

INHERITANCE OF HEIGHT OF PLANTS IN THE ITALIAN MILLET—*SETARIA ITALICA* (BEAUV.)

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Varieties of Italian millet vary very much in their height. An experience in the inheritance of plant height in this millet is recorded here. In 1933 a cross was made between two pure lines, S. I. 1646 and S. I. 2485 (vide illustration.) Both of these had a duration of 85 to 90 days. A first generation of 15 plants was raised. These were widely spaced with a view to selfing. Their average height was 119 cm. Contemporary to the F_1 the two parents were also raised. The average height of 200 plants of the tall parent was 111 cm. and of the short parent 75 cm. One of these fifteen F_1 plants, i. e., No. S. I. 2676 gave in the second generation 219 tall plants with an average height of 104 cm. (85 - 125 cm.) and 67 short plants with an average height of 66 cm. (45—80 cm.) The segregation was sharp, there being no doubtful cases during the classification.

From this F_2 , a third generation was raised. Of the six short plants that were taken all bred true to shortness. Their heights ranged from 45 to 71 cm. with an average of 63 cm. Of the twelve tall selections, 6 bred true to tallness, the height ranging from 99 to 114 cm. with an average of 106 cm. Six selections segregated again sharply and gave a total of 858 talls and 320 shorts ($\chi^2 = 2.82$, $P > .05$)

Along with the F_3 , the parents were also raised. The tall parent had an average height of 110 cm. and the short parent 65 cm. It will be noticed that the parental and the F_3 homozygous height indices closely approximate. In the tall group, none approached the shorts.

It was thus clear that a single gene was at play in this segregation. The groups, tall and short, were analysed into their components. The number of internodes was counted in the main stalk in 275 plants in each group and was found to be an average of 11.49 in the talls and 10.10 in the shorts. The range in internodal number in both the groups was from 8 to 14. The slightly lesser number in the average of the short group is attributable to the compressed corm-like zone at the very base of the stalk. The cause for the differences in height was therefore not in the total number of the internodes.

The length of each of the internodes below the peduncle was recorded in 60 plants in each group and their averages are given in the following table (Table I).

Table I.

Average length of the internode on the main stalk of parents.
(Average of 60).

Number of the internode below the peduncle.	Length in cm. of the internode	
	S. I. 1646 Tall.	S. I. 2485 Short.
Earhead	15.81±1.35	9.65±1.07
Peduncle	23.00±2.81	15.50±2.61
1st	7.45±0.93	6.60±1.58
2nd	8.10±1.29	7.27±1.82
3rd	7.70±1.31	7.35±1.75
4th	7.30±1.43	7.05±1.90
5th	7.20±0.95	5.65±1.31
6th	7.30±1.05	4.88±0.96
7th	7.19±1.09	4.45±0.83
8th	7.15±0.95	3.75±0.81
9th	6.13±0.83	2.40±0.65
10th	4.25±0.96	1.38±0.18
11th	2.37±0.71	
Total height	110.95	75.93

Table No. 1 shows that the tall group has internodes longer than the short group, proving that the gene at work is the one responsible for increase in internodal length¹.

A study of this table shows that there is a slight reduction in the length of the internode just below the peduncle, an experience recorded in some other cereals also². A third point of interest is the fact that the total length of the peduncle and the earhead makes up a third of the total height of the plant. There is indicated a high relationship between plant height and head length. The average measurements for plant height and head length in the parents and in the homozygous F₃ are given in the following table. The relation of head length to plant height is obvious.

Table II.

Generation.	Population.	Mean height of plants. cm.	Mean length of earhead. cm.
Tall parent	200	110.94±.088	14.40±.085
F ₃ —Tall pure	750	106.46±.060	13.62±.090
Short parent	200	74.59±.082	8.51±.056
F ₃ —Short pure	819	62.87±.050	9.0±.030

The earheads in both the groups, tall and short, were analysed and the results are presented in table III.

Table III.
Earhead Analyses of Parents.

	Average length of earhead.	Average thickness of earhead.	Average weight of earhead.	Average No. of Grains.	Average weight of Grains.
	cm.	mm.	gm.		gm.
S. I. 1646—Tall	18.8	16.2	7.6	2104	6.71
„ 2485—Short	10.1	12.8	3.5	1212	3.02
Difference between the averages of the parents.	8.7	3.4	4.1	892	3.69
't' value*	12.49	3.16	15.94	2.88	4.62

* 't' value for $P = .05$ and $n = 8$ as per Fisher's table = 2.306

It will be noted that the earheads of the tall plants are longer, thicker, denser with a larger number of grains and with a heavier seed weight when compared with those of the short parent. The differences are statistically significant as measured by the 't' test.

Summary. In *Setaria italica*, tall plants with an average height of about 111 cm. proved a simple dominant to short plants with an average height of 75 cm. The segregation was monofactorial.

Both the parents had about the same number of internodes but differed in the lengths of the internodes. This internodal length which affected total plant height had its effect on the length, thickness and weight of the main earhead with corresponding increase in grain number and weight.

Literature cited.

1. Rangaswami Ayyangar, G. N., et. al. 1937. The Inheritance of Height—*cum*—Duration in Sorghum. *Madras Agric. J.* Vol. 25 No. 4. Pp. 107.
2. Rangaswami Ayyangar, G. N. and Hariharan, P. V. 1935. The Tillers of the Pearl Millet. *Madras Agric. J.* Vol. 23 No. 12. Pp. 474—477.

CULTIVATION OF CORIANDER (*Coriandrum sativum*) IN TINNEVELLY DISTRICT

Introduction. Coriander is one of the commonest condiments found in every Indian household as it is largely used for culinary purposes. It is also used in preparing confectionery. As it possesses medicinal properties, coriander decoction is the cheapest and the most commonly prescribed specific in every household for biliousness. Coriander is valued for the oil contained in the seeds.

Tinnevely is one of the principal districts where coriander is largely grown. It occupies an important place in the system of cultivation in the black soil tracts of this district, and practically stands next to cotton as a money-crop. The income though small, proves handy to the ryot at a particular period of the year when no other money-crop is available to enable him to meet his sundry expenses