Schärer, E. Freie Universität Berlin, Germany. Brief ecological notes on Drosophila collections from Berlin.

In the period from May until October 1976 collections of Drosophilids were made in Berlin in order to get a survey of the different species occurring in this area. There were five collection sites, four domestic gardens in the outskirts of Berlin and one backyard rather located in the city. The flies were trapped in 1-liter jars filled with the four different baits, banana, potato, tomato (each fermented with baker's yeast), and fermented malt (prepared according to Lakovaara 1969). The jars were exposed on the ground about half a meter apart. The flies were collected every day about two hours before sunset.

Table 1. Drosophila species and total numbers of individuals per species collected during the months May until October in Berlin.

Species	♀♀	♂♂	Σ
D. melanogaster	3446	2450	5896
D. simulans	*	44*	44*
D. ambigua	17	30	47
D. obscura	56	225	281
D. subobscura	1001	3118	4119
D. busckii	917	1879	2796
D. limbata	1	--	1
D. phalerata	9	36	45
D. transversa	6	18	24
D. littoralis	14	17	31
D. funebris	105	108	213
D. hydei	5	8	13
D. repleta	7	11	18
D. immigrans	28	23	51
Total	5638	7941	13579

*Only in October the males of D. simulans were differentiated from D. melanogaster (see text).

14 Drosophila species were captured during the six months with a total of 13,579 flies (Table 1). The most common species was D. melanogaster with a frequency of 44%, followed by D. subobscura with 31%, and D. busckii with 20%. The various species showed a different abundance during the season. Figure 1 demonstrates that the largest numbers of D. suboscura specimens were trapped in May and June, whereas D. melanogaster and D. busckii individuals were rather rare during these months; D. busckii was most abundant in August and September, and most of the D. melanogaster individuals (about 65%) were caught in October.

The frequencies of the distinct species as a function of the total capture per month varied during the season. Figure 2 shows that from May until July D. subobscura was the most abundant of all captured species. In August most individuals caught were classified as D. busckii. In September and October D. melanogaster was the dominating species.

Data on D. simulans are only available for October because the first male was classified at the end of September. From that time on we differentiated the males of the two sibling species D. simulans and D. melanogaster. The mistake resulting from this non-differentiation should not be too heavy as the number of D. simulans males captured in October was less than 5% of the D. melanogaster males and as about 65% of all D. melanogaster flies were caught in this month. It also should be mentioned that the males of D. obscura could not be differentiated from possibly captured D. bifasciata males.

Table 2. Ecological distances between six collected Drosophila species in their food preferences.

	D.mel.	D.amb.	D.obsc.	D.sub.	D.busck.
D. melanogaster					
D. ambigua	0.16				
D. obscura	0.13	0.15			
D. subobscura	0.17	0.26	0.08		
D. busckii	0.63	0.64	0.60	0.51	
D. funebris	0.33	0.40	0.36	0.17	0.38

The distinct Drosophila species and also the individuals of one species showed different preferences for the various baits. The very most of the total captured individuals were caught on banana. The numbers of flies caught on the other three baits showed very little difference. As shown in Figure 3, D. melanogaster, D. subobscura, and D. obscura were caught on banana with a frequency of more than 60%. The fewest individuals were caught on potato and tomato, respectively. The strongest affinity to banana showed D. ambigua with a relative frequency of 91%. D. busckii and D. funebris showed a rather even distribution over the four offered baits.

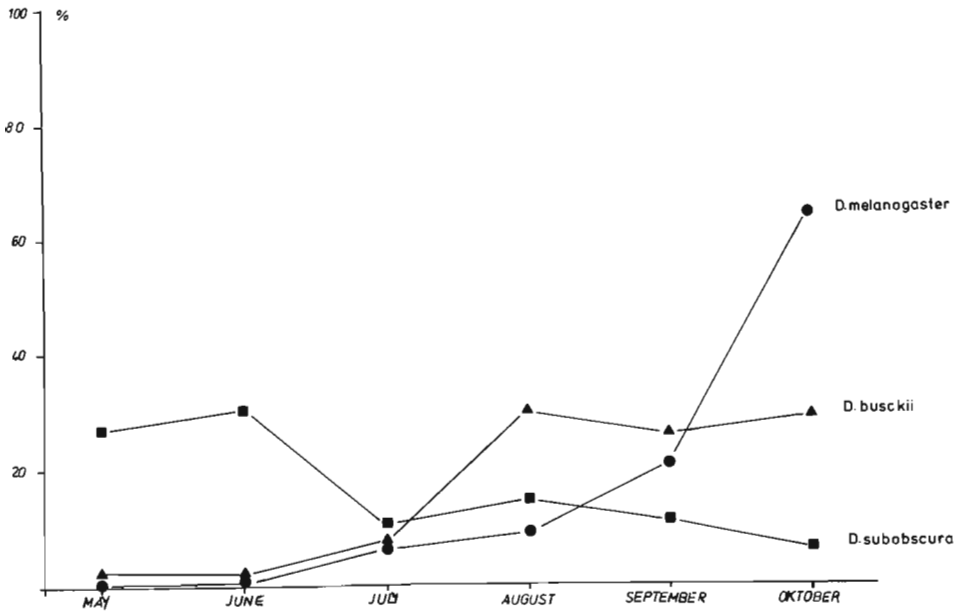

Fig. 1. Distributions of the numbers of captured individuals per Drosophila species in the period from May until October. (The illustrated species were the most abundant ones.)

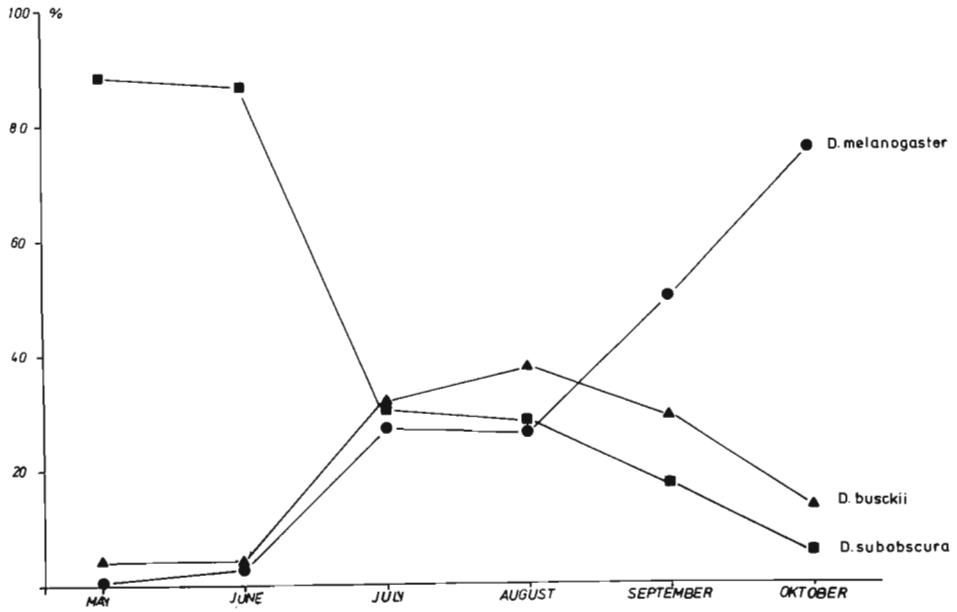

Fig. 2. Frequencies of the most abundant Drosophila species as a function of the total capture in the months May until October.

Table 2 shows the "ecological distances in the food preferences" of the six Drosophila species illustrated in Fig. 3. They can be measured by the following geometric distance:

$$d_{i,j} = \sqrt{\frac{1}{2}\Sigma_h (p_{ih} - p_{jh})^2}$$

where p_{ih} and p_{jh} are the relative frequencies of the species i and j on the bait h.

It can be seen that the species D. melanogaster, D. subobscura, and D. obscura of the sophophora-group had the smallest distances in their food preferences. Very large distances to other species showed D. busckii because of its rather low frequency on banana, which the other species preferred the most.

Reference: Lakovaara, M. 1969, DIS 44: 128.

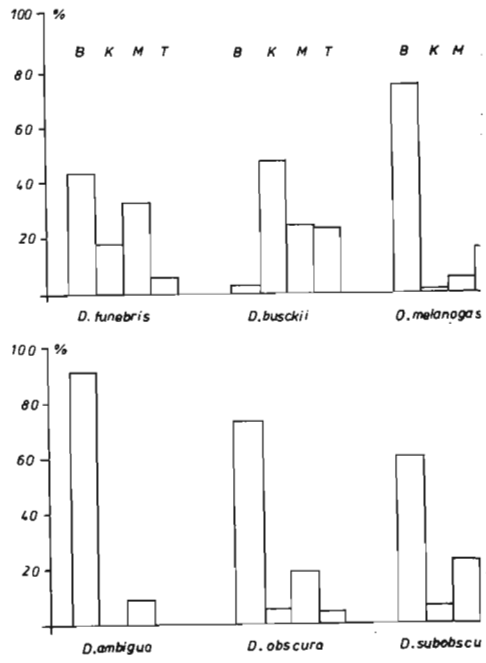

Fig. 3. Food preferences of six collected Drosophila species. Ordinate: percentages of individuals caught on banana (B), potato (K), malt (M), and tomato (T).