

Inheritance of Bush Habit in Cucurbita pepo L.

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Bush growth habit in squash is a very important character for dense planting, especially under the plastic house cultivation. To breed bush-type pepo cultivars for the cultivation, it is an essential step to investigate the inheritance of the bush habit.

Several researchers reported the inheritance of bush-type in C. pepo (1,3,4) and C. maxima (1,2), which include some controversial results. It was generally recognized that the bush character is almost completely dominant during the early growth stage, and recessive or incompletely dominant during the late growth stage.

In Cucurbita pepo L., the bush-type variety 'Zucchini' was crossed with the vine-type 'PI 285611'. The inheritance of bush habit was studied in F₂ and BC₁F₁ populations. The length of main stem was measured in the three different growth stages ; early, middle, and late stages.

The frequency distribution of vine length in each stage is presented in Fig.1. The mean of the F₁ hybrids was almost similar to the bush parent during the early stage, but the bush was not completely dominant to the vine. As the growth continued, the F₁ hybrid population leaned slightly toward the vine, but it was always below the mid-parent value. The segregation ratios of the F₂ and BC₁F₁ populations were 3:1 and 1:1, respectively, with the bush partially dominant to the vine regardless of the growth stages. The segregation ratios were accepted at the 10 to 50 percent level of probability (Table 1). The result obtained almost agreed with Shifriss (4), but was somewhat different from the others (1,2,3).

In conclusion, the characteristic feature of the bush gene action was partial dominance. The degree of dominance lessened as the growth proceeded.

Literature Cited

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Table 1. Segregation of bush and vine types in the 3 different growth stages in the F₂ and BC₁F₁ populations from the cross 'Zucchini' x PI 285611.

Date	Generation	No. of plants		Expected ratio	X ² -value	P
		Bush	Vine			
June 10	F ₂	199	79	3:1	1.731	0.10 - 0.25
	BC ₁ F ₁	78	82	1:1	0.1	0.75 - 0.90
July 6	F ₂	201	77	3:1	1.079	0.25 - 0.50
	BC ₁ F ₁	77	81	1:1	0.101	0.75 - 0.90
August 5	F ₂	197	76	3:1	1.173	0.25 - 0.50
	BC ₁ F ₁	65	77	1:1	1.014	0.25 - 0.50

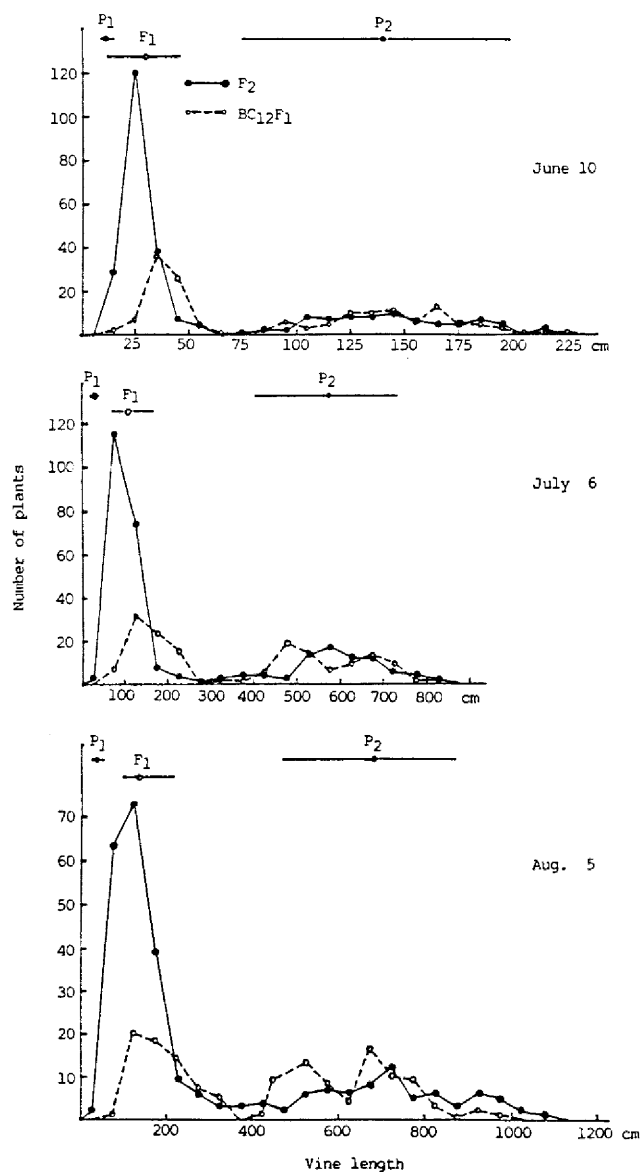


Fig.1. Frequency distribution of vine length at the 3 different growth stages in the F₂ and backcross populations from the cross, Zucchini/PI 285611. The means of parents (P₁, P₂) and F₁ populations are indicated as black and open circles, respectively.