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Acrodictiopsis-a new  
genus of Hyphomycete

COOPERATIVE RESEARCH PROGRAMME NO. 27  
TROPICAL ENVIRONMENTAL DATA (TREND)  
ECOSYSTEM STUDY OF TROPICAL DRY-EVERGREEN FOREST

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EARTH SCIENCES LABORATORY, U.S. ARMY NATICK LABORATORIES (NLABS)

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APPLIED SCIENTIFIC RESEARCH CORPORATION OF THAILAND

under U.S. Army Contract DAJB 29 67 C 0122

in collaboration with

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NATIONAL STATISTICAL OFFICE, OFFICE OF THE PRIME MINISTER

ROYAL FOREST DEPARTMENT, MINISTRY OF AGRICULTURE

DEPARTMENT OF RICE, MINISTRY OF AGRICULTURE

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CHULALONGKORN UNIVERSITY

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MILITARY RESEARCH AND DEVELOPMENT CENTER, MINISTRY OF DEFENCE

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RESEARCH PROJECT NO. 27/1

DESCRIPTION OF TROPICAL DRY-EVERGREEN FOREST ECOSYSTEM

REPORT NO. 13

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BY

BERMIN F. WEILBACHER

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## F O R E W O R D

This report covers the description of an undescribed genus of Hyphomycete fungi, Acrodictiopsis, found during the ecological studies of microfungi inhabiting the dry-evergreen forest of ASRCT Sakaerat Experiment Station during the year 1968-1969. The report is a contribution to ASRCT Cooperative Research Programme No. 27 : Tropical environmental data (TREND) - Ecosystem study of tropical dry-evergreen forest.

# ACRODICTIOPSIS - A NEW GENUS OF HYPHOMYCETE FROM THAILAND

By Bermin F. Weilbacher\*

## SUMMARY

A new genus of Hyphomycete based on Acrodictys M. B. Ellis, from culms of Thrysostachys siamensis (Bambusae), collected in north-eastern Thailand is described and illustrated. It is characterized by having well defined, branched conidiophores which bear brown, tuberculate dictyospores at the apices.

## INTRODUCTION

Population and distribution studies of the microfungi inhabiting the dry-evergreen forest of Sakaerat Experiment Station (Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima) have revealed the presence of an undescribed fungus. The fungus herein proposed to accommodate a new genus is based on Acrodictys M.B. Ellis (1961),<sup>+</sup> the nearest genus which also produces brown tuberculate conidia borne at the apices of well defined conidiophores. The present fungus is distinguished from Acrodictys and other related genera by having a central conidiophore stipe from which a series of well defined lateral and tertiary branches arise. Conidia (dictyospores) are borne at the apices of these structures and are hyaline and smooth-walled when immature, gradually becoming brown or dark brown and tuberculate at maturity. These characteristics place the fungus apart from any presently known genus.

The fungus is apparently restricted to the dead or decaying culms of Thrysostachys siamensis; collections of samples and culms of other species of bamboo from the same local have failed to yield the same fungus. The description of the fungus is made from examination of four collections made from the same source and locality. These four collections were made during periods which represent the annual climatic changes in the area, i.e., April (hot season), July-September (wet season) and December (dry season).

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<sup>+</sup> ELLIS, M.B. (1961).—Dematiaceous hyphomycetes. II. Mycol.Pap 1961 (79): 5-18.

## DESCRIPTION

Acrodictiopsis B.F. Weilbacher, gen.nov.

(Etym. Acrodictys et. - Gr. *opsis*, sight, appearance) Deuteromycotina, Hyphomycetes.

Coloniae naturae aggregatae; mycelium superficiale, ex hyphis ramosis, septatis, pallide brunneis vel atro brunneis, reticulatis compositum; conidiophora singula vel geminata, ramosa, recta vel sinuosa; conidia (dictyospora) singula, primo in apice conidiophori et dein proliferationis cujusque successive oriunda, turbinata vel pyriformia, septatis, constrictis, septis transversalibus longitudinalibus praedita, cella basilari obconica, hyalina vel subhyalina, levia, basi truncata, cellis sub-basilari subhyalinus vel pallide brunneis, levibus, cellis aliis brunneis vel atro brunneis, tuberculatus.

Species typica: Acrodictiopsis tuberculata B.F. Weilbacher, sp.nov.

Colonies in nature aggregated; mycelium superficial, composed of branched, septate, pale brown to dark brown, reticulate hyphae; conidiophores arise singly or in pairs, branched, erect or curved; conidia (dictyospores) formed singly at the apex of conidiophore which after the first one has fallen proliferates to form another conidium at higher level, turbinate or pyriform, septate, constricted at septa, with transverse and longitudinal septa, basal cell of conidia obconic, hyaline to subhyaline, smooth-walled, base truncate, sub-basal cell subhyaline or pale brown, smooth-walled, all other cells brown to dark brown, tuberculate.

Acrodictiopsis tuberculata B.F. Weilbacher, sp.nov. Figures 1 - 4.

(Etym. L. *tuberculata*, rough)

Coloniae naturae aggregatae; mycelium superficiale, ex hyphis ramosis, septatis, pallide brunneis vel atro brunneis, reticulatis, 1.5-3  $\mu$  crassis compositum; conidiophora singula vel geminata, ramosa, 230-500  $\mu$  longa, cella basilari atro brunnea vel nigra, 8-10  $\mu$  crassa, attenuata, pallide brunnea, 2-2.5  $\mu$  crassa in apice; conidia

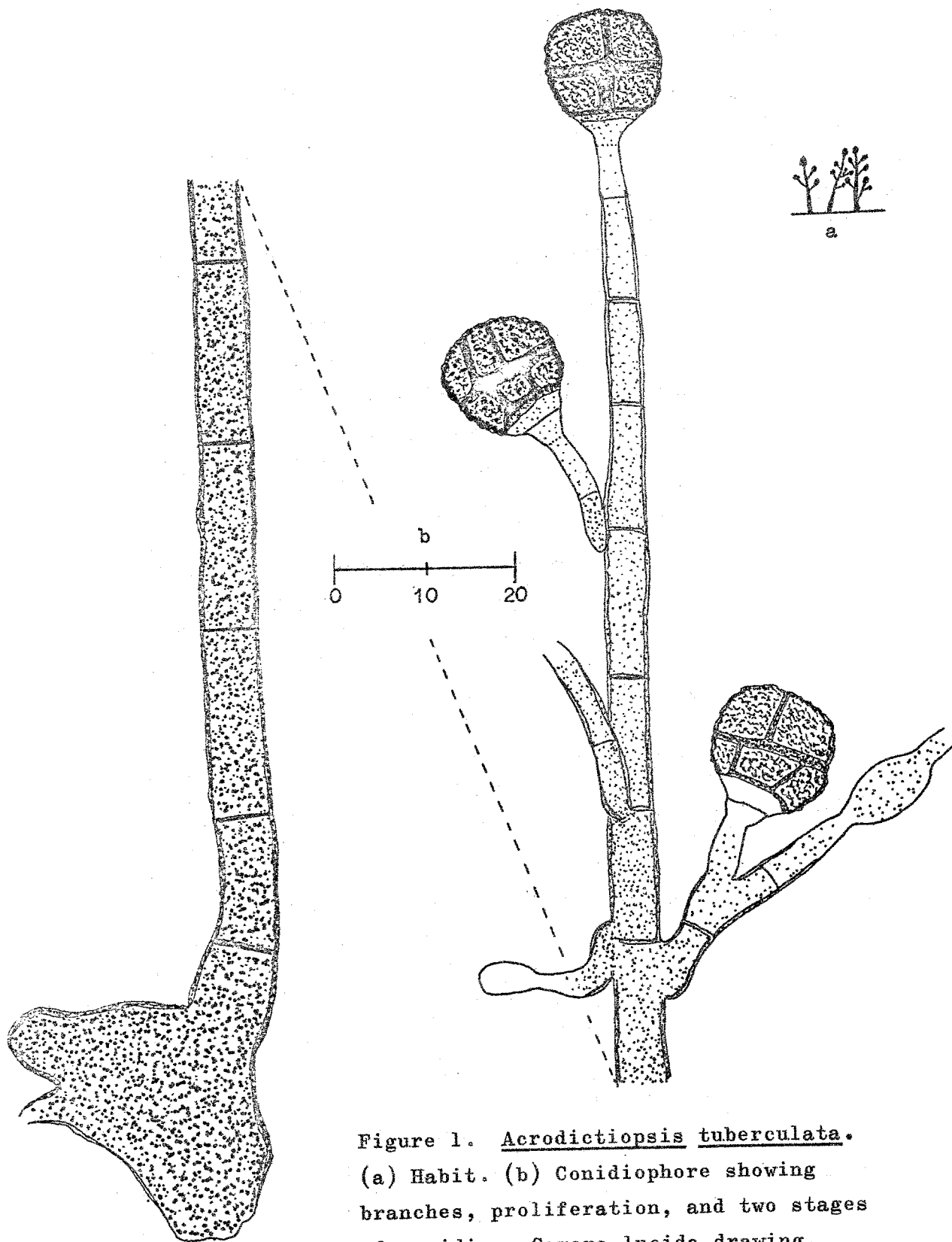


Figure 1. Acrodictiopsis tuberculata.  
 (a) Habit. (b) Conidiophore showing  
 branches, proliferation, and two stages  
 of conidia. Camera lucida drawing,  
 x600. From BFW 994-14.

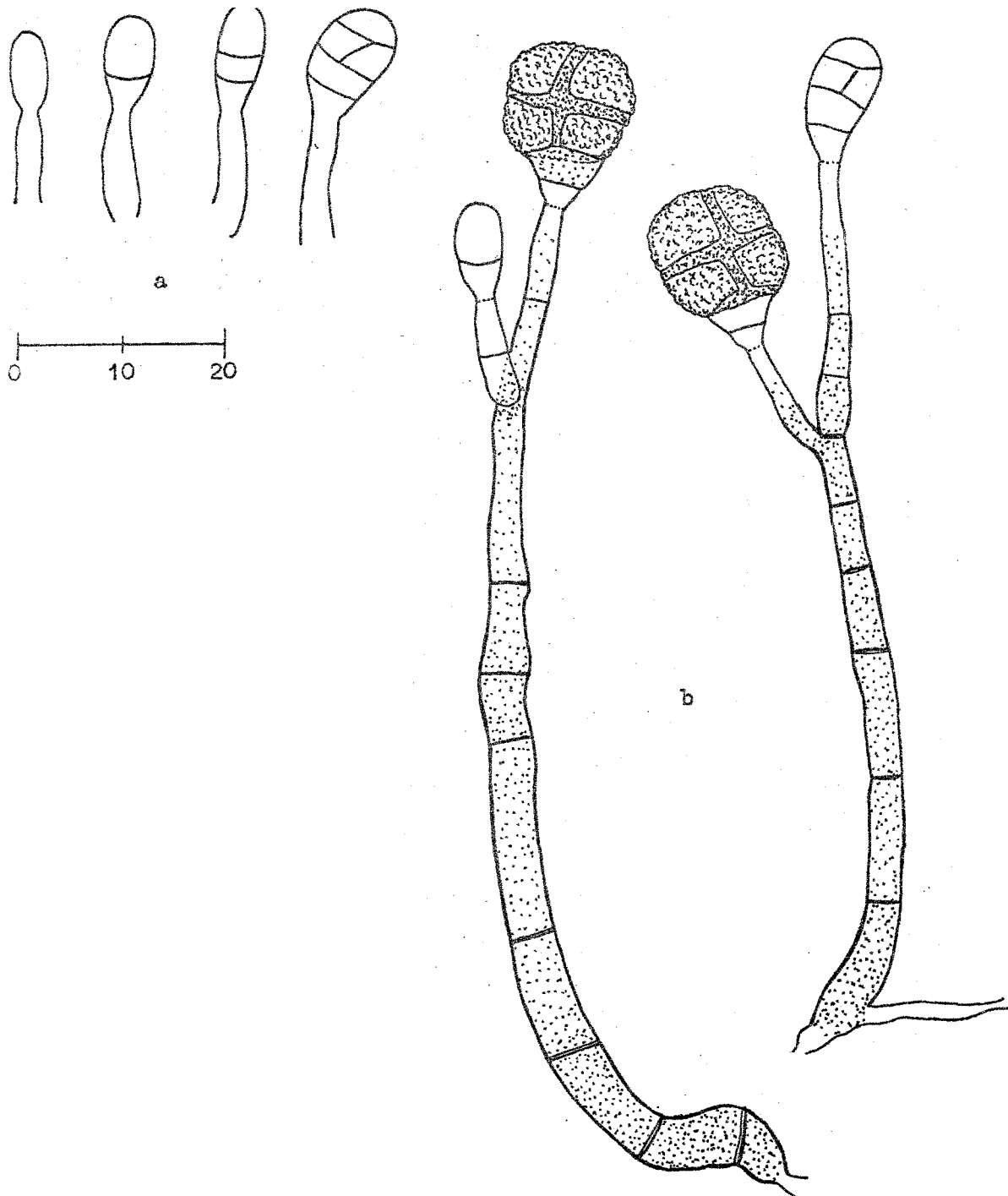


Figure 2. (a) Stages of conidial development. (b) Conidiophores and conidia. Camera lucida drawing, x600. From BFW 753-9(PCA).

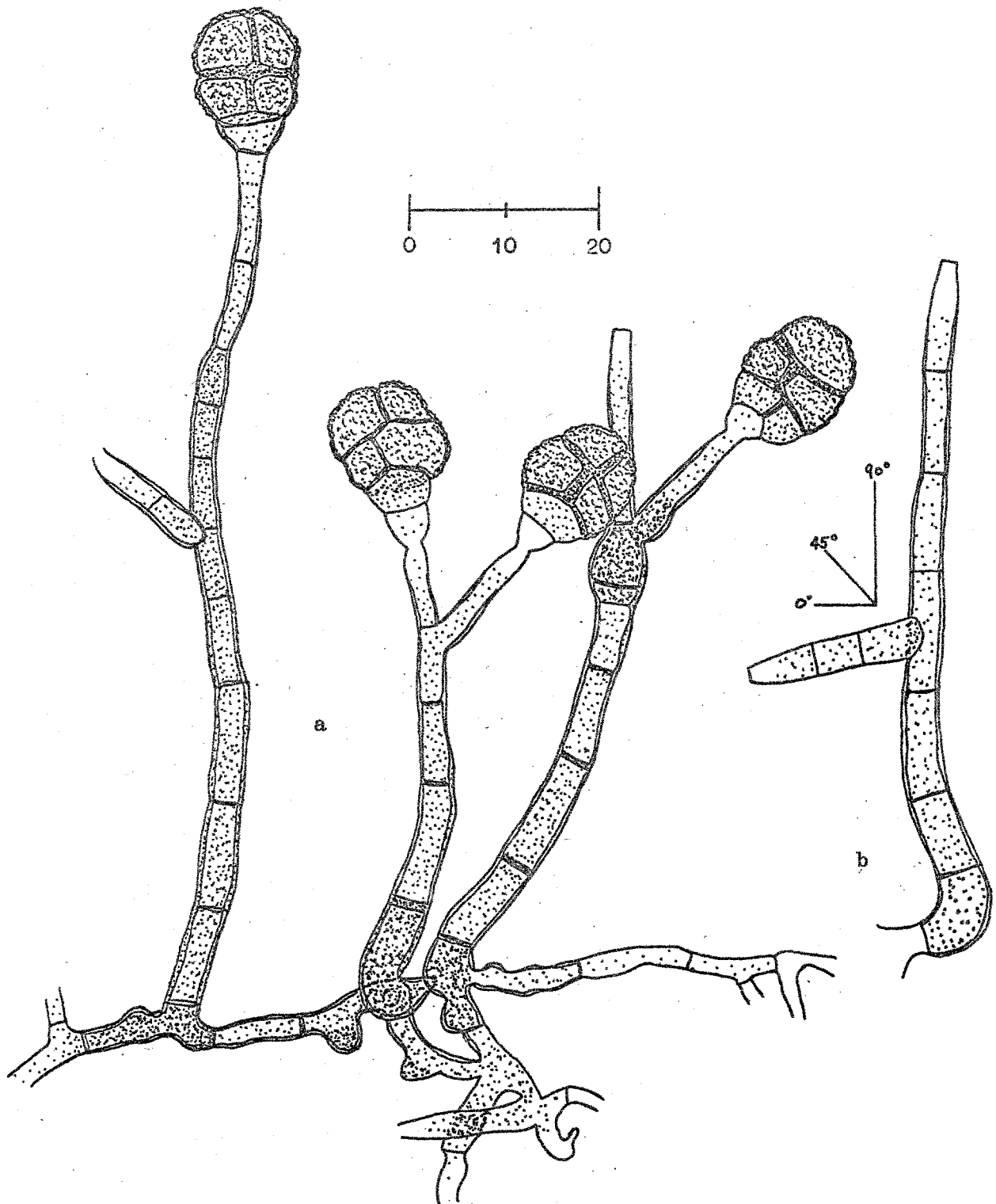


Figure 3. (a) Three conidiophores with conidia and basal cells. (b) A conidiophore with lateral branch diverging more than  $90^{\circ}$  angle. Camera lucida drawing, x600. From BFW 753-9(PCA).



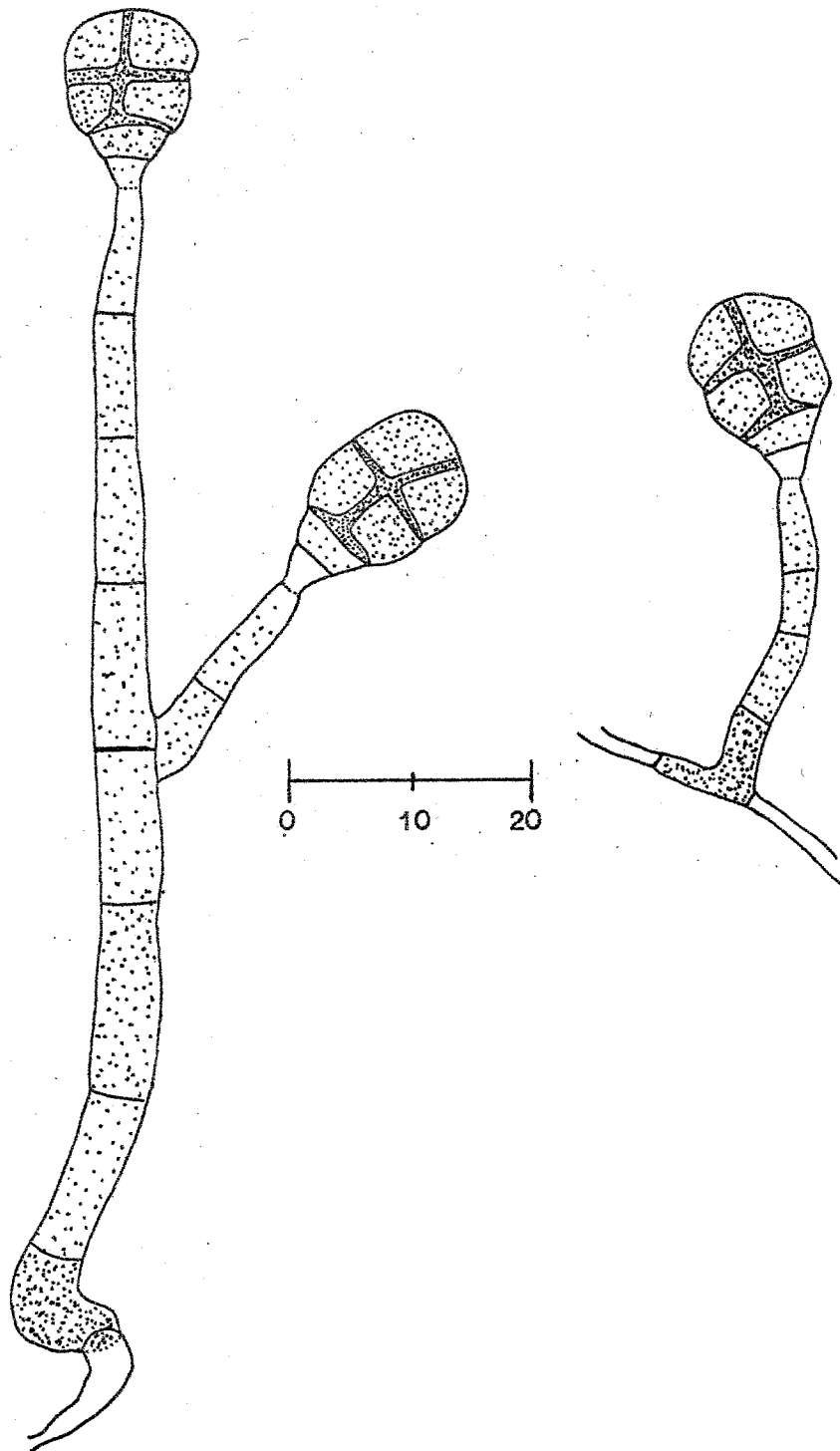


Figure 4. Conidiophores and conidia on Hay infusion agar. Camera lucida drawing, x600. From BFW 944-14 (Hay).

(dictyospora) singula, primo in apice conidiophori et dein proliferationis cujusque successive oriunda, turbinata vel pyriformia, septata, septis transversalibus 3 et longitudinalibus 3-4 praedita, 14-18  $\mu$  longa x 12-19  $\mu$  crassa, cella basilaria obconic, pallide brunnea, levia, basi truncata, cellis sub-basilaris brunneis, levibus, cellis aliis brunneis vel atro brunneis, tuberculatus.

Colonies in nature aggregated; mycelium superficial, composed of branched, septate, pale brown to dark brown, reticulate hyphae 1.5-3  $\mu$  wide; conidiophores arise singly or in pairs, branched, 230-500  $\mu$  long with dark brown to black basal cell 8-10  $\mu$  wide, attenuating, pale brown, 2-2.5  $\mu$  wide at apex; conidia (dictyospores) formed singly at the apex of conidiophore which after the first one has fallen off proliferates to form another conidium at higher level, turbinate or pyriform, septate, constricted at septa, with 3 transverse septa 3-4 longitudinal septa, 14-18  $\mu$  long x 12-19  $\mu$  wide, basal cell obconic, pale brown, smooth-walled, base truncate, sub-basal cell pale brown, smooth-walled, all other cells brown to dark brown, tuberculate.

Coloniae in culturae (Potato-carrot-agar) olivaceae vel atro brunnea, ex hyphis pallide brunneis vel atro brunneis, 0.5-3  $\mu$  crassis compositum; conidiophora singula, geminata vel aggregatae usque ad 23 ex atro brunnea, inflatus cella hypharum forma, perparce ramosa, pallide brunnea vel brunnea, septata, 120-150  $\mu$  longa, raro longa, 6-8  $\mu$  crassa, attenuata, 2  $\mu$  in apice; conidia singula, primo in apice conidiophori et dein proliferationis cujusque successive oriunda, plurie turbinata, brunnea vel atro brunnea, 16-19 (20)  $\mu$  longa x 12-14  $\mu$  crassa, constricta, 3 raro 4 septis transversalibus et 2-3 septis longitudinalibus, cella basilari hyalina, obconica, levia, basi truncata, cellis sub-basilaris pallide brunneis, levibus cellis aliis brunneis vel atro-brunneis et tuberculatus.

Typus: in culmis emortuus Thryostachys siamensis (Bambusae), Sakaerat Experiment Station, Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima, Thailand. B.F. Weilbacher 702-1 (IMI (slide) 145827), 31 July, 1968; 753-9, 24 September 1968; 940-6, 12 April, 1969; 944-14, 8 December, 1969.

Colonies in culture (Potato-carrot-agar) olivaceous brown; mycelium composed of pale to dark brown hyphae 0.5-3  $\mu$  wide; conidiophores arising singly, in pairs, or in groups of up to 23 from inflated dark brown hyphal cells, branched sparingly, pale brown to brown, septate, 120-150  $\mu$  long, rarely longer, x 6-8  $\mu$  wide tapering to 2  $\mu$  at the apex; conidia borne singly at the apex of conidiophore which after the first one has fallen proliferates to form another conidium at higher level, predominantly turbinate, brown to dark brown, 16-19 (20)  $\mu$  long x 12-14  $\mu$  wide, constricted, with 3 rarely 4 transverse septa, 2-3 longitudinal septa, basal cell hyaline, obconic, smooth-walled, base truncate, sub-basal cell pale brown, smooth-walled, all other cells brown to dark brown and tuberculate.

Specimens examined: On dead or decaying culms of Thrysostachys siamensis, Sakaerat Experiment Station, Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima, Thailand, B.F. Weilbacher Nos. 702-1 (IMI (slide) 145827), 31 July, 1968; 753-9, 24 September, 1968; 940-6, 12 April, 1969; 944-14, 8 December, 1969.

#### DISCUSSION

The fungus was successfully grown on three different artificial media, i.e., Potato-carrot-agar, Cornmeal agar, and Hay infusion agar herein referred to as PCA, CMA, and Hay respectively. Unfortunately, all cultures have died.

Examinations of mounted specimens however, have yielded ample information which reveal the nature of development of the fungus. Colonies on PCA are brownish, growing very slow and sporulating after 3-7 days at room temperature. The conidiophores arise singly or in groups of up to 23. They are brown, erect or curved with lateral branches which rarely exceed 2 (compared to 7 in nature), Figures 2 and 3. Each lateral or tertiary conidiophore is concolorous with the primary conidiophore cell from which it arises. The angle at which these conidiophores diverge from the primary conidiophore is usually between 30° to 60° but rarely otherwise (Figure 3b).

The conidia are typically 3-septate with 2-3 longitudinal septa. They are formed as blown-out ends of the apices of the conidiophores. The immature conidium is hyaline, oblong, and smooth-walled (Figure 2a, b).

The first septum (Figure 2a) which develops is a transverse septum. It is formed in such a manner as to divide the conidium into two nearly equal halves. The second septum (Figure 2a) develops in the upper half of the now 2-celled conidium. Due to the continuing upward expansion of the conidium, the second septum sometimes appears almost directly in the center of the conidium. The third and usually last transverse septum develops above the second septum (Figure 2a, b). Sometime after this septum appears, a longitudinal septum develops (Figure 2a) and connects the second and third transverse septa (Figure 2a). Another longitudinal septum develops later and connects transverse septa 1 and 2. Pigmentation of the conidia seems to occur sometime after the first longitudinal septum is formed. Conidia without one or more longitudinal septa remain hyaline.

The outstanding difference observed between naturally growing colonies and those in culture media is the size of the colony. In nature the conidiophores extend up to 500  $\mu$  long. On the other hand, the tallest conidiophore observed on culture media reaches up to a maximum height of 160  $\mu$ . Branching seems frequent in nature and very scarce in culture. Up to seven lateral branches have been observed in nature, compared to 2-3 in culture.

The herbarium has been deposited with the Centre for Thai National Reference Collections, ASRCT, Bangkok, Thailand.

#### ACKNOWLEDGEMENT

I sincerely wish to thank Dr. B.C. Sutton, Commonwealth Mycological Institute, Kew, who kindly examined my specimens and encouraged this report.