somes per female (average Israeli value 2.36 for all chromosomes) is as high as values reported in Italy (Sperlich 1964) and higher than those in Norway and Austria.

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The distribution of Drosophila subobscura in relation to other species in Israel.

In the course of trapping Drosophila subobscura Collin with the purpose of analyzing its inversion polymorphism in a population considered to be marginal in Israel by Goldschmidt (1956, 1958) we made some interesting observations related to its distribution in relation with other species found in artificial baits in four different biogeographic zones in Israel.

D. subobscura has a typical Mediterranean pattern of distribution in Israel penetrating chiefly the more humid areas of the country but does not colonize the hot and dry southern deserts. Traps were distributed according to the four biogeographic longitudinal regions of Israel, Coastal Plain, Foothills, Mountains and Rift Valley in the three mesothermal regions according to Thornthwaite's (1948) classification (Atlas of Israel, 1970, IV/3) avoiding the megathermal or high temperature zone. A total of 4006 individuals of five species of Drosophila were collected from March until the end of June in 1976 and 4888 during the same period in 1977. The species attracted to the artificial baits prepared with malted barley according to Lakovaara and col. (1969) were as follows: D. subobscura Collin, D. melanogaster Meigen, D. simulans Sturtevant, D. hydei Sturtevant, D. buskii Coquillet and D. immigrans Sturtevant. For technical reasons D. melanogaster and D. simulans were scored and analyzed under the heading of simulans group.

In general, the frequencies of the species collected changed greatly in time and according to the biogeographical regions where they were collected, as can be seen in Table 1. The most pronounced changes were exhibited by D. subobscura which decreases in frequency with the increase of temperature. Significant deviation from the 1:1 normal sex ratio was observed in the collected populations of D. subobscura and in a lower degree in D. hydei. In contrast to Shorrocks'(1975) observations the predominance of males was a constant trait of D. subobscura in the four biogeographic regions during the collecting season of 1976 and continued to be so in 1977 as may be seen in Table 2.

Table 2. Proportion of sexes of D. subobscura and of D. hydei in four geographic zones during the collecting season of 1976 and 1977 in Israel.
n = total number of flies

		Biogeographic Zone							
		Coastal Plain		Foothills		Mountains		Rift Valley	
		♀	♂	♀	♂	♀	♂	♀	♂
D. subobscura		n=256		n=130		n=912		n=16	
	1976	54.70	45.30	34.0	66.0	35.0	65.0	31.25	68.75
		n=115		n=130		n=380		n=38	
	1977	19.13	80.87	36.15	63.85	22.0	78.0	29.0	71.0
D. hydei		n=190		n=523		n=61		n=168	
	1976	40.0	60.0	51.0	49.0	49.0	51.0	37.5	62.5
		n=68		*		*		n=11	
	1977	79.4	20.6	*		*		27.27	72.72

* only two individuals.

Table 1. Changes in the relative frequencies of the different species of Drosophila collected in four biogeographic zones in Israel from March until May 1976 and 1977. The figures show the percentages of each species among the total number of Drosophila flies collected during a given period in each zone.

Zone	Month	D. subobscura		Simulans gr.		D. hydei		D. buskii		D. immigrans		no. of flies	
		1976	1977	1976	1977	1976	1977	1976	1977	1976	1977	1976	1977
Coastal Plain	March	44.72	51.39	1.19	19.75	19.77	*	20.22	5.03	8.10	26.46	435	179
	April	9.63	0.94	33.28	54.92	16.90	1.21	19.42	2.02	20.77	40.89	592	741
	May	0.0	0.75	10.20	76.31	4.08*	3.17	26.53	28.02	59.18	17.02	49	1862
Foot-hills	March	20.91	87.24	11.76	11.41	53.59	*	11.11	0.0	2.61*	0.0	152	149
	April	39.74	0.0	20.09	*	17.48	0.0	20.52	76.47‡	2.18	0.0	235	17
	May	0.74	0.0	55.40	100.00	42.50	0.0	0.32*	0.0	1.06	0.0	944	60
Moun-tains	March	96.93	100.00	1.31*	0.0	1.31*	0.0	0.0	0.0	0.44*	0.0	228	35
	April	90.43	76.01	1.85	23.23	7.60	*	0.0	0.0	0.13*	*	763	396
	May	*	60.25	0.0	39.33	0.0	0.0	0.0	0.0	0.0	*	1	239
Rift Valley	March	12.70	0.63	30.95	68.74	35.71	1.14	6.35	3.05	14.28	26.43	136	787
	April	0.0	15.94	50.25	73.91	30.44	*	10.15	5.08	9.16	3.38	404	207
	May	-	-	-	-	-	-	-	-	-	-	-	-

* four or less than four individuals
‡ only 13 individuals
(-) no traps laid

It is suggested that temperature may influence the local number of flies: lower temperature may diminish their sexual drive as suggested by Begon (1976) and high summer temperatures may possibly sterilize the females. This last suggestion is supported by the fact that no sperm cells were found in the spermathecae of females collected in late spring. To account for the deviation of the 1:1 sex ratio we suggest the possibility that females look for better habitats in order to oviposite their fertilized eggs. This would explain the higher percentage of males trapped near habitats were no other vegetation but pine trees and dry shrubs were to be found.

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Marcos, R. and A. Creus. Autonomous University of Barcelona, Bellaterra, Spain. Predictive value of heritability estimates.

In the heritability studies we find two important questions. The first is about the method giving us the best estimate. The second is for how long are the predictions on the changes that result from selective breeding accurate.

According to Falconer (1960) the response to selection is $R = h^2S$. In spite of the fact that this prediction is theoretically valid only for one generation, the data reported by Clayton et al. (1957), Sheldon (1963) and other authors suggest its validity for more than one generation. The purpose of this work is to check for how long the expected response according to this formula is in agreement with the observed facts and to study which method of estimating heritability is the best.

We have worked with a natural population (AR) at 19°C. The heritability of interocellar bristles was estimated in the base population before selection began by the methods of parent-offspring regression, half sib correlation and full sib correlation. The results were:

parent-offspring regression:	0.258 ± 0.030	(1)
half sib correlation:	0.354 ± 0.050	(2)
full sib correlation:	0.356 ± 0.050	(3)

This population has been submitted to mass selection with an intensity of selection of 20%. Four lines of selection were made: two high lines (A1H and A2H), and two low lines (A1L and A2L). Table 1 shows the response to selection from the first 10 generations and the expected responses according to the three methods mentioned.

Table 1

Line	Gen	ΣS	ΣR_{ob}	$R_e(1)$	$R_e(2)$	$R_e(3)$	Line	Gen	ΣS	ΣR_{ob}	$R_e(1)$	$R_e(2)$	$R_e(3)$
A1H	1	1.226	0.413	0.316	0.434	0.436	A1L	1	1.300	-0.006	0.335	0.460	0.463
	2	2.654	0.577	0.684	0.939	0.944		2	2.325	0.708	0.599	0.823	0.827
	3	3.958	0.708	1.021	1.401	1.409		3	3.508	0.876	0.905	1.241	1.249
	4	5.318	0.980	1.372	1.882	1.893		4	4.772	1.146	1.231	1.689	1.699
	5	7.485	-0.368	1.931	2.649	2.665		5	7.238	-0.040	1.087	2.562	2.576
	6	8.978	0.847	2.316	3.178	3.196		6	8.689	1.743	2.241	3.075	3.093
	7	10.451	1.668	2.696	3.699	3.720		7	10.342	1.906	2.668	3.661	3.681
	8	11.845	1.748	3.056	4.193	4.216		8	12.355	2.580	3.187	4.373	4.398
	9	13.371	1.948	3.449	4.733	4.760		9	14.455	3.626	3.729	5.117	5.146
	10	15.278	2.435	3.941	5.408	5.439		10	15.882	4.466	4.022	5.622	5.655
A2H	1	1.202	0.474	0.315	0.425	0.428	A2L	1	1.240	-0.180	0.319	0.439	0.441
	2	2.608	0.433	0.673	0.923	0.928		2	2.446	0.453	0.631	0.866	0.870
	3	3.922	0.693	1.011	1.388	1.396		3	3.560	0.519	0.918	1.260	1.267
	4	5.208	1.020	1.343	1.843	1.854		4	4.673	0.613	1.205	1.654	1.663
	5	6.955	1.326	1.794	2.462	2.476		5	5.473	0.760	1.468	1.942	1.948
	6	8.629	1.600	2.226	3.054	3.072		6	6.693	0.940	1.726	2.369	2.383
	7	10.982	2.586	2.833	3.887	3.909		7	7.720	1.033	1.991	2.733	2.748
	8	13.162	3.126	3.396	4.659	4.685		8	9.326	1.519	2.406	3.301	3.320
	9	16.665	4.080	4.297	5.896	5.929		9	11.414	2.339	2.945	4.040	4.063
	10	20.688	6.073	5.337	7.323	7.365		10	13.346	2.826	3.443	4.725	4.751