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Cytogenetics of suppressor of black.

Five recessive, suppressor of black alleles (su(b)) have been mapped to the distal tip of the X and, on the basis of non-suppression in Df(1)260-1/su(b) females, the suppressor locus was placed proximal to 1B4-6 (Sherald 1981). However, since this deficiency is male lethal (Lindsley & Grell 1968) and FM4 contains su(b)$^+$, some ambiguity was indicated by the sporadic appearance of non-black males and Bar, yellow, black females from the cross; Df(1)260-1/FM4; b x su(b)/Y; b. The Df(1)260-1/FM4 stock was analyzed, and the exceptional progeny were determined to result from nondisjunction caused by the presence of a Y chromosome in some of the females: Single pair matings of Df(1)260-1/FM4 x Df(1)y^{RT10}/y^{2}scY were used to generate Df(1)260-1/y^{2}scY males which were crossed individually to C(1)DX/y^{2}scY females. In four out of 12 crosses, some y^1 female progeny (C(1)DX/Y) were found, indicating an unmarked Y derived from the grandparental females. While this analysis was performed for the stock obtained from Bowling Green, other crosses with the same stock from the Pasadena collection have also produced similar results suggestive of a free Y. The crossing scheme above was also used to isolate three stocks in which Df(1)260-1 was carried in males with only the y^{2}sc marked Y, and each stock was used to construct Df(1)260-1/su(b); +/b females for the test cross (Table 1, top). No black males were found in the progeny of these crosses, and the recovery of black females again confirms that Df(1)260-1 contains su(b)$^+$.

Table 1. Non-black and black progeny from the cross: Df/su(b); b/+ X su(b)/Y; b for ten terminal X deficiencies.

		Males	Females	
Deficiency	Breakpoint*	Non-black	Non-black	Black
Df(1)260-1	1B4-6			
stock a		203	430	145
stock b		198	337	127
stock c		133	277	75
Df(1)y^{RT8}	-**	379	565	0
Df(1)y^{RT10}	1B7-10	223	447	0
Df(1)y^{RT12}	1B7-9	87	151	0
Df(1)y^{RT18}	1B7-10	430	712	0
Df(1)y^{RT19}	1B7-10	410	844	0
Df(1)y^{RT20}	-**	321	497	0
Df(1)y^{RT21}	1B10-12	258	498	0
Df(1)y^{RT30}	1B3-8	586	832	0
Df(1)svr	1B10-13	414	752	0

* Breakpoints for Df(1)svr and Df(1)260-1 are from Lindsley & Grell (1968); other breakpoint determinations were by Drs. G.Lefevre, J. Lim, E. Strobel and/or H. Gyurkovics. For explanation of the three Df(1)260-1 stocks, see text.

**Breakpoints for these deficiences have not been cytologically determined; genetically they are y$^-$ sc$^-$ 1(1)EC7$^+$ su(s)$^+$.

To determine the cytogenetic position of the suppressor locus more precisely, nine terminal, male lethal deficiencies were tested by crossing Df/su(b); +/b females to su(b)/Y; b males (Table 1, bottom). The same suppressor allele, su(b)^{31}, was used for all tests and, except for Df(1)y^{RT12}, the progeny were obtained from duplicate crosses. While black homozygotes should constitute approximately half the progeny, none of the males displayed a black phenotype because all viable male zygotes were hemizygous for su(b). The absence of black female progeny indicated that all nine of the deficiencies uncovered the su(b) locus which must, therefore, lie at least die distal to 1B8. Taken together with the data from Df(1)260-1, these data indicate that su(b) lies between 1B4-6 and 1B8. This provides cytological confirmation for the previously reported nonallelism between su(b) and suppressor of sable, since su(s) is proximal to 1B10-13 (Lindsley & Grell 1968). Assuming that the su(b) alleles represent reisolations of the lost su(b) mutation reported by Plough (1927), this finding is at variance with the arbitrary cytogenetic map in Lindsley & Grell (1968); the black suppressor locus should be distal to su(s).

The locus for the silver mutation may also fall within this region, either in 1B7-8 or slightly to either side (Lefevre 1981). However, no evidence has been obtained for allelism between svr and su(b). None of the su(b) alleles have a visible phenotype, and svr/su(b)^{31} heterozygotes were found to be wild type, not silver. Nor was black suppression observed for svr, either as a hemizygote or in combination with su(b)^{31}.

References: Lindsley, D.L. & E.H. Grell 1968, Carn. Inst. Wash. Publ.; Lefevre, G. 1981, Genetics 99: 461-480; Plough, H.H. 1927, Proc. 5th Inter. Cong. Genet. 2: 1193-1200; Sherald, A.F. 1981, Mol. Gen. Genet. 183: 102-106.