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PLANT STATURE AS AFFECTED BY THE INTERACTION OF na AND le la cry<sup>c</sup>

Marx, G. A. NYS Agricultural Experiment Station, Geneva, NY USA

Indirect evidence obtained in 1981 and 1982 (1,2) indicated that the extreme dwarfing effect of na is counteracted when na is combined with la cry<sup>c</sup> (and presumably la. cry<sup>c</sup>). Thus, when na is present together with La and/or Cry, the plants are nana in phenotype, but when na is combined with la cry<sup>c</sup> the plants are cryptodwarf. In effect, na is hypostatic to le la cry<sup>c</sup>. This article offers direct confirmatory evidence favoring this hypothesis.

Seeds from 29 individual na wlo F2 segregants from entries C281-308 and C281-309 [see (2)] were planted in greenhouse flats filled with quartz sand and the resulting seedlings were scored for the marker wlo and for plant stature. The na and WL 1329 parents were included as controls. If the epistatic effect of na is overridden in an le. la cry<sup>c</sup> background and if, as the F2 data showed, the cry<sup>c</sup> allele segregated in F2, then it follows that some of na wlo F2 segregants should segregate for cryptodwarf plants. The progeny tests bear this out. Nineteen of 29 F3 progenies tested had one or more cryptodwarf plants (Table 1), very close to the expected 2:1 ratio. Collectively, the segregating progenies contained 197 nana plants and 53 cryptodwarfs. All ratios must, of course, be interpreted in the light of the small size of the individual progenies. All plants manifested the wlo phenotype, thus verifying the classification for that gene in the F2 populations.

The F2 and F3 data together demonstrate that na is masked (at least in a gross morphological sense) in the presence of la. cry<sup>c</sup>. By extension, the effect of na is modified by the dosage of alleles at La and Cry. Hence, some of the F2 and F3 segregants that fit the description of "compactum" may be the product of this gene interaction. In effect, the action of na is partially overcome in certain gene combinations.

These findings affect the way in which internode length data are interpreted, especially in attempting to fix the physiological basis for gene action. It might be reasonable to assume that variation in height of nana plants is a reflection of multiple alleles at the na locus when, in fact, the cause is an indirect effect of allelic differences at the La and/or Cry loci. Accordingly, since the allelic status at La. and Cry affect the expression of differences at La and Cry would also affect how gene action at the Na-na locus is measured and interpreted.

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Table 1. Progeny test results of 29 na wlo F<sub>2</sub> plants derived from the cross na wlo x WL 1329 Na Wlo (lm) (see also ref. 2).

	<u>Nana</u> <sup>1/</sup>	<u>Cryptodwarf</u>	<u>Total</u>
C382- 1	10	3	13
2	11	1	12
3	10	1	11
4	12	1	13
5	9	0	9
6	10	2	12
7	9	4	13
8	8	4	12
9	7	6	13
10	14	3	17
11	9	0	9
12	15	0	15
13	11	2	13
14	13	1	14
15	10	0	10
16	12	1	13
17	13	2	15
18	7	0	7
19	9	0	9
20	11	3	14
21	9	0	9
22	8	4	12
23	8	2	10
24	9	0	9
25	6	0	6
26	10	0	10
27	9	7	16
28	11	3	14
29	10	3	13
P <sub>1</sub> (crypto)	0	10	10
P <sub>2</sub> (nana)	8	0	8

<sup>1/</sup> The nana class contained segregants which might be classified as "compactum".