It is seen that the bracts produced in the sunlight had the maximum betacyanin content (OD = 5·0) followed by that in diffused light (OD = 0·75) and least in the dark (OD= 0·07).

The paper electrophoretic separation of pigments also shows that the synthesis of betacyanins that are responsible for magenta colour in the bracts[4] was inhibited in the dark. It is seen that the pigments of bracts growing under normal sunlight were resolved into three bands of betacyanins and two of betaxanthins (density +++, ++)*. The 3 bands of betacyanins had the electrophoretic mobility of 100, 50 and 30, respectively, relative to betanin and that the thirdb and with the lowest electrophoretic mobility was the most intense in colour (density +++++) followed by second (density +++) and first (density ++) bands. The bracts growing in diffused light exhibited only one faint band that pertained to the third band of normal bracts (density ++). The bracts growing in the dark did not show any band of betacyanins and had only a single band of light yellow betaxanthins (density ++).

These results indicate a photo-control of betacyanin synthesis in *Bougainvillea*. A similar induction of amaranthin synthesis by light in *Amaranthus* seedlings has been reported by Garay and Towers[5]. On the other hand, Wohlpart and Mabry[6] showed that light was not required for the synthesis of betacyanin in *Amaranthus* and *Beta vulgaris*. This is the first report of its kind showing the photo-control of betacyanin synthesis in *Bouganivillea* bracts. Our results, thus, support the observations of Garay and Towers[5] in the case of *Amaranthus*. Another interesting feature is that the effect of darkness also seems to be complementary to the natural mutation which occurred in cv. 'H. C. Buck' and gave rise to the cv. 'Mary Palmer' that has both the magenta and the white-coloured bracts. Work is now in progress to understand the mechanism of photo-control of betacyanin synthesis and its precise role in the bract mutation in cv. 'Mrs. H. C. Buck' that gave rise to cv. 'Mary Palmer'.

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* Relative density of each band has been given as score on the basis of visual observation.

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NATURE OF RESISTANCE TO YELLOW VEIN MOSAIC IN *ABELMOSCHUS MANIHOT* SSP. *MANIHOT*

AMONG the commonly grown summer vegetables, Okra [*Abelmoschus esculentus* (L). Moench] is most widely cultivated throughout India. Yellow vein mosaic is known to be a serious virus disease of okra. The disease is spread by an insect vector *Bemisia tabaci* Genn (Varma[4]). This disease causes 50–94% loss (Sastry and Singh[2]). The widely cultivated variety Pusa Sawani which had been reported to be a symptomless carrier of this virus (Singh *et al.*[3]) has recently lost this reaction due to various genetic and agroclimatic factors. An accession of okra received from Ghana (identified as *Abelmoschus manihot* (L.) Medicus ssp. *mainhot* by Royal Botanic Gardens, Kew-London) under the auspices of the National Bureau of Plant Genetic Resources, IARI, New Delhi, has been reported to have a considerable amount of resistance to yellow vein mosaic (Sandhu *et al.*[1]). It was, therefore, necessary to find a suitable source of host resistance in order to develop the cultivars resistant to this virus.

The experimental material consisted of the following species and hydbrids:

1. *A. esculentus* (L.) Moench. Cvs. Pusa Sawani and Pusa Makhmali
2. *A. manihot* (L.) Medicus ssp. *manihot*.
3. F_1 (*A. esculentus* cv. Pusa Sawani × *A. manihot* ssp. *manihot*).

Grafting procedure was used for screening the material for yellow vein-mosaic resistance. Several plants of *A. manihot* F_1 and Pusa Sawani were grafted by "tongue" grafting using Pusa Makhmali as scion. The scion variety (Pusa Makhmali) was kept virus-free by growing in the glass house. The grafted plants were covered with muslin cloth bags in order to avoid the attack of white fly until the symptoms appeared on the grafted scion portion. The plants were sprayed with Nuvacron prior to grafting to avoid the white fly.

The results (Table I) show that the appearance of virus was very high in Pusa Sawani, low in F_1 and very low in *A. manihot* ssp. *manihot*.

TABLE I

Transmission of yellow vein mosaic of okra by grafting

Material	Number of grafts made	Number of successful grafts	Number of grafts infected	Days for the appearance of disease after grafting
A. manihot ssp. *manihot*	25	5	3	30–49
F_1 (Pusa Sawani × *A. manihot*)	15	10	10	20–27
Pusa Sawani	13	4	4	10–12

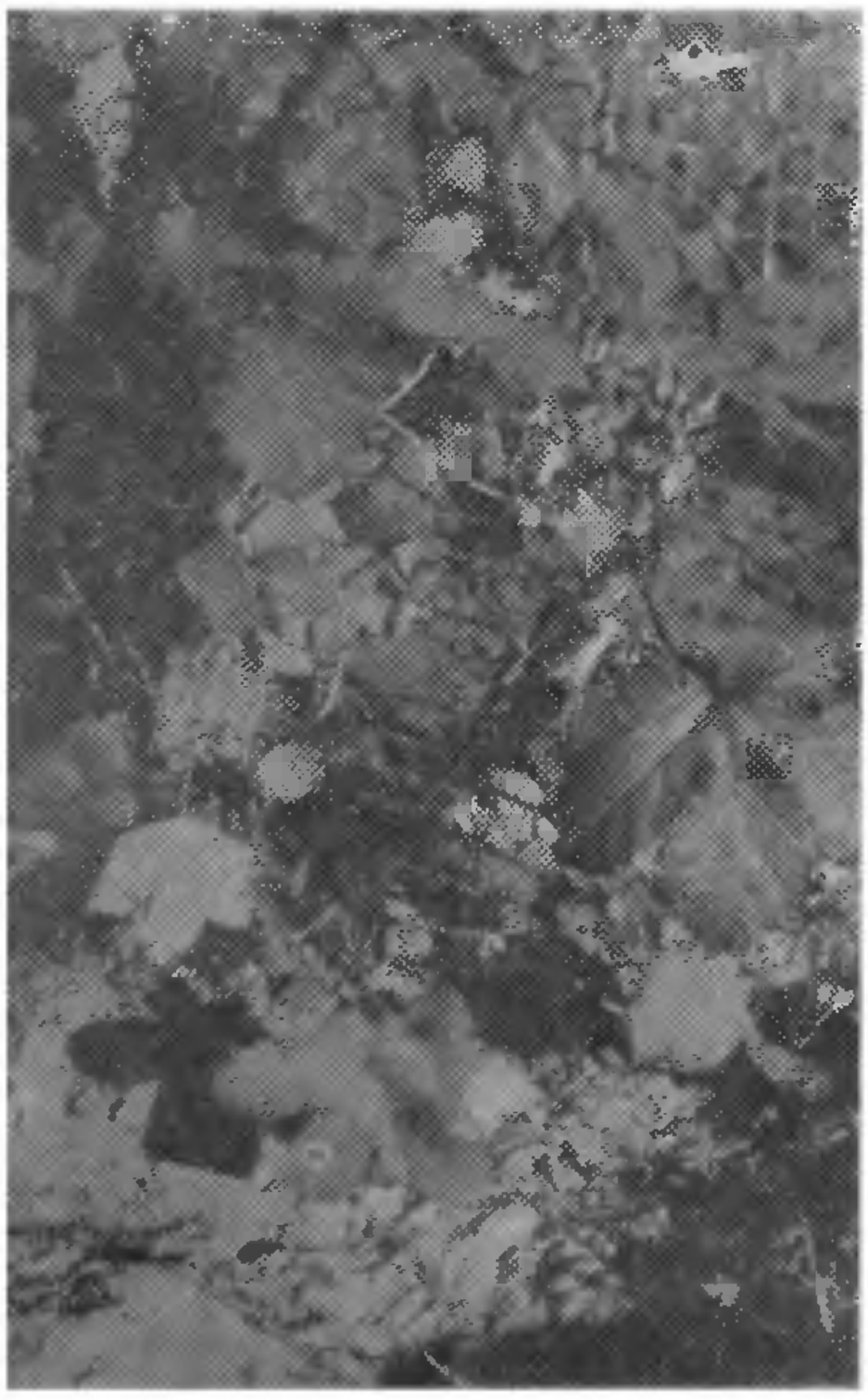

FIG 1. Yellow vein mosaic virus symptoms on the grafted scion portion of F_1.

The virus symptoms in F_1 appeared after 20 days of grafting and within seven days, the virus appeared on scion portion in all the 10 plants. The appearance of the virus in the scion portion of *A. manihot* was delayed by 14 days as compared with F_1. The percentage of scions showing virus symptoms were 60,100 and 100 in the case of *A. manihot*, F_1 and Pusa Sawani respectively.

The appearance of symptoms on the scion portion of *A. manihot* and F_1 plants (Fig. 1) showed that the virus was actually present in the root stock itself. This indicated that the F_1 and species *A. manihot*, although resistant, yet carried the virus within. The results in the present study indicate that *A. manihot* acted as a symptomless carrier, and it agrees with the similar observations made by Sandhu *et al.*[1].

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A NEW SPECIES OF *MILLETTIA* FROM THE TERTIARY OF WEST BENGAL, INDIA

IN the present note, a fossil wood resembling the modern genus *Millettia*, is described from Silabati River bed, near Garbeta, Midnapur district, West Bengal. This is the first record of the occurrence of *Millettia* type of wood from the Tertiary of Midnapur district, West Bengal. The fossil wood is represented by a small piece of decorticated secondary xylem and shows the following characters: *Wood* diffuse-porous (Fig. 1). *Growth rings* present. *Vessels* small to medium sized, mostly solitary often in radial multiples of 2–4 or more cells, t.d. 57–125 μ, r.d. 52–240 μ; vessel-members 230–350 μ in length with truncate ends, storied (Fig. 2); perforations simple; intervessel pits small, alternate, vestured (Fig. 3). *Parenchyma in thin regular concentric bands alternating* with broad fibre bands (Fig. 1) and partially or wholly encircling the vessels; parenchyma bands 2–4 cells thick, 28–72 μ in width, strands storied. *Xylem rays* 1–2 (mostly 2) seriate (Fig. 2), storied; homocellular to heterocellular, composed of mainly procumbent cells, sometimes with one or two upright cells at one or both the ends; rays 5–15 cells