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at the Punjab Agricultural University, Ludhiana. Due to continuous feeding from the undersurface of the leaves the plants lost vitality and all the leaves turned pale yellow. Gradually the infested leaves fell off the plants. All the attacked leaves were seen to bear small brownish spots indicating the points of feeding.

As quite a large number of varieties of pigeon pea were sown and since attack was seen in all the varieties, it was considered desirable to study the comparative susceptibility of these varieties to this mite. These studies were conducted in 13 varieties replicated four times. Five leaves were plucked at random from each plot and mite population of adults, nymphs and larvae from the entire leaf was counted under stereobinocular microscope. These observations were made twice during December, 1970 (Table-1).

TABLE 1

Comparative susceptibility of diferent varieties of the pigeon pea to the attack of *Schizotetranychus* sp. of mite.

Sr. No.	Variety	Population of mites per 5 leaves. (Mean of 4 replications)	
		2-12-70	16-12-70
1.	148	176(13.31)*	31(5.64)*
2.	R-60	77(8.86)	56(7.58)
3.	S-5	131(11.50)	41(6.46)
4.	Khargaon-2	45(6.77)	23(4.92)
5.	S-8	46(6.87)	55(7.45)
6.	S-1	120(10.99)	60(7.80)
7.	RG-72	72(8.52)	62(7.91)
8.	4839	89(9.49)	77(8.85)
9.	S-10	68(8.31)	6(2.53)
10.	P-1141	11(3.51)	4(2.22)
11.	T-21	18(4.32)	8(3.03)
12.	4758	22(4.81)	11(3.47)
13.	4785	46(6.87)	7(2.75)
	C.D.(P=0.05)	(1.72)	(1.51)

Figures in parentheses are $\sqrt{n+1}$ transformations

varieties. T-21, [illegible] S-8 were as good as P-1141.

P-1141 along with S-10 and 4785 were significantly better than the varieties S-5, S-8, R-60, S-1, RG-72 and 4839 at the time of the second observation made on 16.12.70 in regard to the resistance against this mite. Varieties T-21, 4758, Khargaon-2 and 148 were also equally resistant and were at par with P-1141, S-10 and 4785 whereas S-5, S-8, R-60, S-1, RG-72 and 4839 were equally susceptible showing no significant difference among themselves.

Thus, it seems that the variety P-1141 is the least susceptible to the attack of this mite. Among the other varieties T-21, 4785, 4758 and Khargaon-2 proved to be quite resistant while S-1, S-5, R-60, RG-72 and 4839 were highly susceptible to the attack of *Schizotetranychus* sp.

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Destruction of Chlorophylls *a* and *b* in Virus-infected Leaves

Actively photosynthesising chloroplasts of higher plants contain two types of chlorophylls, *a* and *b*, each with its own specific functions in the process of photosynthesis. [illegible]

seems to have been published yet on the effect of plant viruses on the two types of chlorophylls, although it has been reported that plant viruses destroy chlorophyll as a whole in the infected tissues[1,2].

Three plant virus diseases namely, *bhendi* yellow vein mosaic of *Abelmoschus esculentus* Moench., cucurbit mosaic of *Luffa aegyptiaca* Mill. and pumpkin mosaic of *Cucurbita moschata* Duchesne ex Poir were investigated. Discs of 1 sq. cm size were obtained from a number of healthy and chlorotic leaves of the three vegetable plants. They were divided into 4 lots, each lot of 20 discs. Pigments from each of the 4 lots were extracted immediately by macerating it thoroughly in 80% acetone with a pestle and mortar. The extract was filtered and then made to 100 ml with 80% acetone. The various pigments in the filtrate were estimated by using the following equation given by Arnon[3] and Duxbury and Yentsch[4] :

Total Chlorophyll $(a+b)$ (mg/l)[3]: $\frac{OD_{652} \times 1000}{34.5}$

Chlorophyll a (mg/l)[4] : $15.6\ OD_{665} - 2.00\ OD_{645} - 0.8\ OD_{630}$

Chlorophyll b(mg/l): Total chlorophyll(mg/l) —Chlorophyll b (mg/l).

Optical densities (OD) of each pigment extract was determined in a spectro-colorimeter at wavelengths as given above in the equations. The results, given in table 1, are the mean obtained from 8 different readings, 2 readings per each of the four filtrates obtained.

Both the chlorophylls a and b were destroyed by all the three viruses, the maximum destruction of chlorophyll a occurred in *Luffa aegyptiaca* and minimum in *Cucurbita moschata* while the maximum destruction of chlorophyll b occurred in *Abelmoschus esculentus* and minimum in *Luffa aegyptiaca*. Destruction of the two chlorophylls will affect both the photosystems of photosynthesis, since photosystem I is associated with chlorophyll a[5] and photosystem II with chlorophyll b[5]. Hill reaction, which is a measure of the integrity of the photosystem II[6], must also therefore be affected. The earlier reports[7,8] about the impairment of Hill reaction are therefore, explainable on the basis of chlorophyll b destruction.

The results obtained are significant in two aspects. Firstly, in all the three cases reported here chlorophyll b, which is able to absorb light energy and its subsequent transfer to chlorophyll a, is destroyed to a greater extent by viruses. The overall photosynthesis will, therefore, be limited as a result of the impairment of Hill reaction. Secondly, the relative per cent destruction of the two chlorophylls varies from host to host, for example, while the destruction of chlorophyll b in *Cucurbita moschata* is about 4 times that of chlorophyll a, in *Abelmoschus esculentus* it is about double and in *Luffa aegyptiaca* it is only slightly more.

TABLE 1

Destruction of Chlorophyll *a* and *b* in the Virus-infected Leaves of three Vegetable Crops.

Name of the Virus disease and host	Total chlorophyll (mg/m²)			Chlorophyll *a* (mg/m²)			Chlorophyll *b* (mg/m²)		
	In healthy tissue	In diseased tissue	Percent decrease in diseased tissue	In healthy tissue	In diseased tissue	Percent decrease in diseased tissue	In healthy tissue	In diseased tissue	Percent decrease in diseased tissue
Bhendi Yellow vein mosaic of *Abelmoschus esculentus*	173.50	64.50	62.82	107.50	57.30	46.70	66.00	7.20	89.06
Cucurbit mosaic of *Luffa aegyptiaca*	240.00	80.50	65.11	108.12	39.40	63.55	137.88	47.16	65.84
Pumpkin mosaic of *Cucurbita moschata*	266.50	65.00	74.70	33.00	25.70	22.18	227.50	39.30	82.72

This may depend upon the characteristics of the virus or chloroplasts of the host concerned.

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