

Carabid distribution in a farmland mosaic: the effect of patch type and location

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Received 15 April 1999, accepted 1 July 1999

Kinnunen, H. & Tiainen, J. 1999: Carabid distribution in a farmland mosaic: the effect of patch type and location. — *Ann. Zool. Fennici* 36: 149–158.

The distribution and abundance of carabid beetles was studied in a large patch of farmland of 150 fields. If the species pool is supposed to be the same over the study area, differences between the occurrence of beetles on the fields are probably due to habitat choice. We investigated the carabid communities of 27 fields by pitfall trapping. The community composition of the green set-asides differed from those of the tilled fields. In the set-asides, the proportion of the autumn-breeding individuals was almost 70% at the beginning of June, while the potato fields and bare set-aside field supported mostly spring breeders. Morisita's index indicated that there was a relationship between the similarity of the communities and the distance between them. However, the distance was found to be an important factor in explaining dissimilarity only in barley fields. This may be because colonization of tilled fields occurs early in spring and is dependent on the species pool of neighbouring fields and field margins.

1. Introduction

Habitat distribution of carabid beetles has been studied assiduously (e.g., Lindroth 1949, Thiele 1977, Luff 1987), and the broad habitat occurrences in Fennoscandia are known. However, few researchers have actually studied habitat use on the scale where habitat selection can take place, i.e. within the home range of beetles. Comparing different areas and their communities does not necessarily give a correct view of the phenomenon, since factors acting on other scales may signifi-

cantly contribute to the variation (Kinnunen, H., Tiainen, J. & Tukia, H. unpubl.).

There is sufficient information on the home range of carabids to allow an assessment of the scale at which habitat selection may occur. Thiele (1977) estimated that carabid beetles' daily walking distances vary between a metre or less to tens of metres. The results of Baars (1979), and Loreau and Nolf (1993) support these findings. However, studies of movements involve mostly a few large or middle sized beetles and less is known about small sized animals. However, it can be supposed

that carabid beetles are capable of moving several hundreds of metres or even kilometres in their lifetime. Good dispersers that are capable of flying can naturally move even longer distances.

Finnish agricultural land is made up of patches mainly surrounded by forest. The patch size varies from less than a hectare to several square kilometres (see Kinnunen & Tiainen 1994). Patches of farmland are internally heterogeneous, since fields are usually sown for more than one crop. It is likely that some parts of a field system in a patch of farmland are more favourable to some species than others. If this is true, habitat should be chosen among the fields inside the patch, within the dispersion range of beetles.

The crop plant (including set-aside vegetation) will hardly determine the occurrence of carabid species which do not consume the cultivated plants. Most of the species are catholic feeders and not dependent on any specific prey (Hengeveld 1980). However, tilling work and vegetational development of fields may have a great impact on beetle occurrence. Vegetational development is determined by the timing of tillage and sowing, and by herbicide treatments. As most of the prey of carabid beetles are herbivores, herbicide treatments affect arthropod abundance both directly and indirectly although this effect is usually not long-lasting (Thiele 1977, Luff 1987, Huusela-Veistola 1996).

The structure of vegetation should also be important, since it determines e.g., the light conditions and microclimate prevailing on the ground. In southern Finland, spring cereals, especially barley and oats, are the most common crops grown, although root crops, such as potato, sugarbeet, and oilseed rape, pasture, and autumn cereals (especially rye) are also common. Moreover, many fields are set-asides. The untilled crops provide very different conditions from those of tilled crops, as do the autumn sown crops compared to fields tilled and sown in spring. Accordingly, spring and autumn breeding species may be differently susceptible to farming work of different fields. In this study we tested whether tilled crops differed from non-tilled set-asides in the composition of spring and autumn breeders. We also wanted to study the habitat distribution of carabid beetles in agricultural fields in a fairly large patch of farmland to find out how community composi-

tion would vary within the study area. In nearby patches the species pool was assumed to be the same. If beetles chose actively between the habitats, it would be possible that communities were very similar in patches of same habitat type within the home range of carabids. On the other hand, if beetles had no preferences for any habitat types then all the nearby patches should be similar.

2. Material and methods

2.1. Description of field parcel types: management and crops

Fields studied were of seven different types (Table 1): two types of set-asides, two kinds of spring cereals, two root crops, and one oil-seed plant. For brevity, we call the vegetated set-aside "green set-aside" and the non-vegetated one "bare set-aside".

The following crop types are ploughed in the autumn:

- Spring cereals (barley and oats). Tillage and sowing from late April to late May depending on the year. Herbicide treatment in early or mid-June. Spraying of insecticides only in years of mass occurrence of aphids (not in the study year). Harvest in early September.
- Sugar beet. Like spring cereals, but from 1-3 sprayings with insecticides. Harvest in October.
- Oilseed rape. Like sugarbeet, harvest in late September.
- Potato. Tillage and sowing in mid or late May. Harvest in August.
- Bare set-aside. Tilled in spring, but not sown for any crop. Harrowed weekly for mechanical control of weeds.

Green set-aside was not ploughed in the autumn. Permanent for 5 to 20 years depending on the agreement the farmer made. Usually established by sowing perennial grass e.g., timothy.

2.2. Field work

The study area was situated near Lammi Biological Station (61°03'N, 25°03'E) in southern Finland in a 450 ha patch of farmland mainly surrounded by forest. There were a total of 150 field parcels in this area, of which we randomly selected 27 for catching carabid beetles (Fig. 1, Table 1). Beetles were trapped using pitfalls (diameter 7 cm) during 10 consecutive weeks, starting in the beginning of June and ending in mid-August 1995. Each site consisted of 20 traps placed in a 4 × 5 grid about three metres from one another. The traps were filled up to one third with 20% ethylene glycol to kill and preserve the beetles. Detergent was used

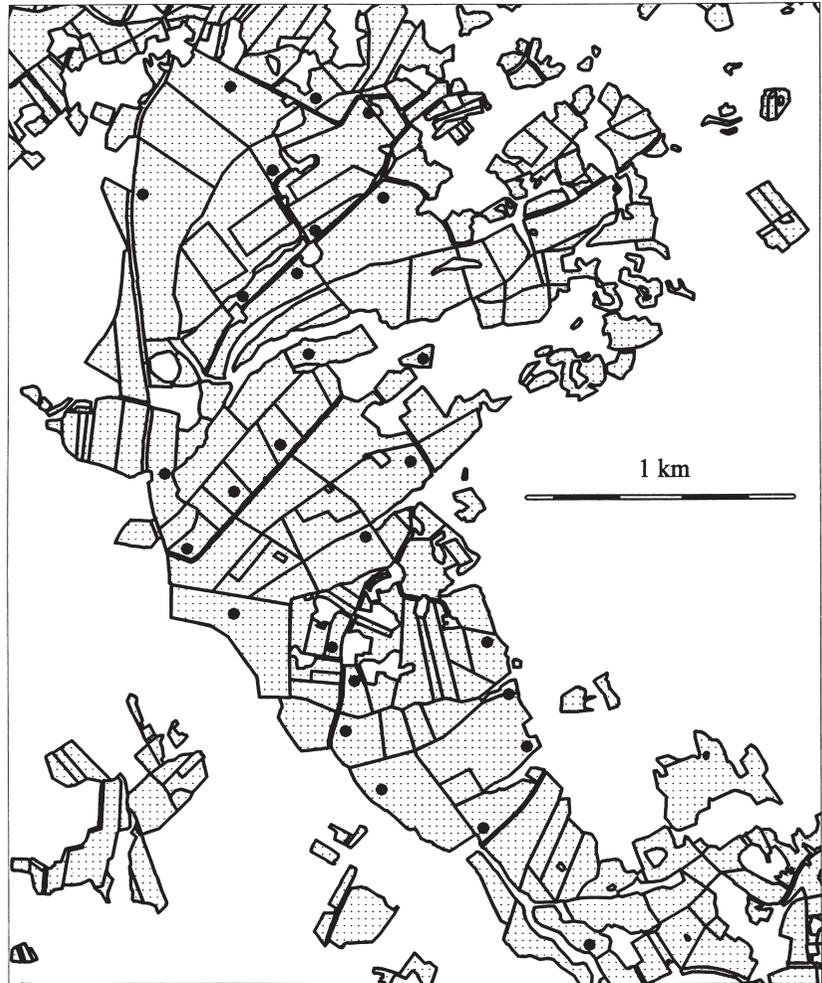


Fig. 1. The study area is formed of a patchwork of fields. White areas between the fields are farm yards and gardens or small wood lots. The circles indicate the location of the sampling sites.

to expedite their drowning. Traps were emptied every fortnight.

At each site the contents of the twenty traps were pooled and stored in 70% ethanol prior to identification. Beetles were identified according to Lindroth (1985, 1986).

2.3. Statistical methods

We used Morisita's similarity index (Krebs 1989) to measure the similarity of the carabid communities. Morisita's index varies from 0 (no similarity) to about 1 (complete

Table 1. The number of individuals and species caught in different crops.

Crop	Number of sites	Number of individuals	Mean no. per site	Number of species observed
Set-aside	6	8 652	1 442	59
Barley	8	3 983	498	53
Potato	2	884	441	33
Sugarbeet	3	1001	334	36
Oats	5	1 625	524	48
Oilseed rape	2	683	342	42
Bare set-aside	1	644	644	25
Total	27	17 472	647	72

similarity). The similarity index of each pair of sites was plotted against their distance from each other. Linear regression was used to describe the relationship between similarity and distance. The Kruskal-Wallis non-parametric ANOVA was used to test differences in abundances between oats, barley and set-aside fields and the Mann-Whitney *U*-test was used to compare the individuals numbers of set-asides and other habitat types.

3. Results

3.1. Occurrence of beetles in different habitats

In all, 17 472 carabid beetles belonging to 72 species were trapped. The number of individuals caught was highest in the green set-aside fields (Table 1). The other habitat types yielded significantly fewer individuals per site (Mann-Whitney *U*-test, $p = 0.0056$).

Pterostichus melanarius (Ill.) was the most common species in the set-asides and barley. It dominated the communities by making up 36% and 33% of all the individuals caught, respectively. Several *Bembidion* spp. were abundant in the oats, sugarbeet and potato fields, as well as in the bare set-aside. *Bembidion quadrimaculatum* (L.), which ranked second in the pooled data, was the most dominant species in potato (53%), the bare set-aside (43%), and sugarbeet (30%). *Bembidion guttula* (F.), however, seemed to prefer the green set-aside to all other habitats. *Trechus secalis* (Payk.) and *Amara aulica* (Pz.) also occurred frequently in the set-asides (Appendix). The most dominant species in rape and oats were *Loricera pilicornis* (F.) (35%) and *Bembidion bruxellense* (Wesm.) (16%).

Species occurrence in different crops was tested by comparing species abundance in the set-

asides (six samples), oat fields (five samples) and barley fields (eight samples) (Table 2). We only tested the species whose total number of individuals exceeded 100 (21 species). Analysis of variance showed that two species, *Trechus secalis* and *Dyschirius globosus* (Hbst.), were significantly more abundant in the green set-asides than in the oat or barley fields. *Harpalus rufipes* (Deg.) was more abundant in the set-asides than in barley and oats but the difference was not significant ($p = 0.0581$). On the other hand, *Asaphidion pallipes* (Dft.) was the only species which was significantly more abundant in the cereal fields than in the green set-asides. *Bembidion quadrimaculatum* occurred with significantly higher numbers in barley fields than in the green set-asides.

4.2. Seasonal changes

The beetles were divided in two groups: spring and autumn breeders. Information on the phenology of carabid beetles was collected from Lindroth (1949), Varis *et al.* (1984), Desender (1989), and it was partly based on our own observations. In the total data, the autumn-breeding species dominated the spring breeders in numbers (58% vs. 42%, respectively), even though agricultural lands are usually considered to support mainly spring-breeding carabid species (Thiele 1977). Autumn breeders were especially dominant in the set-asides (Fig. 2). Even in the beginning of June, almost 70% of the individuals caught in the set-asides were autumn breeders, and their proportion increased towards the end of the summer.

Spring breeders clearly preferred the crops tilled in spring. In the tilled fields, 56% ($n = 8\ 820$) of the individuals caught were spring breeders,

Table 2. Analysis of variance of the four species, whose individual numbers in the oat, barley and set-aside fields differed significantly from each other. Letters *a* and *b* indicate which of the means differed significantly from one another.

Species	Mean numbers			Kruskal-Wallis statistics	<i>p</i> -value
	Oats	Barley	Set-aside		
<i>Trechus secalis</i>	11.4 ^b	9.8 ^b	227.3 ^a	10.6	0.0051
<i>Dyschirius globosus</i>	1.6 ^b	2.1 ^b	38.7 ^a	10.25	0.0059
<i>Asaphidion pallipes</i>	25.4 ^a	10.4 ^a	0.7 ^b	11.52	0.0031
<i>Bembidion quadrimaculatum</i>	45.6 ^{ab}	60.1 ^a	5.8 ^b	7.66	0.0217

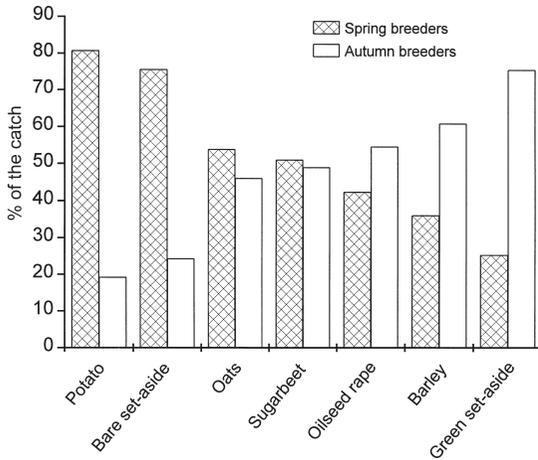


Fig. 2. Proportion of spring- and autumn-breeding carabid individuals in different crops.

whereas the proportion of spring breeders was only 31% ($n = 8\ 652$) in the green set-asides. In the beginning of summer in the fields where the soil had been tilled in spring, almost 80% of the individuals belonged to spring breeding species. Naturally, both in the ploughed crops and in set-asides, the numbers of spring breeders were at their highest in early season and lowest in August. The numbers of autumn breeders increased towards the end of the summer (Fig. 3a and b).

4.3. Abundance and occupancy

There was a strong positive correlation between the abundance and occupancy of carabid beetle species in the fields (Fig. 4). Only three species were found in every site (*Pterostichus melanarius*, *Harpalus rufipes* (Deg.) and *Clivina fossor* (L.)).

The most habitat-specific species were *Amara nitida* Sturm, *A. communis* (Pz.) and *Bembidion gilvipes* Sturm. They were found almost exclusively in the set-aside fields. In general, genus *Amara* was mostly confined to the set-asides, where 1 239 of the 1 563 total number of individuals (80.7%) were caught.

4.4. Similarity of communities

We used detrended correspondence analysis (DECORANA) to examine differences of carabid as-

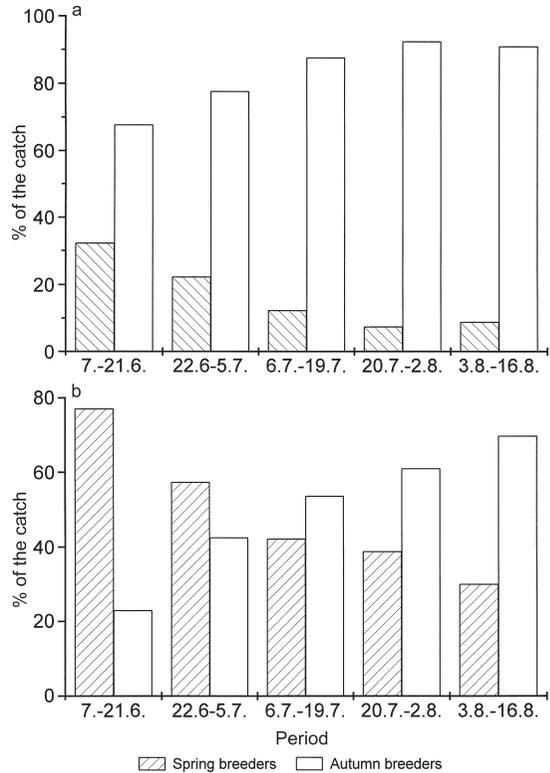


Fig. 3. — a: Proportion of spring- and autumn-breeding carabid individuals caught in the green set-asides in five two-week periods. — b: Proportion of spring- and autumn-breeding carabid individuals caught in the tilled fields and the bare set-aside in five two-week periods.

semblages in the study sites. In the ordination plot, the green set-asides, except one site, were separated from the other fields (Fig. 5). The communities of the potato fields were close to the bare set-aside and one of the oat fields. The other crops could not be easily separated from one another.

The similarity analysis using Morisita's index was made first between all the carabid communities and then separately for the carabid communities of green set-asides and barley fields. In order to analyse the spatial effects, we correlated the pairwise similarity indices of the carabid samples with the distance between sampling sites. When all the sites (of different crops) were included in the analysis, there was a weak negative relationship between the similarity of the communities and the distance between them (Fig. 6; altogether 351 pairwise comparisons, $y = 0.53 - 6.98x$ $p < 0.01$, $r^2 = 0.04$). However, when the crops were analysed separately, there was a strong

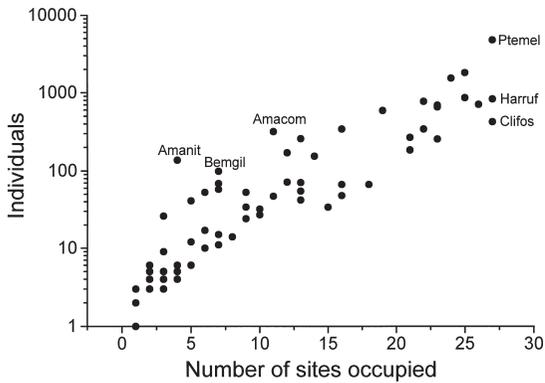


Fig. 4. Occurrence of the species in the study sites in relation to their abundance. Ptemel = *Pterostichus melanarius*, Harruf = *Harpalus rufipes*, Clifos = *Clivina fossor*, Amacom = *Amara communis*, Amanit = *Amara nitida* and Bemgil = *Bembidion gilvipes*.

negative relationship between the similarity among the communities in the barley fields (28 pairs) and their distance from each other (Fig. 7; $y = 0.90 - 2.06x$, $p < 0.0001$, $r^2 = 0.69$). The similarity in the green set-aside fields (15 pairs) did not correlate significantly with the distance (Fig. 8; $y = 0.60 - 1.18x$, $p = 0.19$, $r^2 = 0.13$). The other field types were not analysed because the number of pairs was small.

5. Discussion

5.1. True densities and activity densities

The number of individuals caught was the highest in the green set-aside fields. Could this be due to the high activity density? Or do set-asides really support higher population densities than agricultural crops in tilled fields? Chiverton (1984) suggested that lack of food would increase the activity of beetles and that actively moving beetles are more prone to fall into traps than those that move less. On the other hand, he claimed that dense vegetation provides more food by augmenting herbivorous invertebrates. Whether or not the dense vegetation itself prevents movements of carabids has also been discussed. Mauremooto *et al.* (1995) were able to show that a hedgerow 2 m wide and 3 m high markedly slowed down the movement of *P. melanarius*. Frampton *et al.* (1995) also concluded that dense vegetation may slow down the movements of *P. niger* (Schall.) in

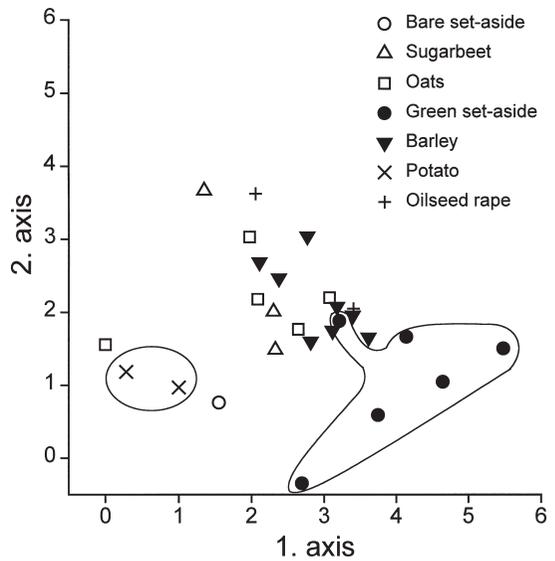


Fig. 5. Ordination (DECORANA) of carabid communities of the 27 sampling sites.

grassy banks.

The dense vegetation in set-aside fields probably slows down the movements of carabid beetles and decreases the possibility of their being caught in traps. Thus, it is possible that the real carabid densities are even higher in set-asides than our study indicated.

On the other hand, the bare set-aside field yielded more individuals than all the other types of tilled fields. This is perhaps because the bare ground did not hinder the beetles' movements. Also lack of vegetation may have resulted in low availability of food. The warm soil may have also accelerated the metabolisms of the beetles and thus kept them active. Whether or not the true population densities were higher in the bare set-aside than in other cultivated crops is hard to determine with the present data.

5.2. Community characteristics

The ordination analysis indicated that the set-asides supported somewhat different communities from those of the tilled fields. One group was formed by the potato fields and a bare set-aside. Comparison of habitat types in terms of proportion of spring and autumn breeders shed additional light on the issue: set-asides supported mostly

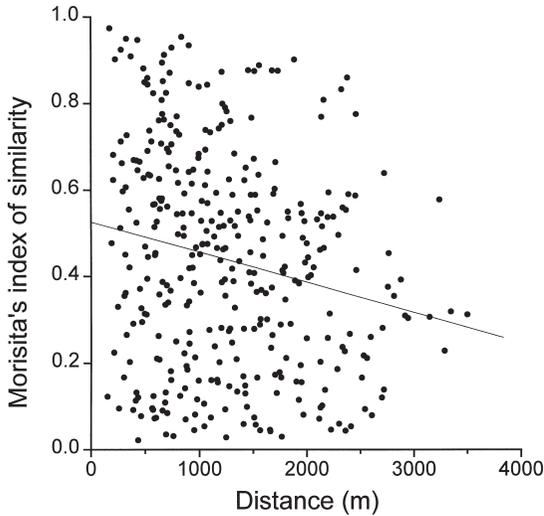


Fig. 6. The pairwise similarity (Morisita's index) of the 27 carabid communities plotted against the distance between the sampling sites, with fitted regression line.

autumn breeders, whereas potato fields and bare set-asides were occupied mostly by spring-breeding beetles. Hance and Gregoire-Wibo (1987) however, concluded that spring crops were unfavourable to spring breeders. They argued that overwintering adults are very sensitive to autumn ploughing and bare soil in winter (but see Sotherton 1985, Wallin 1986, Andersen 1997, for hibernation sites).

Since most of spring breeders are day-active (Thiele 1977), they probably benefit from the disturbance of farming activities, at least in the beginning of season. Black ploughed soil warms up quickly in daytime. In our study, bare soils supported spring-breeding species e.g., *Bembidion quadrimaculatum* and *B. bruxellense*. Both species willingly appear in daylight (Lindroth 1985). Bare black soil probably provides a suitable microclimate for breeding. Potato fields and bare set-asides that are kept clean of vegetation by harrowing provide these conditions even longer than other field types. However, we noted that not all spring breeders favoured managed sites. *Dyschirius globosus* was significantly more abundant in the set-asides than in the cereal crops (Table 2).

In ordination analysis the green set-asides differed from the crop fields. The overall dominance of autumn-breeding species in the green set-asides was characterised by the high number of individu-

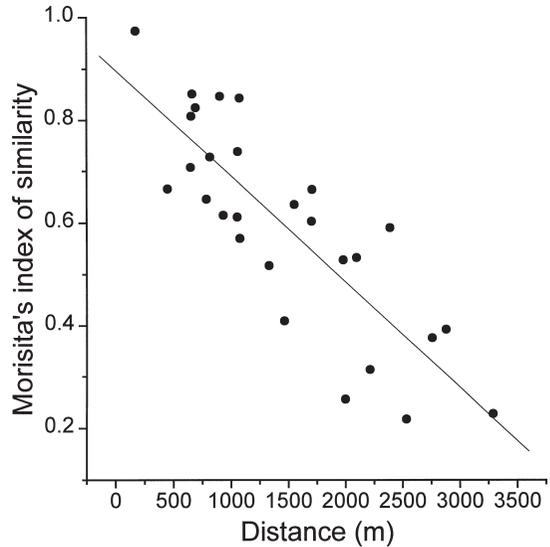


Fig. 7. The pairwise similarity (Morisita's index) of the carabid communities in the barley fields plotted against the distance between the sampling sites, with fitted regression line.

als of the genus *Amara*. Of the total 1 563 individuals, 1 239 were caught in the set-asides. Weedy habitat probably provides more food for the herbivorous members of genus *Amara* than tilled crops. Other authors have made similar findings. For instance, Bosch (1987) found that the activity density of genus *Amara* was 30 times higher in weed-infested sugarbeet plots than in conventionally farmed fields.

Other frequent species in the set-asides were *Pterostichus melanarius* and *Trechus secalis*, both of which are autumn breeders. Their occurrence is probably related to the microclimate rather than to the weeds providing food for them. Wallin (1986) has shown that these species prefer humid conditions (woods) to cereal fields.

5.3. The effect of habitat

The closer the barley fields are to one another, the more likely they are to support similar kinds of carabid communities. However, the carabid communities in the green set-asides did not follow the same pattern quite as strictly as in the barley fields. A probable explanation would be that living conditions between set-aside fields vary more than between barley fields. Thus, different kinds of set-

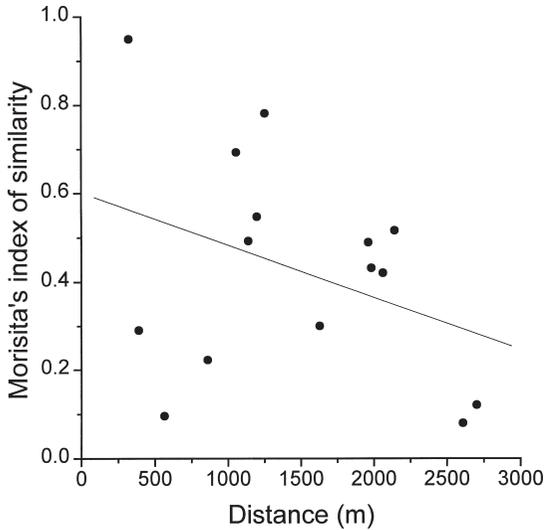


Fig. 8. The pairwise similarity (Morisita's index) of the carabid communities in the green set-asides plotted against the distance between the sampling sites, with fitted regression line.

asides favour different communities independent of their distance from one another. At least the habitat-specific and macropterous members of genus *Amara* seemed to aggregate in few fields.

The community composition of the barley fields instead may be determined by the species pool of the surroundings. The beetles of the nearby fields and field margins colonise suitable habitats early in spring. Which species are abundant in the surroundings of the cereal fields is likely to be determined by several factors: the physiological conditions (topography, soil texture etc.), the history and the surroundings of the fields (field margins, ditches etc.). This could explain why the nearby fields support more similar faunas than the fields further away from each other. On the other hand the communities of the set-asides have developed over a longer period of time. Species which thrive in grassy, lush habitats have probably been able to establish communities specific to the environmental conditions of a field.

Even if it seems that some species occurred more often in the tilled and others in non-tilled fields, we have no direct evidence that beetles would actively choose their habitat in a patch of farmland. We do not know for sure if beetles fly or move by walking from one field parcel to another. As Zollner and Lima (1999) pointed out,

very little is known about the perceptual ability of animals e.g., how far away they can sense suitable habitats. Wallin (1986) suspects that beetles are able to detect habitats about only 30 metres or less away. If beetles cannot choose their habitat very efficiently, then what determines their distribution?

An alternative explanation would be that the distribution of beetles in previous year largely determines the distribution patterns of the following season. Females lay eggs on sites which seem favourable for the development of offspring. However, the female cannot predict the farmer's actions. A nice green set-aside may be altered to a barley field already the following spring. The results of M. Pitkänen (pers. comm.) suggest that the crop of the previous year has an effect on the carabid assemblages in the following year. The chances for eggs of a carabid species to survive in certain habitats and the habitat preferences of carabid larvae are complicated questions to study. Still, the whole life cycle of beetles should be studied in order to understand fully the distribution patterns of adult beetles in a small scale.

Acknowledgements: We are grateful to the owners of the research areas for permitting us to carry out pitfall trapping in their fields. Maija-Liisa Prinkkilä helped substantially in the field work. The grant of the Finnish Cultural Foundation (to HK) is gratefully acknowledged. This work is part of the project "Biodiversity in Agricultural environments: spatial and temporal variations at multiple scales and functional significance for the cultivation system" of the Finnish Biodiversity Research Programme.

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Appendix. The carabid beetles in different field types. Note that sampling effort varied between habitats.

Species	Bare set-aside	Sugar-beet	Oats	Green set-aside	Barley	Potato	Oilseed rape	Total
<i>Agonum fuliginosum</i>	0	0	1	4	0	0	0	5
<i>Agonum muelleri</i>	2	0	1	2	12	0	0	17
<i>Agonum sexpunctatum</i>	7	0	0	36	9	0	1	53
<i>Agonum thoreyi</i>	0	0	0	51	2	0	0	53
<i>Amara aenea</i>	0	1	6	31	6	0	3	47
<i>Amara apricaria</i>	0	17	2	5	5	2	3	34
<i>Amara aulica</i>	0	8	35	523	22	4	4	596
<i>Amara bifrons</i>	1	4	5	36	14	2	5	67
<i>Amara brunnea</i>	0	1	0	1	1	0	0	3
<i>Amara communis</i>	0	0	0	310	3	5	1	319
<i>Amara eurynota</i>	0	0	4	0	2	2	6	14
<i>Amara familiaris</i>	1	0	0	0	0	0	4	5
<i>Amara fulva</i>	0	8	42	5	12	1	4	72
<i>Amara lunicollis</i>	0	0	1	49	2	4	2	58
<i>Amara montivaga</i>	1	0	9	19	6	1	6	42
<i>Amara nitida</i>	0	0	1	137	0	0	0	138
<i>Amara ovata</i>	1	0	0	5	0	1	3	10
<i>Amara plebeja</i>	0	2	4	118	8	23	1	156
<i>Amara similata</i>	0	0	0	0	0	0	2	2
<i>Anisodactylus binotatus</i>	0	0	3	17	3	1	2	26

Continued

Appendix. Continued.

Species	Bare set-aside	Sugar- beet	Oats	Green set-aside	Barley	Potato	Oilseed rape	Total
<i>Asaphidion flavipes</i>	2	0	6	3	4	0	0	15
<i>Asaphidion pallipes</i>	5	28	127	4	83	0	23	270
<i>Badister lacertosus</i>	0	0	0	0	1	0	0	1
<i>Bembidion bruxellense</i>	58	7	268	36	222	74	30	695
<i>Bembidion femoratum</i>	6	6	0	0	0	14	0	26
<i>Bembidion gilvipes</i>	0	0	0	93	2	4	0	99
<i>Bembidion guttula</i>	0	0	0	37	4	0	0	41
<i>Bembidion lampros</i>	8	111	126	74	333	52	11	715
<i>Bembidion quadrimaculatum</i>	279	304	228	35	481	470	30	1 827
<i>Bembidion tetracolum</i>	1	0	0	0	0	0	0	1
<i>Broscus cephalotes</i>	0	0	1	0	0	0	0	1
<i>Calathus erratus</i>	0	39	1	0	26	3	0	69
<i>Calathus melanocephalus</i>	0	32	23	37	121	16	28	257
<i>Calathus microptereus</i>	0	3	11	1	9	0	0	24
<i>Carabus cancellatus</i>	1	2	105	415	201	5	51	780
<i>Carabus glabratus</i>	0	1	2	1	0	0	0	4
<i>Carabus hortensis</i>	0	1	1	0	1	0	1	4
<i>Carabus nemoralis</i>	2	0	5	156	4	0	4	171
<i>Clivina fossor</i>	52	53	57	107	103	27	30	429
<i>Cychrus caraboides</i>	0	0	0	4	1	0	0	5
<i>Dromius sigma</i>	0	0	0	2	0	0	0	2
<i>Dyschirius globosus</i>	53	0	8	232	17	35	0	345
<i>Dyschirius politus</i>	0	0	3	2	0	0	0	5
<i>Harpalus affinis</i>	0	5	2	4	16	3	2	32
<i>Harpalus latus</i>	0	2	3	45	5	0	1	56
<i>Harpalus quadripunctatus</i>	0	5	0	0	4	0	0	9
<i>Harpalus rufibarbis</i>	0	0	1	3	0	0	0	4
<i>Harpalus rufipes</i>	2	200	47	453	68	46	22	838
<i>Harpalus tardus</i>	0	2	1	27	2	2	0	34
<i>Lebia chlorocephala</i>	0	0	0	1	0	0	0	1
<i>Leistus ferrugineus</i>	0	0	0	0	3	0	0	3
<i>Leistus terminatus</i>	0	1	7	27	12	0	1	48
<i>Licinus depressus</i>	0	0	0	0	1	0	0	1
<i>Loricera pilicornis</i>	21	1	123	133	334	13	242	867
<i>Notiophilus palustris</i>	0	0	0	1	0	0	0	1
<i>Patrobis atrorufus</i>	40	7	53	253	250	40	18	661
<i>Pterostichus cupreus</i>	0	3	1	241	9	3	2	259
<i>Pterostichus diligens</i>	0	0	1	3	0	0	0	4
<i>Pterostichus melanarius</i>	36	73	198	3 155	1 314	17	85	4 878
<i>Pterostichus minor</i>	0	0	0	3	0	0	0	3
<i>Pterostichus niger</i>	0	1	16	191	100	4	33	345
<i>Pterostichus nigrita</i>	0	0	0	2	0	0	0	2
<i>Pterostichus oblongopunctatus</i>	0	0	1	7	2	0	1	11
<i>Pterostichus strenuus</i>	0	0	0	2	0	0	2	4
<i>Pterostichus vernalis</i>	0	0	0	8	1	1	2	12
<i>Syntomus truncatellus</i>	0	3	0	0	1	0	2	6
<i>Synuchus vivalis</i>	1	41	10	102	27	0	5	186
<i>Trechus discus</i>	2	2	8	32	20	2	1	67
<i>Trechus micros</i>	0	1	1	1	1	0	2	6
<i>Trechus quadristriatus</i>	24	18	8	1	15	3	2	71
<i>Trechus secalis</i>	38	8	57	1 364	78	4	5	1 554
<i>Tricocellus placidus</i>	0	0	1	5	0	0	0	6
Total	644	1 001	1 625	8 652	3 983	884	683	17 472