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Short Communication

An induced dwarf mutant of grasspea

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Only scanty information is available in literature about induced mutations in grass pea, and morphological as well as yield related parameters are less explored [1-4]. An induced dwarf mutant showing striking variations in most of the traits from control plants was isolated in grass pea.

Fresh seeds of grass pea (var. Bio R 231) were germinated and hundred healthy seedlings of 3-4 days old were treated with 0.25% colchicine solution for 6h each consecutive days for induction of polyploidy. One of the treated plants (6 h, 3 days) was quite distinguishable from normal and other. treated plants by its remarkable short stature and other characteristics although it was diploid in nature. This plant was designated as a dwarf mutant (Fig. 1). Out of the 21 filled seeds harvested from the dwarf plant in February-March 1997, 18 germinated but only 15 matured (M_1) producing 69 filled seeds, which were grown in the next *rabi* season for raising M_2 generation. All the M_2 plants showed dwarfism. Data on various quantitative characters studied in M_2 generation are presented in Table 1.

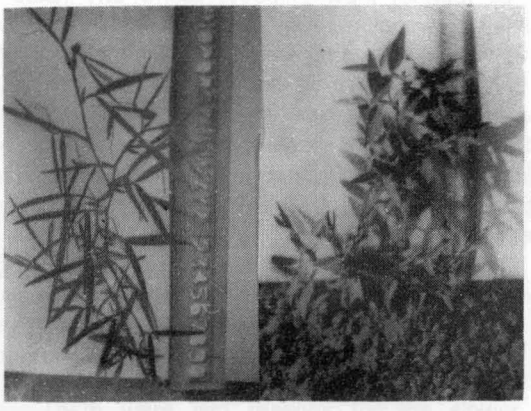

Fig. 1. Control and dwarf mutant at M_2 generation

Compared to control, this mutant showed very slow rate of growth and reduced plant height from the early seedling stage till maturity. This might be due to marked reduction in the length of internodes (Fig. 2), the number of which was nearly equal to that of normal

Table 1. Range and mean of different characters of normal control plants (var. Bio R231) and dwarf mutant of grass pea

Characters	Dwarf mutant			Control (Bio-R231)		
	Range	Mean	± SE	Range	Mean	± SE
Plant height (crn)	14-18.2	16.20	±0.07	50-55	52.40	±0.03
Internodes/ plant	70-80	78	±0.03	208-212	210.12	±0.01
Length of internode (cm)	0.9-1.4	1.23	±0.12	3.20-3.25	3.22	±0.01
Leaves/branch	12-16	13.20	±0.10	24-28	27.5	±0.4
Branches/plant	5-8	6.8	±0.15	10-15	12.4	±0.11
Leaves/plant	75-81	76	±0.02	301-312	306.8	±0.01
Leaflets/leaf	2-4	2.6	±0.21	2-6	4.6	±0.27
Leatlet length (cm)	2.8-3.1	2.99	±0.03	6-6.2	6.1	±0.01
Leaflet width (cm)	0.46-0.56	0.53	±0.06	0.51-0.53	0.52	±0.01
Stipule Length (cm)	0.55-0.62	0.52	±0.03	1.60-1.66	1.62	±0.01
Stipule width (cm)	0.22-0.40	0.32	0.02	0.50-0.53	0.51	±0.02
Length of pedicel (cm)	1.1-1.3	1.22	±0.05	2.5-3.4	3.26	±0.08
Days to first branching	25-28	27	±0.3	10-12	10.5	±0.06
Days to final branching	69-75	73	±0.02	100-110	106	±0.03
Days to first flowering	63-66	65	±0.01	45-52	48	±0.04
Days to 50% flowering	78-80	79	±0.01	60-65	62	±0.01
Days to maturity	110-118	116	±0.02	132-136	134	±0.01
Pods/palnt	12-14	12.5	±0.05	80-88	84	±0.03
Seeds/pod	2-4	3.1	±0.26	3-4	3.6	±0.14
Pod Length (cm)	3-3.03	3.01	±0.002	3.53-3.55	3.53	±0.002
Pod width (cm)	0.65-0.71	0.68	±0.03	0.72-0.76	0.74	±0.01
Seed yield/pl (g)	0.9-1.9	1.73	±0.17	10.6-12.2	11.6	±0.04
Biological yeidl/pl (g)	2.9-5.01	4.09	±0.11	25.5-28.0	26.65	±0.03
100 seed weight (gm)	4.1-5.8	5.0	±0.12	5.0-6.2	5.5	±0.10
Harvest index (%)	31.03-43.98	40.27	±0.09	41.56-44.36	43.52	±0.02

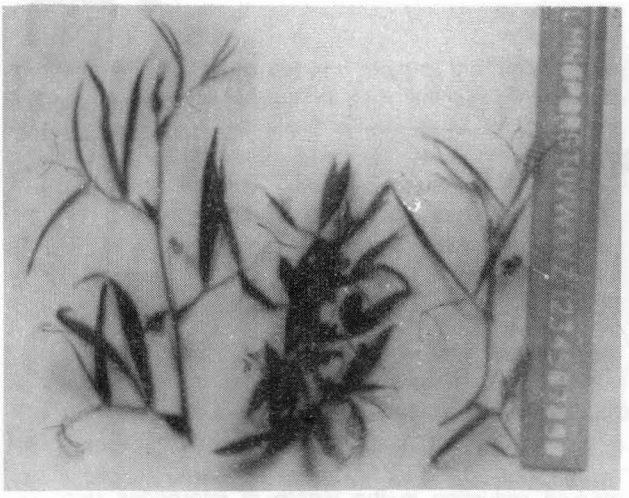

Fig. 2. Dwarf mutant (middle) showing reduced internode in comparison to normal control plants

control plants up to 9 days at early vegetative stage but reduced remarkably from mid flowering period (Table 1).

Internodes, in this mutant were prominantly winged which might be attributed to its rigid and erect habit. Main axis was almost perpendicular to the soil surface. The orientation of early formed branches was very close and inclined to the main axis. The nature of leaflets, stipules and internodes gave this mutant a distinct dwarf and condensed phenotypic identity. Branching was found to be delayed by 15-16 days while ceasation of branching was late by 33 days as compared to the control plants (Table 1). Although the mutant was late in initiation as well as 50% flowering by 17 days, it matured earlier by 18 days as compared to control (Table 1). Total number of branches, flowering nodes, pods per plant and seed yield per plant (g) reduced remarkably but number of seeds/pod, pod size, 100 seed wt (g) and harvest index value were reduced marginally.

Since only one out of the 100 treated plant manifested dwarf mutant phenotype and all the progenies of which were dwarf in M_2 and subsequent generations, possibly the mutant has arisen through recessive mutation involving both the alleles and it may be true breeding. It is however, not wise to rule out other possibilities regarding the type of mutation without making intercross with normal diploid.

Thus, optimistically it may be concluded that early maturity, erect and condensed stem habit of this dwarf mutant may be utilized as desirable traits for improvement in grass pea by hybridization.

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