

Table 31-a

Plants from C Bz - C bz, Sh-sh, Wx-wx kernels of 4892 x C sh bz wx, ds ac d

Dup. C sh bz <sup>↓</sup>Wx Wx Bz Sh Ds ac ac ♀

Norm. C sh bz wx

Kernel type	4892B-1 x 4804-21	4892B-2 x 4804-21	4892B-3 x 4804-21	4892B-5 x 4804-21	4892C-1 x 4804-7	4892C-3 x 4804-7	Totals
C Sh Bz Wx var. and non-var.	310	186	261	172	188	128	1245
C sh bz Wx	4	2	4	1	0	1	12
C sh bz wx	334	205	253	132	216	117	1257
Totals	648	393	518	305	404	246	2514

Table 31-b

C sh bz wx, ds ac ♀ x Dup. C sh bz Wx Wx Bz Sh Ds Ac ac ♂  
 Norm. C sh bz wx

4892 culture

Kernel type	4804-7 x 4892B-3	4804-22 x 4892C-1	4801-30 x 4892C-3	4801-32 x 4892C-3	4804-28 x 4892C-3	4803-48 x 4892C-3	Totals for 4892C-3	Grand totals
C Sh Bz Wx Non-var.	26	64	34	47	40	29	150	240
C Bz - C bz, Sh-sh, Wx-wx (bz areas wx)	35	46	37	53	45	29	164	245
C sh bz Wx Non-var.	2	3	4	2	1	1	8	13
C sh bz wx	211	197	200	208	79	159	646	1054
Totals	274	310	275	310	165	218	968	1552

Table 31-c

c sh Bz wx, ds ac ♀ x Dup. C sh bz Wx Wx Bz Sh Ds Ac ac ♂  
 Norm. C sh bz wx

Kernel type	4785-82	x	4892C-6
C Sh Wx, non-var.			18
C-c, Sh-sh, Wx-wx (c areas wx)			32
C sh Wx, non-var.			1
C sh wx, non-var.			197
Total			248

Table 32-a

Norm. C sh bz Wx Self-pollinated  
 Norm. C sh bz wx

Kernel type	4893-1 selfed	4893-3 selfed	Totals
C sh bz Wx, non-var.	129	90	219
C sh bz wx	35	31	66
Totals	164	121	285

Table 32-b

Norm. C sh bz Wx      ♀ x C sh bz wx ♂  
 Norm. C sh bz wx

Kernel type	4892D x 4803-30
C sh bz Wx	245
C sh bz wx	234
Totals	479

Table 32-c

C sh bz wx ♀ x C sh bz Wx ♂  
 C sh bz wx

Kernel type	4901G-6 x 4893-3
C sh bz Wx	124
C sh bz wx	138
Totals	262

Table 33-a

C sh bz wx, ds ac ♀ x Dup. C sh hz ~~Bz~~ Wx Wx Bz Sh Ds

Norm. c sh Bz wx normal

Ac ac

Kernel type	4804-29 x 4896
C Sh Bz Wx non-var.	113
C Bz - C bz, Sh, Wx-wx	93
C sh Bz wx	195
C sh bz Wx non-var.	0
C sh bz wx	38
Odds	0
<b>Totals</b>	<b>439</b>

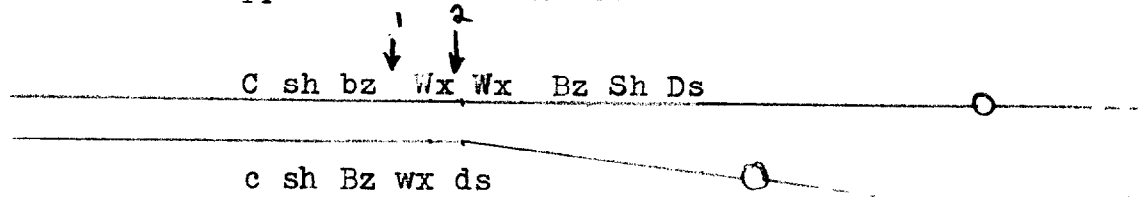
Table 33-b

<u>Dup. C sh bz Wx Wx Bz Sh Ds</u>	♀	x	C sh bz wx, ds ac	♂
Norm. c sh Bz wx (normal)				
Kernel type	4896	x	4803-27	
C Sh Bz Wx non-var.				195*
C sh Bz wx				184
C sh bz Wx non-var.				3 <sup>+</sup>
C sh bz wx				17
Odds				0

\* 42 were clearly C Bz - C bz Sh Wx-wx

+ 2 probably not cross-overs but due to deficiency

Supplement to table 33



Non-crossover gametes	$F_1$ kernel appearance										
Dup. C sh bz Wx Wx Bz Sh Ds	<table border="0"> <tr> <td>Ac</td> <td>=</td> <td>C Bz - C bz, Sh, Wx-wx</td> <td><i>observed</i></td> </tr> <tr> <td>ac</td> <td>=</td> <td>C Sh Bz Wx</td> <td></td> </tr> </table>	Ac	=	C Bz - C bz, Sh, Wx-wx	<i>observed</i>	ac	=	C Sh Bz Wx			
Ac	=	C Bz - C bz, Sh, Wx-wx	<i>observed</i>								
ac	=	C Sh Bz Wx									
Norm. c sh Bz wx ds (normal)	<table border="0"> <tr> <td>Ac and ac</td> <td>=</td> <td>C sh Bz wx</td> <td> <table border="0"> <tr> <td></td> <td>a</td> <td>b</td> </tr> <tr> <td>=</td> <td>195</td> <td>184</td> </tr> </table> </td> </tr> </table>	Ac and ac	=	C sh Bz wx	<table border="0"> <tr> <td></td> <td>a</td> <td>b</td> </tr> <tr> <td>=</td> <td>195</td> <td>184</td> </tr> </table>		a	b	=	195	184
Ac and ac	=	C sh Bz wx	<table border="0"> <tr> <td></td> <td>a</td> <td>b</td> </tr> <tr> <td>=</td> <td>195</td> <td>184</td> </tr> </table>		a	b	=	195	184		
	a	b									
=	195	184									

Region 1

Norm. C sh bz wx ds	Ac and ac	=	C sh bz wx	=	38	17						
Dup. c sh Bz Wx Wx Bz Sh Ds	<table border="0"> <tr> <td>Ac</td> <td>=</td> <td>C Bz - C bz, Sh, Wx-wx</td> </tr> <tr> <td>ac</td> <td>=</td> <td>C Sh Bz Wx</td> </tr> </table>	Ac	=	C Bz - C bz, Sh, Wx-wx	ac	=	C Sh Bz Wx					
Ac	=	C Bz - C bz, Sh, Wx-wx										
ac	=	C Sh Bz Wx										

Region 2

Norm. C sh bz Wx ds	Ac and ac	=	C sh bz Wx	=	0	1						
Dup. c sh Bz wx Wx Bz Sh Ds	<table border="0"> <tr> <td>Ac</td> <td>=</td> <td>C Bz - C bz, Sh, Wx-wx</td> </tr> <tr> <td>ac</td> <td>=</td> <td>C Sh Bz Wx</td> </tr> </table>	Ac	=	C Bz - C bz, Sh, Wx-wx	ac	=	C Sh Bz Wx					prob.
Ac	=	C Bz - C bz, Sh, Wx-wx										
ac	=	C Sh Bz Wx										



Table 34

Kernel type	4806-5	4880C-3	4806-5	Totals
	x 4883A-1	x 4883A-1	x 4883A-2	
I wx	72	76	80	228
I Bz - C Bz - C bz, wx	44	58	80	182
C bz Wx	139	178	173	490
I Wx	27	29	14	70
C Bz wx	9	11	4	24
C Bz - C bz, wx	1	3	2	6
I bz - C bz, Wx-wx (bz areas Wx-wx)	3	4	2	9
I Bz - C Bz - C bz, Wx-wx (bz areas Wx-wx)	21	18	18	57
C Sh bz wx	48	60	40	148
Others	2 C Bz - C bz, Wx-wx*	1 trans- posed Ds= I Sh Bz Ds	1 trans- posed Ds= I C Sh bz, Wx-wx*	5
Totals	366	438	415	1219

\* Probably from Ds mutation in div. to give sperm = loss of I but not Bz.

C.O. I to Wx (excluding odds) = 25.8%

Supplement to Table 34

C sh bz wx ds ac ♀ x I Ds Sh Bz Wx Ac ac ♂  
 C ds Sh bz Wx  
 1 2 3  
 I Ds Bz wx  
 C ds bz Wx

Non-crossovers

I Ds Bz wx  $\left\{ \begin{array}{l} \text{Ac} = \text{I Bz} - \text{C Bz} - \text{C bz, wx} = 182 \\ \text{ac} = \text{I wx} = 228 \end{array} \right.$

C ds bz Wx Ac + ac = C bz Wx = 490

Region 1

I ds bz Wx Ac + ac = I Wx

C Ds Bz wx  $\left\{ \begin{array}{l} \text{Ac} = \text{C Bz} - \text{C bz, wx} = 6^* \\ \text{ac} = \text{C Bz wx} \end{array} \right.$

Region 2

I Ds bz Wx  $\left\{ \begin{array}{l} \text{Ac} = \text{I bz} - \text{C bz, Wx-wx} = 9 \\ \text{ac} = \text{I Wx} \end{array} \right.$

C ds Bz wx Ac + ac = C Bz wx

Region 3

I Ds Bz Wx  $\left\{ \begin{array}{l} \text{Ac} = \text{I Bz} - \text{C Bz} - \text{C bz, Wx-wx} = 57 \\ \text{ac} = \text{I Wx} \end{array} \right.$

C ds bz wx Ac + ac = C Sh bz wx = 148

Reg. 1 + 3

I ds bz wx Ac + ac = I wx

C Ds bz Wx  $\left\{ \begin{array}{l} \text{Ac} = \text{C Sh bz, Wx-wx} = 1 \\ \text{ac} = \text{C bz Wx} \end{array} \right.$

Reg. 2 + 3

I Ds bz wx  $\left\{ \begin{array}{l} \text{Ac} = \text{I bz} - \text{C bz, wx} \\ \text{ac} = \text{I wx} \end{array} \right.$

C ds Bz Wx Ac + ac = C Bz Wx = 0

\* Several of these probably from germinal losses of I in an I Ds Sh Bz wx chromosome.  
 Max. c.o. Reg. 1 = 2%

Table 35

C sh bz wx ds ac ♀ x C Ds Sh Bz wx  
Ac ac ♂ (4883B)  
C ds Sh bz Wx

or

C Ds Sh Bz wx  
Ac ac ♂ (4883C)  
c ds Sh bz Wx

Kernel type	4804-13	4804-27	4801-1	4803-31	4806-2	Totals
	x 4883B	x 4883B	x 4883C	x 4883C	x 4883C	
C Bz Wx Not obviously var.	12	25	16	14	17	84
C Bz - C bz, Wx-wx (bz areas Wx-wx)	15	18	25	13	16	87
C Bz wx Not obviously var.	61	70	81	56	50	318
C Bz - C bz, wx	60	57	51	44	39	251
C bz, Wx non-var.	123	158	119	124	122	646
C bz, Wx-wx	4	3	5	4	5	21
C bz wx	33	52	29	22	29	165
Odds	0	0	2 C sh Bz wx	0	0	2
<b>Totals</b>	<b>308</b>	<b>383</b>	<b>328</b>	<b>277</b>	<b>278</b>	<b>1574</b>

Summary (minus odds)

740 Bz : 832 bz  
838 Wx : 734 wx

Reduced numbers of Bz and wx due to:

Ds mutations in ♂ parent giving deficient chromosome 9

Supplement to table 35

Gametes of 4883B and C

1      2  
 Ds ↓ Bz ↓ wx      Ac ac  
 ds    bz    Wx

<u>Gametes</u>	<u>Kernel type</u>	
Ds Bz wx	Ac = C Bz - C bz, wx	= 251
	ac = C Bz wx	= 318
ds bz Wx      Ac	+ ac = C bz Wx	= 646

Region 1

Ds bz Wx	Ac = C bz, Wx-wx*	= 21
	ac = C bz Wx	
ds Bz wx      Ac	+ ac = C Bz wx	

Region 2

Ds Bz Wx	Ac = C Bz - C bz, Wx-wx* = 87	} Total 336 = 21.3%
	ac = C Bz Wx = 84	
ds bz wx      Ac	+ ac = C bz wx = 165	

\* Wx-wx from breakage-fusion-bridge cycles following a Ds mutation giving a dicentric chromatid.

Crossing-over Ds to Bz = 5.2%  
 Bz to Wx = 21.3%  
 Ds to Wx = 26.5%

Based on var. kernels  
 Non c.o. = 251  
 Reg. 1 = 21 = 5.8  
 Reg. 2 = 87 = 24.2

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Total      359

Table 36

c sh Bz wx, ds ac ♀ C Ds Sh Bz wx Ac ac ♂  
C ds Sh bz Wx

Kernel type	4785-21 x 4883B	4787-13 x 4883B	Totals
C Sh Wx non-var.	128	142	270
C-c, Sh-sh, Wx-wx (c areas Wx-wx)	20	18	38
C Sh wx non-var.	88	97	185
C-c Sh-sh wx	47	40	87
Odds	1 colorless Sh-sh, Wx-wx	1 c sh wx	2
Totals	284	298	582

308 Wx : 272 wx (minus odds). Reduction in wx class due to Ds mutations in sporophyte of ♂ eliminating the C Ds Sh Bz wx chromosome because of deficiency formation.

30.4% crossing-over Ds to Wx



Table 37

c sh wx ds ac ♀ x C Ds Sh wx Ac ac ♂  
 c ds Sh Wx

Kernel type	4787-20 x 4883C tiller	4786-74 x 4883C main stalk	Totals
C Sh Wx non-var.	15	25	40
C-c, Sh, Wx-wx (c areas Wx-wx)	18	11	29
C Sh wx non-var.	49	61	110
C-c, Sh wx	37	32	69
c Sh Wx non-var.	77	111	188
c Sh wx	31	34	65
Totals	227	274	501

248 C : 253 c

257 Wx : 244 wx

29.4% crossing-over Ds to Wx

Supplement to table 37

1 2

Gametes from 48830

C Ds wx

c ds Wx

Non cross-Over

C Ds wx  $\left\{ \begin{array}{l} Ac = C-c wx = 69 \\ ac = C wx = 110 \end{array} \right.$   
 c ds Wx Ac + ac = c Wx = 188

Region 1

C ds Wx Ac + ac = C Wx  
 c Ds wx  $\left\{ \begin{array}{l} Ac = c, Sh-sh, wx \text{ (difficult to classify)} \\ ac = c Sh wx \end{array} \right.$

Region 2

C Ds Wx  $\left\{ \begin{array}{l} Ac = C-c, Wx-wx = 29 = 29.4\% \text{ of } C-c \text{ kernels} \\ ac = C Wx \end{array} \right.$   
 c ds wx Ac + ac = c Sh wx  
 about same as distance between  
 C + Wx = 134 gametes in 501 = 24.7%



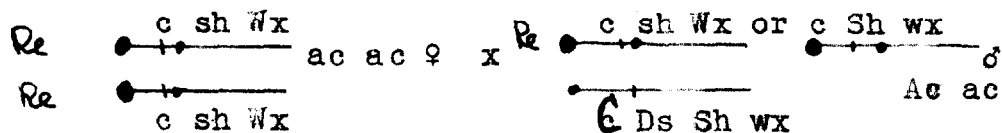
Table 38

	c	sh	Bz	wx	ds	ac	♀	x	C	Ds	Sh	Bz	wx	Ac	ac	♂
									C	ds	sh	bz	wx			
									4969-15	4785-23	4786-112	4785-8	4793-12			
									x	x	x	x	x			
Kernel type									4884	4884	4884	4887B	4890C-1			Totals
C Sh									131	96	63	89	104			483
C-c, Sh-sh									86	85	96	80	102			449
C sh									207	197	141	192	174			911
C-c sh									1	7	4	5	4			21
Odds									0	1 C-c Sh transp. Ds	1 colorless Sh wx*	0	0			6
										1 colorless Sh*	1 pec. C-c def.					
Totals									425	389	306	366	384			1870

449 C-c Sh : 21 C-c sh = 4.5% crossing over Ds to Sh

\* Due to loss of C in sperm from Ds mutation probably.

Table 39



Kernel type	4793-17 x 4882	4793-13 x 4890D-1	4793-14 x 4890D-1	4792-6 x 4890D-2	4793-7 x 4890D-2	Totals
C non-var.	60	98	108	102	57	425
C-c, var.	65	68	94	92	85	404
c	131	191	189	202	139	852
Odds	0		0	0	1 c, Sh-sh, Wx*	1
Totals	256	357	391	396	282	1682

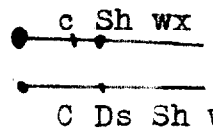
\* Probably from loss of C through Ds mutation leaving Sh in chromosome with broken end. Sh-sh due to breakage-fusion-bridge cycle.

Table 40

c sh wx ds ac ♀ x c sh Wx  
 Re ● ———— Ac ac ♂  
 ● ————  
 C Ds Sh wx

Kernel type	4786-52 x 4882
C Sh wx non-var.	80
C-c, Sh wx	63
C-c, sh, Wx-wx (c areas Wx-wx)	1
c sh Wx	177
c Sh wx	1
c sh wx	3
Totals	325

Table 41

c sh wx ds ac ♀ x  Ac ac ♂

Kernel type	4785-4	x	4890D-1
C Sh wx non-var.			35
C-c, Sh wx			32
c Sh wx			80
Totals			147

Table 42

C sh bz wx ds ac q x I Ds Sh Bz Wx Ac ac d  
 C ds sh bz wx

Kernel Type	5402-9	5402-10	5402-12	5402-14	5402-17	5403-67	5401-68	5403-71	5401-1	5403-10
	x	x	x	x	x	x	x	x	x	x
	5492-1	5492-1	5492-3	5492-3	5492-3	5492-5	5492-5	5492-5	5492-6	5492-6
I Sh Wx	49	51	89	78	79	59	53	74	46	69
I-C Bz-C bz, Sh-sh Wx-wx	40	42	71	76	76	84	62	86	53	80
I Sh wx	{ 13 Bz 15	15 Bz 20	12 Bz 14	21	14 Bz 15	25 Bz 34	19 Bz 20	29 Bz 42	19 Bz 28	17 Bz 29
I-C Bz-C bz-Sh wx	13	17	12	14	16	27	30	36	29	23
I bz-C bz Sh wx	1	0	1	6	1	3	1	2	1	0
I sh wx	4	2	4	10	7	5	6	11	4	9
I bz-C bz sh wx	7	1	4	2	5	9	6	7	5	2
C Sh Bz Wx	2	8	6	16	9	17	14	14	12	14
C Bz-C bz Sh Wx-wx	0	2	2	0	2	2	0	1	1	2
C sh Bz Wx	3	4	6	6	8	7	7	6	5	13
C sh bz Wx	27	25	37	43	47	84	75	69	47	75
C sh bz wx	85	71	132	116	166	147	126	145	97	156
C Sh Bz wx	1	1	0	1	1	2	3	0	0	0
Odds	0	1 C sh Bz wx	0	1 C sh Bz wx	1	1 I sh Wx	1 C Bz-C bz Sh, wx 1 I sh Wx 1 C sh Bz wx	0	2 I sh Wx	1 C Sh bz Wx 1 I sh Wx

5400-20 X 5494A-1	5400-23 X 5494A-1	5400-50 X 5494A-2	5403-15 X 5494A-2	5404B-25 X 5494A-2	Totals
56	85	36	48	59	931
49	76	61	85	76	1017
16	18 Bz 24	21 Bz 22	14 Bz 15	5 Bz 6	321
18	19	24	17	17	312
2	2	3	1	2	26
3	4	2	2	4	77
2	3	7	4	3	67
4	3	6	1	11	137
0	1	0	1	0	14
5	2	2	4	5	83
24	60	47	34	44	738
101	158	138	96	141	1875
1	0	1	0	1	12
2 I sh Wx 1 C Sh bz wx	2 I sh Wx	1 I bz- C bz sh Wx-wx	0	2 I sh Wx (1 var.)	C sh Bz w I sh Wx

Table 43

c sh Bz wx, ds ac ♀ x I Ds Sh Bz Wx  
 C ds sh bz wx Ac ac ♂

Kernel Type	5392-68	5392-13	5393-9	5392-23	5392-45	5392-37	5393-3	5392-36	5392-53	Totals
	x	x	x	x	x	x	x	x	x	
	5492-1	5492-3	5492-5	5492-5	5492-6	5494A(1)	5494A(2)	5494A-2	5494A-2	
Colorless Sh Wx	82	70	55	49	54	53	22	55	70	510
Colorless Sh, Wx-wx	80	67	54	51	42	51	29	85	81	540
Colorless Sh wx	53	31	49	41	47	47	6	48	32	354
Colorless sh wx	7	9	9	11	17	6	1	7	5	72
C Sh Wx	11	7	18	14	11	8	3	7	2	81
C-c, Sh, Wx-wx (c areas Wx-wx)	0	1	4	0	1	0	0	1	0	7
C sh Wx, non-var.	54	42	80	65	52	40	10	59	53	455
C sh wx, non-var.	143	122	96	110	120	112	46	105	153	1007
Colorless sh Wx	0	0	1	0	0		0	0	2	3
Colorless sh Wx-wx	2	1	0	0	0	1	0	0	0	4
Odds	0	0	0	1 C Sh wx	0	1 C-c Sh wx Ds to left of C	0	0	0	2
Totals	432	350	366	342	344	319	117	367	398	3035

Supplement to table 43

(1)(2)(3)  
 ↓ ↓ ↓  
I Ds Sh Wx  
 C ds sh wx

Non-crossovers

I Ds Sh Wx	Ac = colorless Sh-sh, Wx-wx	540
	ac = colorless Sh Wx	510
C ds sh wx, Ac and ac	= C sh wx, non-var.	1007

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Region 1

I sh wx, Ac and ac	= colorless sh wx	
C Ds Sh Wx	Ac = C-c, Sh Wx-wx (c areas Wx-wx)	7
	ac = C Sh Wx, non-var.	

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Region 2

I Ds sh wx, Ac and ac	= colorless sh wx	72
C ds Sh Wx Ac and ac	= C Sh Wx, non-var.	81

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Region 3

I Ds Sh wx Ac and ac	= colorless Sh wx (Ac = Sh-sh var.)	354
C ds sh Wx Ac and ac	= C sh Wx, non-var.	455

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Crossing over, regions 1 + 2 = 160 = 5.2%

"	"	region 1 = 7x4 = 28 = 0.9%
"	"	region 1, C class = 14
"	"	region 2, C class = 75