soil and when the plants were 2' high, fresh nematode inoculum taken from the spongy mass of the diseased papaya trees was macerated and added to the soil at a depth of 3". 10 plants were inoculated with the nematode and equal number of plants were kept as control. Observations showed that within 35 to 45 days all the inoculated plants showed the typical chlorotic patches on the leaves like the virus symptoms reported by Capoor and Varma. The lower leaves were shed, and about a month later there were only few small leaves on a weak stem which was lanky and spindling at the top (Fig. 3). The inoculated plants died after 2 to 3 months. These experiments were repeated on a large scale on plants of different ages with the same results. In the absence of addition of nematode inoculum, the control plants remained completely healthy and no visible symptoms of mosaic were seen though plants were kept exposed in the open.

These studies open up a new problem whether the serious disease of papaya in Maharashtra is not mainly a nematodes disease. The mosaic which may be transmitted by aphids may cause a mottle not connected with the decline and death of trees. The aphids reported as vectors do not colonise on papaya and this has been reported by Capoor and Varma also. The papaya decline disease reported herein as being due to nematodes has the same status like that of peach re-planting problem in Canada reported by Koch.[4] Whether the nematode causes disease by toxin secretion as was found to be the case in the Peach disease by Mountain and Patrick[5] or transmits a virus as in the case of fan-leaf of grape reported by Hewitt *et al.*[3] is a problem for future investigation. The immediate method of control of the disease appears to be one requiring large-scale application of nematicides. The wilt of betel-vine in Maharashtra due to nematodes is another such instance.

The investigation was mainly carried out at home in Poona. Certain facilities given at the M.A.C.S. Laboratory, Poona, are thankfully acknowledged.

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POLLEN PRODUCTION IN SOME ALLERGENIC PLANTS

ALTHOUGH aeropalynological surveys have been done at various places in India,[1-5] such data have not been supported by pollen production studies of the plants producing atmospheric pollen. In the present study pollen production per flower of some allergenic plants of Lucknow[3] has been made as the density of dispersion of the various pollen types in the air at a given area is conditioned by several factors such as plant habit and distribution of the various plants.

In making pollen counts, unopen flowers are collected, from which one anther or a measured portion of an anther is crushed, dispersed uniformly in a measured quantity (50 drops) of dilute glycerine contained in a glass centrifuge tube. From the dispersion a drop is transferred to a slide and covered with a cover glass. From the number obtained in one drop of dispersion, the relevant calculations for the whole anther and for one flower are made. The palynological data are presented in Table I.

TABLE I

Pollen production in some allergenic plants of Lucknow

Plant name	No. of anthers	Production per flower	No. per anther
Amaranthus spinosus	5	4136	827
Argemone mexicana	70	185500	2650
Azadirachta indica	9	1900	211
Botriochloa pertusa	3	97	32
Cedrela toona	5	6500	1300
Chenopodium album	5	666	133
Morus alba	4	93550	23388
Salmelia malabarica	66	2772000	42000
Holoptelea integrifolia	7	59500	8500
Xanthium strumarium	5	5283	1056

As evident from Table I, the largest pollen production is in *Salmelia malabarica* and the lowest in *Cedrela toona*. Although *Salmelia* is a high producer, aeropalynological data[3] have shown its very poor representation, possibly due to the scarcity of their occurrence in Lucknow, or may have been conditioned by the density of the grains. On the other hand, *Holoptelea integri-*

folia has been found to occur in such great abundance in the air as to eclipse all other sporomorphs, because of their anemophilous nature (pollen being loose, scantily sculptured, small), and the abundance of those plants in Lucknow. Similarly, *Botriochloa pertusa* producing only 32 grains per anther is not of minor significance, because the occurrence of the herb, as also of other grasses, in enormous numbers during specific periods.

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SOME NEW RECORDS OF ZYGNEMACEAE FROM INDIA AND PANJAB

THE communication deals with eight forms collected from some low-lying areas along the G.T. Road, between Subhanpur and Dhilwan, District Kapurthala, a distance of five miles, during November 1961 to April 1962, and in September 1962. Of the eight forms, five are new records for India and three for Panjab.

1. *Mougeotia floridana* Transeau. *Trans. Amer. Micros. Soc.*, 53, 12, 224, 1934 ; Randhawa, *Zygnemaceæ*, p. 154, f. 74, 1959.

This is a new record for Panjab. Rattan's algal collection No. A-2.

2. *Spirogyra irregularis* Nageli. In Kutzing, *Species Algraum*, 440, 1849, also *Tab. Phycol.*, 5, Pl. 23, 2, 1855 ; Randhawa, p. 360, f. 290, 1959.

This is a new record for India. Rattan's algal collection No. 208.

3. *Spirogyra minor* (Schmidle) Transeau. *Ohio. Jour. Sci.*, 44, 243, 1944 ; Schmidle, 1901, Randhawa, pp. 336-37, f. 332, 1959.

This is a new record for Panjab. Rattan's algal collection No. 200.

4. *Spirogyra paradoxa* Rao, *J. Indian bot. Soc.*, 16, 281, f. 5-E, 1937 ; Randhawa, pp. 326-27, f. 313, 1959.

This is a new record for Panjab. Rattan's algal collection No. 201.

5. *Spirogyra pulchrifigurata* Jao. *Sinensia*, 6, 601, Pl. 8, f. 91, 1937 ; Randhawa; pp. 334-35, f. 328, 1959.

This is a new record for India. Rattan's algal collection No. 203.

6. *Spirogyra pratensis*, Transeau. *Amer. Jour. Bot.*, 292, 1914 ; Randhawa, pp. 297-98; f. 257, 1959.

This is a new record for India. Rattan's algal collection No. 207.

7. *Spirogyra reinhardi* Chmielevski. In Borge's *Susswasserflora Deutschland*, 9, 31, f. 41, 1903 ; Randhawa, p. 373, f. 406, 1959.

This is a new record for India. Rattan's algal collection No. A-2.

8. *Spirogyra wollnyi* de Toni. *Sylloge Algarum*, 2, 754, 1889 ; Wollny, *Hedwigia*, p. 166, 1887 ; Randhawa, p. 417, 1959 (Fig. 1).

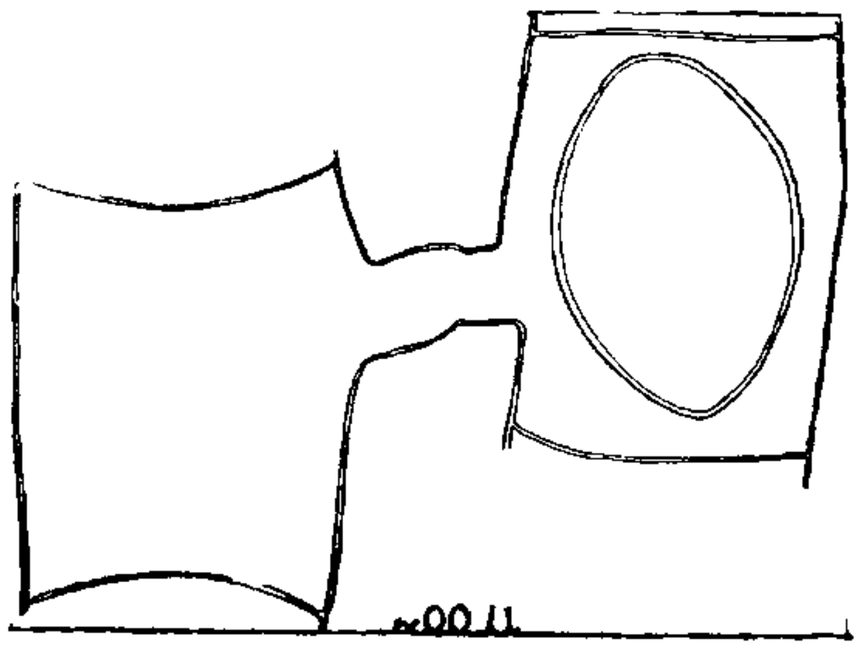

FIG. 1. *Spirogyra wollnyi*

This is a new record for India. Rattan's algal collection No. 207.

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Nabha, *February* 18, 1963.

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