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YELLOW MOSAIC OF PATCHOULI (*POGOSTEMON PATCHOULI*) IN INDIA

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Pogostemon patchouli Pellet. a member of *Labiatae* is the source of patchouli oil of commerce is being presently cultivated on an experimental scale in States of Karnataka and Tamil Nadu. During the screening of the patchouli germplasm maintained at the experimental farm of Indian Institute of Horticultural Research, Hessaraghatta (Bangalore), most of the plants showed symptoms similar to the one caused by viruses and the incidence ranged from 43 to 76% in four strains. The infected leaves of Malaysian strain showed a calico-like pattern of bright yellow irregular patches in addition to a systemic mottle (Fig. 1). The Indonesian strain of patchouli had typical mosaic mottling symptoms, devoid of bright yellow patches, whereas Johore and Java patchouli strains showed very diffused mosaic mottling and chlorotic spotting on the young leaves. The results of the pathogenic experiments are reported herein.

The sap inoculation tests were conducted by macerating the infected patchouli leaves in phosphate buffer pH 7 (0.05 M) with and without sodium sulphite/EDTA. None of the 19 test plants belonging to the families of *Labiatae*, *Solanaceae*, *Cucurbitaceae* and *Chenopodiaceae* was infected, indicating that the virus under study is not mechanically sap transmissible. However

successful transmission was obtained by wedge grafting and out of the 14 plants grafted, 11 survived and 91% of the plants were infected. The plants expressed symptoms 18–20 days after grafting. Insect transmission tests were conducted by using whiteflies (*Bemisia tabaci* Gen.) and aphids (*Myzus persicae*, *Aphis gossypii* and *Macrosiphum sonchi*). During experimentation, the whiteflies were given 1 hr fasting period, acquisition feeding period of 6 hr and inoculation feeding period of 12 hr. Out of 15 plants tested only 4 patchouli (Malaysian strain) plants showed symptoms indicating thereby that the virus under study is whitefly transmitted. The disease was also transmitted to *P. purpurascens* and *Ocimum basilicum* through white flies. For the other three aphid species, the fasting period of 1 hr, the acquisition and inoculation periods of 30 min each were given and a set of 8 plants were used for each aphid species. None of the aphid species used in the studies could transmit the disease, in both the experiments.

Because of the high (76%) disease incidence field trials were conducted to find out the actual cause of the spread. Even though this disease is transmitted by the whiteflies, generally their colonization on patchouli is not noticed under field conditions. The transmission through whiteflies was only 27%. Six experiments were conducted to see the transmission through the single node cuttings, which is one of the general ways of patchouli multiplication. Out of the 2,680 cuttings raised, 2,386 plants were infected, giving an indication that the primary cause of high incidence is due to propagating the cuttings from the infected plants, without any selection.

Experiments were conducted to eliminate the virus from the infected cuttings by hot water and hot air therapy. The rooted cuttings of infected plants were



FIG. 1. Patchouli leaves showing yellow patches and mosaic mottling symptoms.

subjected to hot water treatment at 40–55° C for 30 to 60 min. The cuttings survived only at 40 and 45° C, but all of them were infected. Even in hot air treatment experiments, the cuttings survived at 50° C for 40 min but the virus could not be eliminated.

The bibliography¹ clearly indicate that there is no record of any virus on *P. patchouli* from India. However, from Belgium, Roland² reported Pogostemon virus-1, which is sap transmitted. The virus under study is transmitted by whitefly (*B. tabaci*), but not by sap inoculation, and therefore it is different from that of Roland's report. The occurrence of this whitefly transmitted virus on patchouli, is a new record for India.

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SCANNING ELECTRON MICROSCOPIC STUDY OF *PARTHENIUM HYSTEROPHORUS* L. POLLEN

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THE plant *Parthenium hysterophorus* L., a noxious exotic weed of the family *Asteraceae* is allergenic and responsible for contact dermatitis in human beings. The floral heads of the allergenic weed are thought more harmful compared to the leaves of the same species¹. It is obvious that the pollen grains of the floral heads with their efficient dispersal mechanism play a major role in the disease development. The present study is focussed on the micromorphology of the pollen grains using scanning electron microscope.

The pollen grains of *Parthenium hysterophorus* L. were made to adhere over a thin film of Dolite Silver paint on specimen stubs, dried and were sputter coated with a thin film of gold. Photomicrographs were

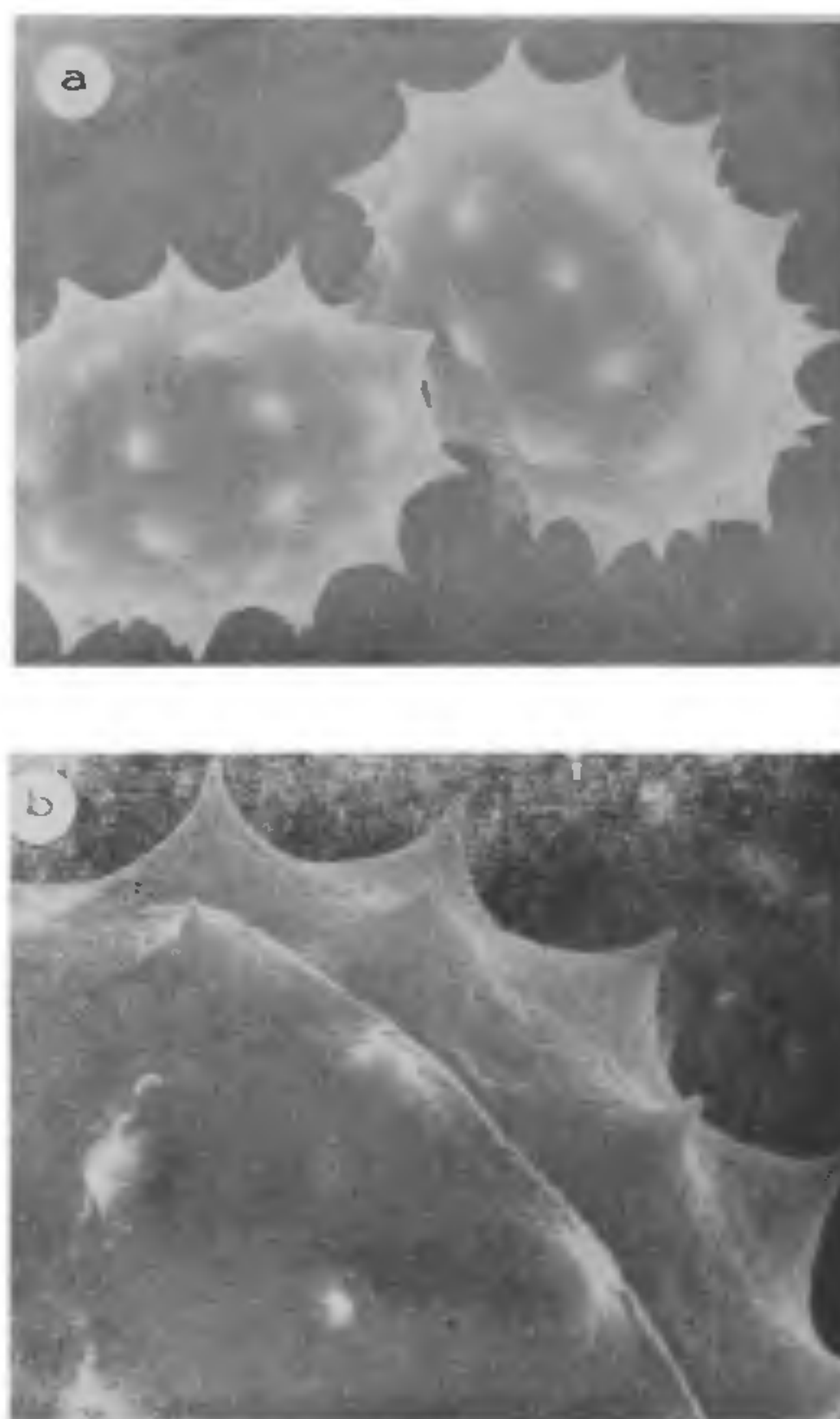


FIG. 1, a-b. Scanning electron micrographs of *Parthenium hysterophorus* pollen, (a) 3,000 × and (b) 6,600 ×, are showing spinous exine ornamentation.

taken on JEOL 35 scanning electron microscope at an accelerating voltage of 15 kV.

The scanning electron microscopic study has provided quasi three-dimensional photomicrographs of the pollen. The pollen grains showed prominent spines throughout the surface (Fig. 1 a-b) and were ovate in shape and tricolpate with three germinal apertures, a common characteristic feature of advanced dicots. The spinous nature of the pollen facilitates easy infection of the disease, contact dermatitis.

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