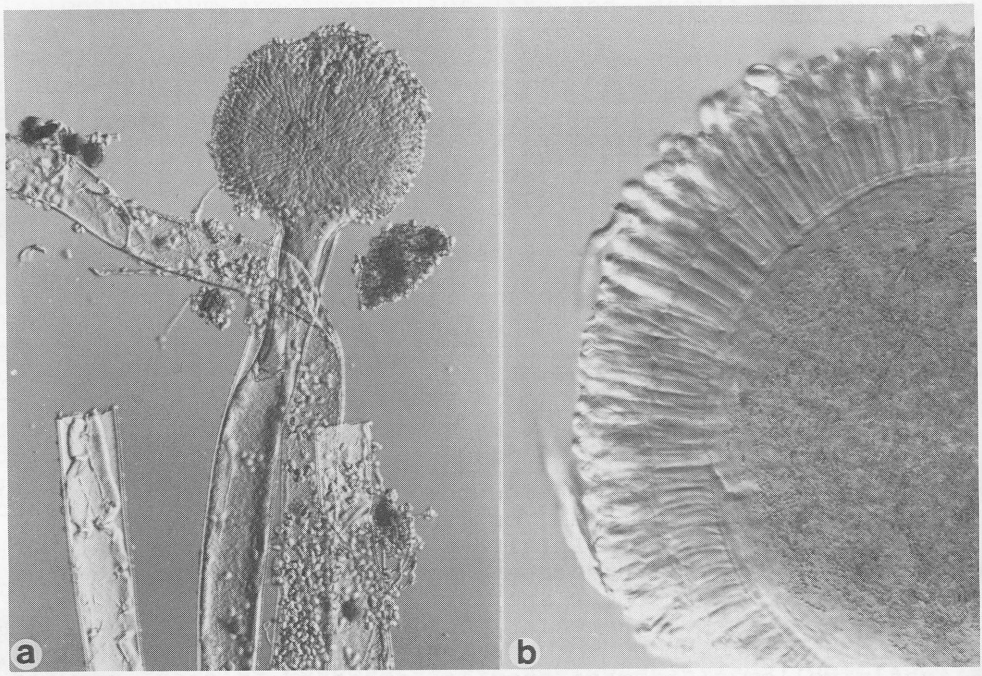

Fig. 9. Aspergillus erythrocephalus, holotype. a. Conidiophore (x 140). b. Detail of biseriate head (x 540).

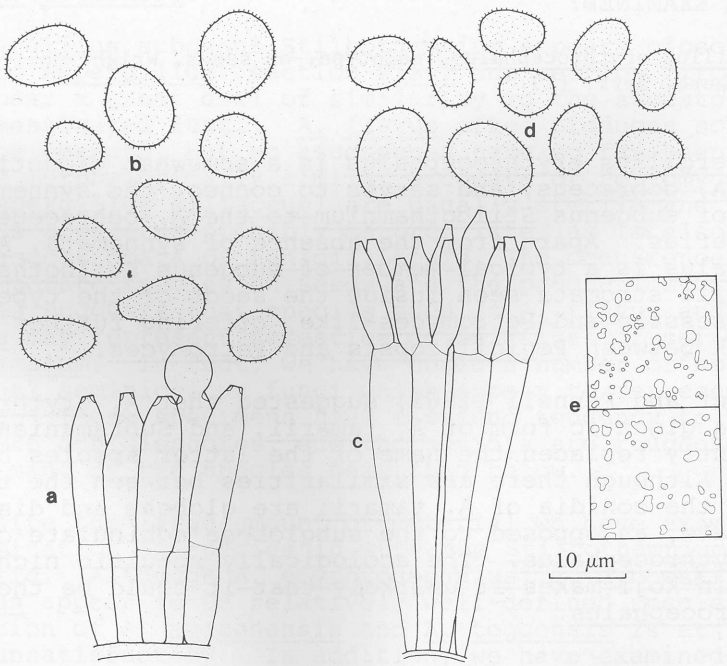

Fig. 10. a-b. Aspergillus erythrocephalus, holotype. a. Arrangement of phialides and metulae on vesicle. b. Conidia. c-e. Aspergillus vitellinus, c. Phialides and metulae on vesicle. d. Conidia. e. Roughening of conidiophore stipe from two different conidiophores on the same synnema.

Aspergillus vitellinus (Ridley) Samson & Seifert, comb. nov., Fig. 10 d-f, 11.

= Sterigmatocystis vitellina Ridley --J. Botany, Brit. & Fopr. 34: 152. 1896 (basionym).

Synnemata solitary or 2-3 on seed, with a stipe composed of tightly packed and anastomosing conidiophores which splay out to form a divergent fertile head, yellow brown, 1-3 cm tall, stipe 3-5 mm wide. Stipe of synnema composed of conidiophore stipes 35-70 um wide with granular walls 1-4 µm thick, bound together by a network of interweaving hyphae 5-16 um wide with smooth thin walls. Conidiophores 3-3.5 mm long, stipe 70-110 µm wide with a granulose wall, warts up to 2 um wide, often distinctly yellow, wall to 12 µm thick at the base, narrowing to about 2-5 µm thick below capitulum, vesicles globose 150-200 µm diam. Metulae clavate, 40-75 x 4-7 µm. Phialides in terminal whorls of 2-4 on metulae, cylindrical or slighty clavate with a tapered apex, 14-19 µm long, 3-6 µm wide, with a conidiogenous aperture 1.5-2 µm wide without a noticeable collarette. Conidia ellipsoidal, ovate, sometimes obpyriform or cylindrical, 6.5-13 x 5-10, echinulate. Stromata not observed.

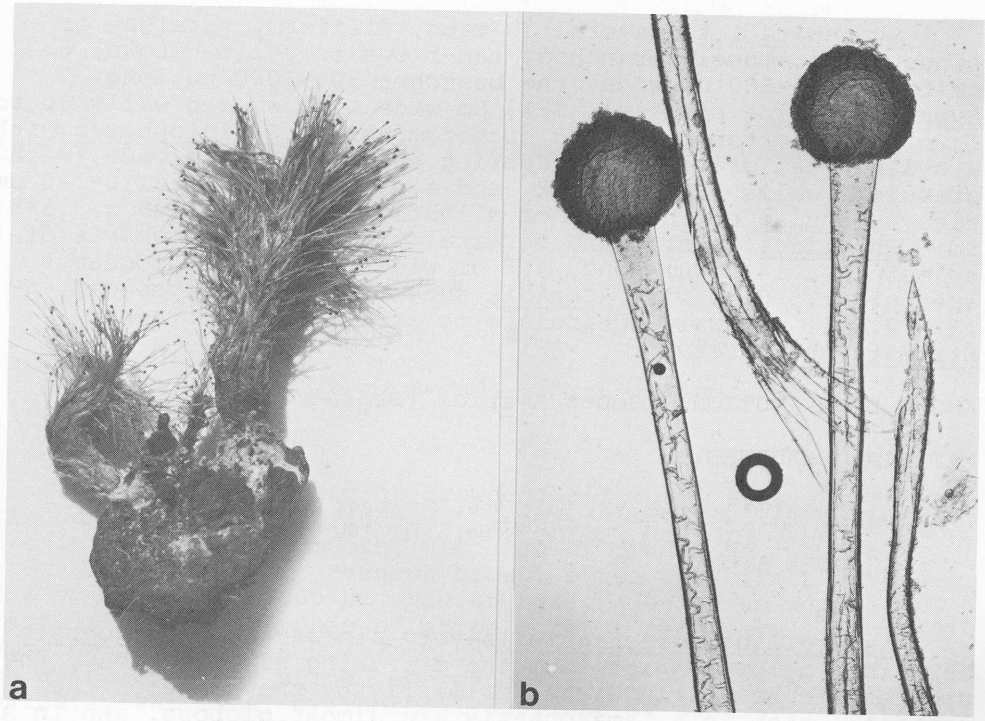

Fig. 11. Aspergillus vitellina, holotype. a. Synnemata emerging from seed (x 3). b. Conidiophores (x 40).

MATERIAL EXAMINED:

Sterigmatocystis vitellina, holotype, Flora of Singapore no. 2970, leg. H. Ridley, 1894 (K, isotype IMI).

Aspergillus vitellinus is distinguished from the similar A. amazonensis and A. togoensis primarily by the organization of its synnemata, in which the stipe is composed of conidiophore stipes woven together by a network of thinner hyphae. The synnemata tend to be shaped like a shaving brush, rather than racemosely branched as in the other two species. The very long metulae of A. vitellinus serve to further distinguish it from the other two species.

Petch (1944) suggested that A. vitellinus was a synonym of Sterigmatocystis monilifera (Berk. & Br.) Petch. The holotype of Periconia monilifera in K is similar to Aspergillus ochraceus but has roughened conidia. It differs from A. vitellinus in having smaller conidia and narrower conidiophore stipes. Although the conidiophores of P. monilifera are densely caespitose and occasionally fasciculate, they do not form stipitate synnema such as those produced by A. vitellinus.

Aspergillus amazonensis (Henn.) Samson & Seifert, comb. nov., Fig. 12.

= Stilbothamnium amazonense Henn. -- Hedwigia 43: 396. 1904 (Basionym).

Synnemata 1 to several on seed, filiform, straight or sinuous, racemosely branched, tan-brown to yellow-brown, to 2 cm tall, 300-600 µm wide, the branches 500-1000 µm long. Hyphae of stipe parallel, 5-13 µm wide with smooth walls up to 1 um thick, often branching dichotomously. Conidiophores with a cylindrical or slightly tapering stipe 60-100 um wide, with granulose walls 3-5 µm thick, and a globose vesicle 110-140 µm diam. Metulae cylindrical or slightly clavate, 15-20 x 3.5-5 µm. Phialides lateral and terminal or in terminal whorls of 3 on metulae, 14-15 µm long, 4-5 µm wide with a conidiogenous aperture 1.5-2 µm wide. Conidia subglobose to ellipsoidal, 8-11 x 7.5-11 µm, wall echinulate to irregularly roughened. Stromata not observed.

KNOWN DISTRIBUTION: South America (Brazil).

MATERIAL EXAMINED:

Stilbothamnium amazonense, holotype, on seeds of Lecythidea, leg. E. Ule, Rio Jurua, Jurua, Miry, July 1907. herb. Hennings (S, isotype BR).

Aspergillus amazonensis is very similar to A. togoensis described below. Apart from the differing distributions, the species can be distinguished primarily by the shape of the conidia, which in A. amazonensis are almost globose, and in A. togoensis tend to be oblong ellipsoidal to somewhat doliiform. Unfortunately, the one specimen of A. amazonensis we have seen was in poor condition, and it is probable that additional variation of macroscopic characters will be noted in future collections.

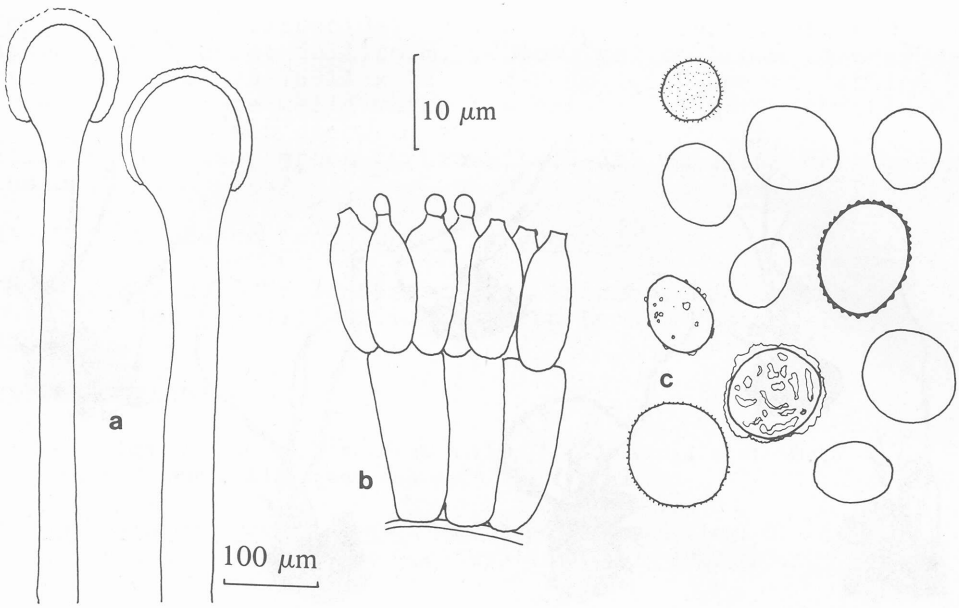

Fig. 12. Aspergillus amazonensis, holotype. a. Conidiophores. b. Arrangment of phialides and metulae on vesicle. c. Conidia.

Aspergillus togoensis (Henn.) Samson & Seifert, comb. nov.
Figs 13, 14.

=Stilbothamnium togoense Henn. -- Bot. Jb. 23: 542. 1897 (Basionym)
= Stilbothamnium novoguineense H. & P. Sydow -- Annls mycol. 14: 262. 1916.
= Stilbothamnium nudipes Hauman -- Bull. Soc. r. Bot. Belg. 69: 123. 1936.
= Aspergillus coremiiformis Bartoli & Maggi -- Trans. Br. mycol. Soc. 71: 386. 1978.

Synnemata solitary or crowded, filiform, straight or sinuous, racemosely branched, appearing hirsute because of branching, surface smooth, floccose or granulose, yellow - brown, tan-brown or greenish brown, often dark green at base, 2-8 cm tall, 625-3000 µm wide at base, 300-900 µm wide in fertile region. Hyphae of stipe more or less parallel, 10-21 µm wide, with walls 0.5-2 µm thick. Conidiophores concentrated on apical part of stipe, emerging at nearly right angles or slightly antrorse, cylindrical-capitate or subulate-capitate, the stipe light yellow-brown, 1000-2000 µm long, 20-60 µm wide, with granulose walls 1-5 µm thick near base, 0.5-2 µm thick below vesicle, vesicle globose, 35-100 µm diam, with or without metulae, or with 'septate phialides'. Metulae cylindrical to slightly capitate, 10-15 x 3-5 µm. Phialides arising directly from vesicles, single and terminal on inter-

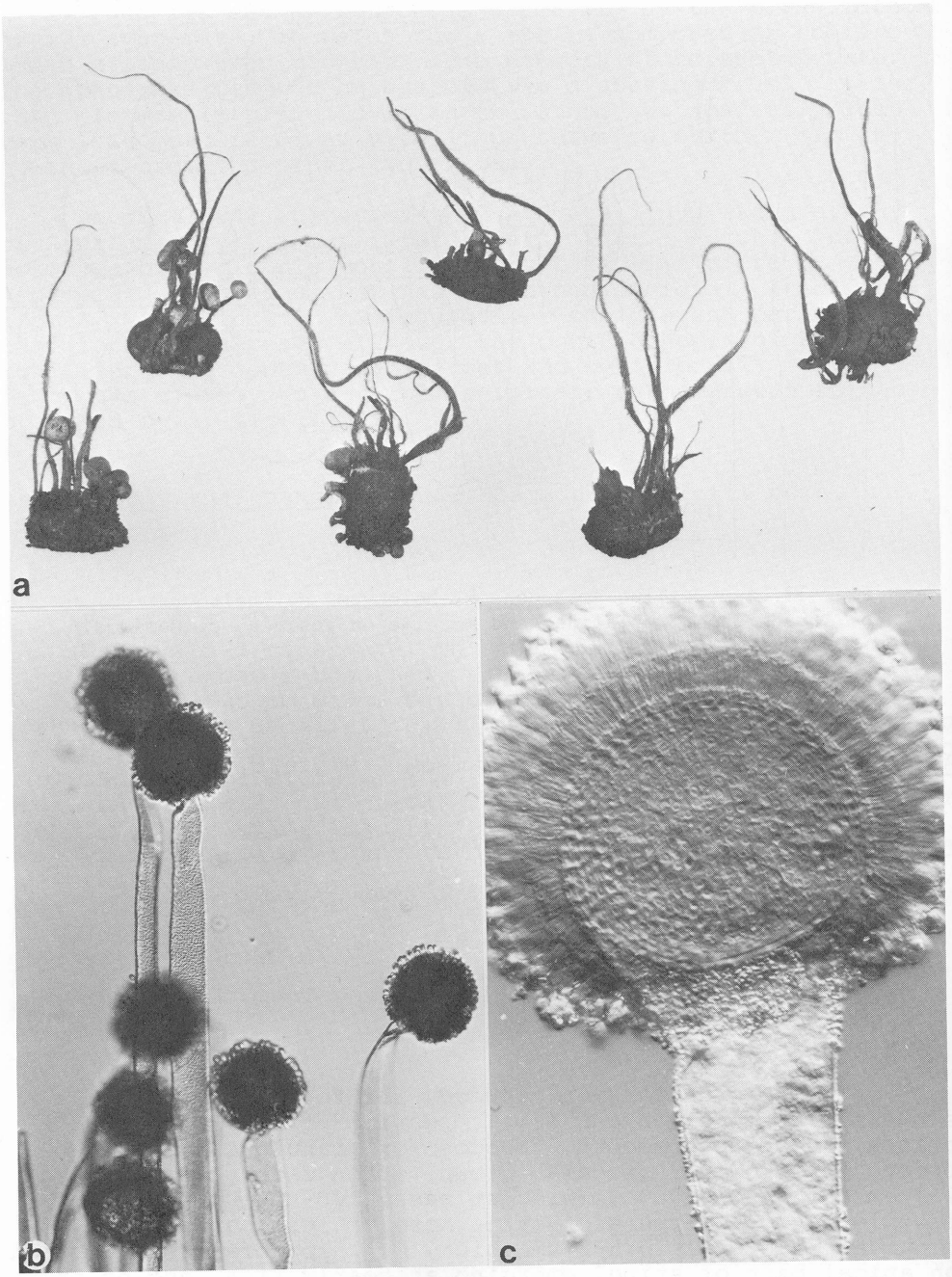

Fig. 13. Aspergillus togoensis, neotype. Synnemata on seeds. (x 0.6). b. conidiophores showing roughening of stipe (x 80), c. Conidiophore head showing metulae and phialides (x 1250)

calary cells, or in terminal pairs or whorls of 3 on metulae, 11-20 x 6-7 µm, the conidiogenous aperture 1.5-3 µm wide.

Conidia oblong-ellipsoidal, ellipsoidal or ovate, often appearing somewhat doliiform, yellow, yellow-brown to orange-brown in mass, (5-)6-11 x (2.5-)4-8 um, with smooth, echinulate or granulose walls which are thin to slightly thickened. Stromata sometimes present, sterile, hard, smooth, ovate, ellipsoidal, grey-green to brown, 2.5-3.3 mm diam, dark green inside.

HABITAT: Seeds of Landolphia, Strychnos.

KNOWN DISTRIBUTION: Southeast Asia (Borneo, New Guinea, Thailand, Singapore), Africa (Sierra Leone, West Africa, Uganda).

MATERIAL EXAMINED:

Herbarium specimens: Specimens marked * have sterile stromata present. Authentic specimens only are listed.

Stilbothamnium novoguineense, *holotype, on seed, leg. C. Ledermann no. 8065, New Guinea, Urwald, 27 July 1912 (B).

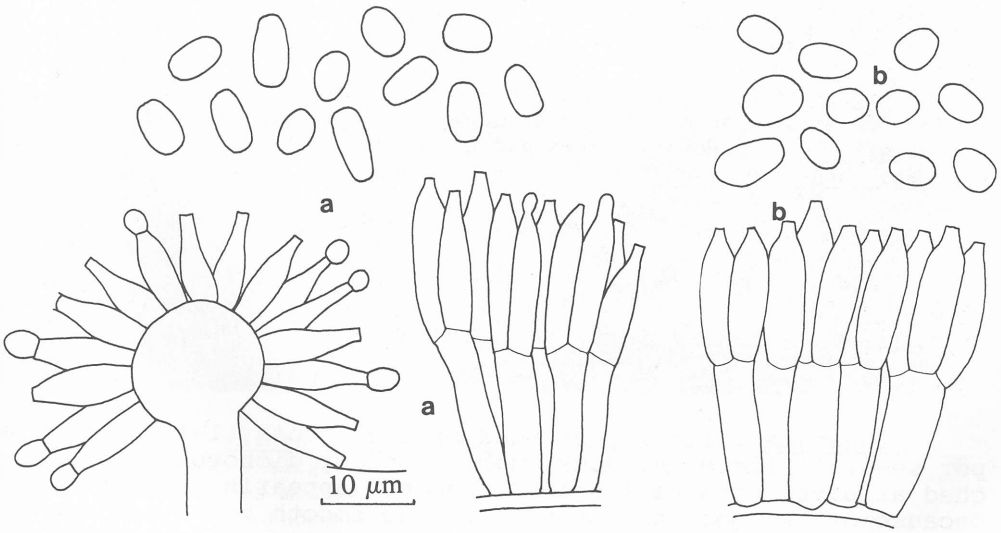

Fig. 13 Aspergillus togoensis. Camera lucida drawings of conidial heads and conidia. a. Specimen "P. clavariaeformis" no. 41, Singapore, K., b. S. novoguineense, holotype.

Stilbothamnium nudipes, lectotype here designated, on seed, leg. L. Hauman no. 586, Zaire, Forest between Bolafa and Mongana, Sept. 1932 (BR). Syntype, on seed, leg. L. Hauman no. 587, same time and place as no. 586 (BR).

Stilbothamnium togoense, neotype here designated, as Stilbothamnium nudipes, leg. J. Louis no. 6196, Zaire, s. dat., B 1009 (BR).

Living cultures:

CBS 205.75, received as Stilbothamnium nudipes, isol. ex seed of Landolphia sp., M.F. Roquebert.

CBS 553.77, ex-type culture of Aspergillus coremiiformis, isol. ex soil, Ivory Coast, A. Rambelli.

The characters which distinguish Aspergillus togoensis from the similar A. amazonensis are discussed above under the description of the latter species. A. togoensis is notable for the extreme variability of the arrangement of phialides. On any one synnema, capitula may be found with or without metulae, or with 'septate phialides'. This latter type has been examined in some detail by Roquebert and Nicot (this publication).

Samson (1979) suggested that Aspergillus coremiiformis was actually an isolate of Stilbothamnium. Our comparison of the ex-type culture of A. coremiiformis with a culture originating from a specimen of A. togoensis (CBS 205.75, received as S. nudipes from M.-F. Roquebert) confirms that cultures of these two species are identical, and A. coremiiformis is hence regarded a synonym of A. togoensis here.

Aspergillus dybowskii (Pat.) Samson & Seifert, comb. nov., Figs 15, 16.

= Penicilliopsis dybowski Pat. -- Bull. Soc. mycol. Fr. 7: 54. 1892 (basionym, anamorph only described) = Stilbothamnium dybowskii (Pat.) Henn. -- Monsunia 1: 7. 1899.
= Stilbothamnium usneoides Sydow -- Annls mycol. 14: 262. 1916.
= Stilbothamnium dybowskii var. macrospora Beeli -- Bull. Soc. r. Bot. Belg. 59: 16. 1927.
= Stilbothamnium dybowskii var. laevispora Hauman -- Bull. Soc. r. Bot. Belg. 69: 120. 1936.
= Stilbothamnium usneoides var. verrucosum Hauman -- Bull. Soc. r. Bot. Belg. 69: 122. 1936.

Synnemata solitary, crowded or caespitose, 1-12 synnemata per seed, filiform, sinuous, unbranched or dichotomously branched at base, then racemosely branched, appearing hirsute because of racemose branching, surface smooth but sometimes lanose at base, greenish brown to dark brown, 2-13 cm tall, 0.5-1(-4) mm wide at base, 300-625 µm wide throughout most of length. Hyphae of stipe more or less parallel, light brown, (2-)4.5-23 um wide, with walls thin to 1 µm thick. Conidio-

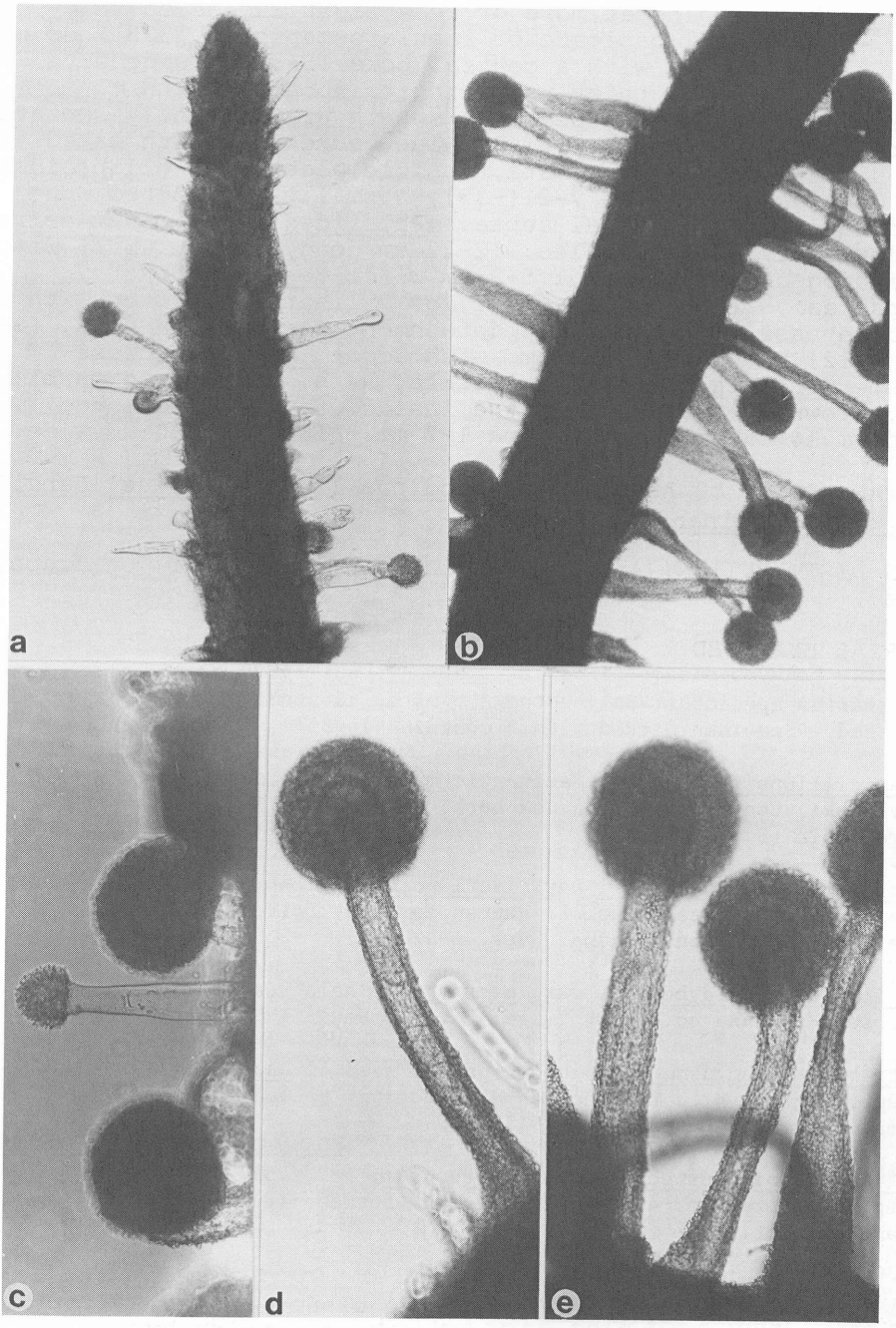

Fig. 15. Aspergillus dybowskii, development of sheathing hyphae on a single synnema. a. Apex of synnema with conidiophore stipes mostly naked (x 50). b. Lower down on synnema with conidiophore stipes covered by sheathing hyphae (x 50). c. Detail of naked conidiophore stipe near synnema apex. d. Detail of conidiophore stipe covered in the lower part by sheathing hyhae, and becoming covered in upper part. e. Detail of conidiophore stipes completely covered by sheathing hyphae. (c-e, all x 140)

phores scattered over lower part of stipe, concentrated in upper part, emerging at more or less right angles to the stipe, cylindrical-capitate or subulate-capitate, 375-2000 um long, 25-75 um wide with a central core 15-50 um wide with smooth walls 3-4 um thick narrowing to about 1 um thick beneath vesicle, surrounded by a sheath of frequently septate interweaving hyphae 2-6(-10) um wide, sometimes with naked stipes near apex of synnemata, vesicle globose to ellipsoidal, 50-100 um diam, metulae 7-21(-35), normally unbranched, but often developing internal septa. Phialides in terminal pairs or whorls of 3-5 on metulae, 12-22 um long, 3-7 um wide, with a conidiogenous aperture 1.5-3 um wide. Conidia obovate, ellipsoidal, oblong-ellipsoidal, or cylindrical, often with a truncate base with a visible detachment scar, olivaceous, (3-) 5-10 (-12) x (2.5-) 3.5-7 um, with smooth to verruculose walls. Stromata sterile, stipitate, hard, globose to turbinate, brown, 2-3.5 mm diam, the inside grey or green, the peridium 10-25 um thick, stipe 1-2 mm tall, 500-600 um wide.

HABITAT: Seeds of Anondium, Carpodinus lingustifolius, Landolphia dubreucquinana, L. florida.

KNOWN DISTRIBUTION: Africa (Belgian Congo, Burundi, Cameroon, Zaire).

MATERIAL EXAMINED:

Herbarium specimens: Only authentic material examined is listed. Specimen marked with * contains sterile stromata.

Penicilliopsis dybowskii, authentic material, on seed, leg. Dybowski, Congo, Jan. 1894, ex herb. Patouillard in herb. Bresadola (S).

Stilbothamnium dybowskii var. laevispora, *lectotype here designated, on seed, leg. L. Hauman no. 585, Zaire, forest between Bolafa and Mangana, Sept. 1932 (BR).

Stilbothamnium dybowskii var. macrospora, holotype, leg. Mme Goosens-Fontana no. 379B, Zaire, Lisala, Sept. 1925, A 599, BR).

Stilbothamnium usneoides, holotype, on seed of Anonidium sp., leg. J. Mildbraea no. 4560, Cameroon, between Lokoma, Bumba and Bange, Feb. 1911 (S).

Stilbothamnium usneoides var. verrucosum, holotype, on seeds, leg. J. Lebrun no. 4183, Zaire, forest between Irumi and Mambasa, Oct. 1931 (BR).

Aspergillus dybowskii is distinguished from the similar A. amazonensis and A. togoensis by the sheathing hyphae which cover the conidiophore and the smooth rather than roughened Aspergillus-stipes. These sheathing hyphae are unusual in Aspergillus, although less extensively developed sheathing hyphae are sometimes seen in A. togoensis.

Hauman (1936) considered S. dybowskii var. macrospora a nomen dubium because the type specimen was a mixture of S. dybowskii and Stilbodendron cervinum. Our observations confirm

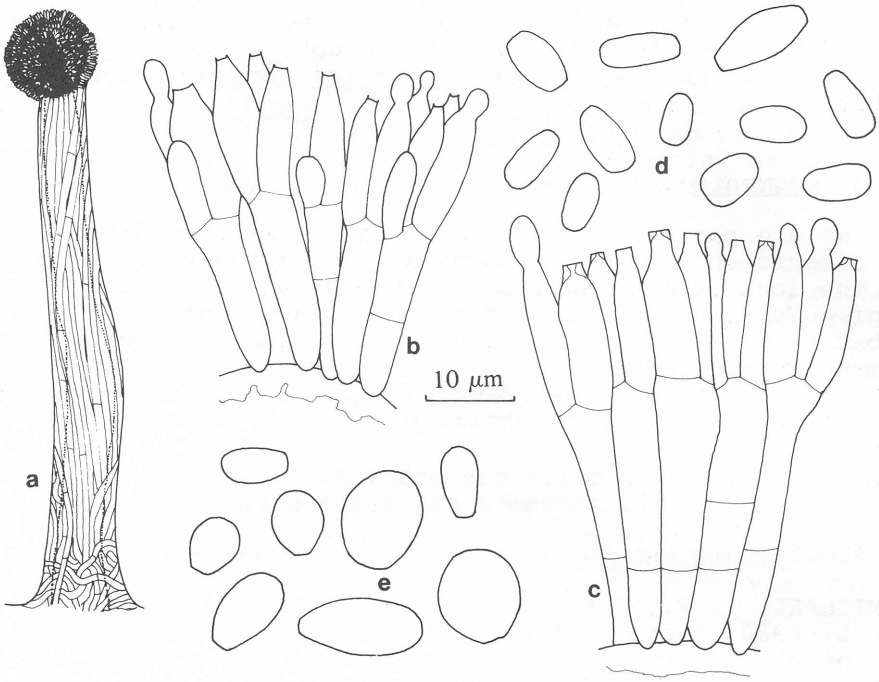

Fig. 16. Aspergillus dybowskii. a. Conidiophore covered with sheathing hyphae. b, c. Arrangement of metulae and phialides on vesicle. d, Conidia. (a, b, Rammeloo 6677, BR. c, d, authentic material, S). e. Conidia (Goosens, no. 379, BR).

this, but we include this variety in the synonymy above because the protologue clearly describes the Stilbothamnium to the exclusion of the Stilbodendron.

EXCLUDED SPECIES

Penicilliopsis bambusae Nag Raj & Govindu -- Sydowia 23: 112. 1969. The type specimen, IMI 89197, is not referable to any of the genera treated here. Its affinities are uncertain. No teleomorph was mentioned in the diagnosis.

Penicilliopsis togoense Henn. -- Bot. Jb. 30: 40. 1901. Type not in B, S. The diagnosis suggests this may be Stilbodendron cervinum or Sarophorum palmicola, but the habit on leaves rather than seeds makes the identity uncertain.

Stilbothamnium javanicum Henn. & E. Nym -- Monsunia 1: 37. 1899. Type not in B, BO, S. A specimen collected by Bakhuizen v. d. Brink labelled with this name deposited as BO 2306 contains no synnemata. Although the diagnosis appears to describe an Aspergillus, Stilbodendron cannot be ruled out. Nomen dubium.

Stilbothamnium penicillopsis Henn. & E. Nym. -- Monsunia 1: 37. 1899 = Aspergillus penicillopsis (Henn. & E. Nym.) Raciborski -- Bull. Acad. Sci. Cracovie 1909: 372. Type not in B, BO, S. Two specimens with this name collected by Van