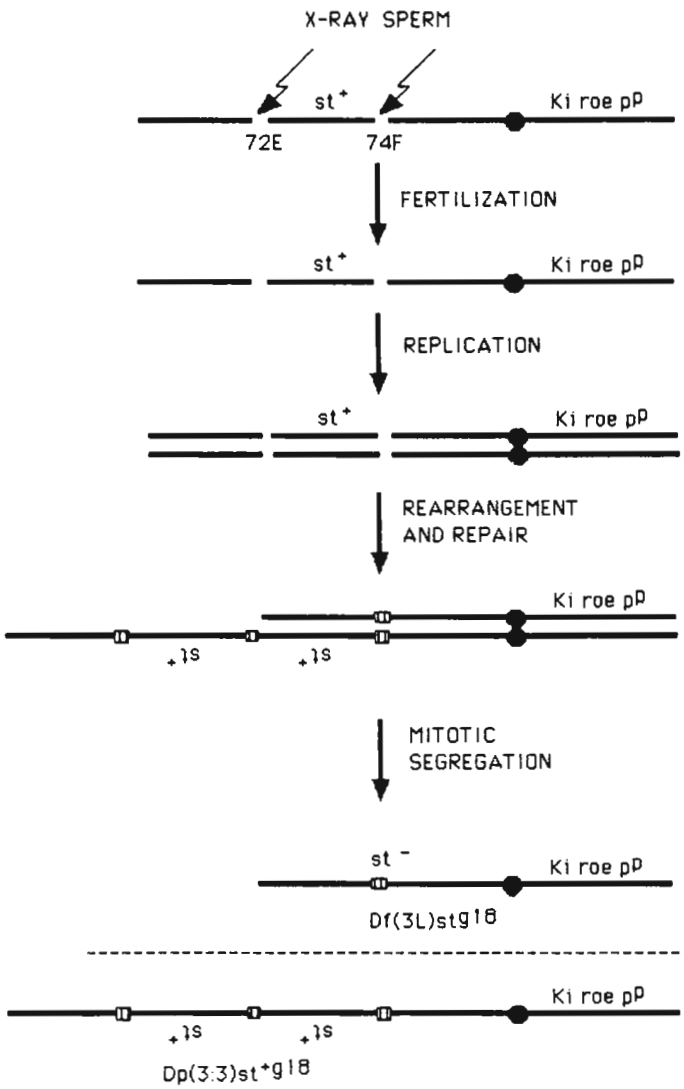

Figure 2. Model for the generation of the duplication and deficiency chromosomes shown in Figure 1.

wrong order, resulting in one chromatid with an inverted tandem duplication, and another chromatid with a deletion. Segregation of these sister chromatids at mitotic anaphase resulted in an individual that was mosaic for these chromosome rearrangements. The occurrence of post-replicative repair is also evident from the observation that the Df(3L)st^{g18} chromosome carries an inversion between regions 65A1·2 and 99A1·2, whereas the Dp(3L)st^{+g18} chromosome carries no such inversion (data not shown).

A similar interpretation invoking chromatid exchange occurring after replication in the zygote was proposed in 1969 by Leigh & Sobels (cited in Sankaranarayanan & Sobels 1976) to explain their recovery of homo-isochromosomes following irradiation of post-mitotic male germ cells.

Flies homozygous for the Dp(3L)st^{+g18} chromosome can survive to the adult stage, although their viability is low. The observation that these flies exhibit normal sexual phenotypes and are fertile is noteworthy, since they should carry four wild-type doses of the transformer (tra, 3-45) locus, a sex determination regulatory gene whose function is required in females, but not in males, for normal sexual development (Sturtevant 1945; Baker & Ridge 1980).

Acknowledgements: The Df(3L)st$^{81K17(2)}$ and st^{82c3} mutations were provided by Dr. M.M. Green. This work was supported by a Helen Hay Whitney Fellowship to M.M. and by research grants from NSF (PCM-8202812) and NIH (GM07199).

References: Helfer, R.G. 1940, PNAS 26:3; Kaufmann, B.P. 1941, PNAS 27:18; Muller, H.J. 1940, J. Genet. 40:1; Sankaranarayanan, K. & F. Sobels 1976, in:The Genetics and Biology of Drosophila, v1c:1089-1250; Sturtevant, A.H. 1945, Genetics 30:297; Baker, B.S. & K. Ridge 1980, Genetics 94:383.

Bierniaux, C., J. Lechien, E. Depiereux and A. Elens. F.N.D.P., Namur, Belgium.
Temperature and efficiency of a disruptive selection for phototactism.

In a previous paper (Dubucq et al. 1984) it was assumed, as a tentative hypothesis, that a disruptive selection for phototactism, using the Benzer method (1967) or the Kekic method (1981), could be more efficient at 30°C than at 25°C. Indeed, the range of the final distribution of the flies in the various chambers (Kekic test) or test tubes (Benzer test) was greater at 30°C than at 25°C, and consequently it was hoped that it should be easier to separate the most phototactic flies from the less phototactic ones.

From the same initial population "Namur", four strains have been obtained by disruptive selection. We have used the Benzer method modified by Tompkins et al.(1978), and the tests were carried on at 30°C and at 25°C. All the flies were raised and maintained at 25°C, but for the "population I" the tests were done at 30°C from the 5th till the 15th generation, whereas they were always done at 25°C for the "population II". The selection intensity was always the same: 10% (the most phototactic ones or the less phototactic ones, respectively) of at least 100 flies of same sex tested together were taken as parents for the next generation. At the beginning (September 1983) and at the end (May 1984) of the selection experiments, 5 tests have been done using the non-selected population "Namur". In the same way, 5 tests were done with the four strains resulting from the selection procedure. The comparison between the experimental results

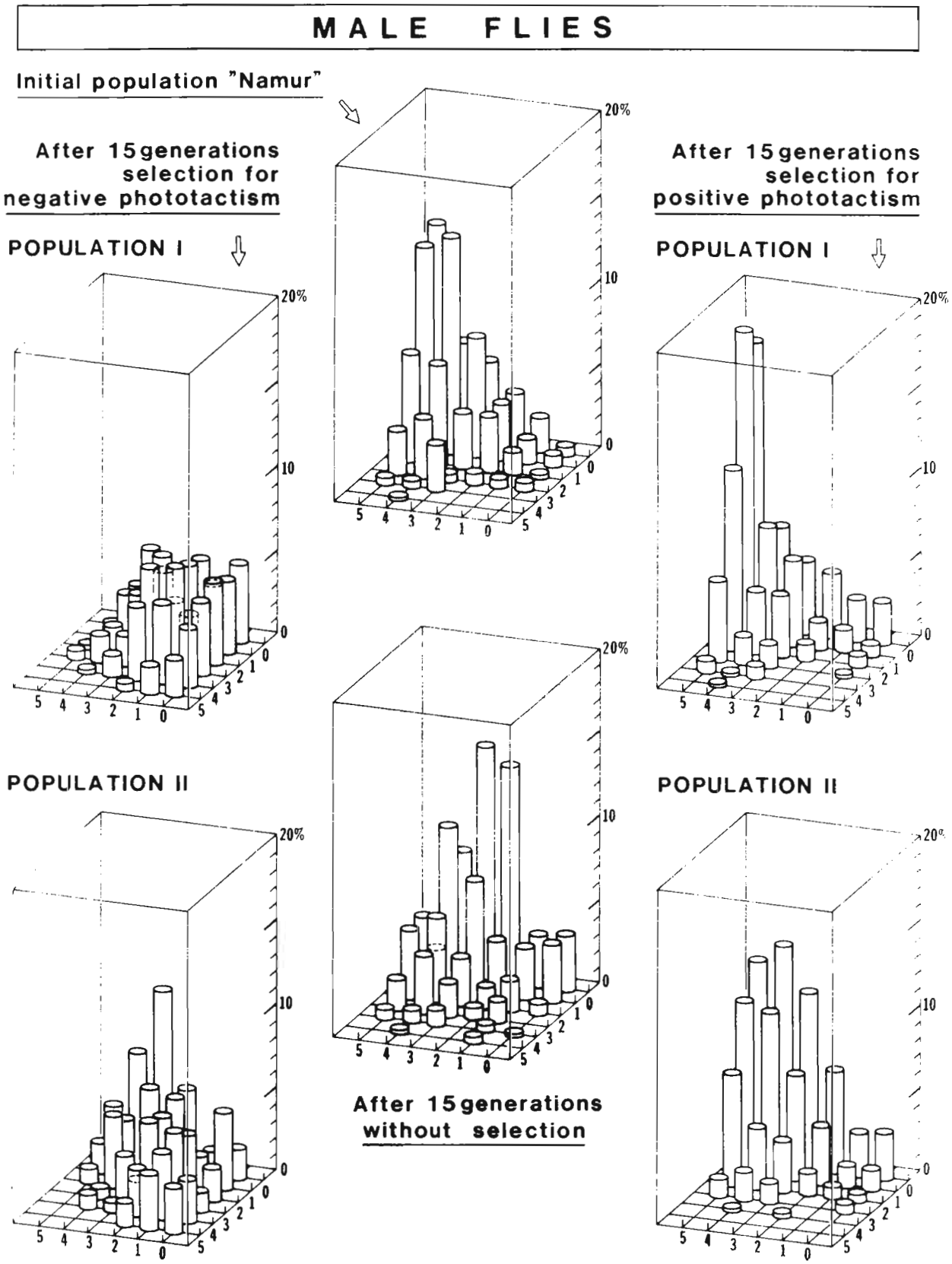

Figure 1. Countercurrent Benzer test for phototactism: final distribution of the flies. Ordinate: mean number of flies in the test tubes, in percent of the total. Front view abscissa: number of positive responses (toward light). Side view abscissa: number of negative responses (from light).

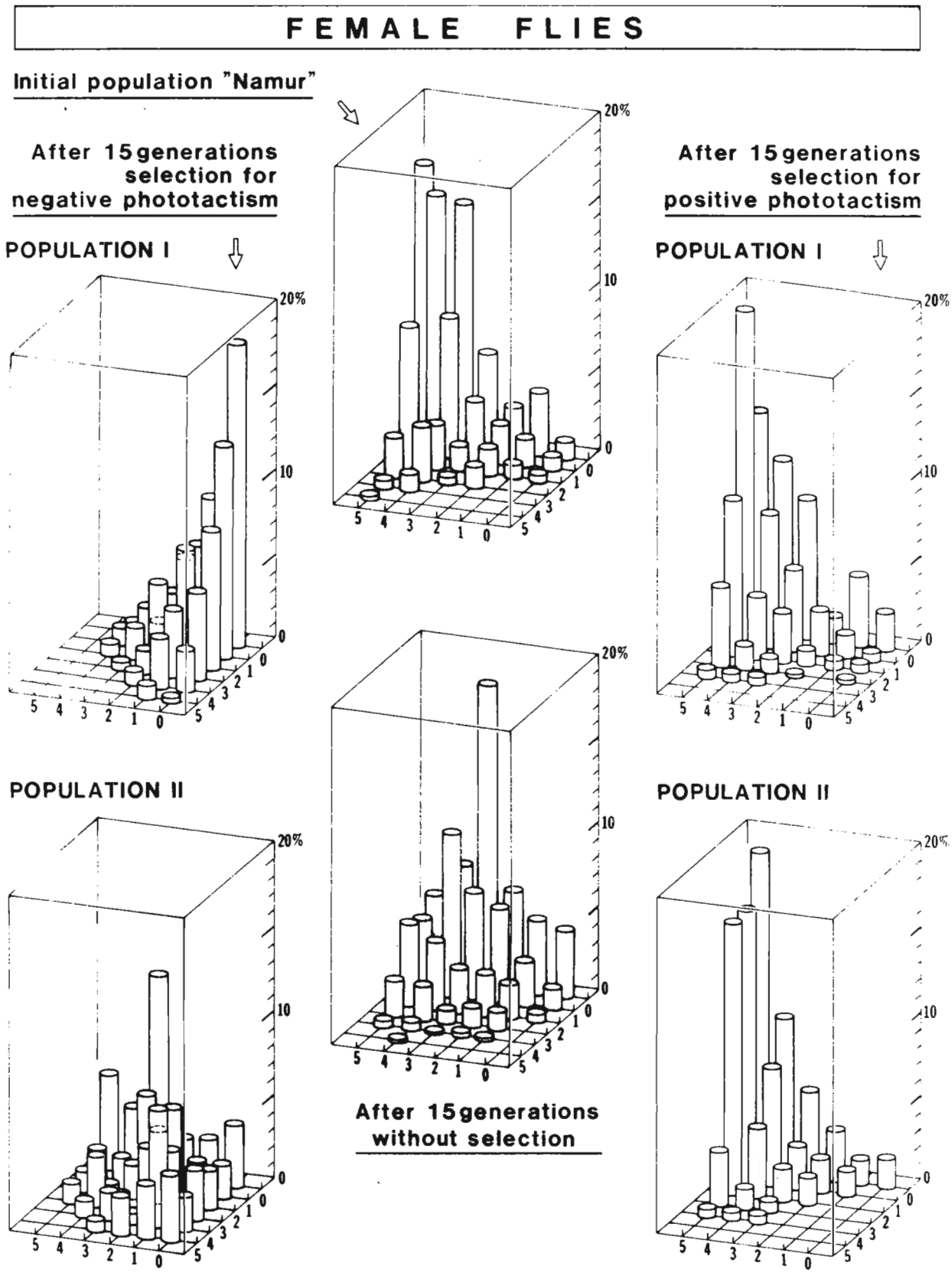

Figure 1 (continued).

were done by chi-square tests. The results are shown in Fig. 1. The unselected stock population "Namur" appears significantly less phototactic in May 1984 than in September 1983. In both populations I and II, the selection for positive phototactism has succeeded: after 15 generations, the resulting strains are significantly more phototactic than the population "Namur" as it appears from the September 1983 initial tests and as well in the May 1984 final experiments. The selection for negative phototactism seems to have succeeded in the population II only: some flies seem to be really attracted by darkness. For the population I, the difference with the population "Namur" consists essentially in a greater proportion of flies which are locomotrically less active and remain in the starting test tube. A 30°C temperature certainly increases the excitement and the agitation of the flies, and consequently influences the segregation between the "runner" and the "sluggish"flies. It doesn't seem to influence the phototactism in itself.

References: Benzer, S. 1967, Proc. Nat. Acad. Sci. 58:1112; Dubucq,D., E. Depiereux & A. Elens 1984, DIS 60:87; Kekic, V. 1981, DIS 56:178; Tompkins, L., J.A. Fleischman & G. Sanders 1978, DIS 53:211.

Bihari, B. and J.P. Gupta. Banaras Hindu University, Varanasi, India. Records of Drosophila species from three different areas of Madhya Pradesh, India.

As a matter of fact, there has been a conspicuous gap in our knowledge of world distribution of Drosophila where India is concerend. It is only very recently that interest has grown considerably in this field in India. However, a vast area of the Indian subcontinent still awaits exploration. Madhya Pradesh is one of the 22 states of India which has been largely neglected for such studies. Although it was Bachli (1973) who made for the first time a cursory survey of Drosophilid fauna of Kanha national park (M.P.) and collected 17 species of Drosophilidae. Since then nothing could be known about the Drosophilid species inhabiting this state of India.

Table 1. Drosophila species collected from Madhya Pradesh (India) during August 1984.

Species	Sub-genus	Locations			
		Betul	'Bilaspur'	'Shahdole'	Total
D.kikkawai	Sophophora	32	16	24	72
D.malerkotliana	"	91	80	65	236
D.jambulina	"	71	52	64	187
D.punjabiensis	"	56	43	48	147
D.bipectinata	"	42	13	29	84
D.biarmipes	"	75	91	35	201
D.takahashii	"	56	39	47	142
D.latifshahi	Scaptodrosophila	49	64	26	139
D.bryani	"	42	17	59	118
D.brunea	"	4	3	--	7
D.nasuta	Drosophila	47	19	62	128

During the present study, collections were undertaken at three different localities, namely Betul, Bilaspur and Shahdole, using different fermenting fruits as baits and also by net sweeping over wild vegetation. Altogether eleven species of Drosophila were collected from these areas as shown in Table 1. Based on the collection data, it was found that there lies a remarkable similarity in the species spectrum of these three areas. Although similar distribution of species suggests that similar, but obviously not that similar, ecological niches are also utilized by these species in these areas.

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Reference: Bächli, G. 1973, Vjschr. Naturf. Ges. Zürich 118:29-30.