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Kozlova, A., and L. Omelyanchuk. Institute of Cytology and Genetics, Novosibirsk 630090. Y-chromosome factor controls transcription of fertility genes in *Drosophila melanogaster*.

Three transposants of P[lArB] showing sterility of homozygous males were induced and mapped by *in situ* hybridization (ms (3) P50 - 67A4-B13, ms (3) P122 - 92A2-14 and ms(3) P115 - 75D). The lacZ reporter gene in P[lArB]construction is under the control of a weak P-element promoter. In chromosome, nearby enhancer can activate lacZ, and β-galactosidase encoded by this gene is registered by X-gal staining of tissues. We use this approach to reveal an influence of Y aneuploidy on the activity of male fertility genes.

The presence of β-galactosidase in testes was detected after fixation in 0.1M PIPES pH6.9, 2mM EDTA, 1mM $MgSO_4*H_2O$, 9.2% formaldehyde for 20 min and incubation in staining solution (10mM $NaH_2PO_4*2H_2O$/ $Na_2HPO_4*2H_2O$ pH 7.2, 150 mM NaCl, 1mM $MgCl_2*6H_2O$, 0.3% Triton X-100, 0.2% X-gal) overnight.

The results of X-gal staining in male testes with different sets of sex chromosomes (Table 1) show that the presence of Y-chromosome is neccessary for the expression of male fertility genes. Our next step was to test the effect of Y-chromosome arm aneuploidy on the LacZ expression (Table 2).

Table1.

Genotype	Staining
X / Y; ms(3) P50 / TM3	+
X / Y; ms(3) P122 / TM3	+
X / Y; ms(3) P115 / TM3	+
X / O; ms(3) P50 / +	_
X / O; ms(3) P122 / +	_
X / O; ms(3) P115 / +	_
X / O; TM3 / +	_

Table 2.

Genotype	Staining
X/Y; ms(3) P50/TM3	+
X/Y; ms(3) P122/TM3	+
X/Y; ms(3) P115/TM3	+
X/O; ms(3) P50/+	_
X/O; ms(3) P122/+	_
X/O; ms(3) P115/+	_
YSX., y cv v f /O; ms(3) P50/+	+/-
YSX., y cv v f /O; ms(3) P122/+	+/-
YSX., y cv v f /O; ms(3) P115/+	+/-

Table 3.

Genotype	Staining
X/Y; ms(3) P50/TM3	+
X/Y; ms(3) P122/TM3	+
X/Y; ms(3) P115/TM3	+
X/R(Y)L; ms(3) P50/+	_
X/R(Y)L; ms(3) P122/+	_
X/R(Y)L; ms(3) P115/+	_

Table 4.

Genotype	Heat-shock 37°C 30 min.	Staining
X/Y ; +/+	_	_
X/Y; Bg 9.61/+	+	+
X/Y; Bg 9.61	_	_
y w/O; P103/+	_	+
y w/Y; P103/CyO	_	+
X/O; Bg9.61/+	+	+

The LacZ expression in flies which genotypes contain YS was registered, but its intensity was weaker than in X/Y. An analogous experiment was performed with YL.

The data obtained lead to the conclusion that the YS but not the YL contains factors that control the expression of male fertility genes. However the possibility must be excluded that the Y-chromosome aneuploidy interrupts in a nonspecific manner the expression of the majority of genes involved in spermatogenesis by disruption of this process *per se*.

To test this assumption we use P[lArB] transposant stocks P103 (described earlier, Omelyanchuk, 1995) and Bg 9.61 (Lis *et al.*, 1983). In P103 individuals, staining was observed in neural ganglia, imaginal disks, ovaries and testes. The Bg 9.61 stock contains insertion of a construct where the LacZ gene is under control of heat-shock promoter. All tissues were stained after heat-shock in this stock.

The relults of testes staining in males containing different sets of sex chromosomes and insertions P103 and Bg 9.61 are shown in Table 4. The expression of LacZ in flies of X/O and X/Y genotypes is similar. So the possibility that the Y chromosome aneuploidy nonspecifically interrupts gene expression in testes may be excluded. And we can conclude that the YS arm contains factors responsible for the transcription of male fertility genes in *D. melanogaster*.

References:; Lis, J.T., *et al.*, 1993, Cell 35:403-410; Omelyanchuk, L., 1995, Rus.J.Genet. 31:1645-1649.

Singh, B.K., and R.S. Fartyal. Cytogenetics Laboratory, Department of Zoology, Kumaun University, Nainital-263002, India. A list of Drosophilid species so far described and recorded from Kumaun region, India.

The great importance of Drosophilidae in genetic and evolutionary studies evoked most of the countries of the world to study the Drosophilid fauna thoroughly. However, the Indian subcontinent still remains a virgin field to be explored.

The Kumaun region, a wild hilly area is located at an elevation of about 6,000 ft. (1828 meters) from the sea level on the north east periphery of the state Uttar Pradesh. This region includes four border districts of the state, Nainital, Almora, Pithoragarh and Udham Singh Nagar.

Although more than 300 species of Drosophilidae have been described and recorded so far from different parts of Indian subcontinent (Gupta, 1981, 1985), a vast area of great ecological interest still awaits exploration. Our knowledge in this field seems scanty in comparison with other countries of the world. Due to the above situation an extensive study of the Drosophilidae of Kumaun region was done, which is almost a virgin field for the above mentioned study. The following table shows the results of surveying studies of Drosophilids of Kumaun region since 1984 to 1996. The present surveying studies shows that the members of the Drosophilidae are fairly distributed in Kumaun region, particularly the members of the subgenus *Drosophila* of the genus *Drosophila*.

List of Drosophilid species so far described and recorded from Kumaun region:

GENUS *Amiota* Loew
Subgenus *Phortica* Schiner
1. *bandes* Singh and Negi, 1992

GENUS *Gitona* Meigen
2. *distigma*, 1830

GENUS *Leucophenga* Mik
3. *bellula* (Bergrowth, 1984)
guttiventris (de meijere, 1908) Syn. ref. Bock, 1979, Aust. J. Zool. Suppl. Ser. 71:25
4. *neolacteusa* Singh and Bhatt, 1988
5. *angulata* sp. nov. (In press)
6. *Okhalkandensis* sp. nov. (In press)
7. *Clubiata* sp. nov. (In press)

GENUS *Paraleucophenga* Hendel
8. *neojavanaii* Singh and Negi, 1992
Lissocephala Malloch
9. *parasiatica* Takada and Momma, 1975