https://doi.org/10.29321/MAJ.10.A02086

Madras Agric J. 75 (1-2) : 29-32 January-February 1988.

STIGMA RECEPTIVITY, FLOWER SHEDDING, FLOWER ABNORMALITY AND POLLINATION STUDIES IN *Psidium Sp.*

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In Guava and its relative, stigma were non-receptive prior to and after flower opening of 24 hours except in *P. cattleianum* and *P. cattleianum* var *lucidum*. Stigma was green, lustrous and sticky at the time of flower opening and faded from second day onwards. All species were self compatible except *P. cattleianum P cattleianum* var *lucidum* and *P. friedrichsthaljanum*. The flower drop ranged guava cultivars shedded from 22-79 per cent in guava cultivar while in the relatives it was 12-100 per cent. Flower abnormality and cross and selfpollination were observed in both the guava cultivars and its relatives The cultivar Seedless was inclened to more of self pollination, where as 100 per cent self incompatibility was recorded in *P. friedrichsthaljanum*. However, in all species the fruits resulting from sellpollination were small.

Information on the blossom biology of guava in inadequote. Hence, studies were undertaken on stigma respectivity, flower shedding, flower abnormality and pollination studies in guava and seven of its wild relatives at Allahabad Agricultural Institute.

MATERIALS AND METHODS

Two healthy, vigorous and uniform trees of ten years of age receiving identical cultural treatments of each species of 1) *P guajava* var Safeda b. *P guajava* var Seedless, 2) *P cujavillus* (3) *P. pumilum* (4) *P polycarpum* (5) *P cattleianum* (6) *P cattleianum* var *lucidum* (7) *P molle* and (8) *P. friedrichsthalianum* were selected for the study. The stigma receptivity was studied by adopting the methods by Balasubramaniyam (1959) and Teaotia *et al* (1970). The flower shedding was made by adopting the method of Issac and Shankar (1963) and pollination on the lines of Soubine and Gurgal (1962).

RESULTS AND DISCUSSION

i) *Stigma receptivity:*

The secretion of stigma could be seen after complete opening of flowers. It was more sticky within eight hours of flower opening. The stigma was light green and brownish on the second and third days respectively. The stigma was receptive from anthesis to 24 hours after flower opening. The stigma was non-receptive before 24 hours and 48 and 72 hours after anthesis in guava varieties and its relatives except for *P. cattleianum* and *P. cattleianum* var *lucidum* and *P. friedrichsthalianum* (Table-1).

ii) *Flower shedding:*

The flower shedding was 80 and 68 per cent in Seedless and 28 and 16 per cent in Safeda for July and August-Septemiber seasons respectively. The cultivars shed more flowers in second week in both the seasons. The flower shedding was 100 per cent in *P. cattleianum and P. friedri-*

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clisthalianum. The lowest percentage of flower shedding was recorded in *L. polycarpum* (12 per cent). There was no flowering in the first season in *P. polycarpum* *P. cattleianum* *P. cattleianum* var *lucidum* and *P friedrichsthalianum* (Table-II).

iii) *Flower abnormality*:

In guava cultivars some flowers were unable to open because of under development of floral organs like petals and filaments. The petals were fringed and reduced in size (rudimentary). Thin feather like structures were observed. in the filaments in the presence and absence of anthers. Frequetly the petals formed a scoop at the top. The style was too short either with pin head like structure or without stigma. The calyx and corolla were not covering the essential organs. The percentage of abnormality was two to three and one to five for Safeda and Seedless respectively. Flower abnormality was observed. In the guava relatives at 2.5 to 3.7 per cent in *P. cujavillus* 2.9 to 3.9%. The pedical length was reduced and almost it was attached to the branches.

iv) *Pollination studies*:

Both cross and self pollination was observed in guava cultivars. The fruit set obtained in open and self pollination was 77, 26 and 54, 44 per cents for Safeda and Seedless respectively. The fruitset for selfing and crossing were 100 per cent and 88 per cent respectively in *P Polycar pum* Where as it was 48 per cent and 80 per cent in *P Pumilum* However, the *P. molle* recorded only 10 per cent fruit set by self-pollination. There was no fruit setting in *P cattleiannm* and in *P. friedrich thalianum* in both the methods. However, the friut setting in guava and its relatives did not exhibit any significant differences by the mode of pollination (Table-III).

On the opening day the stigma was green and sticky, second day it slowly lost its lustre and became brownish. Similar observations were made by Dasarathy (1951) Seth (1962) and Teaotia *et al.* (1970). The guava and its relatives were self compatible except with *P. cattleianum* and *P. friedrichsthalianum*. This was in agreement with Teaotia *et al* (1970), who also observed self incompatibility in the letter species. Flower shedding was 80, 68, 28, 16 per cents in Seedless and Safeda for July and August - September flushes respectively. The least flower shedding was 12 per cent in *P Polycarpum*. The flower abnormality ranged from 1.5 to 3 per cent in guava cultivars and 2.5 to 3.9 per cent in it relatives. Similar report was made by Issac and Shanker (1963).

In guava cultivars both self and cross pollination was recorded. The fruits retained upto harvest was 48 per cent, 56 per cent for Safeda and 40 per cent and 48 per cent for Seedless in July and August-September seasons respectively. However, the fruits retained after crossing was more in Safeda and less in Seedless. The *P. Polycarpum* recorded 100 per

Table : 1 Stigma receptivity in Psidium species

Species	Before 24 hours of flower opening	At the time of flower opening	After 4 hours of flowering	8	12	24	48	72
a) *P. guajava* var Safeda	N	R	R	R	R	R	N	N
b) *P. guajava* var Seedless	N	R	R	R	R	R	N	N
P. cujavillus	N	R	R	R	R	R	N	N
P. pumilum	N	R	R	R	R	R	N	N
P. polycarpum	N	R	R	R	R	R	N	N
P. cattleianum	N	N	N	N	R	R	R	N
P. cattleianum var *lucidum*	N	N	N	N	R	R	R	N
P. molle	N	R	R	R	R	R	N	N
P. friedrichsthalianum	N	N	R	R	R	N	N	N

N = Non-receptive
R = Receptive

Table : 2 Average flowers shedding in Psidium species

Species	No. of flowers used	JULY 1st week	JULY IInd week	JULY Total	% flower drop	AUGUST-SEPTEMBER 1st week	AUGUST-SEPTEMBER IInd week	AUGUST-SEPTEMBER Total	% flower drop
P. guajava var Safeda	25	2	5	7	28	1	3	4	16
P. guajava var Seedless	25	7	13	20	80	5	12	17	68
P. cujavillus	25	2	8	10	40	1	4	5	20
P. pumilum	25	3	7	10	40	2	3	5	20
P. polycarpum	25	—	—	—	—	1	2	3	12
P. cattleianum	25	—	—	—	—	7	18	25	100
P. cattleianum var *lucidum*	25	—	—	—	—	2	7	9	36
P. molle	25	6	13	19	76	4	14	18	72
P. friedrichsthalianum	25	—	—	—	—	6	19	25	100

Table : 3 Mode of pollination in Psidium species

Species	Selfing-bagging			Crossing		
	July %	Aug.-Sept. %	Average %	ly %	Aug.-Sept. %	Average %
P. guajava var Safeda	52	56	54	72	84	77
P. guajava var Seedless	40	48	44	20	32	26
P. cujavillus	32	24	28	60	80	70
P. pumillum	44	52	48	80	80	80
P. polycarpum	—	100	100	—	88	88
P. cattleianum	—	0.00	0.00	—	0.00	0.00
P. cattleianum var *Incidum*	—	0.00	0.00	—	64	64
P. molle	12	8	10	24	28	26
P. friedrichsthalianum	—	0.00	0.00	—	0.00	0.00

Species : SE : 15.54 CD : 32.01
Season : SE : 7.32 CD : 15.09
Crossing : NS

cent fruit set in self-pollination while it was it was 88 per cent in cross pollination. In self-pollination the fruit setting was 48 and 28 per cent for *P. pumilum* and *P. cujavills* respectively whereas the response was poor in *P. molle* Simliar observation was made by Blasubramaniyan (1959) for self-pollination and Singh and Seghal (1968) for cross pollination. However, Soubine and Gurgel (1962) recorded 35.6 per cent cross pollination in guava. The percent finding showed that self and cross pollination depended on variety and species. There was highly significant differences between seasons and species.

The hlep rendered by G. Sankar during the course of the study is greatfully acknowledged.

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