mutants, because of their higher yield potential, could be grown as commercial varieties or used as scented semidwarf donors for improvement of other scented rice varieties. Thus, when the breeding objective is elimination or modification of one or two characters with the integrity of all other characters in tact in a rice cultivar, mutation breeding seems to be a more elegant and quick approach.

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A PARTIALLY SELF-COMPATIBLE SUNFLOWER

The low seed yields of sunflower (*Helianthus annuus* L.) are due to the occurrence of a high degree of unfilled or empty seeds ranging from 10 to 50%[1]. The problem is further accentuated by the sporophytic self-incompatibility system[2] which prevents seed set under self-pollination. The high degree of empty seededness is a major genetical problem[1] and therefore the incorporation of certain degree of self-compatibility would ensure seed filling eliminating the need for pollnating agents. Some of the lines and hybrids developed were found to be partially compatible[3,4]. However, the degree of self-compatibility was not reported. The discovery of a spontaneously occurring self-compatible sunflower line and its performance under selfing and in crosses is reported here.

The self-compatible (SC) mutant has a distinct plant type with conical appearance and additional inflorescences in the terminal axils of leaves (Fig. 1). The progeny derived from this exhibited wide variability for several morphological characters. The plants were of different heights (200–250 cm) and later in duration (120–140 days). The leaves numbering 80 to 98 were typically light green in colour. The diameter of the head ranged from 9 to 19 cm at maturity. The seeds (achenes) were small with thick ashy white hull and small kernels.

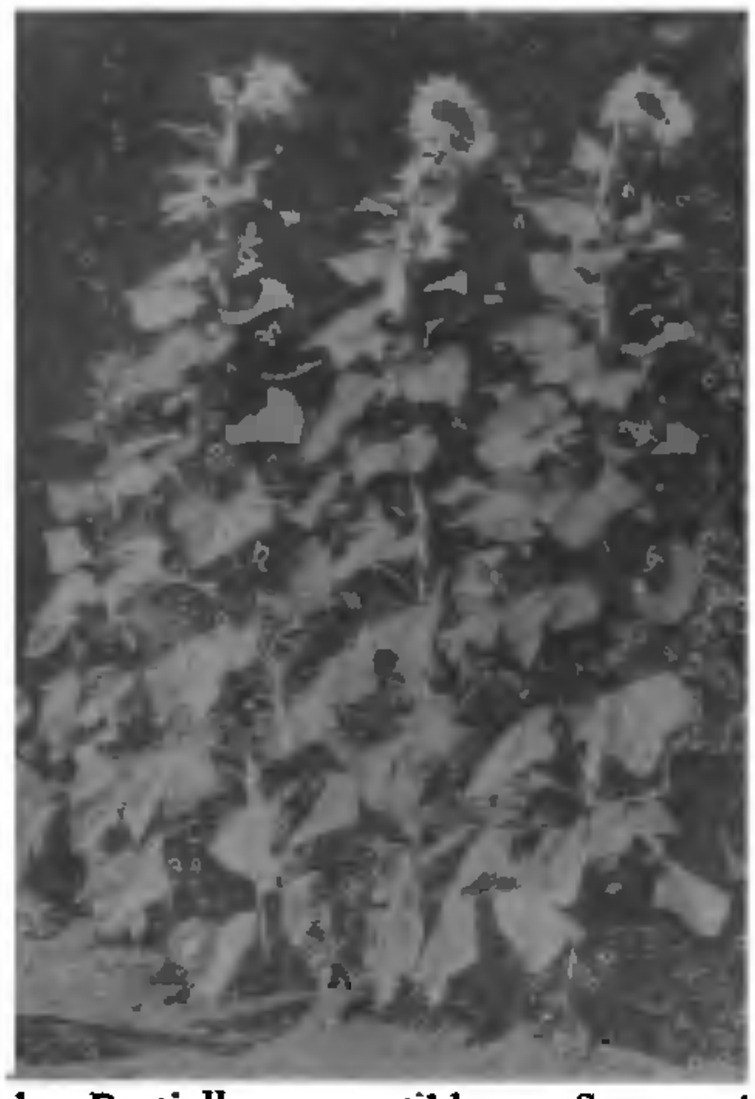

Fig. 1. Partially compatible sunflower plants.

Table I

Seed set under selfing in sunflower

Particulars	Range %	Mean
A. Self-incompatible (SI)		
EC 27501 (10)*	0 0– 0 0	0·0
Sunrise (13)	0 0–46·7	8·3
EC 77195 (12)	0·0–38·7	8·5
B. Self-compatible (SC)		
(Plant numbers)		
289 (2)	13 0–56 9	35·0
290 (3)	4 5–37·0	25 8
291 (8)	0·0–54·3	30 5
292 (2)	42·8–69·9	56·3
293 (11)	25·5–85·8	54·0
C. Hybrids (F_1's)		
SC × EC 77195 (7)	0 0–64 0	26·6
SC × EC 27501 (13)	0·0–82·9	41·6
SC × Unknown (14)	0·0–80·8	59·3
SC × Sunrise (1)	0·0–80·8	65·1
D. Group means		
SI	0·0–46·7	5 6
SC	0·0–85·8	40·3
F_1's	0·0–82·9	48·2

* Number of plants.

The filled seeds in the self-compatible mutant ranged from 25 to 56% as compared to less than 9% observed in the self-incompatible types in the present studies (Table I) and elsewhere[5]. Some of the self-compatible plants were crossed with selected self-incompatible types without emasculation. The true hybrids were identified and data collected. The improvement in the seed set achieved by utilising the self-compatible mutant is given in Table I. The filled seeds in the F_1 hybrids ranged from zero to 83% with an average mean of 48·2%. Thus there is considerable scope for isolating self-compatible lines from the segregating material. It is also possible that the percentage of filled seeds in these partially compatible hybrids or lines could substantially increase under open-pollination. Apart from mutational rectification of excessive vegetative growth, duration and seed characters, the genetics of self-compatibility is also being investigated.

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JUVENILE HORMONE EFFECTS ON THE PREPUPAL AND PUPAL STAGES OF THE TOBACCO CUTWORM, *SPODOPTERA LITURA* FABRICIUS (NOCTUIDAE: LEPIDOPTERA)

Introduction

THE use of analogues and antigonists of insect growth regulators, such as juvenile hormones and ecdysones for the suppression of insect populations is getting into vogue. 'Altozar' an analogue of insect hormone has been used in this work to determine its effect on the prepupal and pupal stages of *Spodoptera litura* Fab. in different concentrations.

Materials and Methods

The test insect culture was developed and maintained in the laboratory from a single egg mass collected from the cabbage fields around Hebbal (Bangalore). The larvae were reared on caster leaves throughout the insect life-cycle.

The juvenile hormone analogue (JHA)—"Altozar" was obtained from M/s. Zoecon Corporation, Palo Alto, California.

Concentrations of 0·5%, 0·75% and 1·0% of the JHA were prepared in 1% acetone solution ; for control only 1% acetone was used. Each of these concentrations was applied to the prepupae individually on the dorsal surface using an automatic micro applicator at 5/μl per insect. The same concentrations were applied to the pupae topically at 1 μ/individual on the dorsal surface. In each experiment (Pre-pupae pupae) and for each concentration a unit of ten individual insects was used. Each set of experiments was replicated thrice. The experimental data are presented in Tables I and II.

TABLE I

Effect of Altozar on the prepupae of Spodoptera litura *Fabricius**

Sl. No.	Con. Altozar %	% of prepupal moulted into normal pupal	% of prepupal malformed or dead	% of adult emergence
1.	0·50	60	40	20
2.	0·75	30	70	20
3.	1·00	10	90	..
4.	Control	90	10	60

* Averages of three replicate experiments.

TABLE II

Effect of Altozar on the pupal of Spodoptera litura *Fabricius**

Sl. No.	Con. Altozar %	% of normal adult emergence	% of adults with malformed characters
1.	0·50	13·3	..
2.	0·75	20	6·6
3.	1·00	20	13·3
4.	Control	60	..

* Averages of three replicate experiments.

Results and Discussion

The pupation percentage (Table I) decreased with increase in concentration of Altozar. The same trend of results was reported by Hongertner and Masner (1973) against the larvae of German cockroach. Skuhravy (1973) reported the mortality (87–98%) of larch cane borer moth with a juvenoid.