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THE METHODOLOGY OF PITFALL TRAPPING AND THE GROUND BEETLE COMMUNITY OF ZÁNKA (МЕТОДИКА ОТЛОВОВ ПОЧВЕННЫМИ ЛОВУШКАМИ ЖУЖЕЛИЦ СООБЩЕСТВА ЗАНКИ)

The pitfall trapping is one of the most popular and well-known trapping method of the ground-dwelling arthropods. This trapping method gives good results in case of the ground-dwelling spiders and ground beetles. During the trapping, the cups are dug to the soil surface and are filled with various kinds of killing- and preservative materials. As killing- and preservative materials different chemical sand mixtures of these are used. The control period of the traps can vary form one day to one month, depending on the trap material. The traps can be placed in line transects, in random order and in networks. The traps are usually placed 5-10 m from each other. The material and the size of the traps can be various. The use of the roof is important. It protects the trap and partly the collected arthropods against the rain and some other unwanted contaminants, and it keeps the birds and the mammals off the trap.

In 2013 the ground beetle communities of a mixed oak forest in Central Transdanubien were studied. We used 10 pitfall traps filled with 10 % of acetic acid solution. The traps were monitored ones a month, altogether 8 times between April and November. We collected 4357 individuals of 20 carabid species. We analysed the monthly distribution and the frequency of the species. The most common species was the Carabus convexus convexus.

В 2013 г. были изучены сообщества жужелиц в смешанном дубовом лесу в Центрально-Задунайском крае. Нами было расставлено 10 почвенных ловушек, наполненных 10%-ной уксусной кислотой. Ловушки проверялись раз в месяц, всего 8 раз с апреля по ноябрь. В результате было собрано 4357 экземпляров 20 видов жужелиц. Мы проанализировали распределение видов по месяцам и частоту встречаемости видов. Самым распространенным видом оказался Carabus convexus convexus.

Introduction

The pitfall trapping is one of the most popular and well-known trapping method of the ground-dwelling arthropods (Barber, 1931). This trapping method gives good results in case of the ground-dwelling spiders and ground beetles (Lövei & Sunderland, 1996). During the trapping, the cups are dug to the soil surface and are filled with various kinds of killing- and preservative materials (ethylene glycol, propylene glycol, formalin, water, alcohol, salinesolution, chloralhydrate, aceticacid) (Woodcock, 2005; Kádár & Samu, 2006). The control period of the traps can vary form one day to one month, depending on the trap material. The traps can be placed in line transects, in random order and in grid. The traps are usually placed 5-10 m from each other. The material and the size of the traps can be various. The use of the roof is important (Fig. 1). It protects the trap and partly the collected arthropods against the rain and some other unwanted contaminants, and it keeps the birds and the mammals off the trap (Woodcock, 2005).

Material and methods

In 2013, the ground beetle assemblages of an artificial gap were researched in a mixed oak stand in Central Transdanubien (Balaton-Uplands, Zánka 1B). We used 10 double cup pitfall trapps filled with acetic acid solution (Fig. 2).

In our research we examined four habitats (gap, gap edge, closed forest, mesic part of the forest). In each habitat two pitfall traps were set up. We analysed the number of species and the number of individuals by dates and habitats.

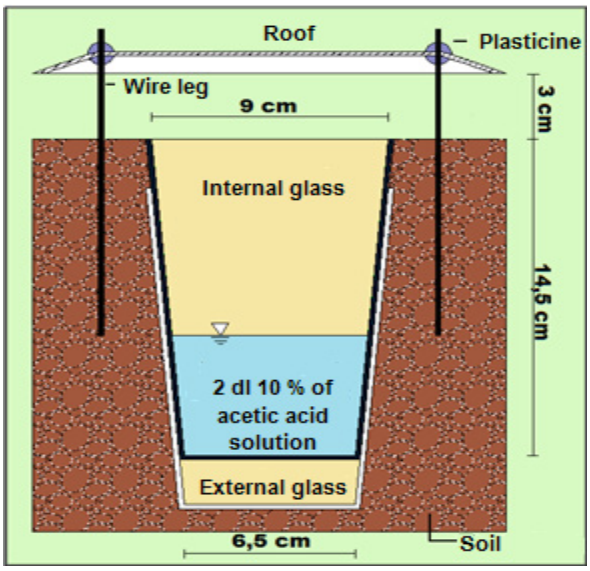

Figure 1. The structure of the pitfall trap

Figure 2. The double cup pitfall trap

Results

We collected altogether 4357 individuals of 20 carabid species. We trapped the highest number of species (16 species) on the 28th of June, while we trapped the highest number of specimens (1422 specimens) on the 31th of July (Fig. 3).

The number of species was the highest in the gap edge and in the mesic part of the forest (16 species each). The number of specimens was the highest in the gap edge (1308 specimens) (Table).

The ground beetle fauna of the investigated locations (gap, gap edge, closed forest, mesic part of the forest) were compared with various ecological parameters (diversity, the level of consistency, similarity measures and hierarchical cluster analysis, based on Bray-Curtis).

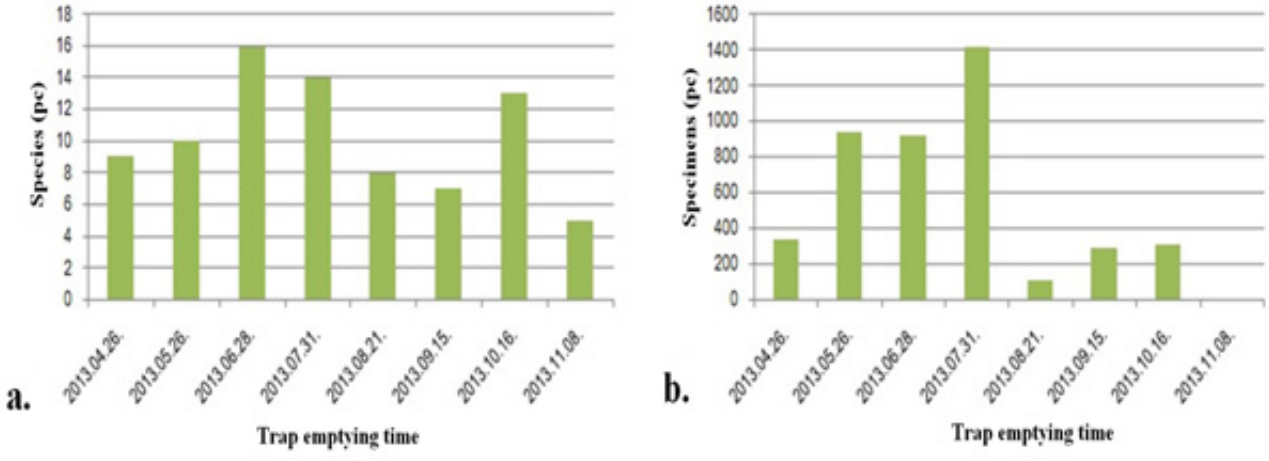

Figure 3. The number of collected ground beetles in each habitats
a. according to the number of species; b. according to the number of individuals

The cumulate number of ground beetle specimens

Species	Mesic part of the forest	Closed forest	Gap edge	N part of the gap	S part of the gap
	S (pc)	S (pc)	S (pc)	S (pc)	S (pc)
Brachinus crepitans (Linnaeus, 1758)	-	-	-	1	-
Calosoma inquisitor (Linnaeus, 1758)	104	43	220	103	76
Calosoma sycophanta (Linnaeus, 1758)	5	1	221	120	160
Carabus convexus convexus (Fabricius, 1775)	283	419	386	202	160
Carabus coriaceus coriaceus (Linnaeus, 1758)	22	18	39	31	37
Carabus germari exasperatus (Duftschmid, 1812)	-	1	1	-	3
Carabus hortensis hortensis (Linnaeus, 1758)	19	20	39	32	28
Carabus intricatus intricatus (Linnaeus, 1761)	2	-	1	-	-
Carabus nemoralis nemoralis (O. F. Müller, 1764)	220	169	203	80	113
Leistus rufomarginatus (Duftschmid, 1812)	4	2	1	-	-
Notiophilus rufipes (Curtis, 1829)	11	10	1	1	1
Pterostichus melas (Creutzer, 1799)	2	-	7	7	4
Abax parallelepipedus (Piller et Mitterpacher, 1783)	116	149	127	70	109
Platyderus rufus (Duftschmid, 1812)	2	-	-	-	-
Calathus fuscipes (Goeze, 1777)	4	1	1	1	1
Amara saphyrea (Dejean, 1828)	-	-	-	-	1
Harpalus atratus (Latreille, 1804)	1	1	6	5	6
Harpalus rufipes (DeGeer, 1774)	7	1	54	37	21
Harpalus tardus (Panzer, 1796)	-	-	1	-	1
Ophonus laticollis (Mannerheim, 1825)	1	-	-	-	-
Summary	803	835	1308	690	721

Summary

The cluster analysis' dendrogram (Fig. 4) shows that the traps of the gaps separeted well from the traps of the closed forest, the mesic part of the forest and the gap edge.

More open habitat's species appeared in the gaps. The research presents one year results, the refore we are planning to continue in order to get more accurate results.

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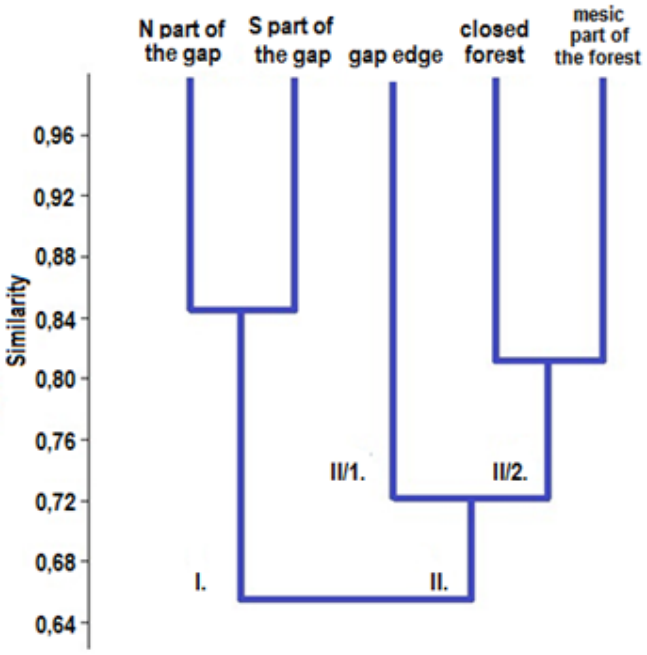

Figure 4. Agglomerative hierarchical cluster analysis dendrogram based on Bray-Curtis similarity

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