PHAEOISARIA HOHNEL, A NEW GENERIC RECORD TO INDIAN HYPHOMYCETES

In the course of a mycological survey of the forests of Kerala during January 1976, an interesting hyphomycetous fungus was collected on two different hosts, from two different localities. On critical examination and study, the two collections were found to agree in all respects with *Phaeoisaria clematidis* (Fuckel) Hughes. Since the form-genus *Phaeoisaria* Hohnel reported herein, constitutes a new generic record to India and being of rare occurrence, a brief description of the same, along with an illustration, is presented here for ready reference.

Phaeoisaria clematidis (Fuckel) Hughes (Fig. 1)

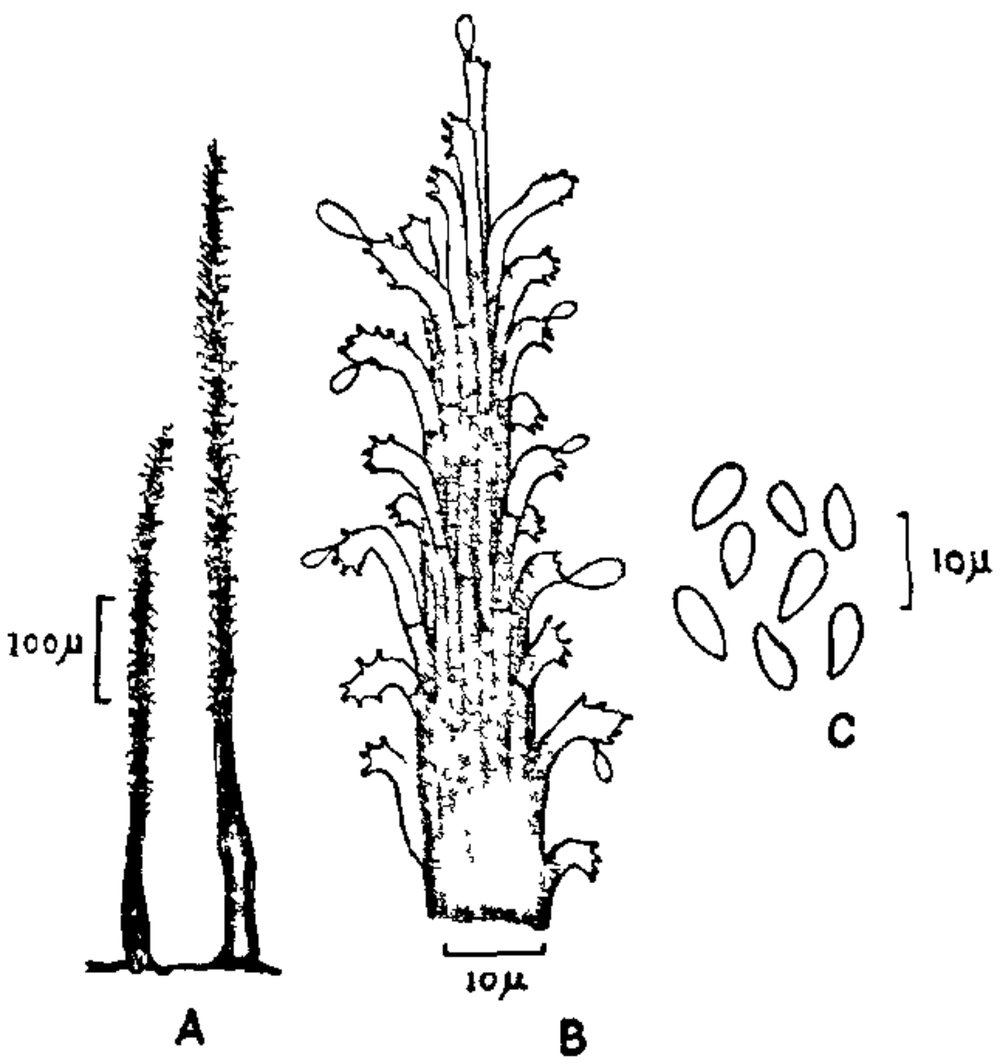

FIG. 1. *Phaeoisaria clematidis*: A. Synnemata, B. Top of the synnemata showing conidial attachment, C. Conidia.

Mycelium partly superficial and partly immersed. Synnemata black, hairy, upto 1·25 mm high; 15–35 μ thick at the base, 7·5–15 μ thick at the apex, individual threads narrow, branched towards their apices, splaying out at the apex and along the sides of each synnema, pale to mid-brown and 2–3 μ thick. Conidiogenous cells cylindrical hyaline to pale brown with numerous cylindrical denticles. Conidia solitary, dry, fusiform; narrowly ellipsoidal, hyaline, smooth; 1-celled; measure 5–8 × 2–3·5 μ.

Matrix:

(*i*) On dead twings of *Aegle marmelos* Corr. Legit. K.I.M.V. (23–1–1976) Moonnar, Kerala, No. AMH 3046.

(*ii*) On dead stems of a palm. Legit. K.I.M.V. (20–1–1976) Waynaad, Kerala, No. AMH 3047.

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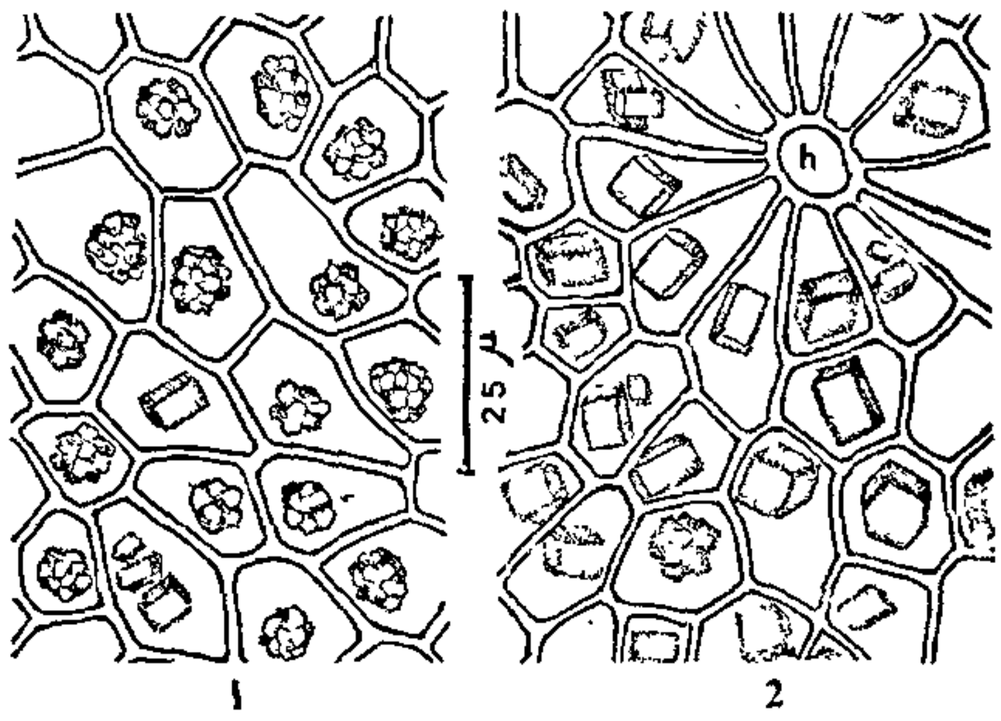
A SIMPLE MORPHOLOGICAL TECHNIQUE FOR DISTINGUISHING THE SEX OF NUTMEG SEEDLINGS

NUTMEG (*Myristica fragrans* Houtt.) is an important spice plant of the world, but its popularity as a plantation crop is seriously handicapped by its dioecious nature and prolonged preflowering period. In any plantation of nutmeg, 40–45% of plants turn out to be male and nearly 5% bisexual[1,2]. Only the female plants are of commercial value. Phadnis and Choudhari[3] recently reported some color difference between the leaf extracts of male and female nutmeg plants when treated with ammonium molybdate but this method is rather cumbersome. A study of the foliar epidermis of a large number of nutmeg plants cultivated on the West Coast of South India revealed that calcium oxalate crystals found in the epidermal cells are different in form in the male and female plants, and this can be employed as a method of sexing the plants five to seven years before the plants come to flower.

The epidermal cells are sparsely chlorophyllous, polygonal, 15–40 μ across, having straight lateral walls. Very young leaves bear uniseriate deciduous hairs of characteristic shape scattered along the lower epidermis. In mature leaves the epidermal cell bearing the hair remains small and circular in outline; the surrounding cells are radially elongated. Nearly all cells contain globose hyaline to pale yellowish-green oil globules. Several small (2–5 μ across) crystals of calcium oxalate are found in each cell in young leaves of both male and female plants. A single large rhomboidal or prismatic crystal with rectangular or squarish flat faces occurs in the epidermal cells of mature leaves (usually the 5th leaf from the apex of branch and those below)

of the male plant (Fig. 2); one or two small crystals of the type found in the young leaves are seen in addition in some cells. In the epidermal cells of female plants (Fig. 1) the crystals are



FIGS. 1–2. Fig. 1. Portion of lower foliar epidermis of an adult plant of *M. fragrans*. Fig. 2. Same, of a male plant (*h*—hair-bearing cell.)

clustered to form large compound spherical masses (druses). Some epidermal cells of the male plants may have compound crystals of the female type; simple prismatic crystals of the male type are occasionally found in some epidermal cells of the female plant. The bisexual trees are similar to the male trees in the nature of the crystals. A study of 4-year-old grafted plants, in which seedlings of *M. contorta* Warb. are used as stalk, reveals that there is no apparent difference in the nature of the crystals in the foliar epidermis, even though crystals are abscent in foliar epidermis of *M. contorta*.

As in the young leaves of adult plants, the foliar epidermis of young seedlings (one year old) contain 2–10 small prismatic crystals of nearly equal size. One of these crystals grows conspicuously larger as seedlings grow and gradually all or nearly all the others wane off in some plants while in the others the crystals get aggregated towards the middle of the cell. By the time the seedlings are two years old it is possible to distinguish the two types of plants, one having simple crystals and the other druses, even though the distinction is not as marked as in the adult plants. An analysis of 80 plants three to four years old in the University orchard revealed that 41 of them possess simple crystals of the male type and 39 possess druses in the cells of their lower foliar epidermis. This proportion of 51 : 49 nearly corresponds to the reported 50 : 50 proportion between male (including bisexual) and female plants in seed-raised plantations. It is reasonable to state that the sex of nutmeg plants can be identified from the nature of the crystals found in the lower foliar epidermis of seedlings which are two or more years old *i.e.*, five to seven years before the seedlings come to flower.

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HERBICIDAL POLLUTION-CHLOROPHYLL CONTENT AS AN INDEX OF RESIDUAL TOXICITY

PREFIX [2, 6-dichlorothiobenzamide], 2, 4-D [2, 4-dichlorophenoxyacetic acid], Bladex [2-(4-chloro-6-ethylamino-S-triazin-2-ylamino)-2-methylpropionitrile] and Planavin [4-(methyl sulphonyl)-2, 6-dinitro-N, N-dipropyl aniline] were mixed in the garden soil on 50 ppm by weight basis. The treated soils were kept in pots. About 20 cm rainfall was recorded during the exepriment. Additionally these soils were leached with 16 litres of water. The gram (*Cicer arietinum*) was grown in these pots as test plant. Leaves of one month old plants were sampled for chlorophyll content and it was estimated by Bray[2] (1960) formula.

Apparently no difference could be marked in the leaves of the test plant grown in treated soils. But the data (Table I) indicate a reduction in chlorophyll contents with all the types of herbicides belonging to the different chemical groups. Planavin, residues

TABLE I

Chlorophyll content in the gram grown in treated soils

Herbicide	Chlorophyll content mg/g fresh weight				
	a	*b*	*a/b* Ratio	Total	% Reduction
Control	2·004	1·329	1·5	3·333	..
Prefix	2·242	0·946	2·3	3·188	4·5
2, 4–D	2·164	0·734	2·9	2·898	13·11
Bladex	1·872	0·736	2·5	2·608	21·6
Planavin	1·580	0·730	2·1	2·310	30·2

appeared most toxic as about 30·2% reduction was recorded. This is followed by Bladex (21·6%), 2, 4-D (13·11%) and Prefix (4·5%). It is known that different groups of herbicides have different modes of action as Prefix inhibits the respiration and protein synthesis