

nites, *Podocarpidites*, *Monoporopollenites*, *Alipollenites* and *Tetradomonoporites*. The present palynological assemblage from the Pinjor Formation (Upper Siwalik) is, therefore, significant as it may serve as a reference assemblage for the future studies on Upper Siwalik palynology.

The material for the present work was collected from a carbonaceous shale bed exposed in the vicinity of Chandigarh. The palynotaxa recorded are listed below: *Cyathidites minor* Couper, *Cyathidites* sp., *Lygodiumsporites* sp., *Todisporites* sp., *Striatriletes* sp., *Podocarpidites ellipticus* Cookson, *P. microreticuloidatus* Cookson, *Pinuspollenites* sp., *Cedripites* sp., *Laricoidites magnus* (Potonie) Potonie, Thomson and Thiergart, *L. punctatus* Saxena, *Araucariacites australis* Cookson, *Retinaperturites pinjoricus* Saxena and Singh, *Palmitidites maximus* Couper, *Psilamonocolpites* sp., *Pinjoriapollis magnus* Saxena and Singh, *P. lanceolatus* Saxena and Singh, *Liliacidites matanomadhensis* Saxena, *Favitracolporites* sp., *Graminidites chandigarhensis* Saxena and Singh, *Triorites* sp., Pollen types 1-3, *Inapertisporites vulgaris* Sheffy and Dilcher and *Monoporisporites minutus* van der Hammen.

The systematic description of the above mentioned palynomorphs will be published later. An analysis of the present Pinjor assemblage reveals that out of a total of 19 genera and 23 species, 4 genera and 5 species belong to pteridophytes (3%), 6 genera and 8 species belong to gymnosperms (65%), 7 genera and 8 species belong to angiosperms (23%) and 2 genera and 2 species belong to fungal spores (9%). It is interesting to note that inaperturate pollen grains are the dominant element, constituting 61% of the assemblage.

The recovered palynomorphs have been compared with the living ones. On the basis of this comparison it has been surmised that they represent the spores and pollen grains of the families Cyatheaceae, Schizaceae, Parkeriaceae, Podocarpaceae, Araucariaceae, Pinaceae, Palmaceae, Liliaceae, Gramineae, Magnoliaceae, Proteaceae and Oleaceae. The possible representation of the above mentioned families indicates that the Pinjor assemblage consists of tropical as well as temperate elements. It may, therefore, be surmised that the basin of deposition would have received the palynomorphs from two different regions, the temperate elements from the north and tropical ones from the south.

Comparison of the present Pinjor assemblage with those recorded by Nandi<sup>1</sup> and Ghosh<sup>2</sup> from Jawalamukhi, Punjab reveals that only 3 genera, viz., *Cyathidites*, *Podocarpidites* and *Pinuspollenites* are common to both the assemblages and as such the two assemblages are not comparable. Such a difference may be attributed to the disparity in stratigraphic horizons as

the Jawalamukhi assemblage comes from the basal part of Upper Siwalik (Nandi<sup>1</sup>, pp. 417-419) while the present assemblage has been derived from the middle part.

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#### WALKEROMYCES THAUNG AND PARAPITHOMYCES THAUNG, TWO NEW GENERIC RECORDS FROM INDIA

DURING a survey of the terai belt of North Eastern U.P. for the fungi parasitizing angiospermic flora, two leaf spotting fungi were collected on *Grewia asiatica* Linn. and *Bridelia squamosa* Gehr. which were identified as *Walkeromyces grewiae* Thaung and *Parapithomyces brideliae* Thaung respectively (Thaung<sup>1</sup>, 1976) for the first time from the country (Bilgrami *et al.*<sup>1</sup>). They are described and illustrated in this paper.

##### *Walkeromyces grewiae* Thaung

Spots hypogenous in the beginning but becoming amphigenous with age, marked with dark brown necrotic areas on the upper surface of leaf; colonies hypophyllous, more or less orbicular to irregular, appearing as small spots but radiating gradually to assume considerably large size in due course, whitish to dark grey, effuse, cottony, tufted; hyphae mostly superficial partly immersed; superficial hyphae mostly repent measuring 3.5-4.5  $\mu$ m, olivaceous grey, branched, septate, smooth walled; stromata absent; conidiophores solitary to rarely in groups, macro-nematous, septate, unbranched to branched, almost straight to flexuous, erect or sub erect, pale olivaceous grey, cylindrical, geniculate, smooth, 35.0-218.5  $\times$  4.5-5.2  $\mu$ m; conidiogenous cells integrated, terminal, polyblastic, sympodial, distinctly cicatrized, more or less denticulate, scars either pressed along the sides or situated at the apices of denticle-like structures;

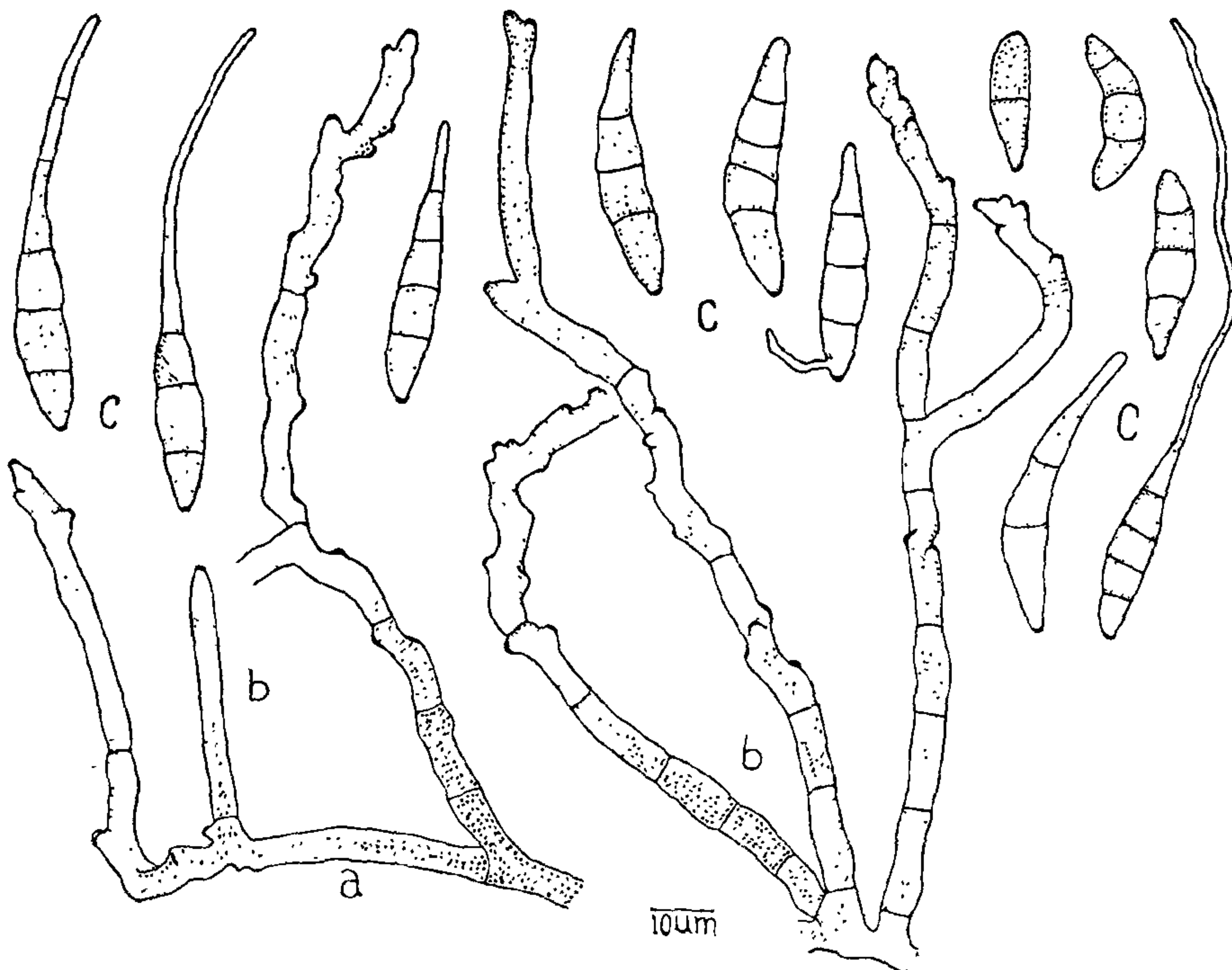


FIG. 1. (a) Repent hypha, (b) Conidiophores, (c) Conidia.

conidia solitary, dry, acropleurogenous, usually fusiform to navicular, with or without short to long filiform rostra, rarely clavate, with acute to obtuse apices and obconicotruncate bases, concolourous with conidiophores, bearing thick and projecting hila, germinating while attached with the conidiophores, smooth to slightly constricted along the septa, 1-5 transversely septate,  $20.5-85.0 \times 5.2-7.0 \mu\text{m}$  (Fig. 1 a, b and c).

On living leaves of *Grewia asiatica* Linn. (Tiliaceae); South Gorakhpur Forest Division, leg. B. Raj, KR 223, IMI 237078.

In spite of possessing crowded to sparsely distributed and distinctly geniculate conidiophores, the present collection appears to be conspecific with *Walkeromyces grewiae* Thaug. However, the conidiophores in the present collection were found to be characterised by denticle-like projections bearing distinct and thickened scars along their apices. But Thaug while describing the type species of *Walkeromyces* (*W. grewiae* Thaug) has not made any mention of denticulate nature of conidiophores. The thickened nature of scars is further substantiated by the presence

of correspondingly thick hila at the bases of conidia while he (Thaug<sup>3</sup>), has used the term 'unthickened' for the same. Since the thickness of the scar not only goes beyond the wall of conidiogenous cells but the bases of the conidia are always with thick and projecting hila, the scars can be referred to as thickened with reasonable certainty (Deighton<sup>2</sup>). The thickness of the scars and their nature have been taken as fairly good criteria particularly in the generic delimitation of the cercosporoid complex (Deighton<sup>2</sup>).

#### *Parapithomyces brideliae* Thaug

Spots hypogenous; colonies hypophyllous, more or less punctiform to somewhat confluent, irregular, dark olivaceous brown to very dark brown, effuse; hyphae mostly superficial and repent,  $2.70-5.50 \mu\text{m}$  diam., usually anastomosing or more or less intertwined forming loose hyphal cords, mid olivaceous brown, septate, smooth, terminating in sterile hyphae or in conidiophores of various shapes and sizes; conidiophores solitary, either direct continuations of the sterile hyphae or arising as lateral fertile branches of the primary or secondary hyphae, semimacronema-

tous to macronematous, mononematous, procumbent or repent to less commonly erect or suberect, clavate to capitate or irregular in shape and size, unbranched to branched, straight to flexuous, septate to continuous, the large and irregular ones showing constrictions or bone like articulations along many septa, also exhibiting many lateral outgrowths of various

obovoid, oblong, obpyriform, etc., mid olivaceous brown to dark olivaceous brown or blackish brown, dictyosporic having 0-5 transverse and 0-many oblique and/or longitudinal septa, smooth or slightly constricted along the septa, seldom more or less finely verruculose,  $6.8-34.5 \times 4.6-20.7 \mu\text{m}$  or even more (Fig. 2 a, b, and c).

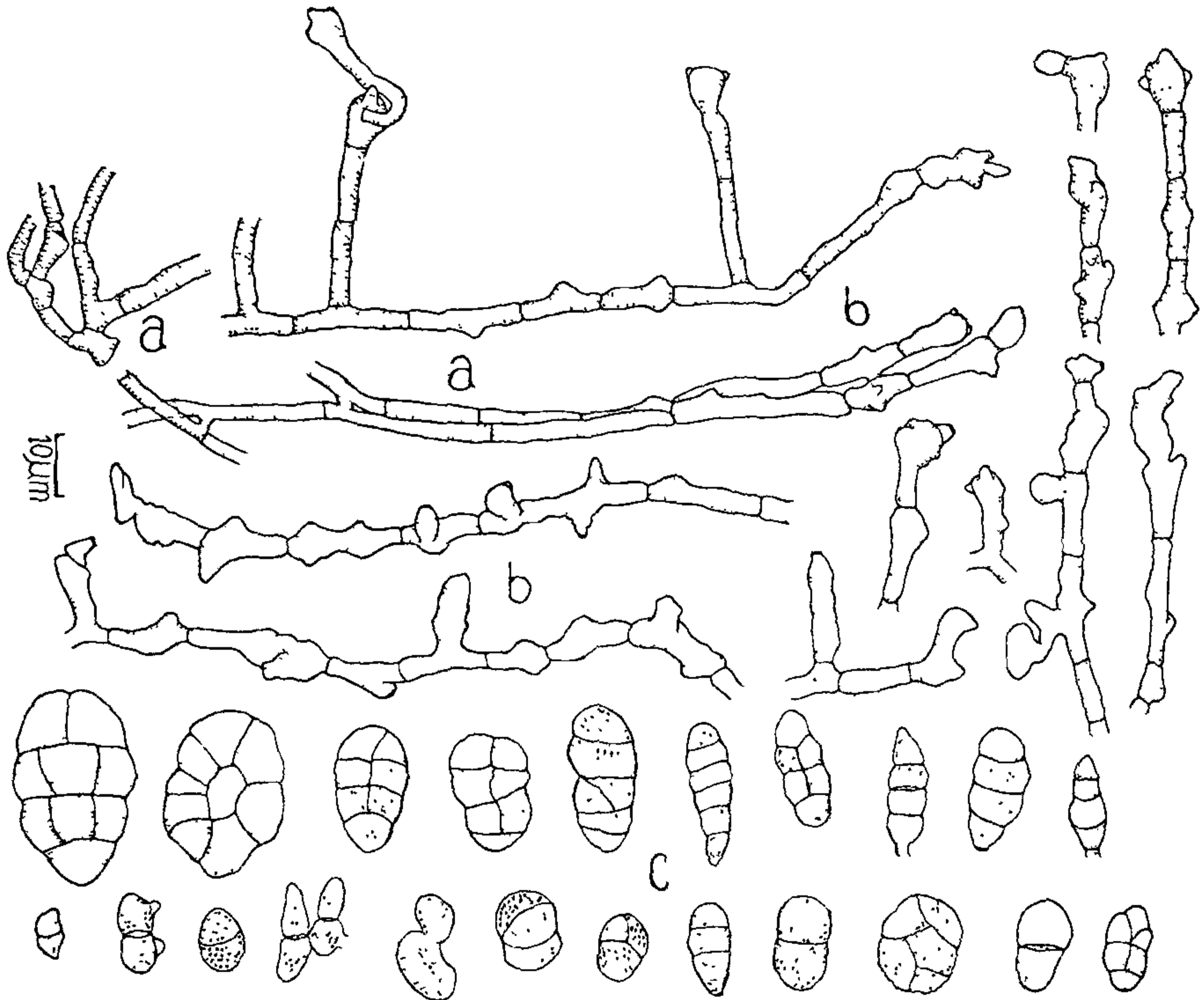


FIG. 2. (a) Mycelium (a part only), (b) Conidiophores, (c) Conidia.

shapes and sizes (which are the conidiogenous cells or the secondary conidiophores under various stages of development), concolourous with the mycelium, highly variable in length and breadth; conidiogenous cells integrated to discrete, terminal to intercalary or lateral, mono or polyblastic more or less sympodial, clavate or vesicular bearing one or more denticles or irregular in shape and size with more or less hyaline apices; conidia solitary to catenate, dry, acropleurogenous or pleurogenous, more or less clavate to ovoid,

On living leaves of *Bridelia squamosa* Gehr. (Euphorbiaceae), January, 1979, Kakaraba (Beharaiich South Forest Division); leg. B. Rai, KR 206, IMI 237081.

The present collection can easily be assigned to *Parapithomyces brideliae* Thaug on the basis of above characters. However, no mention has been made by Thaug<sup>3</sup>, about the constrictions and bone like articulations in the hyphae which are of fairly common occurrence in the hyphae bearing conidiogenous cells.

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#### STUDIES ON A MELON RINGSPOT VIRUS

A RINGSPOT type mosaic disease of muskmelon (*Cucumis melo* L.) has been found to be of common occurrence at Delhi. The disease is characterised by mosaic mottling of the leaves, the chlorotic areas invariably assuming a ringspot shape (Fig. 1). The young spots on the leaves consist of small yellowish brown spots surrounded by bright yellow halo or margin. The disease was found to be mechanically sap transmissible indicating its virus origin. Studies conducted on the host range, insect transmission and physical properties of the causal virus are reported in the present note.



FIG. 1. Melon Ringspot virus on *Cucumis melo* L.

The virus was transmissible to *Nicotiana tabacum* var. White burley, *N. glutinosa*, *Cucumis melo*, *C. sativus*, *Petunia hybrida* and *Vigna sinensis* by mechanical sap inoculations producing systemic symptoms. Typical ringspot symptoms were produced on *N. tabacum*, *N. glutinosa* and *Petunia hybrida*. On *N. tabacum* there is a tendency to recovery from the symptoms in the subsequent leaves. *Chenopodium amaranticolor* reacted with local lesions.

Insect transmission trials with *Aphis craccivora* Koch, *A. gossypii* Glov., and *Myzus persicae* Sulz. gave negative results. The virus in the crude sap was found to be infective when heated to 60°C for ten minutes but was rendered innocuous when heated to 70°C. It had a dilution end point between 1 : 1,000 and 1 : 10,000 and longevity *in vitro* of 3 days at room temperature (26°C) and 8–12 days at 8–10°C.

The symptomatology, physical properties, differential host reaction and inability of the virus to be transmitted by aphids suggest the virus to belong to nematode transmitted tobacco ringspot group<sup>1</sup>. Earlier tobacco ringspot virus infection was also reported on brinjal<sup>2</sup> and on petunia<sup>3</sup> from India. However, this appears to be the first record of this virus on muskmelon from India under natural conditions. Further work on purification and serology of the virus under study is in progress.

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#### EFFECT OF MORPHACTIN ON THE EPIDERMAL STRUCTURES OF OKRA PODS

The foliar application of morphactin, a synthetic bio-regulant<sup>1</sup> affects the leaf epidermis<sup>2</sup> of *Lycopersicon esculentum* Mill and suppresses the stomatal aperture<sup>3</sup> in the isolated leaf strips. The encouraging results on the control of post-harvest weight loss in