

PMR ( $\text{CCl}_4$ ):  $\delta$  3.63 (s, 6H, 2x-OMe), 6.73–7.57 (m, 8H, Ar-H). Similarly, Va was obtained as colourless crystals (hexane) from fraction B; 320 mg, m.p. 180°C (lit. m.p. 181°C)<sup>7</sup>; IR (KBr): 3500, 1600, 1580  $\text{cm}^{-1}$ ; 60 MHz PMR ( $\text{CDCl}_3$ ):  $\delta$  3.5 (s, 9H, 3x-OMe), 6.8–7.43 (m, 12H, Ar-H).

**Cyclization of 2,2'-dimethoxybenzophenone (IVa) to xanthone (VII)**

A mixture of IVa (50 mg) and pyridine hydrochloride in 1:5 proportion was heated in a dry flask in an oven at 180°C for 36 h. After cooling, water was added and the mixture extracted with ether and dried. Removal of ether gave crude product which on purification (prep. TLC) and crystallization from ethanol furnished colourless crystals of VII; 35 mg, m.p. 174°C (lit. m.p. 174°C)<sup>15</sup>. NMR and IR data are in agreement with those of xanthone.

18 June 1988

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**INDUCED SHY MUTANT OF LENTIL (*LENS CULINARIS* MED.)**

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DURING induced mutation studies in lentil, various types of mutants with altered morphological characteristics were isolated. In the present communication a morphological mutant with changed leaflet shape and size and shy in flowering and pod bearing is reported.

Dry seeds of a lentil variety Sehore 74–7 were irradiated with 5, 10, 15 and 20 krad of  $\gamma$ -ray at the Gamma Cell Laboratory of Indian Agricultural Research Institute, New Delhi. The  $M_1$  and later generations were grown at the College Farm, Dholi of the Rajendra Agricultural University. In  $M_2$  generation from 10 krad treated population one dwarf mutant with narrow leaflets and slight longitudinal bending was isolated. This had less flowers and fruits. The mutant was therefore named 'shy mutant'. In  $M_3$  it did not segregate indicating recessiveness of the character induced. Some  $M_3$  mutant plants were crossed with the parent variety.  $F_1$  was like parent and  $F_2$  segregated in the ratio of 3 tall-like parent:1 dwarf-like mutant. The ratio confirmed that shyness is a monogenically controlled recessive character.  $M_3$  mutant was separately evaluated for other characteristics.

Though the mutant plants were dwarf there were no significant differences in flowering and maturity days (table 1). Mutant plants were erect and non-bushy whereas the parent was semispreading and bushy. Rachis length, leaflets/leaf, leaflet length, leaflet breadth and stipule length of mutant plants were significantly lower than that of parent plants. Pod-bearing was significantly lower in the mutant compared to the parent. Seed weight and seed colour were almost the same as in the parent.

**Table 1** Characteristics of shy mutant

Character	Parent (Sehore 74-7)	Shy mutant
Plant height (cm)	38.4 ± 2.4	20.0 ± 1.8
Days to flowering	60.0 ± 3.5	56.0 ± 3.4
Days to maturity	105.0 ± 4.2	100.0 ± 4.0
No. of primary branches	6.1 ± 0.5	3.2 ± 0.4
Rachis length (cm)	5.52 ± 0.08	2.13 ± 0.04
No. of leaflets/leaf	13.6 ± 0.05	10.8 ± 0.03
Leaflet size		
Length (cm)	1.20 ± 0.02	0.60 ± 0.02
Breadth (cm)	0.35 ± 0.01	0.15 ± 0.01
Stipule length (cm)	0.51 ± 0.01	0.34 ± 0.01
Pods/plant	104.8 ± 8.4	38.3 ± 4.2
Seeds/pod	1.41 ± 0.12	1.12 ± 0.05
1000-seed wt. (g)	32.6 ± 0.23	30.4 ± 0.18
Seed colour	Grey mottled	Grey mottled
Plant habit	Semi-spreading	Erect
Foliage colour	Light green	Light green

Because of the monogenic recessive behaviour of the induced mutant, the gene symbol *sy* is proposed. The mutation exhibited a high degree of pleiotropism affecting several characters. The visible pleiotropic spectrum may not always be due to the action of a single gene. But it can at times be due to the action of adjacent genes<sup>1</sup>. Such a mutant has not been reported earlier in lentil. This mutant would be useful for academic study and practical breeding purpose.

The author thanks Dr B. Sharma, Division of Genetics, IARI, New Delhi, for getting the seeds irradiated.

28 June 1988; Revised 5 September 1988

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## INHERITANCE OF RESISTANCE TO A GALLMIDGE (*OSEOLIA ORYZAE*) IN RICE

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*ORSEOLIA ORYZAE* (Wood-Mason) the rice gallmidge, is one of the rice pests in India, causing serious damage to rice crop. Phalguna, Vikram and Surekha are a few of the gallmidge-resistant varieties which occupy considerable area in the country.

Inheritance studies on resistance to gallmidge had earlier indicated that resistance was controlled by one to four pairs of recessive genes<sup>1-3</sup> while one to three dominant genes governing resistance were also reported<sup>4</sup>. The present study was initiated to investigate inheritance with newly developed resistant lines, in IET 6080 which is again a derivative of the cross Vijaya × Ptb 21. Crosses were made during 1984-85, F<sub>1</sub> and F<sub>2</sub> plants were studied during the *kharif*, *Rabi* seasons of 1985 and 1986 respectively.

The reaction of the plants to rice gallmidge incidence in F<sub>2</sub> population was studied following the standard technique<sup>5</sup>. The progenies of Pankaj × IET 6080 were grown in wooden trays (50 × 30 × 14 cm) in lines along with two lines of parents and one line of susceptible check Taichung native (1) in the middle. Each tray had 13 lines with each line having ten sprouted seeds. When the seedlings were 20 days old, they were exposed to severe pressure of adult gallmidge population (20 females, 10 males/tray) for 24 h in oviposition cages. After oviposition period, each tray was transferred to humidifying chamber where 80-90% RH was maintained using humidifier machine. After 4 days of incubation the trays were shifted to another chamber and maintained under normal green house conditions for a further 25 days to study the damage in the test material. Observations were recorded after 30 days of oviposition on resistant and susceptible plants by individual checking. Those plants which showed silver shoots were considered susceptible and those which were free from silver shoots were considered resistant.

One cross Pankaj × IET 6080 was studied. The F<sub>1</sub> plants were susceptible while in F<sub>2</sub> plant population the ratio between resistant and susceptible plants was 1:15 (1 resistant:15 susceptible). These observations indicate that susceptibility was dominant and resistance was governed by two pairs of duplicate recessive genes (table 1).

**Table 1** Nature of segregation in F<sub>2</sub> plant population

Cross	Reaction of gallmidge in F <sub>1</sub> plants	No. of plants in F <sub>2</sub> genera- tion			
		Total tested	Resis- tant	Susce- ptible	Ratio
Pankaj × IET 6080	S	216	9	207	1:15
Parents Pankaj IET 6080	S R				