Heterostigmata	-	-	0.001	0.006	-	0.004
Mesostigmata	0.140	0.275	0.497	1.030	0.241	0.664
Cryptostigmata	0.892	1.798	0.095	14.004	0.247	2.529
Astigmata	0.312	0.160	35.958	0.783	0.968	0.050
Araneae (Sum)	1.118	1.215	1.059	0.752	0.803	0.674
Gnaphosidae						
<i>Haplodrassus signifer</i>	-	-	0.003	0.005	-	0.005

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CLASS	Order	Number of trapped specimens/day					
		Sandy soil		Peat soil		Silty soil	
		Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
	Family						
	Species						
	Thomisidae						
	<i>Xysticus cristatus</i>	-	-	-	0.001	-	0.007
	Lycosidae						
	<i>Pardosa palustris</i>	0.006	0.005	0.009	0.032	0.037	0.121
	<i>P. sphagnicola</i>	0.005	0.127	0.009	0.033	0.007	0.006
	<i>Pirata piraticus</i>	-	0.001	-	-	-	-
	Linyphiidae						
	<i>Ceratinella brevipes</i>	-	0.001	-	-	0.001	0.001
	<i>Walckenaeria nodosa</i>	-	0.007	-	-	-	-
	<i>Dismodicus bifrons</i>	-	0.002	0.001	0.004	-	0.005
	<i>Gonatum rubens</i>	-	0.007	0.001	-	-	-
	<i>Silometopus ambiguus</i>	0.009	0.004	0.036	0.023	0.034	0.095
	<i>Cnephalocotes obscurus</i>	0.004	0.003	-	-	-	0.001
	<i>Savignya frontata</i>	0.011	0.096	0.006	0.106	0.020	0.049
	<i>Erigone atra</i>	0.867	0.006	0.873	0.150	0.524	0.132
	<i>E. arctica</i>	0.005	-	0.014	-	0.009	0.001
	<i>Latithorax faustus</i>	-	0.002	-	-	0.001	0.001
	<i>Lepthorhoptum robustum</i>	0.002	0.048	0.001	0.015	0.005	-
	<i>Agyneta decora</i>	0.005	0.016	0.001	0.002	0.003	0.018
	<i>Bathyphantes gracilis</i>	0.009	0.025	0.004	0.010	0.003	0.004
	<i>Lepthyphantes mengei</i>	0.029	0.435	0.020	0.201	0.019	0.015
	<i>L. complicatus</i>	-	-	-	0.001	-	-
	<i>Allomengea scopigera</i>	0.142	0.230	0.024	0.115	0.070	0.180
	Juveniles	0.024	0.200	0.057	0.054	0.070	0.033
	Opiliones						
	<i>Mitopus morio</i>	0.153	0.104	0.056	0.333	0.008	0.079
	INSECTA						
	Collembola (Sum)	11.920	6.169	18.506	35.503	9.809	15.018
	Hypogastruridae	2.901	0.127	4.716	0.988	0.393	3.685
	Onychiuridae	0.069	0.335	0.170	0.095	0.176	0.604
	Isotomidae	1.843	1.402	2.845	23.904	4.912	2.118
	Entomobryidae	0.086	3.502	0.268	1.651	0.363	2.546
	Sminthuridae	7.021	0.803	10.507	8.865	3.965	6.065
	Plecoptera						
	<i>Capnia vidua</i>	0.004	-	0.029	0.001	-	0.001
	Hemiptera (Sum)	0.212	0.320	0.166	0.061	0.047	0.149
	Miridae						
	<i>Teratocoris saundersi</i>	-	-	-	-	-	0.002
	Saldidae						
	<i>Salda littoralis</i>	-	-	0.009	-	-	-
	Cicadellidae						
	<i>Jassargus distinguendus</i>	-	0.001	-	0.005	-	0.015
	<i>Macrosteles laevis</i>	0.001	-	-	0.002	-	0.007
	Aphididae	0.211	0.076	0.156	0.052	0.047	0.123
	Ortheziidae						
	<i>Arctorthezia cataphracta</i>	-	0.243	0.001	0.002	-	0.002
	Thysanoptera						
	Thripidae						
	<i>Aptinothrips rufus</i>	-	-	0.005	-	-	0.001

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Order Family Species	Number of trapped specimens/day					
	Sandy soil		Peat soil		Silty soil	
	Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
Coleoptera (Sum)	0.450	0.415	0.546	2.392	0.397	0.897
Carabidae						
<i>Notiophilus biguttatus</i>	-	0.001	-	-	-	-
<i>Patrobus septentrionis</i>	0.006	0.090	0.013	0.079	0.016	0.044
<i>Trechus obtusus</i>	-	-	-	0.001	-	0.001
<i>Bembidion bipunctatum</i>	0.003	-	-	-	-	-
<i>Calathus melanocephalus</i>	0.003	0.019	0.023	0.137	0.047	0.067
<i>Amara quenseli</i>	-	0.003	0.003	0.001	0.005	0.004
<i>Trichocellus cognatus</i>	-	0.001	0.001	-	-	0.004
Hydrophilidae						
<i>Cercyon analis</i>	-	-	0.003	-	-	-
Staphylinidae						
<i>Philonthus cephalotes</i>	-	-	0.001	-	-	0.001
<i>Gabrius trossulus</i>	-	-	0.006	0.001	0.001	0.005
<i>Creophilus maxillosus</i>	-	-	-	-	-	0.001
<i>Quedius boops</i>	-	0.052	0.032	0.274	0.003	0.029
<i>Q. fulvicollis</i>	-	0.012	-	0.085	0.005	0.015
<i>Q. umbrinus</i>	-	-	-	0.001	-	-
<i>Othius angustus</i>	-	-	0.001	0.013	-	-
<i>Omalium excavatum</i>	0.001	-	0.006	0.001	0.005	0.001
<i>O. rivulare</i>	0.006	0.002	0.039	0.012	0.016	0.011
<i>O. septentrionis</i>	0.003	-	0.004	0.001	-	-
<i>Anotylus sculpturatus</i>	-	-	-	0.004	0.005	-
<i>Tachinus corticinus</i>	0.115	0.036	-	0.001	0.008	0.098
<i>Oxyroda haemorrhoea</i>	0.003	-	0.020	0.018	0.011	0.005
<i>O. islandica</i>	0.065	0.070	0.071	0.814	0.103	0.056
<i>Atheta melanocera</i>	0.010	0.008	0.011	0.139	0.008	0.036
<i>A. fungi</i>	0.020	0.032	0.036	0.263	0.041	0.073
<i>A. islandica</i>	0.013	0.020	0.011	0.024	0.004	0.006
<i>A. atramentaria</i>	0.176	0.035	0.118	0.295	0.067	0.082
<i>A. graminicola</i>	0.008	0.001	0.005	0.001	-	-
<i>A. excellens</i>	0.014	0.012	0.017	0.051	0.009	0.013
<i>Stenus carbonarius</i>	-	-	-	0.001	-	0.001
Scarabaeidae						
<i>Aphodius lapponum</i>	-	-	-	0.002	0.001	0.002
Elateridae						
<i>Hypnoidus riparius</i>	0.001	0.001	-	-	-	-
Byrrhidae						
<i>Cytilus sericeus</i>	-	-	-	0.001	0.001	0.001
<i>Byrrhus fasciatus</i>	-	-	-	-	-	0.001
Cryptophagidae						
<i>Cryptophagus pilosus</i>	-	-	0.001	-	0.005	0.001
<i>C. scanicus</i>	-	-	-	-	0.005	-
<i>Atomaria analis</i>	-	0.013	0.120	0.170	0.023	0.338
Coccinellidae						
<i>Nephus limonii</i>	-	-	-	-	-	0.001
<i>Coccinella undecimpunctata</i>	0.003	-	0.001	-	-	-
Lathridiidae						
<i>Lathridius minutus</i>	-	-	-	-	0.005	-
Curculionidae						
<i>Otiorhynchus arcticus</i>	-	0.001	-	0.001	-	-
<i>O. nodosus</i>	-	0.006	0.003	0.001	0.003	0.001
<i>Tropiphorus obtusus</i>	-	0.001	-	-	-	-

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Order Family Species	Number of trapped specimens/day					
	Sandy soil		Peat soil		Silty soil	
	Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
Hymenoptera (Sum)	0.062	0.018	0.598	0.253	0.237	0.117
Hymenoptera spp.	0.004	0.006	0.033	0.007	0.035	0.011
Tenthredinidae						
<i>Pachynematus obductus</i>	-	-	-	-	0.003	-
Ichneumonidae	0.003	0.001	0.006	0.002	0.005	0.007
<i>Aclastus gracilis</i>	0.001	-	-	-	0.001	-
<i>Endasys varipes</i>	0.003	0.005	0.005	0.001	0.012	0.006
<i>Sussaba pulchella</i>	-	-	-	-	-	0.001
Braconidae	-	-	0.007	0.001	-	-
<i>Biosteres carbonarius</i>	-	-	-	0.001	-	-
<i>Chasmodon apterus</i>	0.006	0.001	0.001	0.001	0.011	0.004
<i>Dacnusa</i> spp.	-	-	0.006	-	0.003	-
<i>D. confinis</i>	-	-	0.005	-	0.004	0.001
<i>Microctonus intricatus</i>	0.003	-	0.004	-	-	0.001
Aphidiidae	0.005	0.001	0.103	0.168	0.036	0.008
<i>Aphidius</i> spp.	-	-	0.001	-	-	0.001
<i>Monoctonus caricis</i>	-	0.001	0.006	-	0.007	-
Cynipidae	0.001	-	0.005	-	0.009	-
Cynipidae, Eucoilidae	0.004	-	0.017	-	0.016	-
Eucoilidae	-	-	0.004	-	0.003	-
Pteromalidae, Encyrtidae, Aphelinidae, Eulophidae,						
Mymaridae	0.001	-	0.001	0.001	0.003	-
Proctotrupidae	-	-	0.019	0.001	0.004	0.002
Diapriidae						
<i>Trichopria aptera</i>	-	0.001	0.008	0.002	0.012	0.017
Scelionidae	-	-	0.003	-	0.001	0.008
Platygastridae	0.028	-	0.258	0.055	0.056	0.032
<i>Platygaster splendidulus</i>	0.003	-	0.106	0.013	0.013	0.018
Ceraphronidae						
<i>Aphanogmus nanus</i>	-	0.001	-	-	0.003	-
Apidae						
<i>Bombus jonellus</i>	-	0.001	-	-	-	-
Diptera (Sum)	0.359	0.063	2.263	0.882	1.424	0.755
Mycetophilidae	0.004	0.001	0.010	0.001	0.004	0.004
<i>Exechia</i> spp.	0.003	0.004	-	0.001	-	0.004
Sciaridae	0.281	0.027	1.659	0.703	0.899	0.494
<i>Bradysia rufescens</i>	-	-	-	-	0.001	-
Cecidomyiidae	0.040	0.003	0.178	0.015	0.167	0.025
Psychodidae						
<i>Psychoda</i> spp.	-	-	-	-	0.001	-
Bibionidae						
<i>Bibio nigriventris</i>	-	-	0.022	0.001	0.001	0.010
<i>B. pomonae</i>	-	-	0.001	0.001	0.004	0.001
<i>Dilophus femoratus</i>	-	-	-	0.001	0.004	0.007
Chironomidae	0.001	-	-	-	-	0.006
Dolichopodidae	-	-	-	0.001	-	-
<i>Dolichopus plumipes</i>	0.004	0.004	0.015	0.011	0.013	0.017
<i>Campsicnemus armatus</i>	0.003	-	0.018	0.004	0.003	0.001

Continued on next page

Order	Family	Number of trapped specimens/day					
		Sandy soil		Peat soil		Silty soil	
		Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
	Species						
	Lonchopteridae						
	<i>Lonchoptera furcata</i>	-	0.006	0.009	0.031	0.025	0.018
	Phoridae						
	<i>Megaselia</i> spp.	-	-	-	0.002	-	0.006
	<i>M. clara</i>	-	-	-	-	0.001	-
	<i>M. sordida</i>	-	-	-	0.002	-	-
	<i>M. giraudii</i>	-	-	0.001	-	0.001	0.005
	Syrphidae						
	<i>Sphaerophoria scripta</i>	-	-	-	-	-	0.002
	<i>Platycheirus clypeatus</i>	-	-	0.001	-	-	-
	Piophilidae						
	<i>Piophila</i> spp.	-	0.001	-	0.001	-	0.001
	Heleomyzidae						
	<i>Heleomyza borealis</i>	-	-	0.006	0.006	0.007	0.002
	Sphaeroceridae	0.003	0.007	0.014	0.016	0.021	0.038
	<i>Ischiolepta pusilla</i>	-	-	0.001	-	-	-
	<i>Copromyza</i> spp.	-	-	0.001	0.006	-	0.007
	<i>C. similis</i>	0.001	-	-	-	0.001	0.004
	<i>Crumomyia</i> spp.	-	-	-	0.001	-	0.001
	<i>C. nitida</i>	-	-	-	0.005	-	0.004
	<i>Trachypella bovilla</i>	-	-	-	0.001	0.001	0.006
	<i>Leptocera</i> spp.	-	-	0.005	-	0.001	0.004
	<i>L. caenosa</i>	-	-	0.008	0.001	0.003	0.001
	<i>L. fontinalis</i>	-	-	0.010	0.004	0.001	0.002
	<i>Minilimosina vitripennis</i>	0.003	-	0.004	0.015	0.009	0.010
	<i>Spelobia</i> spp.	0.003	-	-	-	-	0.010
	<i>S. rufilabris</i>	0.001	-	0.006	0.002	-	0.005
	<i>Pullimosina heteroneura</i>	-	-	0.001	-	-	-
	Drosophilidae						
	<i>Scaptomyza graminum</i>	-	0.001	0.104	-	0.068	0.004
	<i>S. pallida</i>	-	0.001	-	-	-	-
	Ephydriidae						
	<i>Hydrellia griseola</i>	-	-	-	0.001	-	-
	<i>Lamproscatella sibilans</i>	-	-	-	-	-	0.001
	<i>Scatella</i> spp.	-	-	0.001	-	-	-
	<i>S. tenuicosta</i>	-	-	-	0.001	-	0.001
	Chloropidae						
	<i>Oscinella hortensis</i>	0.005	0.003	0.121	0.007	0.159	0.025
	Scathophagidae						
	<i>Chaetosa punctipes</i>	0.001	-	-	0.001	-	-
	<i>Scathophaga</i> spp.	-	0.001	0.001	-	-	0.001
	<i>S. furcata</i>	-	0.001	0.013	0.002	0.005	-
	<i>S. stercoraria</i>	0.001	-	0.006	-	0.007	0.005
	Antomyiidae						
	<i>Pegoplata infirma</i>	-	-	-	-	-	0.001
	<i>Botanophila betarum</i>	0.001	-	0.001	-	-	-
	<i>B. fugax</i>	0.001	-	-	0.001	-	-
	<i>B. rubrigena</i>	-	-	-	0.001	-	-
	<i>Delia radicum</i>	-	-	0.004	0.001	0.004	-

Continued on next page

Order Family Species	Number of trapped specimens/day					
	Sandy soil		Peat soil		Silty soil	
	Hayfield 1	Pasture 2	Hayfield 3	Pasture 4	Hayfield 5	Pasture 6
Muscidae	0.003	-	0.018	0.010	0.011	0.001
<i>Thricops cunctans</i>	-	-	0.010	0.006	0.001	0.005
<i>T. longipes</i>	-	-	-	0.002	-	-
<i>Helina annosa</i>	-	-	-	0.004	-	-
<i>Myospila mediatubunda</i>	-	-	-	0.005	-	0.004
<i>Spilogona</i> spp.	-	-	0.008	0.001	0.001	-
<i>S. contractifrons</i>	-	-	0.001	0.001	-	0.001
<i>S. depressiuscula</i>	-	-	0.001	-	-	-
<i>Coenosia pumila</i>	-	-	0.003	-	-	-
Fanniidae						
<i>Fannia postica</i>	-	0.003	0.001	0.006	-	0.011
Larvae	0.073	0.030	0.145	0.145	0.097	0.275