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# Madurai. 1 - An Improved Chilli Variety

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A cluster flowering chilli mutant (culture -1) was identified as a mutant in the gamma irradiated K.1 chilli seeds and released as an improved strain MDU.1. This strain has a duration of 210 days and can be cultivated where K.2 strain is being cultivated in Southern districts of Tamil Nadu. It gives an yield of 1809 kg/ha under irrigated condition with an increase of 15.1 per cent over K.2 chilli strain.

Chilli *(Capsicum annuum* L) is an essential ingredient. both as a condiment and a spice in several preparations of Indian diet. In Tamilnadu chilli is cultivated in about 87,500 hectares with an annual production of 1.25 lakhs tonnes of dry chillies. In view of the importance of this crop and limited success achieved, for the genetic improvement of this crop, breeding through induced mutagenesis was attempted and the results are presented herein.

## MATERIALS AND METHODS

The dry seeds (with moisture content 12±1.0 per cent) of the chilli (*Capsicum annum* L) variety K.1 were subjected to six different doses of gamma rays (using a 2000 curie 60 Co gamma cell) ranging from 10 to 60 krad enhancing 10 krad at each dose. For each dose 360 seeds were irradiated. Along with control $M_1$ generation was raised. From all the surving $M_1$ plants in each dose, first formed five fruits from different branches were harvested and $M_2$ generation was raised on $M_1$ plant and $M_1$ fruit progeny basis. The fruits from the plants with visible changes in comparison to the control were scored, harvested separately and $M_3$ raised as individual progeny rows along with K.2 (control) In $M_4$, an yield trial was conducted, with promising mutants, adopting a randomised block design with three replications. The yield of dry fruits was recorded on individnal plot basis from individual replications. Capscicine content was estimated as described by *Suzuki et al.*, 1957, with fruits collected at random from five plants in one replication for each mutant and control. Based on this study one cluster flowering (culture-1) and two high yielding mutants (culture 2 and culture-3) were identified as high yielders. Multilocational trials were arranged with these cultures along with K.1 and K.2 in the traditional chilli growing zones of Tamil Nadu following the recommended schedule of package of practices from the year 1973-74 to 1975-76 for further evaluation on their yield stability.

## RESULTS AND DISCUSSION

The high yield potential of the cluster flowering mutant (culture-1)

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over other cultures and standards (K.1 and K.2) was evident as could be seen from the data on yield trial conducted at the University Research Stations and cultivators holdings (Table I). Culture-1 has recorded a mean yield of 1809 kg.

TABLE I. The performance of Culture-1 as compared to K.1 and K.2

| Location and year of trial | No. of trials | Mean yield of dry fruits (kg/ha) | | | | | Percentage increase over | |
|---|---|---|---|---|---|---|---|---|
| | | Cult. 1 | Cult. 2 | Cult. 3 | K.1 | K.2 | K. 1 | K. 2 |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Dept. of Agrl. Botany, Agrl. College & Res. Instt., Madurai (1972-73 to 1975-76) | 4 | 2003 | 1752 | 1748 | 1784 | 1684 | 12.28 | 18.94 |
| Trials at the University Research Stations and farmers's field | | | | | | | | |
| (a) 1973-74 | | | | | | | | |
| Bhavanisagar (ARS)<br>Theni (Madurai Dt.)<br>Sedapatti (-do-)<br>Sattur (Ramnad Dt.)<br>Virudhunagar (-do-)<br>Sivakasi (-do-)<br>Karatampatti (Trichy Dt.) | 7 | 1920.3 | 1575.8 | 1341.4 | 1543.1 | — | 24.44 | — |
| (b) 1974-75 | | | | | | | | |
| Bhavanisagar (ARS)<br>Kaveripattinam (ARS)<br>Pondicherry (ARS)<br>Kinnimangalam (Madurai Dt.)<br>Dharmathupatti ,,<br>Reddiarchatram ,,<br>Manachanallur (Trichy Dt.)<br>Kayathar (Tirunelveli Dt.) | 8 | 1508.9 | 1111.0 | 1045.6 | 1250.1 | — | 20.70 | — |
| (c) 1975-76 | | | | | | | | |
| Agrl. College & Res. Instt., Coimbatore<br>Kovilpatti (ARS)<br>Vilar (Thajore Dt.)<br>Kariyampatti (Puddukottai Dt.)<br>Mulanur (Coimbatore Dt.)<br>Chettinaikampatti (Madurai Dt.) | 6 | 1948.7 | 1401.5 | 1506.8 | 1634.3 | 1553 | 19.23 | 25.47 |
| Overall Mean | | 1809 | 1436 | 1351 | 1507 | 1553 | 20.03 | 15.10 |

of dry fruits/ha which is 15 and 20 per cent increase over K.2 (1553 kg/ha) and K.1 (1507 kg/ha) chillies, respectively. Culture-1 (MDU.1) can be sown in June-July and September-October months. It has a per day productivity of 8.61 kg/ha. as compared to 7.76 kg/ha for K.2.

The plants of MDU.1 possess compact plant body, large leaves with cluster flowering and fruiting habit (4 to 9 fruits/node against a single fruit observed in other varieties). The fruits are long, shiny red in colour and more pungent due to higher capscicine content by 0.2 mg. per gram of dry fruits than that of K.2.

TABLE II. The characteristic features of the Culture-1 (MDU.1)

| Characters | Culture-1 (MDU.1) | K.2 |
|---|---|---|
| Height of plant (cm) | 58.6 | 42.1 |
| Number of primary branches | 8.5 | 5.8 |
| Laaf length (cm) | 10.0 | 6.2 |
| Leaf breadth (cm) | 5.0 | 2.3 |
| Spread of the plant (cm) | 30.2 | 43.9 |
| Fruits at node | 4 to 9 | 1 |
| 100 Fruit weight (g) | 73.0 | 65.0 |
| Length of fruit (cm) | 8.0 | 6.2 |
| Breadth of fruit (cm) | 1.0 | 0.88 |
| Number of seeds per fruit | 58.8 | 60.7 |
| Colour of fruit | Dark shining red | Shining red |
| Capsicino content (mg./g of dry fruit) | 0.70 | 0.49 |
| Cost benefit ratio | 1:3.475 | 1:2.940 |
| Duration (days) | 210 | 200 |

Based on the high yield and capscicine content and other important desirable characters (Table II) culture 1 has been released as an improved strain MDU.1 for large scale cultivation in Tamil Nadu.

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