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Quantitative evaluation of induced macromutants in cerlery (*Apium graveolens* L.) and ajowan (*Trachyospermum amni* L.)

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SUMMARY

Ten induced macromutants were quantitatively assessed (plant height, number of primary and total branches per plant, number of compound umbels per plant, number of umbels per plant and number of umbellets of first inflorescence) in respect to control plants of celery (*Apium graveolens* L.) and ajowan (*Trachyospermum amni* L.) at M_3 (from unequal replication) using Duncan's test analysis. Results indicated that thick stem I, lax branching I, funnel, bushy, broad pinnae and early flowering mutants of celery were promising ; while, drooping branched, thick stem I, pigmented stem, early flowering and late flowering mutants of ajowan possessed 1 or 2 significant trait(s) over control, thereby offering scope for efficient breeding for raising superior plant types in the species.

Key words : Celery, Ajowan, Macromutants, Quantitative traits, Duncan's test analysis.

Celery (*Apium graveolens* L.) and ajowan (*Trachyospermum amni* L.), seed spices of Umbelliferae, are economically important as they are consumed and exported from India as raw materials as well as value added products. However, high yielding varieties are rather lacking in these spice species (Pruthi 2000) to meet up the upsurging demand in National and International Markets. Further, genetic variability in these seed spices are limited (Arya 2000). Experimentally induced mutations provide an important source of developing and creating genetic variations in short span of time and the methodology has been successfully administered in different crop plants to raise plant type mutations. Present authors have induced macromutants in celery and ajowan (Paul and Datta 2005) and this communication deals with the quantitative evaluation of those macromutants in relation to controls with the objective to screen desirable mutant(s) for efficient plant breeding.

MATERIALS AND METHODS

Mutants (*thick stem* I and II – TS I and II, *pigmented stem* – PS, *lax branching* I and II – LB I and II, *funnel* – Fu, *bushy* – Bu, *dropping branched* – DB, *dwarf* – Dw, *broad pinnae* – BP, *narrow pinnae* – NP, *early flowering* – EF and *late flowering* – LF) and respective control (C) of celery and ajowan in the M_3 generation were compared for yield (seed yield) and yield related traits (plant height, number of primary and total branches per plant, number of compound umbels per plant, number of umbels per plant and number of umbellets of first formed inflorescence) in an experiment grown in randomized design in 3 replications (spacing of 25 cm between lines and 10 cm between plants). Five plants were randomly selected from each replication (unequal) of each treatment (control/mutant) for assessment of agronomic traits (plants were composited together). Duncan's test (Duncan 1955) was computed (one way ANOVA has been performed as macromutant being the only source of variation) at 5% level of significance for each parameter to assess significant variation among the plant types. Homogeneous treatment means were assessed following Duncan's test. Means were denoted by alphabets and similar alphabets represented homogeneous plant types and any common alphabets in the plant types denote non-significant differences between them; the alphabets are arranged in descending order to indicate the gradation of superiority.

RESULTS AND DISCUSSION

Celery :

The macromutants compared statistically with control (Table 1) revealed that TS I, LB I, Fu, BP and EF had significant enhancement in primary and total branches per plant, number of compound and total umbels per plant and seed yield. *Bushy* mutant also manifested enhanced number of branches and compound umbels and umbels per plant. Plant height was significantly higher in TS I; while, PS had higher number of branches and high seed yield than control. Number of total umbels per plant was maximum in TS I and minimum in Dw mutants.

Ajowan :

Evaluation of quantitative parameters between control and the macromutants (Table 2) demonstrated that LB I and II and Bu were superior as they were taller with enhanced number of branches, compound umbels and total umbels and with higher seed yield than control.Compared

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