

The Agaric Genus *Panellus* Karst. (including *Dictyopanus* Pat.) in Malaysia

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Abstract

Panellus, with *Dictyopanus* as a synonym, has 27 species in Malesia; 11 species (all new) are lamellate; 13 species (8 new) are poroid. Two new subgenera are made for species with more or less centric pileus and well-developed stem, namely *Megalopanellus* (1 species) and *Mesopanellus* (2 species). *P. longinquus* (Berk.) Singer is recorded tentatively for Queensland.

New taxa in subgen. *Panellus* — lamellate species, *P. alutaceus*, *P. ambiguus*, *P. bambusarum*, *P. brunneomaculatus*, *P. dichotomus* and var. *pinnatus*, *P. exiguus*, *P. fuscatus*, *P. intermedius* and var. *stenosporus*, *P. parvulus*, *P. pendens*, and *P. sublevatus*; as poroid species, *P. albifavolus*, *P. bambusifavolus*, *P. brunneifavolus*, *P. hispidifavolus*, *P. megalosporus*, *P. microsporus*, *P. pauciporus*, and *P. sublamelliformis*; subgen. *Megalopanellus*, *P. magnus*; subgen. *Mesopanellus*, *P. glutinosus*, *P. pyru-liferus*.

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Introduction

Some twenty years ago, I studied in detail the collections of this genus which I had made in the Malay Peninsula, Borneo, New Guinea, and the Solomon Islands. I offer these notes and drawings for others to pursue the quest. The Malacca fungus flora enlarges the concept of the genus very considerably, and there are certainly more species to be found. In a few cases I have introduced drawings of exotic material because they convey better the construction than such as I have of the Malesian.

Panellus is like *Pleurotus* but with more or less amyloid spores, commonly with acerose basidioles in the hymenium (as a marasmioid feature), and commonly with granular-encrusted dichophysial hyphae on the edges of gills or pores, and on the pileus and stem. In consequence of this last feature, the pileus is usually opaque, not striate. The fruit-bodies are generally rather small to minute, rather tough or in parts gelatinous, and on the whole without bright colours. They are white to dull ochraceous, brownish, or somewhat rufous, but there is an exception in the golden yellow *P. aureofactus* Horak of India.

The best introduction is to study illustrations of the north temperate *P. stypticus*, which is the type-species and has much in common with the Malesian *P. dichotomus*. They have the opaque incrustation which renders almost impossible the microscopic study of the fruit-body until sections are treated with dilute potash which fortunately, dissolves all or most of the granular matter fairly quickly. With this picture in mind and with the amyloid test for the spores, it is easy to recognise most lamellate collections. The species grow on dead wood and various plant-remains, and are not terricolous. A chalky white edge to the gill may be a sure sign. However, I have added from the Malesian flora two new subgenera, *Megalopanellus* and *Mesopanellus*, in which the stem is not lateral or the pileus sessile, as usual in *Pleurotus*, but central or excentric so that one begins to think of an ordinary agaric as *Collybia*, *Marasmius*, or *Tricholoma*. The decurrent gills, amyloid spores, acerose basidioles, dichophysial processes from the superficial hyphae, and the pallid colour of the pileus become diagnostic. In fact, *Megalopanellus* begins to disclose with its large fruit-bodies the ancestry of the genus.

Dictyopanus Pat.

In the course of collecting, one will find that the underside of the fruit-body, with obvious resemblance to *Panellus*, is not lamellate but closely poroid with the characteristic chalky opacity (Fig. 2). These polyporoid species were the object of the genus *Dictyopanus*, for which it would serve a useful purpose if generic names were taken as ideas and not, as now, for type-species. It has been realised for some time that no sharp line can be drawn between the lamellate and the poroid species; there are intermediates partly poroid and partly lamellate or with the gills closely connected by poroid reticulations in the interstices. It happens that the type-species of *Dictyopanus*, namely *D. pusillus*, has just such an intermediate variety in the American tropics; it is var. *pseudorhipidium* Singer, of which var. *sublamellatus* Corner may be a synonym (Fig. 3). Accordingly, *Dictyopanus* has been reduced to *Panellus* by Burdsall and Miller (1975) and referred to subgen. *Panellus*. Presumably all species of *Dictyopanus* must be transferred to *Panellus* whether or not they have lamellate indication; otherwise, they are without a genus unless it is *Favolaschia*.

Favolaschia (Pat.) P. Henn.

This genus of long uncertainty, dating from 1895, has been revised by Singer (1945, 1975) and by Dennis (1952, 1970). The extraordinary fact that emerges is that their definitions reveal no distinction from *Dictyopanus*. Perusal of the species now attributed to *Favolaschia* shows that some are panelloid as *Dictyopanus* and others are mycenoid, including the type-species. Singer (1969) made the new family Favolaschiaceae to be allied with the thelephoraceous Aleurodiscaceae, in which he is followed by Jülich (1981). Alliance with Panellaceae was ruled out; yet, there is no fundamental difference between the descriptions of the two families; they read almost exactly alike. Clearly, there is still some misunderstanding. Thus, *D. gloeocystidiatus* Corner (1954), which I here transfer to *Panellus*, was left out of

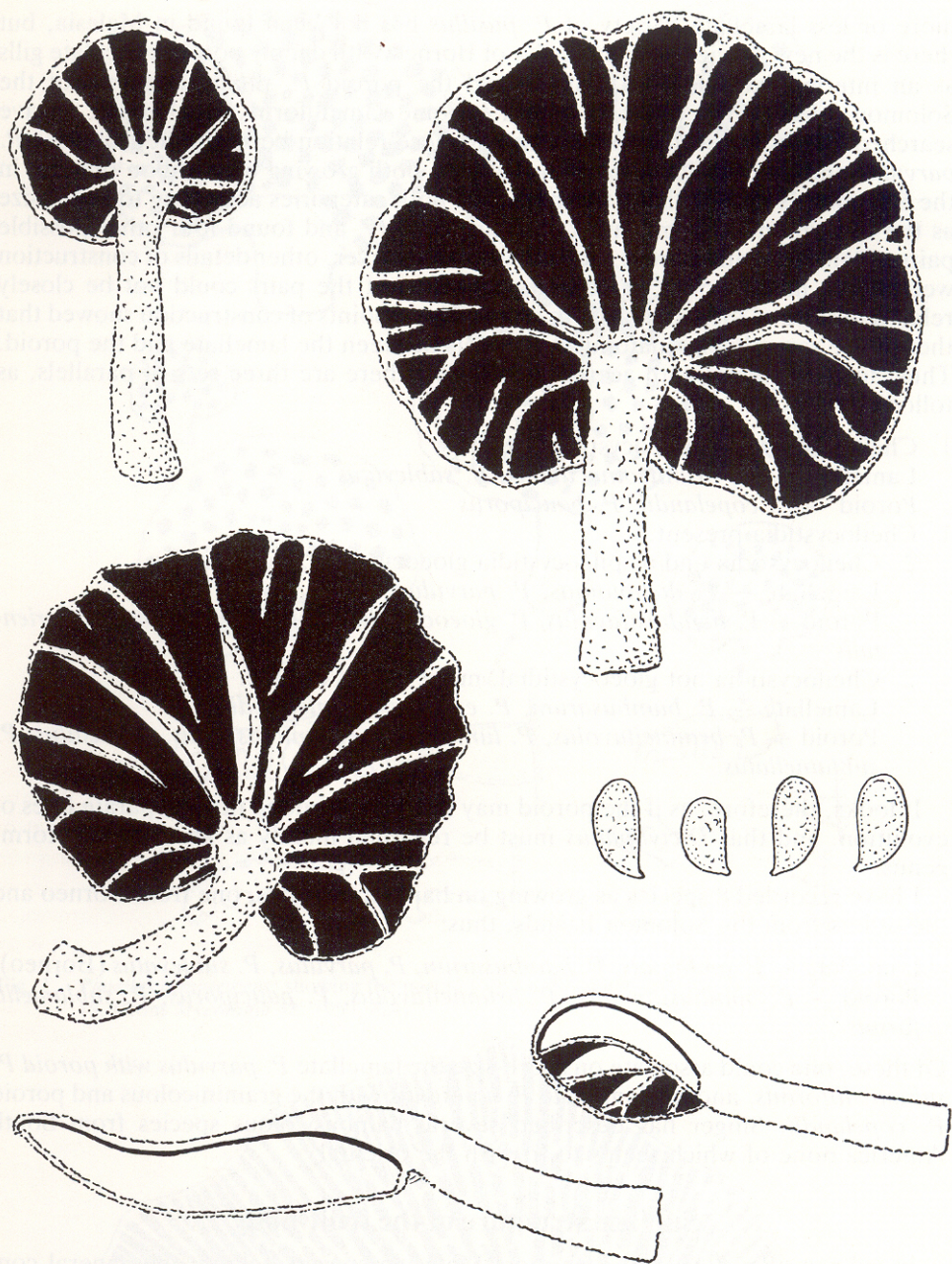


Fig. 1. *Panellus* sp. (aff. *P. pteridophytorum* Singer) from Brazil, to show the lamellate form with distant gills; $\times 12$, the spores $\times 1200$.

consideration because it upset any supposed distinction. I do not regard *Favolaschia* as a suitable deposit for poroid *Panellus*.

Lamellate and poroid species of *Panellus* in Malesia

Dictyopanus having been lost, I refer to the many species with gills, not pores, as the lamellate, and to the many with pores, not gills, as the poroid. The question arises whether the species of one group can be related to any of the other. The

more or less lamellate variety of *P. pusillus* has not been found in Malesia, but there is the new species *P. intermedius* of Borneo with deeply poroid-reticulate gills as an intermediate (Fig. 14), and I add the poroid *P. sublamelliformis* of the Solomon Islands, the pores of which become lamelliform peripherally. I have searched for instances and found only the close relation between the lamellate *P. parvulus* and the poroid *P. sublamelliformis*, both growing on bamboo remains in the Solomon Islands. I listed the species of both categories according to spore-size as the most immediate means of assessing affinity, and found four other possible pairs of lamellate and poroid species. When, however, other details of construction were taken into account, it became obvious that the pairs could not be closely related in spite of their similarity in spore. These points of construction showed that there were remarkable anatomical parallels between the lamellate and the poroid. Thus, for the species with acerose basidioles, there are three sets of parallels, as follows:

1. Cheilocystidia and pileocystidia absent.
 Lamellate — *P. brunneomaculatus*, *P. sublevatus*
 Poroid — *P. copelandii*, *P. pauciporus*
1. Cheilocystidia present.
 2. Cheilocystidia and/or pileocystidia gloeocystidial, subcylindric
 Lamellate — *P. dichotomus*, *P. parvulus*
 Poroid — *P. bambusifavolus*, *P. gloeocystidiatus*, *P. megalosporus*, *P. orientalis*
 2. Cheilocystidia not gloeocystidial, more or less clavate.
 Lamellate — *P. bambusarum*, *P. exiguus*, *P. intermedius*
 Poroid — *P. brunneifavolus*, *P. luminescens*, *P. microsporus*, *P. pusillus*, *P. sublamellatus*.

It looks, therefore, as if the poroid may have arisen along three separate lines of evolution, and that *Dictyopanus* must be regarded merely as an unnatural form-genus.

I have recorded 8 species as growing on bamboo remains, one from Borneo and the others from the Solomon Islands, thus:

- Lamellate — *P. ambiguus*, *P. bambusarum*, *P. parvulus*, *P. sublevatus* (Borneo).
 Poroid — *P. bambusifavolus*, *P. brunneifavolus*, *P. pauciporus*, *P. sublamelliformis*.

Of these, one could associate on spore-size the lamellate *P. parvulus* with poroid *P. sublamelliformis*, and the lamellate *P. ambiguus* with the graminicolous and poroid *P. copelandii*. Singer has described several bambusicolous species from South America none of which seems to fit with the oriental.

Surface structure of the fruit-body

In subgen. *Panellus*, to which most Malesian species belong, the general construction of the surface of the pileus, stem, and gill-edge is shown in Figs. 4 and 5. Cystidia protrude into a superficial felt of narrow hyphae the ends of which ramify into lobules, spicules, or diverticula, and the ends are more or less heavily encrusted with the granular matter that dissolves in dilute potash. The construction seems to be a perfection of Singer's *Rameales*-structure. The narrow, ramified, and diverticulate hyphae have been called acanthophyses, dendrophyses, dichophyses, and astereostromelloid according to the appearance of one or other of these branching hyphal ends with die-away growth. The branchings and lobings, however, are generally so varied and intricate that there are many transitions, even in the same species, from one ideal form to another. I prefer to call them simply

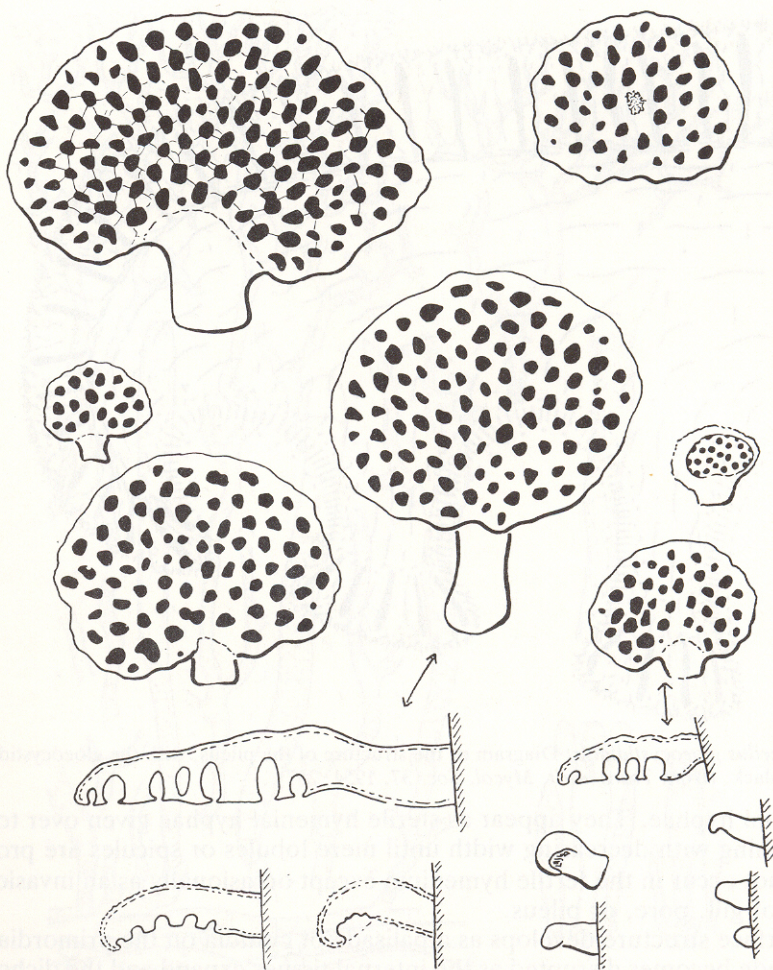


Fig. 2. *Panellus luminescens*, showing the poroid form of the genus, previously called *Dictyopanus*; $\times 15$. (from *Mycologia* 42, 1950, 424).

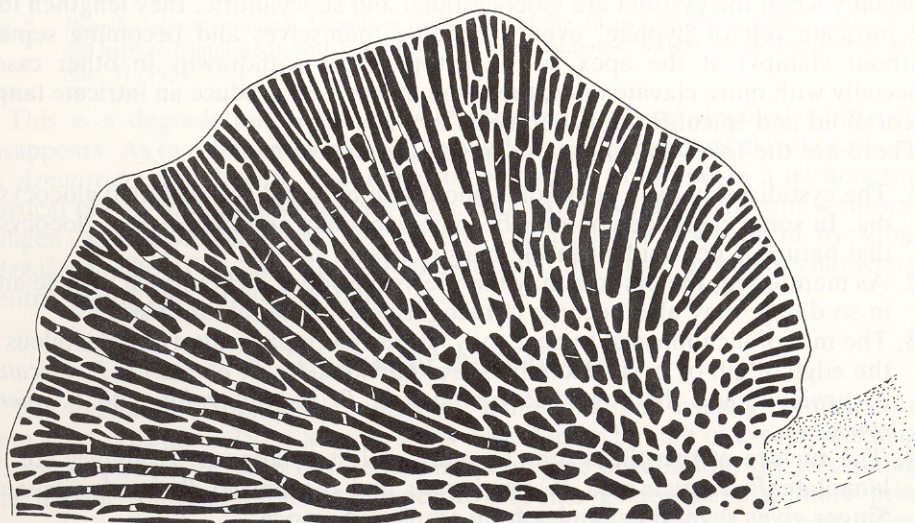


Fig. 3. The sublamellate variety of *Panellus pusillus*; $\times 10$. (from *Trans. Brit. Mycol. Soc.*, 37, 1954, 260).

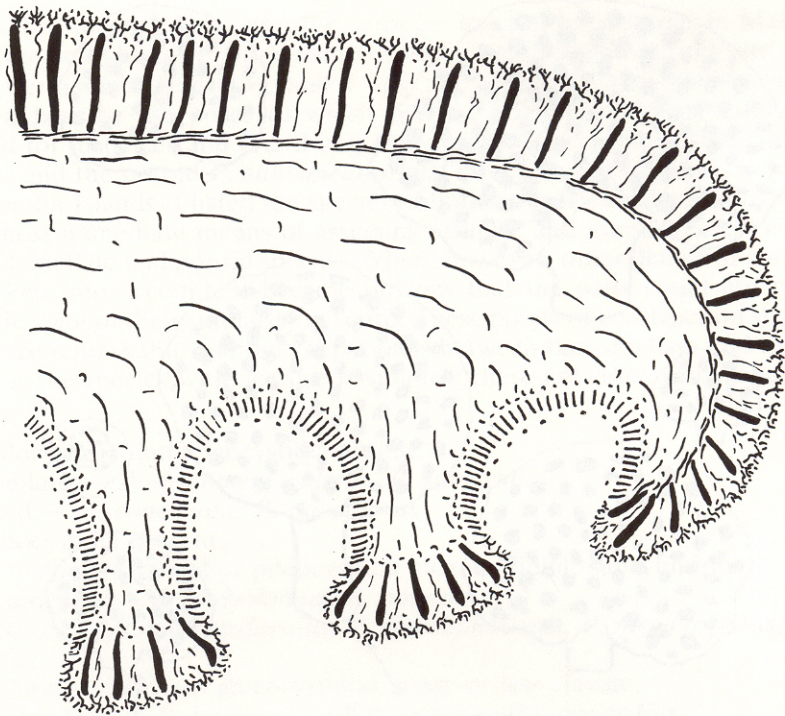


Fig. 4. *Panellus gloeocystidiatus*. Diagram of the structure of the pileus, with the gloeocystidia shown in black. (from *Trans. Brit. Mycol. Soc.* 37, 1954, 257).

dichophysial hyphae. They appear as sterile hymenial hyphae given over to excessive branching with decreasing width until mere lobules or spicules are produced. They do not occur in the fertile hymenium except occasionally as an invasion from the edge of gill, pore, or pileus.

This surface structure develops as a palisade of cystidia on the primordial parts. The palisade becomes disrupted as the internal tissues expand and the dichophysial hyphae grow out between the cystidia to overtop them; they may extend up to 150 μ before developing the terminal mat of encrusted diverticula. In some cases, especially when the cystidia are gloeocystidial and subcylindric, they lengthen into the intricate felt of hyphae, even exceeding themselves and becoming septate (without clamps) at the apex as the cytoplasm is withdrawn. In other cases, especially with more clavate ones, they may themselves produce an intricate tangle of coralloid and spiculiform dichophysial hyphae.

There are the following variations in surface structure:

- 1, The cystidia may have dense oleaginous contents and can be called gloeocystidia. In some cases the contents become vacuolate and the original gloeocystidial nature is not evident in the mature tissue.
- 2, As mentioned, the cystidia may themselves produce dichophysial hyphae and, in so doing, may also become unrecognisable in the mature tissue.
- 3, The mat of dichophysial hyphae may not develop, particularly on the pileus or the edge of gill or pore. Examples are the lamellate *P. alutaceus*, *P. fuscatus*, *P. pendens*, and the poroid *P. albifavolus*, *P. hispidifavolus*, and *P. microsporus*.
- 4, The surface of the pileus may be more or less gelatinous. Examples are the lamellate *P. exiguus* and *P. longinquus* and the poroid *P. bambusifavolus*. Singer gives several examples from tropical America.

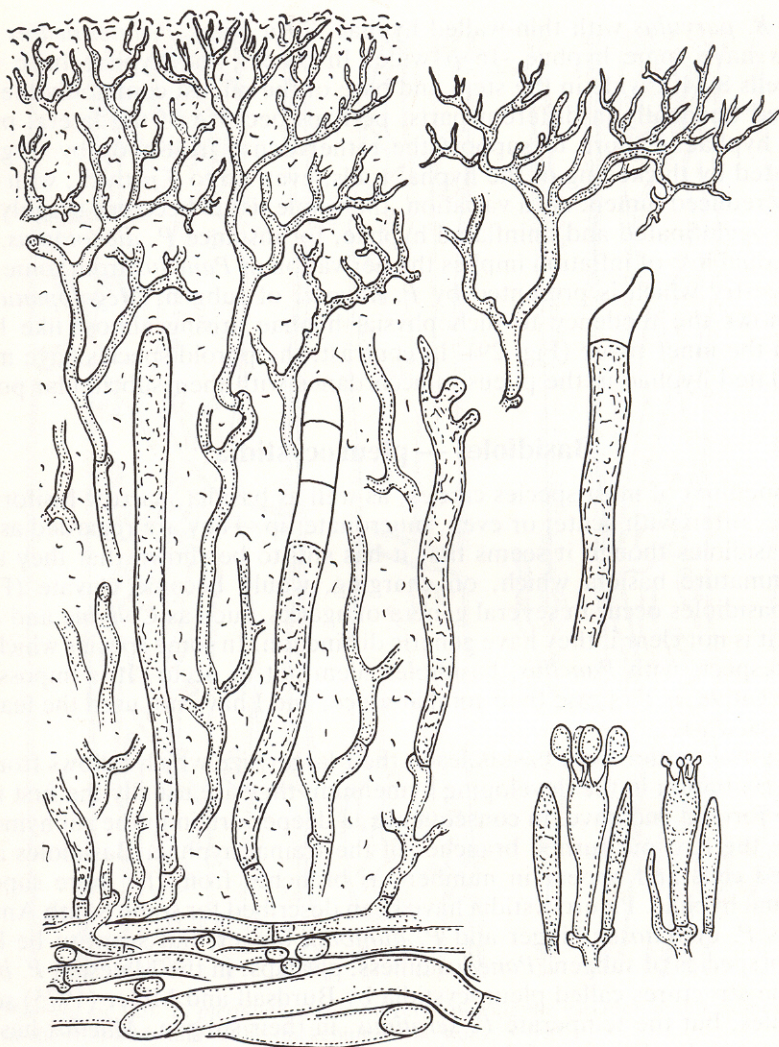


Fig. 5. *Panellus gloeocystidiatus*. Details of the surface of the pileus with gloeocystidia and dichophyal hyphae (simplified), with basidia and acerose basidioles, $\times 1000$. (from *Trans. Brit. Mycol. Soc.* 37, 1954, 257).

This is a degradation series in which the original and detailed construction disappears. As in other cases with a hymeniiderm, or palisade of clavate cells, such as *Amauroderma*, *Boletus*, *Entoloma*, or *pluteus*, it presupposes a trichoderm or cortical pile of inflated and septate ends. The extensive hymeniiderm is shown by subgen. *Mesopanellus* (Figs. 24, 25) and the primitive trichoderm by subgen. *Megalopanellus* (Fig. 28). Both subgenera have the more primitive characters of centric pileus and inflating hyphae.

Hyphae of the fruit-body

The hyphae are monomitic, clamped, inamyloid, and usually colourless, and have short cells up to 250μ long, in a few cases longer but not of exceptional length. There are, however, such differences in the degree of inflation, the thickening of the hyphal walls, and their tendency to become gelatinous that more precise characterisation is impossible (Fig. 6). In subgen. *Panellus* the greatest inflation

occurs in *P. parvulus* with thin-walled hyphae $-20\ \mu$ wide. *P. intermedius* and *P. sublevatus* have some hyphae $-16\ \mu$ wide. In others, the hyphae have slightly inflated cells $8-14\ \mu$ wide in the stem and base of the pileus; commonly these cells are inflated unequally in different parts, perhaps because of the lateral pressure from the hyphae. Failure to support the rather dense fruit-body by turgidity is compensated by thickening of the hyphal walls, even up to $5\ \mu$ thick, with correspondingly reduced lumen. As a variation, the whole tissue becomes toughly gelatinous with agglutinated and uninflated hyphae, for instance *P. dichotomus*.

The gradual loss of inflation implies the derivation of *Panellus* from some typical agaric ancestry which is presented by *P. magnus* of subgen. *Megalopanus*. This species shows the tendency to dichophysial hyphae arising almost like binding hyphae in the inner tissue (Fig. 29). In contrast, the poroid species have more or less uninflated hyphae in the pileus in accordance with their subcircular pores.

Basidioles — pleurocystidia

The hymenium of most species carries, as well as basidia, narrow fusiform cells $3-5\ \mu$ wide, often with acute, or even, mucronate tip. They are regarded as sterile cells or basidioles though it seems that it has still to be shown that they are not merely immature basidia which, on charging, would become clavate (Fig. 7). Acerose basidioles occur in several genera of agarics, such as *Collybia* and *Marasmius*, but it is not clear if they have generic distinction. In some species which agree in other respects with *Panellus*, basidioles seem not to occur. It is impossible to prove a negative, in this case their total absence, and I have not used the feature as a primary character.

Pleurocystidia differ from basidioles in their larger size which follows from their early differentiation in the developing hymenium; they are usually the first mature cells to be formed and have, in consequence, a deeper origin in the subhymenium, even from the first out-turned branches of the tramal hyphae. Basidioles are the last formed cells and appear in numbers as branches from the more superficial subhymenial hyphae. Pleurocystidia have been described for some South American species, as *P. cystidiosus* Singer and *P. dumontii* Singer, but seem to be lacking from other species of subgen. *Panellus* unless, perhaps, in the Malesian *P. bambusarum*. The structures called pleurocystidia by Burdsall and Miller (1975) seem to be basidioles, but the temperate *P. serotinus*, in their subgen. *Mitellus* has abundant pleurocystidia. Species of this subgenus, the distinction of which is not clear, have not been found in Malesia.

Spores and basidia

The impression, gathered from the literature, is that *Panellus* (including *Dicthyopanus*) has rather small, often cylindric to allantoid, spores. This contrasts with the rather large, ellipsoid to subglobose, spores in many species of *Favolaschia*. Any such distinction does not hold, however, in the eastern tropics. In 1963 Kobayasi described *D. orientalis* with subglobose spores $8 \times 7\ \mu$. I add several lamellate and poroid species with moderately large ellipsoid or subglobose spores, among which the poroid *P. megalosporus* is outstanding with subglobose spores up to $18 \times 16\ \mu$, produced by enormous basidia averaging $90 \times 17.5\ \mu$. In contrast, the smallest spores in Malesian species are the minute allantoid spores, averaging $3.5 \times 0.8\ \mu$, of the poroid *P. microsporus* (Fig. 8). *Panellus* is revealed as a genus with great latitude in spores and basidia and one that must have come from an agaric source with large spores on large basidia which qualify for Singer's *Hygrophorus* kind; that is with basidium-length at least 5-6 times the width of the spore. No



Fig. 6. *Panellus* sp. (aff. *P. pteridophytorum* Singer), showing the variation in inflation of the hyphae of the fruit-body and in the thickening of the walls; $\times 500$.

lamellate *Panellus* is known with spores as large as those of *P. megalosporus*, though such a one may be found. I note that the minute allantoid spores of *P. microsporus* should place it in subgen. *Mitellus* but, in all other respects it belongs in subgen. *Panellus*. I note, too, that the spores of the Malesian *P. albifavolus*, *P. ambiguus*, and *P. brunneomaculatus* are hardly amyloid, if at all.

With this range in size of spore and basidium I constructed sporographs and basidiographs but found, as with *Polyporus* (Corner 1981), that no clear locus was obtainable. The reason seemed to be that the variation in size shown mainly by the poroid species, was effected by compression of the basidium-unit in the tubes. Thus, the ratio of spore-width to basidium-width varied from 0.21 in the highly compressed and allantoid spores of *P. microsporus* through all gradations to 0.8 in *P. megalosporus* and 0.87 in *P. orientalis*. However, the usual trends were clear, as follows:

- 1, Spore-volume increased in direct proportion to basidium-volume.
- 2, Spore-width increased with spore-length.
- 3, Basidium-width increased with basidium-length, the smallest structures being the basidioles.

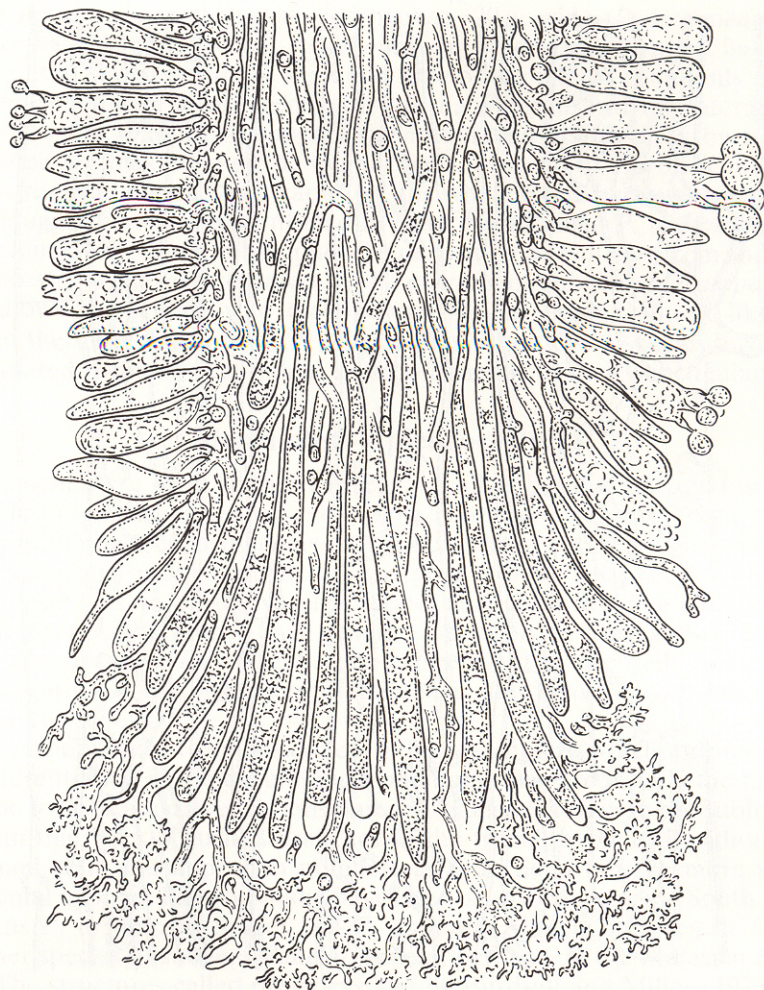


Fig. 7. *Panellus orientalis*, showing the pore-edge with gloeocystidia and dichophysal hyphae; $\times 600$.

- 4, The large spores and large basidia of *P. megalosporus* were consistent with an average sporograph-locus and an average basidium-locus, the value of which, for the basidium-locus, was $l/w = 2.9 \times 0.025l$, where l is the basidium-length and w its width.

Taking figures that I have given for other genera with large spores and basidia (Corner 1983), l/w varies as 0.069l in *Heimiella*, 0.02l in *Oudemansiella*, and 0.013l in *Amauroderma* and *Ganoderma*. These values contrast with 0.08l for the narrow clavarioid basidium.

Phosphorescence

Several species of subgen. *Panellus* are known to be phosphorescent with a greenish light emitted from the gills or pores and the mycelium; others are not phosphorescent, but the majority remains to be tested. The phosphorescent are *P. stypticus* (in North America), *P. luminescens*, *P. gloeocystidiatus*, and the Japanese *Dictyopanus foliicolus* Kobayasi. *P. orientalis*, according to Kobayasi, and *P. megalosporus* are not phosphorescent. In the case of *P. stypticus*, North American

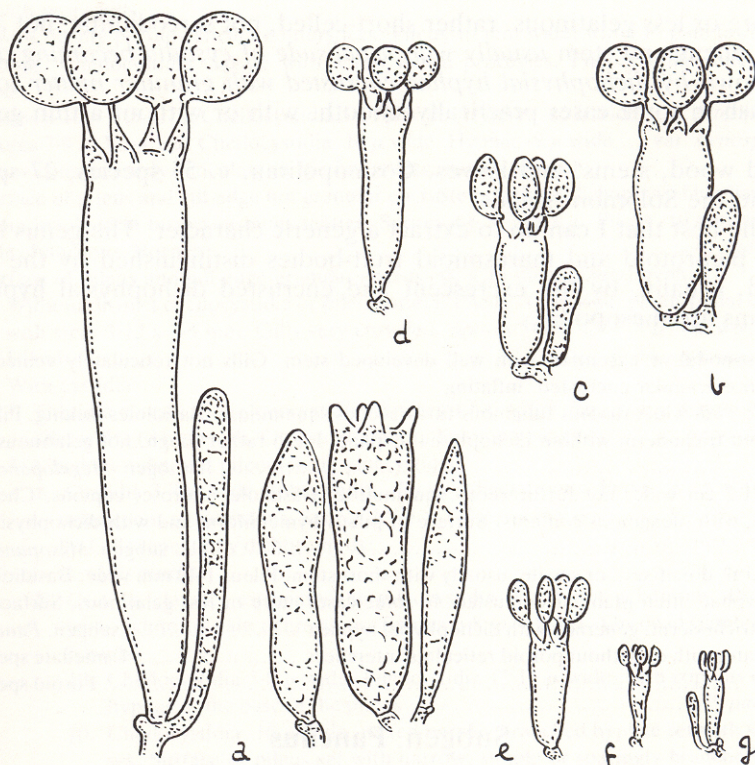


Fig. 8. Basidia and spores of *Panellus*, to show the variation in size and shape; $\times$ c. 700. a, *P. megalosporus*; b, *P. brunneifavolus*; c, *P. luminescens* (large spores); d, *P. orientalis*; e, *P. luminescens* (small spores); f, *P. gloeocystidiatus*; g, *P. microsporus*.

specimens are phosphorescent but not the European. When the mycelia of the two forms were mated, it was found that phosphorescence appeared as a dominant character (Macrae 1937).

Possibly the origin of *Panellus* is to be related with that of the phosphorescent species of *Pleurotus* with large spores (Corner 1981).

Panellus Karst.

Hattsv, Bidr, Finl. Nat. Folk 32 (1879) xiv; Singer, Agaricales Mod. Tax. (1975) 339.

Dictyopanus Pat., Ess. Tax. Hym (1900) 137; Singer, Agaricales Mod. Tax. (1975) 338.

Pileus mesopodal, pleuopodal, or sessile, medium-sized to very small, mostly white, bistre, ochraceous, to cinnamon and rufous brown but golden yellow, olive green, or violaceous in exotic species, mostly opaque, gymnocarpic with incurved margin. Gills adnate to decurrent, or with small to minute pores; edges of gills or pores usually chalky pruinose. Flesh thin, soft, tough or more or less gelatinous.

Spores white, smooth, more or less amyloid, subglobose to ellipsoid, cylindric or allantoid, large to minute. Basidia mostly 4-spored; basidioles subacerose, but lacking in some species; subhymenium usually narrow, with interwoven hyphae; hymenium not thickening. Cheilocystidia usually present, thin-walled, with or without oleaginous contents, in some species emitting diverticula, forming a sterile edge to gill or pore, generally becoming overgrown with encrusted dichophysial hyphae. Pleurocystidia generally absent except in some exotic species. Hyphae monomitic, usually clamped, inflating or not, with thin or thickened walls, in some

species more or less gelatinous, rather short-celled, not sarcodimitic, not amyloid. Surface of pileus and stem *usually with a palisade of cystidia becoming disrupted and overgrown by dichophysial hyphae encrusted with granular matter* soluble in dilute potash in some cases practically smooth, with or without a thin gelatinous pellicle.

On dead wood, stems, and leaves, Cosmopolitan, c. 55 species, 27 species in Malesia and the Solomon Islands.

This is the best that I can do to extract a generic character. The genus has what are called pleurotoid and marasmiod fruit-bodies distinguished by the amyloid spores and, usually, by the excrescent and encrusted dichophysial hyphae. No poroid forms are mesopodal.

1. Pileus mesopodal or excentric, with well developed stem. Gills not reticulately veined. Hyphae generally not granular encrusted, inflating
2. Pileus 2-9 cm wide, fuscous fuliginous furfuraceous squamulose. Basidioles lacking. Pileus with a disrupted trichoderm without dichophysial hyphae. Flesh rather tough, not gelatinous subgen. *Megalopanellus* p. 143
2. Pileus 1-2 cm wide, not furfuraceous squamulose. Basidioles acerose, copious. Cheilocystidia clavate, with oleaginous contents. Surface of pileus hymeniiform and with dichophysial hyphae subgen. *Mesopanellus* p. 139
1. Pileus lateral, dorsifixed, or sessile, usually with short stem. Pileus 1-40 mm wide. Basidioles present or not. Hyphae often granular encrusted, in some cases more or less gelatinous. Surface of pileus without a trichoderm, generally with dichophysial hyphae subgen. *Panellus* p. 114
3. Lamellate, with or without poroid reticulate interstices Lamellate species p. 114
3. Poroid Poroid species p. 128

Subgen. *Panellus*

Singer, Agaricales Mod. Tax. (1975); Burdsall and Miller (1975). 24 species in Malesia and the Solomon Islands (11 lamellate, 13 poroid).

Key to the lamellate species of subgen. *Panellus* in Malesia and the Solomon Islands

1. Hymenium without acerose basidioles. Surface of pileus and gill-edge not granular encrusted Group A
1. With acerose basidioles. Surfaces generally granular encrusted Group B

GROUP A

1. Pileus sessile, dorsifixed, -15 mm wide. Gills distant, 1 mm wide. Spores $4.3-5 \times 3.5-4 \mu$, deeply amyloid. Surface of pileus with appressed oleaginous hyphae in a single layer. Cystidia none. Borneo *P. pendens* p. 126
1. Pleuropodal, Spores larger, pale amyloid. Pileus -30 mm wide, surface with different structure.
 2. Spores $7.5-10 \times 3.3-4 \mu$ m. Cystidia none. Hyphae -21 μ wide. Surface of pileus with a thin gelatinous layer, pale bistre ochraceous. Gills -5 mm wide. Queensland *P. longinquus* p. 124
 2. Spores $5-6 \times 4.7-5.7 \mu$, subglobose. Cheilocystidia clavate to ventricose. Hyphae -13 μ wide. Surface of pileus dry, with a disrupted palisade of clavate cells with pale fuscous sap, buff-white and fuscous brownish scurfy. Borneo *P. fuscatus* p. 121

GROUP B

1. Pileus 1-3 mm wide. Gill-primaries 3-5, often pore-like if without short secondaries
 2. Dorsifixed, pale fawn. Spores $8.5-10.7 \times 3.7-4.5 \mu$. Cheilocystidia cylindric to clavate. Surface of pileus subgelatinous. On fern petioles. Malaya *P. exiguus* p. 120
 2. Pleuropodal, white, scurfy-pruinose. Spores $7-8 \times 5-6 \mu$. Gill-edge and surface of pileus with dichophysial hyphae. On dead bamboo. Borneo *P. sublevatus* p. 127
(Spores $4.5-6 \times 3-3.7 \mu$ *P. bambusarum* p. 117)

1. Larger, with more gills
 3. Gills with deeply poroid-reticulate interstices. Pileus-10 mm wide, white to pale fawn. Flesh not gelatinous. Cheilocystidia clavate with a few apical processes. Pileocystidia none. On sticks. Borneo
 4. Spores $8-10 \times 4.5-5.7 \mu$. Cheilocystidia $5-11 \mu$ wide. Hyphae -16μ wide ... *P. intermedius* p. 123
 4. Spores $7-9 \times 3.5-4.5 \mu$. Cheilocystidia -14μ wide. Hyphae -9μ wide ... var. *stenosporus* p. 124
 3. Gills not conspicuously reticulate in the interstices, mostly smooth.
 5. Surface of pileus and gill-edge not granular encrusted, without dichophysal hyphae. Cheilocystidia involved in brown resinous matter. Spores $4-6 \times 2.5-3 \mu$. Pileus -10 mm wide, sessile, pale alutaceus. Borneo *P. alutaceus* p. 115
 5. Surface of pileus and gill-edge granular encrusted, with dichophysal hyphae
 6. Without distinct cheilocystidia or pileocystidia. Pileus -4 cm wide, pleuropodal or excentric, with stem $3-12 \times 2-4$ mm. Gills very crowded. Spores $5-6.5 \times 2-2.5 \mu$. On wood, Solomon Islands *P. brunneomaculatus* p. 118
 6. With cystidia
 7. Cystidia clavate, not gloecystidial. Spores $4.5-6 \times 3-3.7 \mu$. Pileus -6 mm wide, subsessile, white to brownish. On dead bamboo. Solomon Islands *P. bambusarum* p. 117
 7. Cheilocystidia and pileocystidia gloecystidial
 8. Cystidia $3-7 \mu$ wide, subcylindric. Flesh subgelatinous. Pileus -3 cm wide, brownish ochraceous to subrufous. Spores $2.7-3 \times 1.7-2 \mu$. On wood *P. dichotomus* p. 118
 9. Gills repeatedly dichotomous var. *dichotomus* p. 118
 9. Gills pinnate var. *pinnatus* p. 120
 8. Cystidia clavate, especially the pileocystidia. Flesh not gelatinous. Pileus -10 mm wide, white to pale ochraceous. Spores $6-8 \times 4-5.5 \mu$. On dead bamboo. Solomon Islands.
 10. Cheilocystidia $5-8 \mu$ wide. Pileocystidia $12-15 \mu$ wide, with copious dichophysal hyphae at the base of the pileus *P. parvulus* p. 125
 10. Cheilocystidia -16μ wide, mixed narrow branched hyphae set with short processes. Surface of pileus set with narrow, simple or sparingly branched, excrescent hyphae, not dichophysal. Spores not or scarcely amyloid *P. ambiguus* p. 116

***Panellus alutaceus* sp. nov.**

Fig. 9

Ex integro alutaceus, sessilis, horizontalis. Pileus -10 mm in radio, siccus, basim versus subvillosus. Lamellae confertae. Caro subcoriacea, haud gelatinosa.

Sporae $4-6 \times 2.5-3 \mu$, amyloideae. Basidiola acerosa inconspicua. Cheilocystidia $20-35 \times 4-7 \mu$, lanceolata vel subventricosa, saepe breviter appendiculata vel capitata, haud incrustata, in resina brunnea immersa. Pileocystidia nulla. Hyphae -18μ irregulariter inflatae, fibulatae, tunicis $1-2 \mu$ crassis, haud incrustatae. Superficies pilei hyphis angustis $2-5 \mu$ latis appressis ut in lamina c. 20μ crassa instructa.

Ad lignum emortuum in silva. Borneo, mt. Kinabalu, 20 Jul. 1961, *Corner s.n.* typus, in herb. Corner.

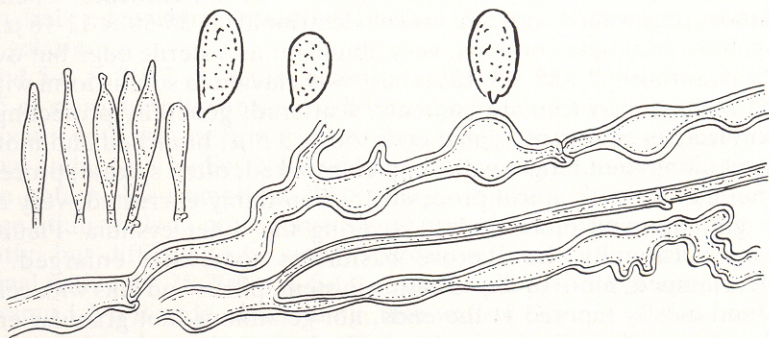


Fig. 9. *Panellus alutaceus*. Spores, $\times 2000$; cheilocystidia and hyphae of the pileus, $\times 500$.

Sessile, horizontal, pale biscuit colour. Pileus 1 cm radius, subvillous towards the base, dry. Gills arising from the base, c. 14 primaries 1 mm wide, 3-4 ranks, not dichotomous, somewhat crowded, the edge entire and darker. Flesh thin, floccoso-firm to subcoriaceous, no gelatinous layer.

Spores $4-6 \times 2.5-3 \mu$, white, smooth, pip-shaped, amyloid. Basidia $18-25 \times 4 \mu$; sterigmata 4; acerose basidioles present but inconspicuous. Cheilocystidia $20-35 \times 4-7 \mu$, lanceolate to subventricose, often with a short cylindric appendage, capitate or not, thin-walled, not encrusted but involved in resinous brown matter, forming a sterile gill-edge. Pleurocystidia none. Hyphae monomitic, clamped, irregularly inflating -18μ wide, often of different widths in different parts of a cell, the walls eventually thickening $1-2 \mu$ closely interwoven and longitudinal in the pileus descending and subparallel in the gills; not granular encrusted. Surface of pileus covered by a thin layer c. 20μ thick of narrow, radiating, mostly thin-walled hyphae $2-5 \mu$ wide, without pileocystidia but with some excrescent hyphal ends at the base of the pileus.

On dead wood in the forest. Borneo.

Mt. Kinabalu, east ridge 3200 m alt., 20 July 1961, *Corner s.n.*

***Panellus ambiguus* sp. nov.**

Albus, dein in centro pilei pallide ochraceus, sessilis vel subpleuropodalis. Pileus -10 mm latus, convexus dein planus, striatus. Stipes ut pulvinula lateralis vel nullus. Lamellae adnatae, subdistantes, primariis 6-12, haud reticulatae, acie pruinosa. Caro mollis, haud gelatinosa.

Sporae $6-8.5 \times 4-5.7 \mu$, haud vel vix amyloideae, Basidiola acerosa. Cheilocystidia trimorpha; $35-50 \times 11-16 \mu$, clavata, intus oleaginosa, copiosa sed aliis superantibus; $-55 \times 7-12 \mu$, subclavata vel subfusiformia obtusa, intus oleaginosa; $-50 \times 3-5 \mu$, subcylindrica ramosa, diverticulis copiosis, simplicibus spiciformibus vel furcatis, -11μ longis praedita, leniter incrustata. Pileocystidia ut cheilocystidia clavata, hyphis $1-1.8 \mu$ latis sparsim vel vix ramosis superantibus, haud dichophysalibus. Hyphae $3-14 \mu$ latae, fibulatae, nec gelatinosae nec incrustatae.

Ad folia caulesque bambusarum in silva. Insulae Solomonenses, Guadalcanal RSS 566 typus, in herb. Corner.

White, the pileus pale cream ochraceous in the centre, sessile or subpleuropodal. Pileus -10 mm wide, convex then plane, reniform, smooth, striate; margin subpruinose. Stem as a slight lateral cushion or none. Gills adnate, subdistant, thin, dry, 6-12 primaries -1 mm wide, 3-4 ranks, not poroid or veined, the edge minutely pruinoso-scurfy. Flesh thin, soft, not gelatinous.

Spores $6-8.5 \times 4-5.7 \mu$, white, smooth, pip-shaped, with rather oleaginous contents, not or slightly amyloid. Basidia $24-33 \times 6-6.5 \mu$; sterigmata 4, $4-5 \mu$ long; acerose basidioles numerous; subhymenium narrow, not corticate. Cheilocystidia of three kinds, thin-walled, not amyloid or dextrinoid; 1, $35-50 \times 11-16 \mu$, clavate, with oleaginous-vacuolate contents, very abundant as a sterile edge but overgrown by the others, smooth; 2, $-55 \times 7-12 \mu$, narrowly clavate to subfusiform with obtuse apex, with oleaginous-vacuolate contents, scattered, generally projecting beyond the first kind; 3, as emergent hyphal ends $-50 \times 3-5 \mu$, branched and more or less copiously set along their length with simple or forked, often spicate, processes $2-11 \mu$ long, (not clavate with apical processes), often thinly encrusted, very abundant along the gill-edge and more or less covering the other cystidia. Pleurocystidia none, but occasionally the acerose basidioles somewhat enlarged. Hyphae monomitic, clamped, more or less inflating in stem, pileus and gills with cells $40-200 \times 3-14 \mu$ and mostly tapered at the ends, not gelatinous, not granular encrusted, more or less longitudinal, rather compact. Surface of pileus covered with filiform, simple or sparingly branched, more or less erect hyphae $1-1.8 \mu$ wide, not gelatinous, with scattered and more or less decumbent pileocystidia like the larger

clavate cheilocystidia (of first kind), with abundant spores embedded in the finely villous surface.

On dead bamboo in the forest, Solomon Islands.

Guadalcanal, Gallego, Hidden Valley, 5 July 1965, RSS 566.

This was collected as *Marasmius*, which the practically inamyloid spores suggest, but it is difficult to see any satisfactory distinction from *Panellus* in view of the variety in the genus, and it is certainly close to *P. parvulus*.

***Panellus bambusarum* sp. nov.**

Fig. 10

Albus, dein pallide brunneus. Pileus -6 mm latus, lateralis subsessilis conchiformis dein planus. Stipes -1 × 0.3-0.5 mm. Lamellae adnatae subdistantes, primariae 4-6, vel subconfertae primariae 6-11, acie pruinosa. Caro mollis, haud gelatinosa, in pileo c. 100 μ crassa.

Sporae 4.5-6 × 3-3.7 μ , ellipsoideae amyloideae. Basidiola acerosa. Cheilocystidia -28 × 4-7 μ , subclavata, hyphis dichophysialibus incrustatis superantibus. Pleurocystidia -18 × 4-6 μ , ventricosa, in apicem gracilem prolongata, sparsa. Pileosystidia -50 × 4-7 μ , copiosa. Hyphae fibulatae (ut videtur), vix inflatae 1.5-11 μ latae. Superficies pilei stipitisque hyphis dichophysialibus superantibus, tenuiter incrustatis.

Ad caules emortuos bambusarum. Insulae Solomonenses, Guadalcanal, RSS 1653 typus, in herb. Corner.

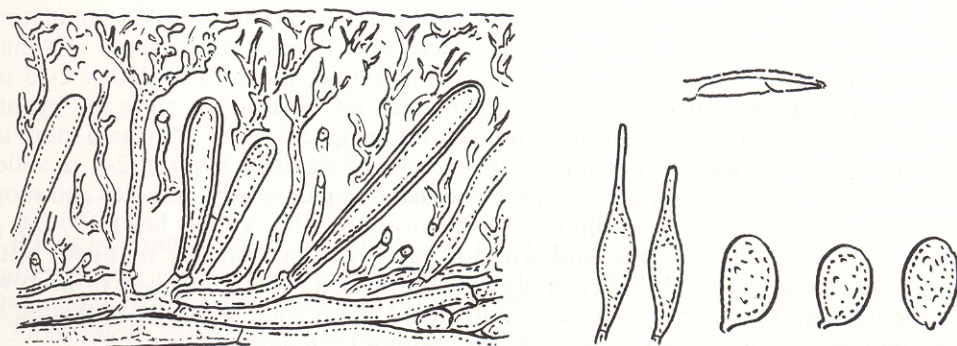


Fig. 10. *Panellus bambusarum*. Fruit-body, × 3; spores, × 2000; pleurocystidia and surface of pileus,

Pileus 3-6 mm wide, lateral, subsessile, conchate then flattened, *white then pale brownish drab-white*, substrate. Stem 0.3-1 × 0.3-0.5 mm, lateral, relatively thick. Gills adnate, subdistant, 4-6 primaries 0.5 mm wide, 2 ranks, but rather crowded with 6-11 primaries and 3-4 ranks in RSS 1654, not veined or poroid, white then pale fawn drab, edge whitish pruinose. Flesh c. 100 μ thick at the base of the pileus, soft, not gelatinous.

Spores 4.5-6 × 3-3.7 μ , white, smooth, ellipsoid, pale bluish amyloid. Basidia 18-22 × 5 μ ; sterigmata 4; subacrose basidioles present. Cheilocystidia -28 × 4.5-7 μ , subclavate, with thin or firm walls, overgrown by a mass of profusely diverticulate hyphal ends, with bodies 2-4 μ wide, -50 μ long overall, with thin incrustation soluble in potash. Pleurocystidia -38 × 4-6 μ , ventricose with a slender subacute appendage, thin-walled, not encrusted, scattered. Hyphae monomitic, clamped (apparently, but difficult to be sure), scarcely inflating, thin-walled: in the stem longitudinal with cells 25-200 × 1.5-11 μ ; in the pileus 1.5-8 μ wide, radiating; in the gill-trama 1.5-6 μ wide, descending, thin-walled. Surface of stem and pileus as the gill-edge but with more copious subclavate thin-walled cells -50 × 4-7 μ , (not gloeocystidial), thinly encrusted.

On dead bamboo stems, rather scattered, Solomon Islands.

Guadalcanal. Popomanasiu, 1800 m alt., RSS 1653 & RSS 1654.

***Panellus brunneomaculatus* sp. nov.**

Albus, dein stipite pileoque rufobrunneo-maculatus. Pileus -4 cm latus, convexus dein planus, villosulus opacus. Stipes 3-12 × 2-4 mm, excentricus vel lateralis, villosulus. Lamellae adnexae angustae confertissimae, acie albofurfuracea. Caro firma, haud gelatinosa.

Sporae 5-6.5 × 2-2.5 μ , cylindricae, amyloideae vel vix. Basidiola acerosa copiosa. Cheilocystidia vix evoluta, lamellae acie hyphis dichophysialibus incrustatis copiosis. Pleurocystidia, caulocystidia et pileocystidia nulla. Hyphae fibulatae, 2-13 μ latae, ad basim stipitis crasse tunicatae. Superficies stipitis hyphis 2-5 μ latis excrescentibus, tunicis tenuibus, plus minus incrustatis praedita, Superficies pilei hyphis dichophysialibus 1-2.5 μ latis copiosis incrustatis praedita.

Ad truncum emortuum in silva. Insulae Solomonenses, Kolombangara, RSS 1106 typus, in herb. Corner.

White, then the stem and pileus suffused and spotted dull rufous brown. Pileus -4 cm wide, convex then plane, smooth, opaque, drying finely subvillous. Stem 3-12 × 2-4 mm, *excentric to lateral, short, subcylindric, solid, finely subvillous*. Gills adnexed, *very crowded, narrow*, 26-31 primaries -1.3 mm wide, 4-5 ranks edge minutely chalky pruinose. Flesh 2-3 mm thick in the centre of the pileus, firm but watery. Smell none.

Spores 5-6.5 × 2-2.5 μ , white, smooth, rod-like, very pale bluish amyloid or not at all. Basidia 19-24 × 4 μ ; sterigmata 4; acerosae basidioles 3-4 μ wide, copious; subhymenium very narrow. Cheilocystidia none, or as scattered enlarged basidioles -40 × 6 μ , the gill-edge becoming overgrown with narrow, thin-walled, lobulating dichophysial hyphae 1-2 μ wide, thinly encrusted. Pleurocystidia none. Hyphae monomitic, clamped, subcylindric, rather short-celled, the cells 40-250 × 2-13 μ , with firm walls (subdiffluent in potash); towards the base of the stem the hyphal walls 1-2 μ thick; in the pileus longitudinal and compact; in the gill-trama more or less descending. Surface of stem with excrescent devious hyphae 2-5 μ wide, thin-walled, septate, more or less thinly encrusted in places with granules and short acicular crystals insoluble in dilute potash, forming a thin villous layer 100-200 μ thick, not as a regular pile and without caulocystidia. Surface of pileus with appressed radiating hyphae becoming covered with a subvillous layer of narrow, branching and lobulating, dichophysial hyphae 1-2.5 μ wide, granular encrusted as on the stem but more profusely branched, without pileocystidia.

On a dead standing trunk in the forest. Solomon Islands.

Kolombangara, low alt., 27 Aug. 1965, RSS 1106.

This has the appearance of a less reduced lamellate *Panellus* but is peculiar in the non-dichophysial covering of the stem, in contrast with the pileus and gill-edges, and the insoluble incrustation. In the almost inamyloid spores, it might be considered a species of *Marasmius*, under which name it was collected. Nevertheless, the species appears to be very close to that described from Argentina with practically no stem and with shorter spores as *P. stenocystis* Singer (Sydowia Beih, 7, 1973, 32).

***Panellus dichotomus* sp. nov.**

Fig. 11

Pileus -32 mm latus, pleuropodalis, convexus dein applanatus reniformis, minute rimosus, subfurfuraceus, cremeo-albus dein cervino-ochraceus vel subrufus. Stipes 1-3 × 2-5 mm, crassus lateralis brunneolus. Lamellae confertae, angustae, dichotomae ter quinquies, cremeo-albae, acie cretaceopruinosa. Caro tenax, subgelatinosa, albida, sicco cornea.

Sporae 2.7-3 × 1.7-2 μ , ellipsoideae, amyloideae. Basidiola subacerosa, copiosa. Cheilocystidia 20-60 × 3-7 μ , ut gloeocystidia, cylindrica vel subfusiformia, saepe ex apice diverticulata, hyphis dichophysialibus incrustatis superantibus. Hyphae fibulatae, vix inflatae, tunicis tenuiter subgelatinosis. Superficies pilei stipitisque ut lamellae acie, gloeocystidiis numerosis, hyphis dichophysialibus superantibus.

Ad truncos ramulosque delapsos in silva. Peninsula Malayana, Borneo, New Guinea; RSNB 5362 typus, in herb. Corner.

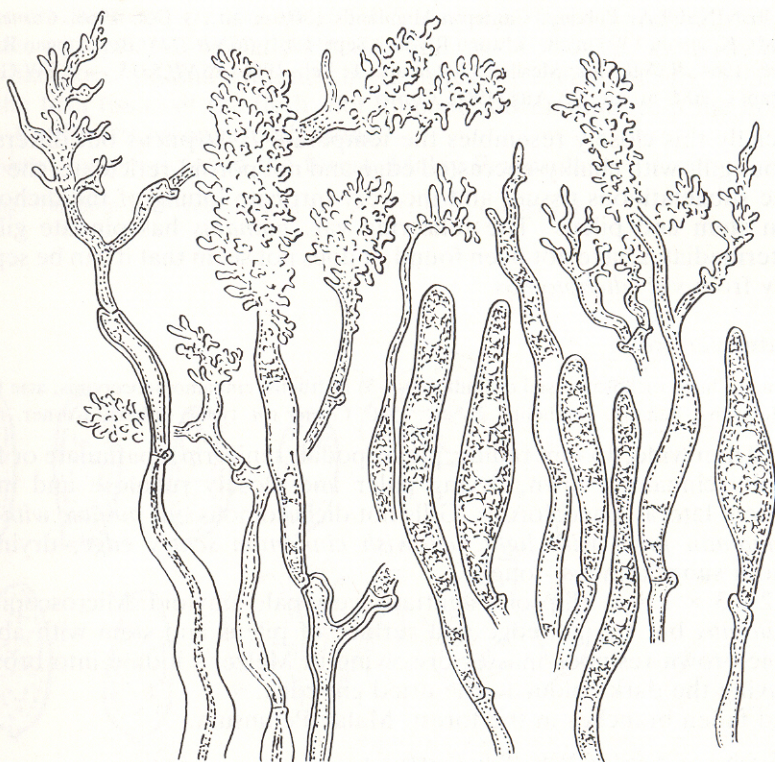


Fig. 11. *Panellus dichotomus*. Cheilocystidia, $\times 1000$.

Pileus -21 mm radius, 32 mm wide, pleuropodal, convex then more or less flattened and reniform, *finely cracked* and rather scurfy, *cream-white then light fawn, fawn ochraceous, or subrufous*; margin incurved at first, white. Stem 1-3 $\times$ 2-5 mm, short, thick, lateral, cracked and scurfy, brownish. Gills *narrow, crowded*, 30-50 primaries -1 mm wide, *dichotomous* 3-5 times, sometimes with a free short gill near the margin of pileus, *white to pale cream with chalky edge*. Flesh -2.5 mm thick at the base of the pileus, *tough, pliant, subgelatinous*, drying very hard and horny, pallid white.

Spores 2.7-3 $\times$ 1.7-2 μ , white, smooth, ellipsoid, faintly amyloid. Basidia 14-17 $\times$ 3.5-4.5 μ ; sterigmata 4; basidioles subacrose, abundant; with more or less amyloid mucilage round the basidia. Cheilocystidia 20-60 $\times$ 3-7 μ , subcylindric to subfusiform with oleaginous gloeocystidial contents, often developing one or more apical processes with short lobes -7 $\times$ 1.5 μ , investing the cystidia, and with exrescent hyphae 1-2.5 μ wide, with short intricate branches and lobings, even coralloid, little incrustated with granular matter soluble in potash, as sterile gill-edge. Pleurocystidia none. Hyphae monomitic, clamped, scarcely inflated, with toughly subgelatinous walls, inseparable, more or less radiating, descending in the gills. Surface of pileus and stem developed as the gill-edge as a more or less continuous, but loose, layer -100 μ thick of cystidia like the cheilocystidia with gloeocystidial contents, sending out processes 2-4 μ wide, mainly apical, developing into the lobed and spicate dendrophyses or dichophyses, accompanied by similar processes exrescent from the narrow superficial longitudinal hyphae, not mucilaginous but encrusted with brownish granular matter soluble in potash.

On wood, sticks, and fallen branches in the forest. Malay Peninsula, Borneo, New Guinea; lowland and montane.

MALAY PENINSULA. Pahang, Cameron Highlands 1300 m alt., 1 Oct. 1966, *Corner s.n.* — BORNEO. Mt. Kinabalu 1300 m alt., Liwagu River, 3 Sept. 1961, *RSNB 2715*; Bembangan River 1700 m alt., 19 Feb. 1964, *RSNB 5362*; Mesilau 1700 m alt., 11 Feb. 1964, *RSNB 5315*. — NEW GUINEA. Papua, Woitapi c. 2000 m. alt., 23 Aug. 1960, *Corner s.n.*

Superficially this closely resembles the temperate *P. stypticus* but differs in the dichotomous gills with chalky-encrusted edge and not poroid-reticulate, the smaller spores, the subgelatinous tissue, and the very intricate lobing of the dichophysial hyphae on stem and pileus. The following var. *pinnatus* has pinnate gills and, though intermediates have not been found, it does not seem that it can be separated specifically from var. *dichotomus*.

var. **pinnatus** var. *nov.*

Differt lamellis haud dichotomis sed ordinibus 3-4(-5) instructis, cinnamomeocervinis, acie flavidula. Peninsula Malayana, Pahang, Tembeling, 8 Nov. 1930, *Corner s.n.* typus, in herb. Corner.

Pileus -20 mm wide, 15 mm radius, pleuropodal, reniform, spatulate or flabelliform, wholly cinnamon fawn, drying paler and closely rugulose and minutely cracked. Stem lateral, concolorous. Gills not dichotomous but *pinnate with 3-4(-5) ranks, cinnamon fawn with light yellowish cinnamon scurfy edge*, drying dark brown. Flesh subgelatinous, tough.

Spores $2.7-3 \times 1.8 \mu$, ellipsoid, aguttate, very pale amyloid. Microscopically as var. *dichotomus* but the gill-edge and surface of pileus and stem with abundant microscopic brown resinous masses dissolving in Melzer's iodine into brown oily masses, giving the dark colour to the dried gill-edge.

On dead fallen branches in the forest. Malay Peninsula.

Pahang, Tembeling, 8 and 10 Nov. 1930, *Corner s.n.*

Panellus exiguus sp. *nov.*

Figure 12

Pileus -2 mm latus, dorsifixus cupulatus dein fere planus, laevis, sublobatus, pallide cervinus. Stipes -1.5 $\times$ 0.5 mm, dorso-lateralis, in pileo subito expansus, concolor, ad basim disco membranaceo affixus. Lamellae 3-5 alveoliformes, haud reticulatae, concolores. Caro superficie tenuiter gelatinosa.

Spores $8.5-10.7 \times 3.7-4.5 \mu$, subcylindricae amyloideae. Basidiola acerosa copiosa. Cheilocystidia -30 $\times$ 5-8 μ , cylindrica vel clavata, hyphis dichophysialibus superantibus. Pileocystidia 20-38 $\times$ 5-7 μ , in pellicula gelatinosa immersa. Caulocystidia nulla? Hyphae fibulatae, vix inflatae, 1.5-8 μ latae, tunicis -2 μ crassis.

Ad petiolorum filicium in silva. Peninsula Malayana, Pahang, Cameron Highlands, 4 Oct. 1966, *Corner s.n.* typus, in herb. Corner.

Very small, pale fawn. Pileus -2 mm wide, dorsifixed, *cupular then almost plane* and horizontal, slightly lobate at the margin, smooth. Stem 0.5-1.5 $\times$ 0.5 mm, subcylindric, enlarged suddenly into the pileus, with a small membranous disc at the base. Gills 3-5 primaries -0.4 mm wide, meeting more or less centrally under the pileus, mostly with a small secondary gill, interstices smooth, the underside of the pileus appearing alveolate. Flesh 0.2-0.4 mm thick at the base of the pileus, firm, with a *thin gelatinous layer* (30-40 μ thick) on stem and pileus.

Spores $8.5-10.7 \times 3.7-4.5 \mu$, white, smooth, subcylindric, obtuse, thin-walled, pale violaceous amyloid, very abundant. Basidia 23-30 $\times$ 7-7.5 μ ; sterigmata 4, 5-7 μ long; basidioles acerosae to mucronate, abundant; subhymenium narrow, not corticate. Cheilocystidia -30 $\times$ 5-8 μ , cylindric to clavate, thin-walled, smooth, contents hyaline to vacuolate (not gloeocystidial), eventually with some excrescent, sparsely branched or lobulate hyphae 1-2 μ wide inserted among them. Pleurocystidia none. Hyphae monomitic, clamped, scarcely inflated, the cells -230 $\times$ 1.5-8 μ the walls 0.5-2 μ thick, firm, often shortly lobulate, very closely interwoven. Surface of pileus and stem with a thin gelatinous layer 30-40 μ thick on the pileus,

thinner on the stem, composed of $1-1.5\ \mu$ hyphae laxly branched, not or scarcely lobulate, with gelatinous walls. Pileocystidia $20-38 \times 5-7\ \mu$, as sterile basidia with somewhat gloeocystidial contents, more or less divergent into the gelatinous layer from the firm tissue of the flesh, not lobulate, developing from the margin of the pileus. Caulocystidia apparently none.

On dead fern petioles in the forest. Malay Peninsula.

Pahang, Cameron Highlands 1600 m alt., 4 Oct. 1966, *Corner s.n.*

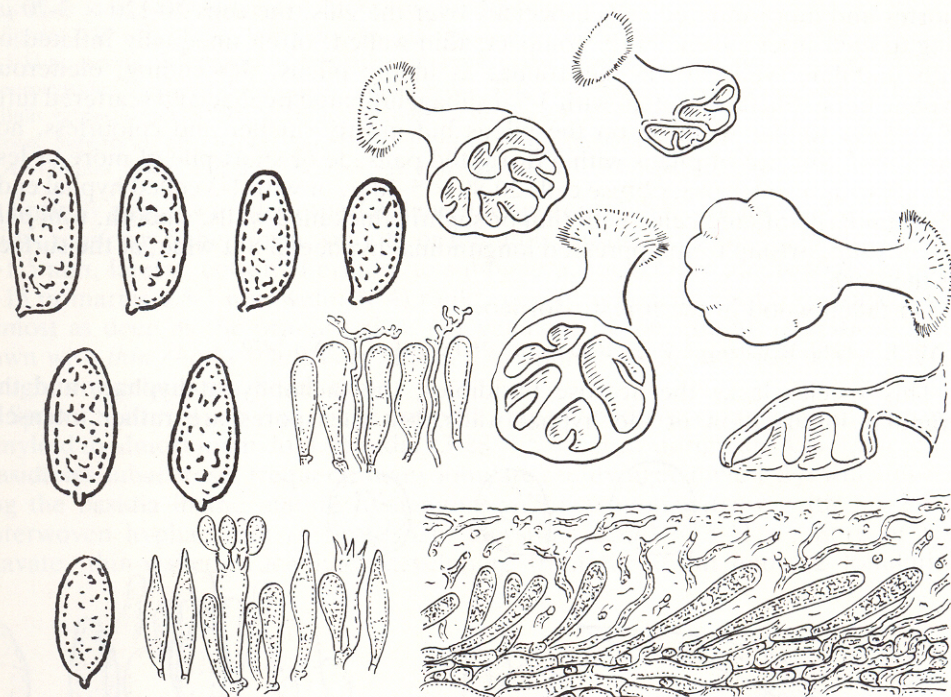


Fig. 12. *Panellus exiguus*. Fruit-body, $\times 10$; spores $\times 2000$; basidia, cheilocystidia, and surface of pileus, $\times 500$.

Panellus fuscatus sp. nov.

Fig. 13

Pileus -3 cm latus, pleuropodalis, reniformis vel flabelliformis, pallide albido-alutaceus, ultimo fuscibrunneo-pruinosis. Stipes -25 $\times$ 3 mm, albus, basi abruptus, pruinoso-furfuraceus. Lamellae decurrentes confertae angustae albae, acie obtusa pruinosa, Caro tenax.

Sporae $5-6(-6.5) \times 4.7-5.7\ \mu$, subglobose amyloideae. Basidiola acerosa nulla. Cheilocystidia $23-55 \times 5-20\ \mu$, clavata vel ventricosa, etiam subcylindrica, tenuiter tunicata, haud incrustata. Pleurocystidia nulla. Pileocystidia $20-80 \times 5-20\ \mu$, clavata vel ventricosa, succo fuscidulo intus. Caulocystidia similia sed incolorata, haud incrustata. Hyphae fibulatae, inflatae; in stipite -13 μ latae, tunicis tenuibus vel crassiusculis; in pileo -20 μ latae.

Ad lignum in silva. Borneo, mt. Kinabalu, *RSNB 5479* typus, in herb. Corner.

Pileus -3 cm wide, pleuropodal, reniform to flabelliform, horizontal, *pallid buff white, finely fuscous brownish scurfy pruinose*, not striate. Stem -25 $\times$ 3 mm, lateral, with slightly dilated apex, solid, fibrous, *white and white scurfy pruinose upwards*, base abrupt. Gills decurrent, *crowded, narrow*, c. 40 primaries -2 mm wide, 2-3 ranks, some dichotomous, *white, the obtuse edge pruinose*. Flesh 1.5 mm thick at the base of the pileus, rather tough, especially in the stem, white. Smell none.

Spores $5-6(-6.5) \times 4.7-5.7\ \mu$, white, smooth, ovoid-subglobose, thin-walled, guttulate opalescent, rather pale bluish amyloid, (bluish black in the mass). Basidia

27-30 $\times$ 6.5-7 μ , guttulate-opalescent, brown in Melzer's iodine; sterigmata 4, 4 μ long; acerose basidioles none; subhymenium 12-16 μ thick, composed of subagglutinated hyphae 1.5-3 μ wide, interwoven. Cheilocystidia 23-55 $\times$ 5-20 μ , clavate to ventricose or waisted, varying subcylindric, obtuse, thin-walled, colourless, not encrusted, as a broad sterile edge to the gill. Pleurocystidia none. Hyphae monomitic, clamped, inflating, not encrusted, not amyloid; in the *stem* parallel, longitudinal, cylindric, the cells 45-600 $\times$ 2-13 μ , with broad septa and often slightly thickened walls, mainly fibrillose but subagglutinated in places; in the *pileus* with shorter and more inflated cells especially over the gills, the cells 20-120 $\times$ 3-20 μ , longitudinal interwoven, fairly compact, thin-walled, often unequally inflated or with undulate walls; in the gill-trama, as in the pileus, descending; oleiferous hyphae none. Surface of stem with 3-5 μ subagglutinated hyphae and scattered tufts of cystidia similar to those on the pileus but mostly smaller and colourless, not encrusted. Surface of pileus with a disrupted palisade or short pile of more or less clavate to subventricose, obtuse cells 20-80 $\times$ 5-20 μ , or with 1-3 celled hyphal ends with similarly inflated cells, with thin or slightly thickened walls, smooth, with *pale fuscous sap*, arising from appressed longitudinal hyphae, 3-8 μ wide, at the surface of the flesh.

On fallen wood in the forest. Borneo.

Mt. Kinabalu, Bembangan River 1800 m alt., 26 Feb. 1964, RSNB 5479.

This species lacks the acerose basidioles, the dichophysal hyphae, and the granular incrustation of the hyphal walls, but the spores are rather intensely

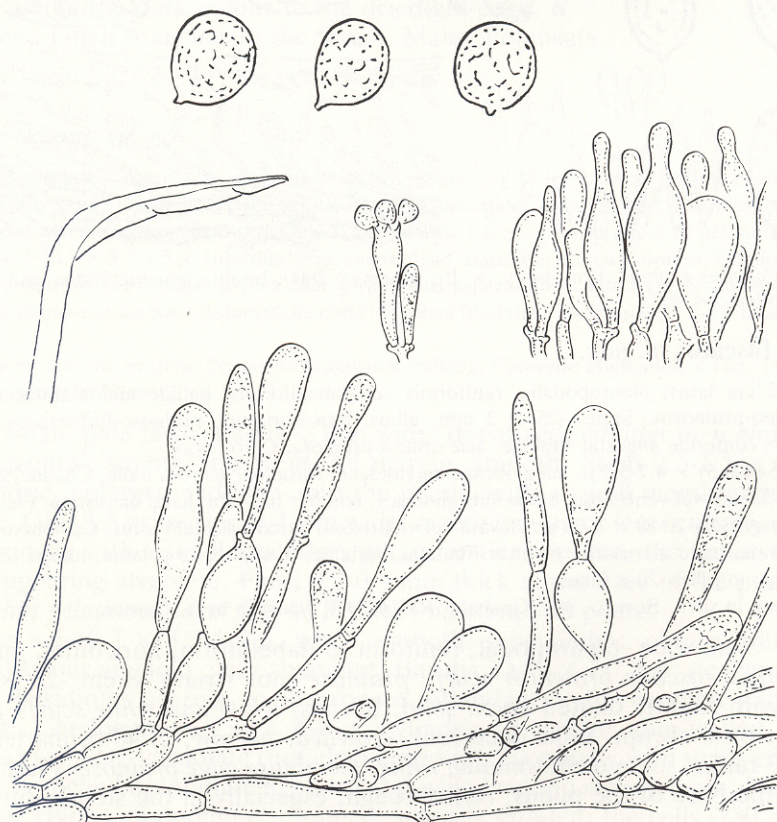


Fig. 13. *Panellus fuscatus*. Fruit-body, $\times$ 1; spores, $\times$ 2000; basidia, cheilocystidia, surface of pileus near the base, $\times$ 500.

amyloid. Compare *P. magnus* (p. 143) with more or less centric pilei, narrow spores, and brown colour in the hyphal walls; both occur in the same forest on mt. Kinabalu.

***Panellus intermedius* sp. nov.**

Fig. 14

Ex integro pallide cervinus, pleuropodalis, lamellato-poroideus. Pileus -15 mm latus, reniformis vel flabelliformis, opacus, siccus. Stipes -3 × 1-1.5 mm. Lamellae adnatae vel decurrentes, poroideo-reticulatae, acie albida furfuracea. Caro tenax, haud gelatinosa.

Sporae 8-10 × 4.5-5.7 μ , lacrymiformes, vix amyloideae. Basidiola subacerosa. Cheilocystidia 22-40 × 5-11 μ , clavata, diverticulis 1-2 lobulatis evolventia, hyphis dichophysialibus incrustatis superantibus. Pleurocystidia, pileocystidia et caulocystidia nulla. Hyphae fibulatae, plus minus inflatae, latiores cellulis subfusiformibus -300 × 16 μ , tunicis 1-5 μ crassis sed superficiem pilei versus tenuibus -1.5 μ crassis. Superficies pilei hyphis appressis sublobulatis leniter incrustatis, haud gelatinosis, praedita.

Ad ramulos dejectos in silva. Borneo, mt. Kinabalu, *RSNB 5474* typus, in herb Corner.

Entirely pale fawn, pleuropodal, lamellate-poroid. Pileus -10 mm radius, 15 mm wide, reniform-flabelliform, smooth or minutely cottony, opaque, dry. Stem 1-3 × 1-1.5 mm, lateral, cottony fibrillose to subfurfuraceous. Gills adnate to decurrent, 7-15 primaries 0.8-1 mm wide, 3(-4) ranks, poroid-reticulate with transverse septa almost as deep as the primary gills, not venulose in the smooth interstices, pale fawn with *thin chalky white edge*. Flesh 0.8-1 mm thick at the base of the pileus, tough, not gelatinous. Smell none.

Spores 8-10 × 4.5-5.7 μ , white, smooth, pip-shaped, varying pale violet-brown amyloid to almost inamyloid. Basidia 23-28 × 5.5-6.5 μ ; sterigmata 4, 3-3.5 μ long; basidioles subacerosa, frequent; many lobulate ramifying hyphae 1-2 μ wide investing the basidia in the mature hymenium; subhymenium narrow, with 1.5-2.5 μ interwoven hyphae, not corticate. Cheilocystidia 22-40 × 5-11 μ , more or less clavate, thin-walled, vacuolate, developing from the distal end 1-2 lobulating

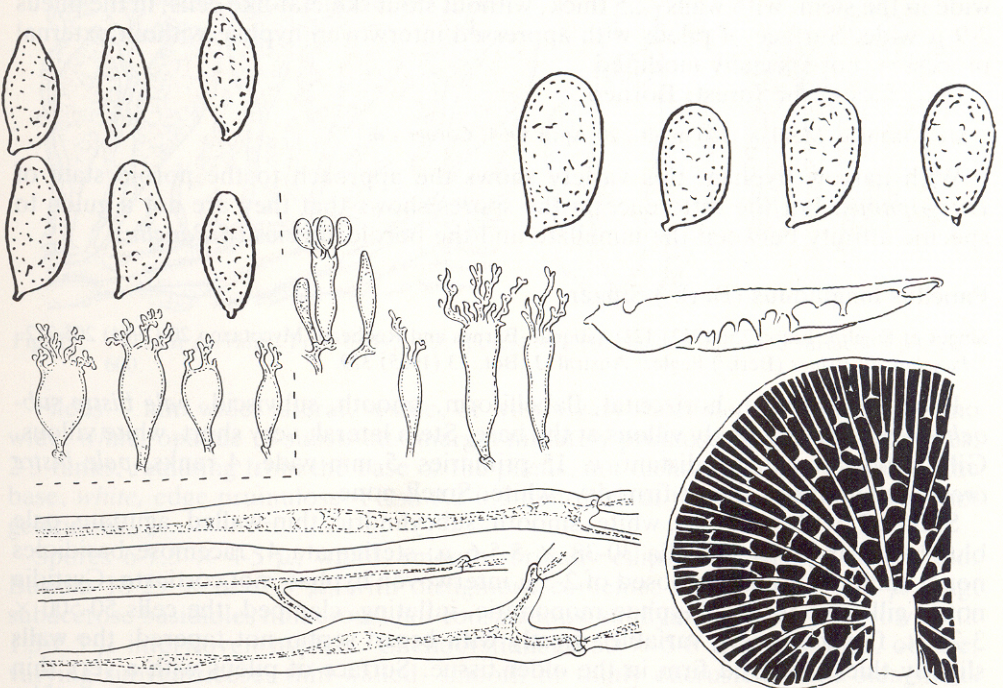


Fig. 14. *Panellus intermedius*. Fruit-body, × 4; spores, × 2250; basidia, cheilocystidia, and hyphae, × 500. Inset (upper left), var. *stenosporus*.

processes -15 μ long, also invested with lobulating hyphae as the basidia; thinly encrusted. Pleurocystidia none. Hyphae monomitic, clamped, more or less inflating, appearing spuriously trimitic, the wider hyphae with somewhat fusiform cells -300 $\times$ 16 μ with firm hyaline walls 1.5 μ thick and narrow fuscous lumen appearing as skeletal, the narrower hyphae appearing as binding hyphae (but clamped); in the stem longitudinal, compactly fibrillar; in the pileus longitudinal as in the stem but in the upper part of the pileus laxly interwoven with thinner walls -1.5 μ thick and wide lumen; in the gill-trama as in the stem, more or less descending, with many narrow interweaving hyphae. Surface of pileus and stem without cystidia but with 1-2 μ processes becoming somewhat lobulate and ramified though not in a dense layer, thinly encrusted or scarcely at all, not gelatinous.

On sticks in the forest. Borneo.

Mt. Kinabalu 1700-1800 m alt.: 6 Feb. 1964, *RSNB* 5243 (immature); 26 Feb. 1964, *RSNB* 5474; 28 Feb. 1964, *RSNB* 5539.

This species is exactly intermediate between *Dictyopanus* and *Panellus*. It seems not to begin sporing until the fruit-bodies are nearly fully grown. Compare the poroid *P. luminescens* on dead palm-leaves.

var. *stenosporus* var. nov.

Fig. 14 (inset)

Spores 7-9 $\times$ 3.5-4.5 μ , amygdaliformes. Cheilocystidia 20-38 $\times$ 8-14 μ , clavata vel subglobosa. Hyphae in stipite 2-6 μ latae, in pileo -9 μ .

Ad ramos dejectos in silva. Borneo, mt. Kinabalu, 20 April 1964, *Corner s.n.* typus, in herb. Corner.

Pileus -10 mm in radius, white to fawn-brown. Stem -1.5 $\times$ 1 mm, lateral, slight. Gills whitish. Flesh -1 mm thick at the base of the pileus, not gelatinous.

Spores 7-9 $\times$ 3.5-4.5 μ , amygdaliform or mango-shaped. Cheilocystidia 20-38 $\times$ 8-14 μ , widely clavate to subglobose. Hyphae narrower and less thick-walled; 2-6 μ wide in the stem, with walls -2.5 thick, without stout skeletal-like cells; in the pileus 2-9 μ wide. Surface of pileus with appressed interwoven hyphae without external processes, not specially modified.

On sticks in the forest. Borneo.

Mt. Kinabalu, Mesilau 1700 m alt., 20 April 1964, *Corner s.n.*

With narrow hyphae, this variety shows the approach to the poroid state of *Dictyopanus*, but the difference in the spores shows that they are not a guide to specific affinity between the lamellate and the poroid species of *Panellus*.

***Panellus longinquus* (Berk.) Singer**

Singer et Digilio, Lilloa 25 (1952) 121; Libonati-Barnes and Redhead, Mycotaxon 20 (1984) 205-212. ? *Panellus diversipes* (Berk.) Pegler, Austral. J. Bot. 13 (1965) 329.

Pileus -3 cm wide, horizontal, flabelliform, smooth, subviscid, *pale bistre subochraceous*, drying finely villous at the base. Stem lateral, very short, white villous. Gills subdecurrent, subdistant, c. 15 primaries -5 mm wide, 4 ranks, *pale bistre cream*, edge entire. Flesh firm dry, white. Smell none.

Spores 7.5-10 $\times$ 3.3-4 μ , white, smooth, subcylindric, thin-walled, aguttate, pale blue-black amyloid. Basidia 30-38 $\times$ 5.5-6 μ ; sterigmata 4; racemose basidioles none; subhymenium composed of 2-3 μ interwoven hyphae, not corticate. Cystidia none, gill-edge fertile. Hyphae monomitic, inflating, clamped, the cells 50-500 $\times$ 3-20 μ , flexuous, very variable, mostly with broad septa, not tapered, the walls slightly thickened and firm in the older tissue. Surface of pileus with a very thin superficial gelatinous layer 20-30 μ thick, composed of hyphae 1.5-2.5 μ wide, mostly appressed and radiating, with scattered processes to the exterior or amassed

here and there into patches of rudimentary hymenium, the processes subcylindric to subclavate $-20 \times 1.5-3 \mu$, simple or with a few short lobes, extending at the base of the pileus -70μ as the villous layer. Hyphae of gill-trama -10μ wide, descending, with slightly thickened subgelatinous walls near the subhymenium.

On a dead trunk in forest. Queensland.

Mt. Lamington, 21 June 1964, *Corner s.n.*

This is my description of an Australian collection, which I include here because the species may well be widely distributed in the Western Pacific. It was described from South America and recently recorded from North America. The Australian collection agrees with the descriptions of the American except that the gills are wider and the pileus lacks a pinkish colour. Acerose basidioles were not mentioned for the American collections.

***Panellus parvulus* sp. nov.**

Fig. 15

Pileus -7 mm latus, pleuropodalis vel sessilis, opacus albus. Stipes -0.5 mm longus et latus, vel nullus. Lamellae e basi pilei radiantes, $7-12$ primariae, haud dichotomae, albae, acie pruinosa. Caro haud gelatinosa.

Sporae $6-7.5 \times 4-5 \mu$, late ellipsoideae, amyloideae. Basidiola subacerosa. Cheilocystidia $25-50 \times 5-8 \mu$, subclavata vel subventricosa, intus oleaginosa, hyphis dichophysialibus superantibus. Pleurocystidia nulla. Pileocystidia $28-58 \times 12-15 \mu$, clavata, intus oleaginosa, vix in strato hymeniiformi, basim pilei versus hyphis dichophysialibus superantibus, leniter incrustata. Hyphae fibulatae, in stipite basique pilei -20μ latae, in lamellis $1.5-6 \mu$ latae.

Ad folia emortua bambusarum in silva. Insulae Solomonenses, Guadalcanal, RSS 688 typus, in herb. Corner.

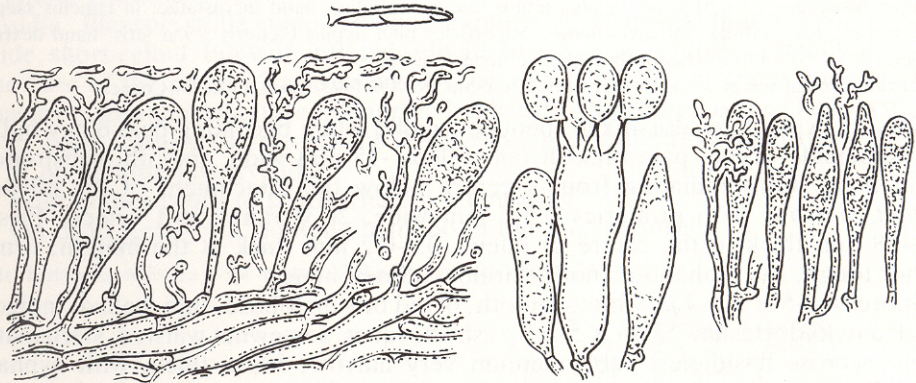


Fig. 15. *Panellus parvulus*. Fruit-body, $\times 3$; spores, $\times 1500$; cheilocystidia and surface of pileus, $\times 600$.

Pileus -7 mm wide, lateral, sessile, or with a very short stem -0.5 mm long and wide, *white*, opaque to substratum: margin minutely pruinose. Gills $7-12$ primaries, $2-3$ ranks, radiating from the base of the pileus, not dichotomous or veined at the base, *white*, edge pruinulose. Flesh $0.2-0.3$ mm thick at the base of the pileus, not gelatinous.

Spores $6-7.5 \times 4-5 \mu$, white, smooth, broadly ellipsoid, pale bluish amyloid. Basidia $18-25 \times 6.5-7.5 \mu$, with oleaginous contents; sterigmata 4 , $4-5 \mu$ long; subacerosa basidioles numerous, not conspicuous; subhymenium very narrow, with $1.5-2.5 \mu$ interwoven hyphae. Cheilocystidia $25-50 \times 5-8 \mu$, subclavate, obtuse, varying subventricose, thin-walled, smooth or thinly encrusted, with oleaginous cloudy contents, as a conspicuous sterile edge to the gill, becoming overgrown with dichophysial hyphal ends with stalks $1-3 \mu$ wide and fine short processes. Pleurocy-

stidia none. Hyphae monomitic, clamped, inflating in the stem and base of pileus with cells $30-160 \times 1.5-20 \mu$, thin-walled, longitudinal interwoven, narrower towards the margin of pileus; in the *gill-trama* $1.5-6 \mu$ wide, not inflated, more or less descending. Pileocystidia $28-58 \times 12-15 \mu$, clavate, rarely with narrowed apex, with slender stalk $1-2 \mu$ wide, thin-walled, smooth or thinly encrusted, containing dense smeary-oleaginous cytoplasm, erect or appressed, abundant and conspicuous but not in a compact palisade, becoming overgrown at the base of the pileus with dichophysial hyphae, their long, sparingly branched, filiform arms c. 1μ wide. All the more superficial hyphae of pileus and gill-edge with granular incrustation soluble in potash. Hyphae and contents of basidia and cystidia merely yellow-brown in Melzer's iodine.

On dead bamboo-leaves in forest. Solomon Islands.

Guadalcanal, Gallego, 11 July 1965, RSS 688.

This is easily known from the conspicuous pileocystidia which, if immersed, would be gloeocystidia. It seems close to the South American *P. nubigenus* Singer (1969), also on bamboo remains, but with the pileus becoming brownish, the spores slightly larger, and the pileus with a thin gelatinous layer below the superficial mat of dichophysial hyphae.

***Panellus pendens* sp. nov.**

Pileus sessilis dorsifixatus, cyphelloformis, -15 mm latus, laevis substriatus, albidulus dein subochraceus et subroseolus. Lamellae distantes angustae, haud venosoreticulatae, Caro hygrophana, haud gelatinosa.

Sporae $4.3-5 \times 3.5-4 \mu$, subglobosae, intense amyloideae. Basidiola acerosa nulla. Cystidia nulla. Hyphae fibulatae, $2-5 (-6) \mu$ latae, plus minus crasse tunicatae, haud incrustatae; in lamellis saepe oleiferae ut gloeocystidia, subagglutinatae. Superficies pilei hyphis oleiferis $5-9 \mu$ latis, haud dextrinoideis, in strato tenui in crassitudine hyphae unae constructa.

Ad ramos delapsos in silva. Borneo, mt. Kinabalu, RSNB 5448 typus, in herb. Corner.

Sessile, cyphelloid, dorsifixed, pendent, pallid white becoming pale dingy buff, the upperside drying pale pinkish tan. Pileus -15 mm wide, smooth, substrate. Stem none. Gills radiating from a centre below the attachment of the pileus, distant, narrow, 9-16 primaries 0.5-1 mm wide, 2(-3) ranks, not veined. Flesh 0.5-0.8 mm thick in the centre of pileus, 0.1-0.2 mm thick at the margin, firm, rather tough, hygrophanous, not gelatinous. Smell none.

Spores $4.3-5 \times 3.5-4 \mu$, white, smooth, ovoid or subglobose, thin-walled, indigo-black amyloid. Basidia $13-15 \times 5-5.5 \mu$, short, squat, somewhat waisted; sterigmata 4; no acerosae basidioles; subhymenium very narrow, $5-8 \mu$ thick, with hyphae $1.5-2.5 \mu$ wide. Cystidia none, or with sterile basidia on the apparently sterile gill-edge. Hyphae monomitic, clamped, *not inflating*, $2-5 (-6) \mu$ wide, more or less thick-walled, not amyloid; in the pileus densely interwoven and impossible to tease apart, many thin-walled but others with walls $1-1.5 \mu$ thick, the cells $70-400 \mu$ long, flexuous, often kinked resembling bits of skeletal hyphae but with distant clamps and occasionally branched, also with scattered more or less radiating oleiferous hyphae $3-7 \mu$ wide with dense contents not staining with Melzer's iodine; in a thin layer, c. 30μ thick, above the gills, with thin-walled radiating hyphae and oleiferous hyphae descending into the gills; in the *gill trama* with thin-walled hyphae descending obliquely towards the margin of the pileus and with many subparallel oleiferous hyphae (as gloeocystidia) reaching almost to the gill-edge with tips tapered to $2-3 \mu$ wide, the tissue of the *gill-trama subagglutinated* (not gelatinous). Surface of pileus with a layer (one hypha thick) of appressed radiating oleiferous hyphae $5-9 \mu$ wide with dense contents (not staining with Melzer's iodine), with agglutinated walls, as a tough layer with many affixed spores; round the basal

attachment of the pileus, with many excrescent hyphae $1.5\text{--}3\ \mu$ wide, clamped, with slightly thickened brownish cells.

On a rotten fallen branch in the forest. Borneo.

Mt. Kinabalu, Bembangan River 1700 m alt., 25 Feb. 1964, *RSNB* 5448.

The spores seem too intensely amyloid for *Panellus*. The agglutinated oleiferous hyphae on the pileus and the absence of incrustation are also differences. Intensely amyloid spores are recorded for the South American *P. mirabilis* Singer.

***Panellus sublevatus* sp. nov.**

Fig. 16

Albus exiguus. Pileus -3 mm latus, pleuropodalis vel subsessilis, cyphelliformis dein reniformis. Lamellae 3-5, haud reticulatae, acie pruinoso-furfuracea. Caro mollis, haud gelatinosa.

Sporae $7\text{--}8(-9) \times 5\text{--}6\ \mu$, ellipsoideae amyloideae. Basidiola subacerosa sparsa. Cheilocystidia et pileocystidia vix evoluta, ut hyphae dichophysiales incrustatae. Pleurocystidia nulla. Hyphae fibulatae $1.5\text{--}5\ \mu$ latae, sed ad basim pilei cellulis hypodermatis $16\text{--}30 \times 80\text{--}16\ \mu$.

Ad caudices bambusarum in silva. Borneo, mt. Kinabalu, *RSNB* 8407A typus, in herb. Corner.

White, very small. Pileus -3 mm wide, lateral, more or less sessile, at first semi-cupular and cyphelloid, then more or less reniform, sinuato-sulcate, slightly scurfy pruinose. Gills distant, 3-5 primaries $0.3\text{--}0.5$ mm wide, 1-2 ranks, interstices smooth, edge scurfy pruinose. Flesh c. $100\ \mu$ thick in the pileus (excluding the scurfy villous layer $50\text{--}80\ \mu$ thick), soft, not gelatinous.

Spores $7\text{--}8(-9) \times 5\text{--}6\ \mu$, white, smooth, ellipsoid, obtuse, pale indigo amyloid. Basidia $20\text{--}27 \times 6.5\text{--}8\ \mu$; sterigmata 4, $5\text{--}7\ \mu$ long; subacerosae basidioles rather sparse; subhymenium slight, with $1.5\text{--}2.5\ \mu$ interwoven hyphae, not gelatinous. Cheilocystidia as dendritic hyphal ends $\sim 50\ \mu$ long, the stalk $1.5\text{--}3(-4)\ \mu$ wide, granular-encrusted, forming a broad sterile edge to the gill with a few sterile basidia. Pleurocystidia none. Hyphae monomitic, clamped, thin-walled, $1.5\text{--}5\ \mu$ wide, short-celled, but with inflated cells $16\text{--}30 \times 8\text{--}16\ \mu$ in a hypodermal layer near the base of the pileus (? as a vestige of the stem). Surface of pileus composed of masses of granular-encrusted dendritic hyphae $50\text{--}80\ \mu$ long, as the cheilocystidia, with a few scattered sterile basidia $20\text{--}40 \times 6\text{--}7\ \mu$ or cylindric hyphal ends $50 \times 4\text{--}5\ \mu$; no definite pileocystidia.

Fruit-bodies begin to spore when c. 1 mm wide.

On dead stems of a climbing bamboo in the forest. Borneo.

Mt. Kinabalu, Mesilau 1700 m alt., 22 April 1974, *RSNB* 8407A.

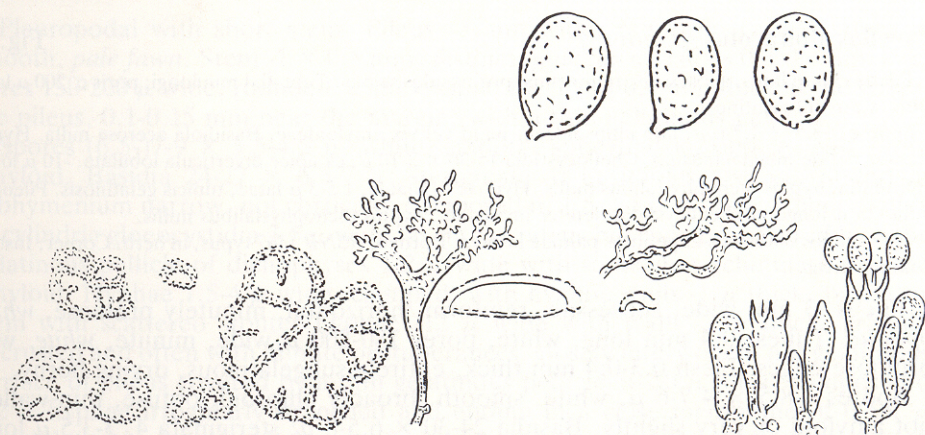


Fig. 16. *Panellus sublevatus*. Fruit-body, $\times 10$; spores, $\times 2000$; basidia and cheilocystidia, $\times 600$.

Key to the poroid species of subgen. *Panellus* in Malesia

1. Spores subglobose, more than $6\ \mu$ wide.
 2. Spores $13-18 \times 12-16\ \mu$. Pileus -22 mm wide, sessile, white. Pores reaching 1 mm wide. Gloeocystidia on pore-edges and pileus. On fallen branches. Borneo *P. megalosporus* p. 133
 2. Spores smaller. Pileus white to pale fawn. Pores 0.2 mm wide.
 3. Spores $6.5-9.5 \times 6-8.5\ \mu$. Pileus -17 mm wide. Gloeocystidia on pore-edges and pileus. On wood *P. orientalis* p. 135
 3. Spores $9-12.5 \times 8-11\ \mu$. Pileus -3 mm wide. Gloeocystidia none. On dead bamboo. Solomon Isl. *P. brunneifavolus* p. 130
1. Spores ellipsoid to allantoid, generally less than $6\ \mu$ wide.
 4. Spores generally more than $6\ \mu$ long. Pileus 1-5 mm wide. On grasses, bamboo or palms.
 5. Cheilocystidia clavate, not gloeocystidial. Pileus -4 mm wide.
 6. Flesh entirely subgelatinous. Acerose basidioles absent. Cheilocystidia developing lobulate processes. Spores $7-8.5 \times 4.5-6\ \mu$, scarcely amyloid. Pileus subsessile *P. albifavolus* p. 128
 6. Flesh dry. Acerose basidioles present. Cheilocystidia not developing processes.
 7. Spores $6-7.5 \times 4.5-5.5\ \mu$. Cheilocystidia $22-35 \times 7-18\ \mu$. Pileus subsessile, white to pale fawn and pinkish. On bamboo *P. sublamelliformis* p. 137
 7. Spores $7.5-9 \times 4-4.5\ \mu$ to $9-13 \times 4-6\ \mu$, ellipsoid. Cheilocystidia $30-55 \times 7-10\ \mu$. Pileus white to pale buff. On palms *P. luminescens* p. 132
 5. Cheilocystidia gloeocystidial, subcylindric, or none.
 8. Cheilocystidia gloeocystidial. Pileus pale fawn, with a thin gelatinous pellicle. Spores $7-9 \times 3.5-4.5\ \mu$. On bamboo *P. bambusifavolus* p. 129
 8. Cheilocystidia none (? very soon obscured).
 9. Acerose basidioles present. Spores $6-9 \times 3.5-5.5\ \mu$. Pileus white to pale fawn. Flesh dry. On grasses *P. copelandii* p. 131
 9. Acerose basidioles absent. Fruit-bodies white. Spores $6-7.7 \times 3-4\ \mu$. Pileus -1.5 mm wide, with 3-15 pores. Flesh dry. On bamboo, Solomon Isl. *P. pauciporus* p. 136
 4. Spores less than $6\ \mu$ long.
 10. Spores $4.5-6 \times 2.5-3.3\ \mu$, Acerose basidioles absent. Cheilocystidia not distinct, pore-edge and pileus with unbranched spinulose hyphal ends $3-6\ \mu$ wide. Pileus -3 mm wide, white. On dicotyledonous leaves *P. hispidifavolus* p. 132
 10. Spores $3-4\ \mu$ long. Acerose basidioles present.
 11. Spores $0.8\ \mu$ wide, allantoid. Pileus -4 mm wide, fawn brown, dorsifixed. Cheilocystidia $7-12\ \mu$ wide, clavate. On twigs. Borneo *P. microsporus* p. 134
 11. Spores $2-3\ \mu$ wide, ellipsoid. Cheilocystidia $3-5\ \mu$ wide, cylindric.
 12. Pileus -12 mm wide or more, fawn tan. Cheilocystidia not or slightly gloeocystidial *P. pusillus* p. 136
 12. Pileus -3 mm wide, white then pale fawn. Cheilocystidia strongly gloeocystidial *P. gloeocystidiatus* p. 131

***Panellus albifavolus* sp. nov.**

Fig. 17

Pileus -3 mm latus, subsessilis, reniformis, pruinosulus, albus. Tubi -0.4 mm longi; poris c. 200 μ latis, albis. Caro subgelatinosa.

Sporae $7-8.5 \times 4.7-6\ \mu$, late ellipsoideae, haud vel vix amyloideae. Basidiola acerosa nulla. Hymenium in acetate mucilaginosum. Cheilocystidia $15-30 \times 3-10\ \mu$, ex apice diverticula lobulata, -10 μ longa emittentia, hyphis dichophysialibus nullis. Hyphae fibulatae, 1.5-3 μ latae, tunicis gelatinosis. Pileocystidia -38 μ longa ut cheilocystidia, leniter incrustata, hyphis dichophysialibus nullis.

Ad ramulos emortuos et petiolos palmae in silva. Borneo, *RSNB* 5367 typus, in herb. Corner; Insulae Solomonensis.

Pileus -3 mm wide, subsessile, reniform, horizontal, minutely pruinose, *white, opaque*. Tubes -0.4 mm long, white, pores 180-200 μ wide, minute, *white*, with pruinose edges. Flesh 0.3-0.4 mm thick, entirely subgelatinous, drying horny.

Spores $7-8.5 \times 4.7-6\ \mu$, white, smooth, broadly ellipsoid, obtuse, thin-walled, not amyloid or very slightly. Basidia $24-30 \times 6.5-8\ \mu$; sterigmata 4, 3-3.5 μ long. Hymenium without acerosae basidioles; subhymenium narrow, interwoven; old hymenium with the basidia half-immersed in a more or less structureless firm

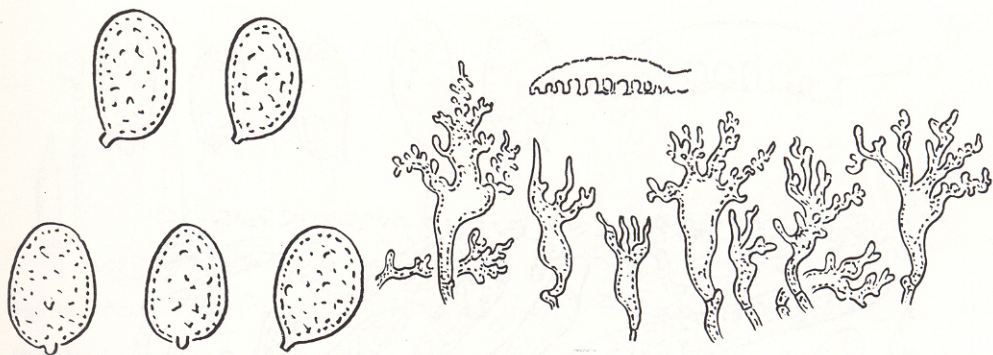


Fig. 17. *Panellus albifavolus*. Fruit-body, $\times 6$; spores, $\times 1800$; pileocystidia, $\times 600$.

mucilage. Cheilocystidia as the pileocystidia but shorter, 15-30 μ long, without excrescent hyphae. Pleurocystidia none. Hyphae 1.5-3 μ wide, clamped, with entirely gelatinous walls, interwoven. Surface of pileus as a loose palisade of subclavate, erect or decumbent, pileocystidia 18-38 $\times$ 3-10 μ , the apex with lobulate processes -10 μ long, sometimes with 2-3 distal lobes, thin-walled, *thinly encrusted*, not amyloid, without excrescent hyphae.

On rotten sticks and dead palm-petioles in the forest.

BORNEO. Mt. Kinabalu, Bembangan River 1700 m alt., 19 Feb. 1964, *RSNB 5367*. — SOLOMON ISLANDS. Guadalcanal, Gallego 500 m alt., 8 July 1965, *RSS 603*.

This seems to approach *Campanella* with inamyloid spores.

Panellus bambusifavolus sp. nov.

Fig. 18

Pileus -3 mm latus, pleuropodalis reniformis, pallide cervinus. Stipes -1 $\times$ 0.5 mm, pileo concolor. Tubi -0.5 mm longi; poris 150-200 μ latis, albocretaceis. Caro sicca sed ad pileum pellicula gelatinosa praedita.

Sporae 7-9 $\times$ 3.5-4.5 μ , subcylindricae, amyloideae. Basidiola acerosa copiosa. Cheilocystidia et pileocystidia 3-5 μ lata, cylindrica ut gloecystidia, hyphis dichophysialibus gelatinosis superantibus. Hyphae fibulatae, 1.5-4 μ latae, tunicis -1 μ crassis, incrustatae; in stipite -12 μ latae, tunicis -2 μ crassis. Superficies pilei pellicula 30-50 μ crassa gelatinosa, ex hyphis 1-2 μ latis ramosis apicibus echinulatis, composita, cystidis immersis.

Ad caules bambusarum in silva. Insulae Solomonenses, San Cristobal, *RSS 898* typus, in herb. Corner.

Pleuropodal with short stem. Pileus -3 mm wide, reniform, convex, opaque, smooth, *pale fawn*. Stem -1 $\times$ 0.5 mm, distinct, *pale fawn*. Tubes 0.3-0.5 mm long; pores 150-200 μ wide, rounded, *chalky white*. Flesh 0.3-0.4 mm thick at the base of the pileus, 0.1-0.15 mm near the margin, with a thin gelatinous pellicle.

Spores (6.5-)7-9 $\times$ 3.5-4.5 μ , white, smooth, subcylindric, obtuse, pale bluish amyloid. Basidia 24-27 $\times$ 6.5-7 μ ; sterigmata 4; basidioles acerosae, abundant; subhymenium narrow, not corticate, composed of 1.5-2.5 μ hyphae. Cheilocystidia as cylindric gloecystidia 3-5 μ wide, as on the pileus but shorter, covered by a thin gelatinous pellicle of dichophyses 1-2 μ wide with somewhat echinulate tips, not amyloid. Hyphae 1.5-4 μ wide, clamped, with hyaline walls -1 μ thick, but in the stem with scattered stouter hyphae -12 μ wide with walls -2 μ thick, granular encrusted and often with minute protuberances, closely interwoven, not gelatinous. Surface of pileus covered by a thin gelatinous pellicle 30-50 μ thick, composed of 1-2 μ hyphae irregularly branched and ending in a close membrane of 0.5-1 μ , minutely echinulate, hyphal ends, with immersed, suberect or oblique to decumbent cylindric gloecystidia -85 $\times$ 3-5 μ , very abundant on young pilei but becom-

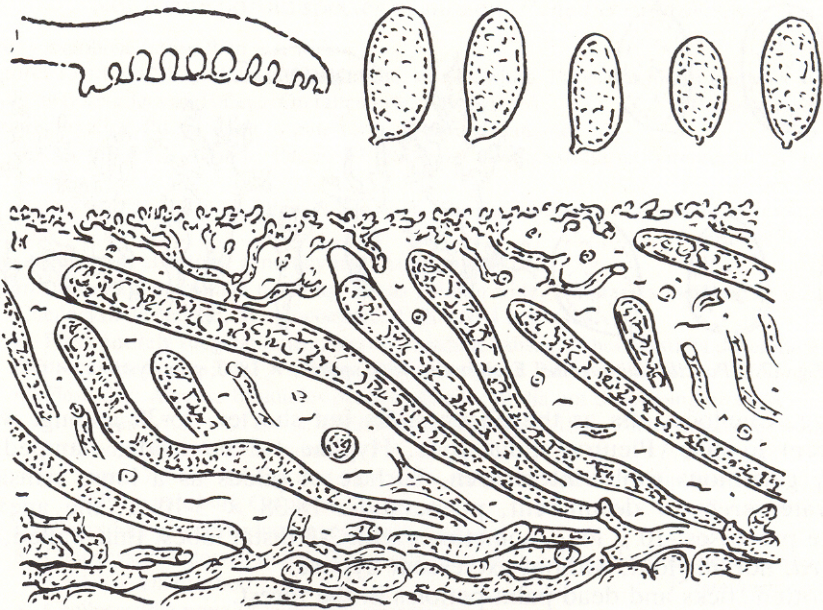


Fig. 18. *Panellus bambusifavolus*. Fruit-body, $\times 10$; spores, $\times 2000$; surface of pileus, $\times 1000$.

ing scarce and inconspicuous, even vacuolate and hyaline, in mature pilei, often with the oleaginous contents shortly retracted from the tip.

On dead bamboo in the forest. Solomon Islands.

San Cristobal, Warahito River, low level, 1 Aug. 1965, RSS 898.

The surface of the pileus has the reduced construction of *P. gloeocystidiatus*, and the gelatinous pellicle forms on the pore-edges.

***Panellus brunneifavolus* sp. nov.**

Figs. 8b, 19

Pileus -3 mm latus, dorsifixus, subsessilis, reniformis, laevis, albus dein pallide cervinobrunneus. Tubi -0.4 mm longi; poris 150-200 μ latis, albocretaceis. Caro subgelatinosa.

Sporae 9-12.5 $\times$ 8-11 μ , subglobsae vel ovoideae, amyloideae. Basidiola acerosa copiosa. Cheilocystidia 18-45 $\times$ 3-4.5 μ , subcylindrica, tunicis leniter incrassatis, haud oleaginosa, hyphis dichophysialibus superantibus. Hyphae fibulatae, 1.5-5 μ latae, tunicis subgelatinosis, subagglutinatae. Pileocystidia ut cheilocystidia, hyphis dichophysialibus superantibus.

Ad bambusam emortuam in silva. Insulae Solomonenses. Guadalcanal, 2200 m alt., RSS 1631 typus, in herb. Corner.

Dorsifixed, almost lateral, convex, reniform, white then pale fawn brown. Pileus -3 mm wide, smooth, opaque. Stem practically none. Tubes -0.4 mm long; pores 150-200 μ wide, rounded, with chalky white edges. Flesh c. 1 mm thick at the base of the pileus, subgelatinous.

Spores 9-12.5 $\times$ 8-11 μ , white, smooth, subglobose or ovoid, very pale violaceous amyloid. Basidia 36-40 $\times$ 12-15 μ , widely clavate with oleaginous contents (dark brown in Melzer's iodine); sterigmata 4, 6-7.5 μ wide at the base; basidioles acerosae, abundant but inconspicuous, hyaline, 3-7 μ wide, shorter than the basidia; subhymenium narrow, not corticate. Cheilocystidia 18-45 $\times$ 3-4.5 μ , subcylindric, hyaline, smooth, with slightly thickened wall, often sparse, not gloeocystidial, becoming covered by excrescent, laxly to profusely branched, dichophysial hyphae 1-2 μ wide with stalks 1.5-2.5 μ wide, thinly encrusted, not amyloid. Hyphae 1.5-5 μ wide, clamped, with hyaline subgelatinous walls 1-2 μ thick, compact, almost agglutinated, not amyloid. Surface of pileus with pileocystidia like

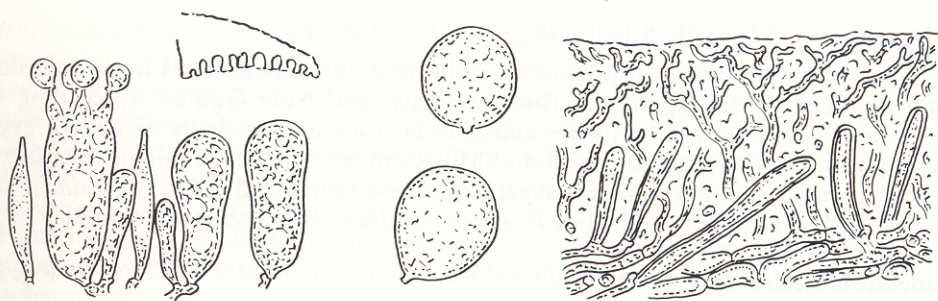


Fig. 19. *Panellus brunneifavolus*. Fruit-body, $\times 6$; spores, $\times 2000$; basidia and surface of pileus, $\times 600$.

the cheilocystidia but becoming scattered and often decumbent, covered by shortly excrecent dichophysal hyphae as a layer c. 40 mm thick.

On dead bamboo in the forest. Solomon Islands.

Guadalcanal, Popomanasiu 2200 m alt., 26 Oct. 1965, RSS 1631.

***Panellus copelandii* (Pat.) Burdsall et Miller**

Nova Hedwigia Beih. 51 (1975) 88.

Dictyopanus copelandii Pat., Elmer Leaflets of Philippine Botany 6 (1914) 2254; Kobayasi, Bull. Nat. Sci. Mus. Tokyo 6 (1963) 363.

Pileus -3 mm wide, pleuropodal, reniform to orbicular, pruinose, *white*. Stem 3-6 $\times$ 0.25-0.5 mm, longer than the pileus, *white*. Pores slightly radially elongate, 120-180 μ in the long diameter, lamellately decurrent (Kobayasi), *whitish rufous*. Flesh not gelatinous.

Spores 6.5-9 $\times$ 3.5-5.5 μ , 6.8-7.8 $\times$ 3.5-4.2 μ (Kobayasi), 5-6 $\times$ 4-5 μ (Pat.), ovoid, bluish amyloid. Basidia 20-27 $\times$ 7-9 μ ; acerose basidioles present. Cheilocystidia and pileocystidia not seen. Hyphae 3-6 μ wide, with swellings -9 μ , irregularly thick-walled. Surface of pileus, stem, and pore-edges developing a mat of lobulate and echinulate dichophysal hyphae; no gloecystidia (Kobayasi).

On dead grass leaves and stems. Philippine Islands.

This description is a summary of previous ones. Patouillard gave the fruit-bodies as whitish with whitish rufous pores. That they should be cinnamon-rufous or hazel according to Burdsall and Miller is misleading and must refer to old, possibly poisoned, herbarium specimens. The species may be wide-spread in Malesia and may connect with those on bamboos in the Solomon Islands. *P. luminescens* on palm-remains has larger spores and pores that are not at all lamelliform. Compare the description of *Favolaschia minima* (Jungh.) Singer (Lloydia 8, 1945, 200).

***Panellus gloecystidiatus* (Corner) comb. nov.**

Figs. 4, 5, 8f

Dictyopanus gloecystidiatus Corner, Trans. Brit. mycol. Soc. 37 (1954) 258, fig. 1, 2; Kobayasi, Bull. Nat. Sci. Mus. Tokyo 6 (1963) 359, fig. 2, 3, pl. 49; Rept Tottori Mycol. Inst. (Japan) 10 (1973) 346.

White then pale fawn, pleuropodal. Pileus -3 mm wide, discoid, scurfy, opaque. Stem 0.2-1 $\times$ 0.1-0.5 mm, lateral, white pruinose. Tubes -0.3 mm long; pores c. 100 μ wide, chalky pruinose. Flesh not gelatinous.

Spores 3-3.5 $\times$ 2-2.5 μ , white, smooth, ellipsoid, pale bluish grey amyloid. Basidia 13-15 $\times$ 4 μ , with 4 sterigmata 3 μ long; acerose basidioles abundant; subhymenium not granular encrusted. Cheilocystidia -40 $\times$ 3-5 μ , subcylindric gloecystidia obtuse, with firm walls. Hyphae clamped, 2-5 μ wide, with firm, slightly thickened and even subdiffluent walls. Surface of pileus with gloecystidia -90 $\times$ 3-5 μ overgrown with lobulate dichophysal hyphae 1-2 μ wide.

On rotten wood in the forest. Borneo.

Mt. Kinabalu, Mahmud River 1300 m alt., 7 Aug. 1961, *RSNB* 1656.

This is the description of a Bornean collection. The species has been recorded hitherto from south Japan, the Bonin Islands, and New Guinea. According to Kobayasi, the pores are luminous and may be somewhat radially arranged, even slightly radially elongate. Burdsall and Miller considered that it might be reduced to *P. pusillus*, but neither Kobayasi nor I am convinced that *P. pusillus* has gloeocystidia. The fruit-bodies of *P. gloeocystidiatus* are also much smaller.

***Panellus hispidifavolus* sp. nov.**

Fig. 20

Albus, superficie pruinoso-cretacea. Pileus -3 mm latus, pleuropodalis, reniformis. Stipes -0.3 × 0.2 mm, brevissimus. Tubi -350 μ longi; poris 150-180 μ latis. Caro sicca.

Sporae 4.5-6 × 2.5-3.3 μ , ellipsoideae amyloideae. Basidiola acerosa nulla. Cheilocystidia, caulocystidia et pileocystidia ut hyphae cylindricae, haud ramosae, -150 × 3-6 μ , tunicis incrassatis, spinulis -1.5 × 0.5-1 μ echinulatae, etiam apices versus diverticulis obtusis -3 × 1.5 μ , leniter incrustata; hyphis dichophysialibus nullis. Hyphae fibulatae, 2-12 μ latae, tunicis tenuibus.

Ad folia emortua *Tristaniae* (Myrtaceae) in silva. Borneo, mt. Kinabalu, 1800 m alt., *RSNB* 5415 typus, in herb. Corner.

White, with finely chalky surfaces. Pileus -3 mm wide, pleuropodal, convex, reniform, opaque, puberulous. Stem -0.3 × 0.2 mm, lateral, very short. Pores minute, 150-180 μ wide, -350 μ deep. Flesh 120-200 μ thick, dry.

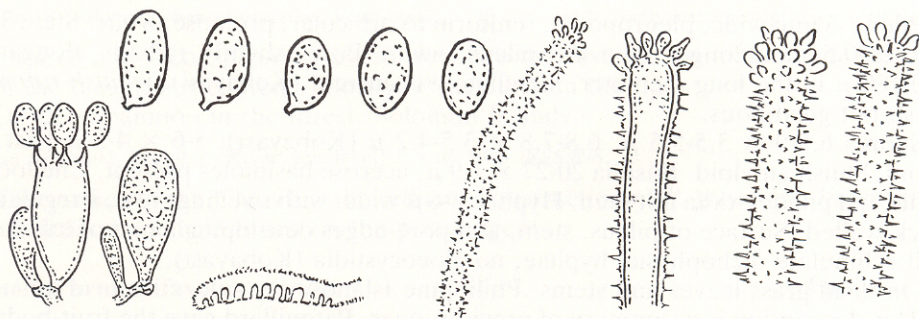


Fig. 20. *Panellus hispidifavolus*. Fruit-body, × 6; spores, × 3400; basidia and one hyphal tip on the pileus, × 600; 3 hyphal tips on the pileus, × 1200.

Spores 4.5-6 × 2.5-3.3 μ , white, smooth, ellipsoid, very pale violaceous amyloid. Basidia 11-15 × 5.8-6.5 μ , widely clavate, short; sterigmata 4; *acerosae basidioles* none. Cheilocystidia as encrusted spinulose hyphal ends as on the pileus. Pleurocystidia none. Hyphae 2-12 μ wide, clamped, thin-walled, cylindric, narrow and interwoven in the pileus. Surface of pileus and stem hispidulous with variously projecting, often curved, cylindric, spinulose, unbranched hyphal ends 70-150 × 3-6 μ , with thickened walls densely set with minute spinous processes -1.5 × 0.5-1 μ and often with several stouter obtuse processes -3 × 1.5 μ at the tips (as a cluster of abortive sterigmata), in places thinly encrusted, not amyloid.

On a dead leaf of *Tristania* (Myrtaceae) in the forest. Borneo.

Mt. Kinabalu, Bembangan ridge 1800 m alt., 22 Feb. 1964, *RSNB* 5415.

Remarkable for the surface-structure, stout basidia, and absence of basidioles.

***Panellus luminescens* (Corner) comb. nov.**

Figs. 2, 8c, 8e

Dictyopanus luminescens Corner, Mycologia 42 (1950) 423.

Pileus 2-4 mm wide, pleuropodal, occasionally mesopodal, convex then flattened and reniform or flabelliform, opaque white becoming pale alutaceous or pale buff,

finely chalky pruinose, drying or ageing pale greyish ochraceous and minutely cracked; margin incurved at first, finally flattening, always making the distal wall of the marginal pores. Stem $0.1\text{--}1.3 \times 0.1\text{--}0.5$ mm, short, distinct, white, finely chalky pruinose, brownish at the base, pale ochraceous in age. Tubes ~ 350 μ long, $200\text{--}250$ μ wide, distinctly delimited from the stem, not decurrent, white; pores $70\text{--}150$ μ wide, with dissepiments $50\text{--}80$ μ thick (including the hymenium) but appearing wider between the pores, round, *white chalky*, drying pale yellowish. Flesh $100\text{--}250$ μ thick at the base of the pileus, dry, rather firm, rather tough in the stem, white. Fruit-bodies entirely green phosphorescent, but not so in some collections.

Spores $9\text{--}13 \times 5\text{--}6$ μ , mostly $10\text{--}11.5$ μ long, in some collections $9\text{--}11 \times 4\text{--}5$ μ , in others $7.5\text{--}9 \times 4\text{--}4.5$ μ , white, smooth, elongate pip-shaped to oblong ellipsoid, contents finely granular, not guttate, pale blue amyloid. Basidia $20\text{--}28 \times 9\text{--}10$ μ , or $18\text{--}25 \times 7.5\text{--}8.5$ μ with the smaller spores, broadly cylindric-clavate, monomorphic, forming a continuous lining to the tubes; sterigmata 4, $5\text{--}6$ μ long; basidioles subacrose, numerous. Cheilocystidia $30\text{--}55 \times 7\text{--}10$ μ , narrowly clavate, thin-walled, as a sterile edge to the pores, becoming overgrown with excrescent dichophyses as on the pileus, and densely granular encrusted. Pleurocystidia none. Hyphae monomitic, clamped, often branching from the clamp, encrusted with fine granular and crystalline matter soluble in dilute potash, mostly $1.5\text{--}4$ μ wide and thin-walled; in the *stem* with some longitudinal fusiform inflated cells $100\text{--}250 \times 6\text{--}20$ μ , with walls ~ 7 μ thick, singly or in irregular rows of 2-4 cells, often with enlarged clamps, at the base of the stem not inflated but subagglutinated with slightly thickened brownish walls; in the *pileus* and dissepiments uninflated, thin-walled, intricately interwoven, but some radiating or longitudinal, more or less contiguous; hyphal tips at the growing margins $1.5\text{--}3$ μ wide with cells $10\text{--}20$ μ long on delimitation. Surface of pileus and stem with a palisade of cystidia like the cheilocystidia becoming disrupted and overgrown by excrescent and heavily encrusted dichophysal hyphae, their ends set with many intricate diverticula $1.5\text{--}7 \times 0.5\text{--}1.5$ μ , the pileocystidia also becoming intricately diverticulate.

Development gymnocarpic, direct, with short primordial shaft and epinastic margin to the pileus.

On dead leaf-sheaths and petioles of various palms (*Arenga*, *Calamus*, *Pinanga*, *Rhapis*). Quite common, Malay Peninsula and Borneo.

Most collections of this fungus which I studied in Singapore had the larger spores, but a few had the smaller though no other difference could be detected. The Bornean collection, *RSNB 556*, on *Calamus*, was not luminous; it had the smaller spores.

***Panellus megalosporus* sp. nov.**

Fig. 8a

Albus, plus minusve sessilis. Pileus ~ 22 mm latus, reniformis, cretaceo-subpruinosis. Tubi ~ 1.5 mm longi; poris $0.2\text{--}0.3$ mm latis. Caro sicca. Haud luminescens.

Sporae $13\text{--}18.5 \times 12\text{--}16$ μ , subgloboseae vel late ellipsoideae, amyloideae. Basidia $60\text{--}120 \times 15\text{--}20$ μ ; sterigmata 4, $11\text{--}15$ μ longa; basidiola acerosa copiosa. Cheilocystidia etc. ut in *P. orientalis*. Hyphae fibulatae, $2\text{--}6$ μ latae, tunicis plus minusve incrassatis.

Ad ramulos emortuos in silva. Borneo, mt. Kinabalu, c. 3000 m alt., *RSNB 895* typus, in herb. Corner.

White, more or less sessile. Pileus ~ 15 mm in radius, 22 mm wide, reniform, horizontal, opaque, chalky. Stem very short, thick, lateral, or none, becoming villous at the base. Tubes ~ 1.5 mm long; pores $0.2\text{--}0.3$ mm wide at first, enlarging to 1.3 mm wide, *subcircular with chalky edges*, drying dark fuscous brown. Flesh dry. Not luminous.

Spores $13\text{--}18.5 \times 12\text{--}16$ μ , white, smooth, subglobose or broadly ellipsoid, apiculus $1\text{--}1.5$ μ long, bluish grey amyloid. Basidia $60\text{--}120 \times 15\text{--}20$ μ ; sterigmata 4,

11-15 μ long, 3-4 μ wide at the base; basidioles subacute, abundant. Cheilocystidia and hyphal structure as in *P. orientalis*. Pleurocystidia none. Hyphae 2-6 μ wide, clamped, with walls 1-2 μ thick in the stem and old flesh at the base of the pileus, not gelatinous; hymenium eventually becoming more or less invaded by 1-3 μ hyphae branching and lobing round the apices of the basidia.

On fallen twigs in montane oak-forest. Borneo.

Mt. Kinabalu east ridge c. 3000 m. alt., Corner s.n.: 29 & 30 June 1961, 15 July 1961; 20 July 1961, RSNB 895.

This species of high mountain forest has the largest spores and basidia of the genus.

***Panellus microsporus* sp. nov.**

Figs. 8g, 21

Dorsifixus, pendens, cervinobrunneus. Pileus -4 mm latus, discoideus. Stipes -1.5 $\times$ 1 mm, plus minusve centralis. Tubi -0.6 mm longi; poris 70-100 μ latis, minutis, subangulatis, acie cretaceo-pruinosa, dissepimentis subgelatinosis. Caro sicca.

Sporae 3-4 $\times$ 0.8 μ , allantoideae amyliodeae. Basidiola subacerosa copiosa. Cheilocystidia 25-80 $\times$ 7-12 μ , clavata vel subcylindrica, ex apicibus saepe diverticulos lobulatos intense amyloideos -4 $\times$ 1.5 μ emittentia; hyphis dichophysialibus nullis. Caulocystidia et pileocystidia ut cheilocystidia, dense instructa, irregulariter lobulata; hyphis dichophysialibus nullis; saepe massulis intense amyloideis intermixta. Hyphae fibulatae, 2-6 μ latae, tunicis submucilaginosi praecipue in dissepimentis.

Ad ramulos emortuos in silva. Borneo, mt Kinabalu 1700 m alt., RSNB 5514 typus, in herb. Corner.

Pendent, dorsifixed, fawn brown. Pileus -4 mm wide, discoid. Stem 1-1.5 $\times$ 1 mm, more or less central, expanding obconically into the pileus. Tubes -0.6 mm long; pores 70-100 μ wide, subangular, chalky; dissepiments subgelatinous. Flesh firm, not gelatinous.

Spores 3-4 $\times$ 0.8 μ , white, smooth, allantoid, pale violaceous amyloid, very abundant in all fruit-bodies but not seen attached. Basidia 12-15 $\times$ 3.5-4 μ ;

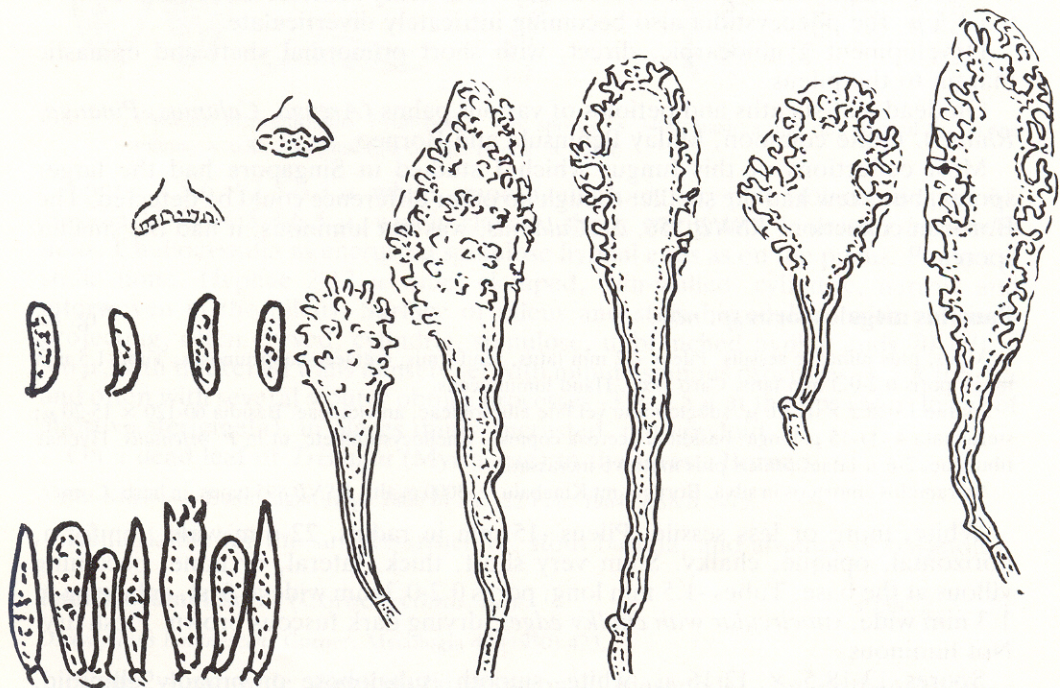


Fig. 21. *Panellus microsporus*. Fruit-body, $\times$ 3; spores, $\times$ 4000; basidia and cheilocystidia, $\times$ 1500.

sterigmata 4; basidioles $1.5\text{--}2.5\ \mu$ wide, subacrose. Cheilocystidia $25\text{--}80 \times 7\text{--}12\ \mu$, clavate to subcylindric, often shortly lobate at the apex or in the distal part, set distally with many minute, lobulate, strongly blue-black amyloid processes $4 \times 1\text{--}1.5\ \mu$, granular encrusted, the proximal stalk often with slightly thickened pale brown walls; without independent lobulate hyphae on the sterile pore-edge. Pleurocystidia none; gloecystidia none. Hyphae $2\text{--}6\ \mu$ wide, clamped, with hyaline submucilaginous walls $0.5\text{--}2\ \mu$ thick, longitudinal, regularly arranged. Surface of stem and pileus with a close palisade of erect cystidia similar to the cheilocystidia but more irregularly lobulate, with pale brown walls, without independent lobulate hyphae, the outside of the cells densely set in places with dark, purple-brown, amyloid masses.

On fallen twigs in the forest. Borneo.

Mt. Kinabalu, Bembangan River 1700 m. alt., 27 Feb. 1964, *RSNB 5514*.

This species appears to be abundantly distinct in the dorsifixed *Helotium*-like habit, the large cheilocystidia, the palisade of pileocystidia with amyloid masses, the subgelatinous hyphae, and the minute allantoid spores. They are the smallest among Malaysian species of the genus and contrast so strongly with the great spores of the preceding species *P. megalosporus* that they prove how spore-shape may have little generic value.

***Panellus orientalis* (Y. Kobayasi) comb. nov.**

Figs. 7, 8d, 22

Dictyopanus orientalis Y. Kobayasi, Bull. Nat. Sci. Mus. Tokyo 6 (1963) 360, fig. 3, pl. 50A.

Chalky white, becoming pale buff to pale fawn-ochraceous, finally rufous pink in age, but the pores white. Pileus-17 mm wide, pleuropodal, reniform, finely pruinoso-scurfy, becoming minutely cracked, opaque; margin slightly incurved at first. Stem $1\text{--}7 \times 2\text{--}3\ \text{mm}$, $1\text{--}1.5\ \text{mm}$ at the base, lateral, dilating upwards into the pileus, pruinoso-puberulous. Tubes $0.7\ \text{mm}$ long; pores $150\text{--}250\ \mu$ wide, circular, elliptic, or slightly radially elongate, with thin cream-white pruinose edges. Flesh firm soft, even subgelatinous, drying very horny.

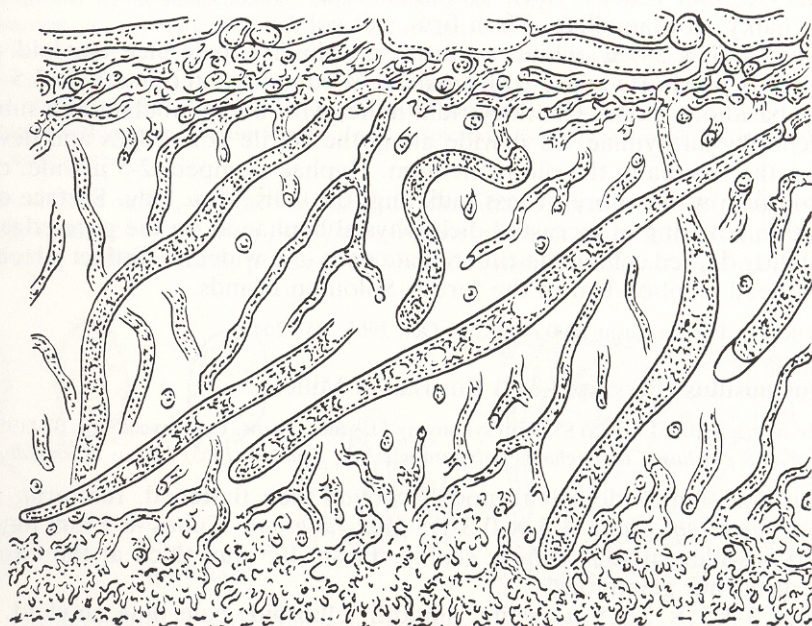


Fig. 22. *Panellus orientalis*. Surface of pileus, $\times 800$.

Spores $6.5-9.5 \times 6-8.5 \mu$, white, smooth, subglobose to lacrymiform, thin-walled, pale indigo amyloid. Basidia $20-40 \times 7.5-10 \mu$; sterigmata 4, $6-8 \mu$ long; basidioles subacute; subhymenium narrow, not corticate. Cheilocystidia $40-190 \times 3-6(-7) \mu$, gloeocystidial with oleaginous contents, thin-walled, cylindric to subclavate, abundant on the pore-edges of young fruit-bodies, often absent (? crushed) from the older, becoming covered with dichophyses with branches $1.5-3 \mu$ wide, often with the ends dilated $4-7 \mu$ wide and set with processes $6 \times 1-1.5 \mu$, wholly immersed in granular incrustation (soluble in dilute potash). Pleurocystidia none. Hyphae $1.5-6 \mu$ wide, clamped, thin-walled, some with subgelatinous walls, in the older tissue with the walls thickening slightly $0.5-1 \mu$, the cells -180μ long, often somewhat tuberculate. Surface of stem and young pileus constructed as the pore-edges with gloeocystidia and echinulate dilated ends of dichophysial branches, the older pilei becoming covered with a chalky-incrusted layer, -120μ thick, of excrescent lobulate dichophyses with the gloeocystidia scarcely distinguishable.

On fallen branches, dead trunks, bark and bits of wood in the forest, south Japan; North Borneo, Solomon Islands, at 800-1800 m altitude.

BORNEO. Mt. Kinabalu 1300-1800 m. alt., *RSNB*: 2705, 2952, 5396, 8078, collected in February, April, August, September. — SOLOMON ISLANDS 800-1800 m. alt., Guadalcanal, Malaita, *RSS*: 1652, 1678, 1805, October to November.

The Japanese specimens, which were considerably smaller than the Malesian, were found not to be luminous by Kobayasi; the tropical have not been tested.

***Panellus pauciporus* sp. nov.**

Pileus -1.5 mm latus, sessilis, albus. Tubi 3-15, minuti, albo-cretacei. Caro sicca.

Spores $6-7.7 \times 3-4 \mu$, subcylindricae amyloideae. Basidiola acerosa nulla. Cheilocystidia et pileocystidia nulla, ad margines tuborum hyphis dichophysialibus copiosis. Hyphae fibulatae, $2-5 \mu$ latae. Superficies pilei hyphis dichophysialibus instructa.

Ad folia emortua bambusae, in silva. Insulae Solomonenses, Guadalcanal 1800 m alt., *RSS* 1649 typus, in herb. Corner.

Pileus -1.5 mm wide, sessile, lateral, smooth, white. Pores 3-15 in all, minute, white, chalky, not lamellate. Flesh firm, not gelatinous.

Spores $6-7.7 \times 3-4 \mu$, white, smooth, subcylindric, pale blue amyloid. Basidia $17-20 \times 7-8 \mu$, short, wide, with opalescent contents; sterigmata 4, 3.5μ long; acerose basidioles none. Cheilocystidia none; with many lobulate and subechinulate dichophysial hyphae $1-2 \mu$ wide along the sterile pore-edges and developing between the basidia in the old hymenium. Hyphae clamped, $2-5 \mu$ wide, cylindric with thin firm walls, more or less radiating, the cells -80μ long. Surface of pileus with a thin covering of incrusted dichophysial hyphae as on the pore-edges, some with slightly dilated echinulate-tuberculate ends -5μ wide; no distinct pileocystidia.

On a dead bamboo-leaf in the forest. Solomon Islands.

Guadalcanal, Popomanasiu 1800 m alt., 27 Oct. 1965, *RSS* 1649.

***Panellus pusillus* (Pers. ex Lév.) Burdsall et Miller**

Nova Hedwigia Beih. 51 (1975) 85, with synonymy.; Corner, Trans. Brit. mycol. Soc. 37 (1954) 258, as *Dictyopanus pusillus*; Cunningham, Polyporaceae New Zealand (1965) 140, as *D. rhipidium*.

Pileus $4-12$ mm wide, pleuropodal, convex then flattened, reniform, smooth, opaque, fawn tan. Stem $-3.5 \times 0.3-1.5$ mm, fawn tan. Tubes -0.5 mm long; pores $100-150 \mu$ wide, circular, white, chalky. Flesh -0.5 mm thick at the base of the pileus, firm, not gelatinous.

Spores $3-4.5 \times 2-2.5 \mu$, white, smooth, ellipsoid, pale blue amyloid. Basidia $13-20 \times 4-5(-6) \mu$; sterigmata 4, 3μ long; basidioles acerose, numerous. Cheilo-

cystidia $20-40 \times 4-5 \mu$, cylindric to subclavate, thin-walled, not or scarcely gloeocystidial, producing 1-3 lobulating hyphae from the apex, becoming overtopped by exrescent dichophysal hyphae, in some collections the cheilocystidia indistinct. Pleurocystidia none. Hyphae $2-7(-11) \mu$ wide, monomitic, clamped, with walls 4μ thick in the stem. Surface of pileus with gloeocystidial hyphal ends $4-5 \mu$ wide overtopped by exrescent dichophysal hyphae more or less profusely diverticulate and densely encrusted, no distinct pileocystidia, the gloeocystidial hyphae lacking from some collections.

On dead wood and dead fallen branches in the forest.

MALAY PENINSULA. Penang Hill 330 m alt., 21 Sept. 1972, *Corner P-81*. — BORNEO. Mt. Kinabalu, east ridge 1000 m. alt., 26 Sept. 1961, *RSNB 1515*. Sandakan, Sepilok Forest low alt., 13 Aug. 1960, *Corner s.n.* — NEW GUINEA. Aiyura 2000 m. alt., 22 Sept. 1960, *Corner s.n.*

This description is drawn from the Malesian collections. They agree in spore-size and microscopic structure with those which I collected in Brazil (Corner 1954), but the fruit-bodies are small and the colour of the living pileus is distinctly brown, not white to pale tan. This pale colour is given for North American specimens by Burdsall and Miller, who find slightly larger spores $4-5.5 \times 2-3 \mu$. Cunningham, in recording the species from Australia and New Zealand, gave the pale colour but the small spores as in the Malesian collections. Whether the species is luminous in Malesia needs to be tested.

Besides differences in the development of cystidia, noted in the description, there were others among these Malesian collections. The Bornean had encrusted subhymenial hyphae, which is rarely the case. The Penang collection had no mat of exrescent dichophysal hyphae on the pileus, but relatively few short lobulating hyphae which formed a thin, bluish amyloid, membrane. Thus, spore-size is the main distinction for the species in the eastern tropics.

***Panellus sublamelliformis* sp. nov.**

Fig. 23

Pileus -3 mm latus, subsessilis, subdorsifixus, reniformis rimoso-pruinulosus, albus dein pallide cervino-brunneus, aetate subincarnatus. Tubi -0.5 mm longi; poris c. 170μ latis, rotundatis vel leniter radiato-elongatis, prope marginem pilei sublamelliformibus. Caro sicca.

Sporae $6-7.5 (-8) \times 4.5-5.5 \mu$, late ellipsoideae, amyloideae. Basidiola acerosa copiosa. Cheilocystidia et pileocystidia $22-35 \times 7-18 \mu$, clavata, hyphis dichophysialibus superantibus.

Hyphae fibulatae, $1.5-5 \mu$ latae, massulis resinosis brunneis intermixtae.

Ad caules emortuos bambusarum in silva. Insulae Solomonenses, Guadalcanal, 700 m alt., *RSS 1534* typus, in herb. Corner.

Pileus -3 mm wide, sublateral, slightly dorsifixed, reniform. minutely rimoso-pruinose, opaque, white then pale fawn brown, pinkish when old. Stem practically none. Tubes -0.5 mm long; pores c. 170μ wide, round to slightly radially elongate,

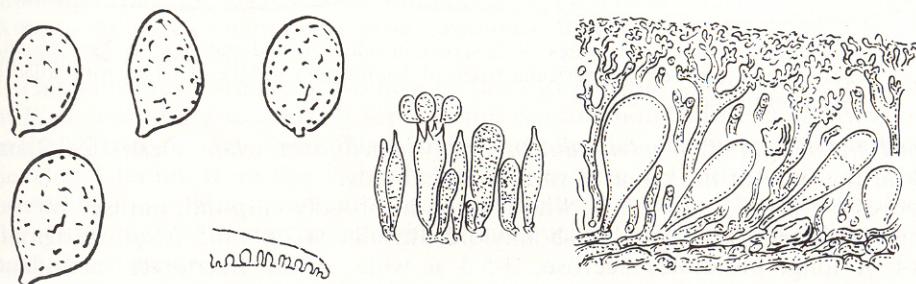


Fig. 23. *Panellus sublamelliformis*. Fruit-body, $\times 5$; spores, $\times 2000$; basidia and surface of pileus, $\times 500$.

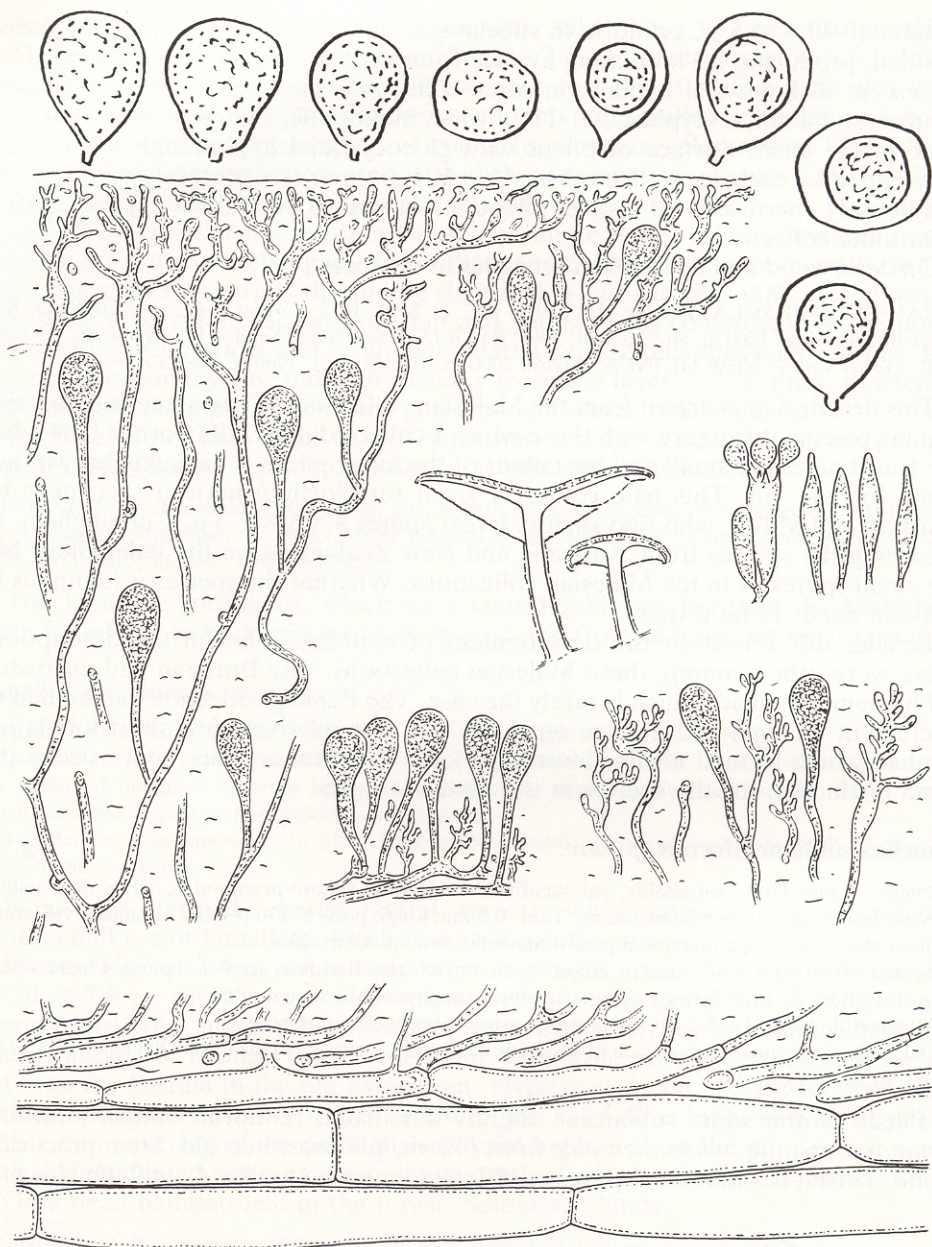


Fig. 24. *Panellus glutinosus*. Fruit-bodies, $\times 2$; spores in side-view and end-view, $\times 2000$; basidia, cheilocystidia (central) caulocystidia (right of centre), and surface of pileus with adjacent hyphae of the flesh, $\times 500$.

towards the margin of the pileus almost shortly lamelliform, white. Flesh 0.2-0.3 mm thick at the base of the pileus, firm, not gelatinous.

Spores $6-7.5(-8) \times 4.5-5.5 \mu$, white, smooth, broadly ellipsoid, obtuse, varying subamygdaliform, very pale bluish amyloid. Basidia $24-29 \times 6.5-7.5 \mu$; sterigmata 4, $4-6 \mu$ long; basidioles acerose, $3-5.5 \mu$ wide, often mucronate, abundant; subhymenium narrow, not corticate. Cheilocystidia $22-35 \times 7-18 \mu$, clavate, thin-walled, smooth, hyaline (not gloeocystidial, even when young), often rather sparse,

becoming overgrown by dichophysial hyphae 40-60 μ long with the body 3-6 μ wide, with closely lobulate branches, thinly encrusted, not amyloid. Hyphae 1.5-5 μ wide, clamped, with firm walls -2 μ thick, compact, with many extra-hyphal brownish resinous masses swelling in Melzer's iodine into large vitreous resinous brown globules. Surface of pileus with cystidia and dichophysial hyphae as on the pore-edges, the cystidia abundant near the margin of the pileus and almost as a palisade, becoming spaced over the general surface and much obscured by the exrescent dichophyses and resinous brown masses.

On dead bamboo stems in the forest. Solomon Islands.

Guadalcanal, Tambalusu c. 700 m alt., 19 Oct. 1965, RSS 1534 and 1536.

Subgen. *Mesopanellus* subgen. nov.

Receptacula mesopodalia marasmioidea, parva. Lamellae decurrentes, haud vel vix reticulato-venosae. Basidiola acerosa copiosa. Cheilocystidia clavata, intus oleaginosa. Hyphae haud granuloso-incrustatae, inflatae. Superficies pilei stipitisque cystidiis clavatis hyphisque dichophysialibus instructa. Duo species, Borneo, Peninsula Malayana. Typus — *P. glutinosus* sp. nov.

Fruit-bodies mesopodal, marasmiod, rather small with pileus -2 cm wide, white then pale ochraceous. Gills decurrent or adnato-decurrent, not dichotomous, not or slightly reticulately veined.

Spores white, smooth, pale amyloid. Basidioles acerose, abundant. Cheilocystidia strongly clavate with oleaginous contents; dichophysial hyphae on the gill-edge, sometimes inconspicuous. Pleurocystidia none. Hyphae not granular incrustated, clamped or not, inflating. Surface of pileus and stem with clavate cystidia and copious dichophysial hyphae.

Key to the species of subgen. *Mesopanellus*

1. Pileus and stem glutinous viscid, with stalked clavate cystidia and dichophysial hyphae in the mucilage. Spores $6-8.5 \times 5.5-7 \mu$, subtriangular in adaxial view. Clamps absent except on the mucilage-hyphae of pileus and stem. Hyphae of stem secondarily septate. Borneo *P. glutinosus* p. 140
1. Pileus and stem dry. Spores $7-8.5 \times 4.3-5 \mu$, not subtriangular. Clamps present; hyphae not secondarily septate. Clavate cheilocystidia not distinctly stalked. Malaya *P. pyruliferus* p. 141

The two species which I have placed in this new subgenus have the spores, basidioles, cystidia, and dichophysial hyphae of subgen. *Panellus* but, with mesopodal fruit-bodies and decurrent gills, they appear to belong to the alliance of *Marasmius*. Their hyphae lack the granular incrustation of typical *Panellus*, but this is a feature, also, of the three species of subgen. *Panellus* which lack the acerose basidioles, and it seems to be typical of the temperate subgen. *Mitellus*. Thus, only the mesopodal stem remains as a satisfactory distinction; along with the thin-walled inflating hyphae, it suggests that *Mesopanellus* is a relic of the ancestry of *Panellus*. Among the species without acerose basidioles, that which seems nearest to *Mesopanellus* is *P. fuscatus*.

This subgenus introduces two new features to *Panellus*. The hyphae in the stem of *P. glutinosus* are secondarily septate; this is a common feature in *Mycena* but not in the alliance of *Marasmius*. Then in this same species, the pileocystidia appear to develop laterally from the dichophysial hyphae (Fig. 24). It may be an illusion caused by the gelatinisation and swelling of the hyphal walls. Thus, the cheilocystidia are terminal with interposed dichophysial hyphae, and the caulocystidia seem to have this same arrangement.

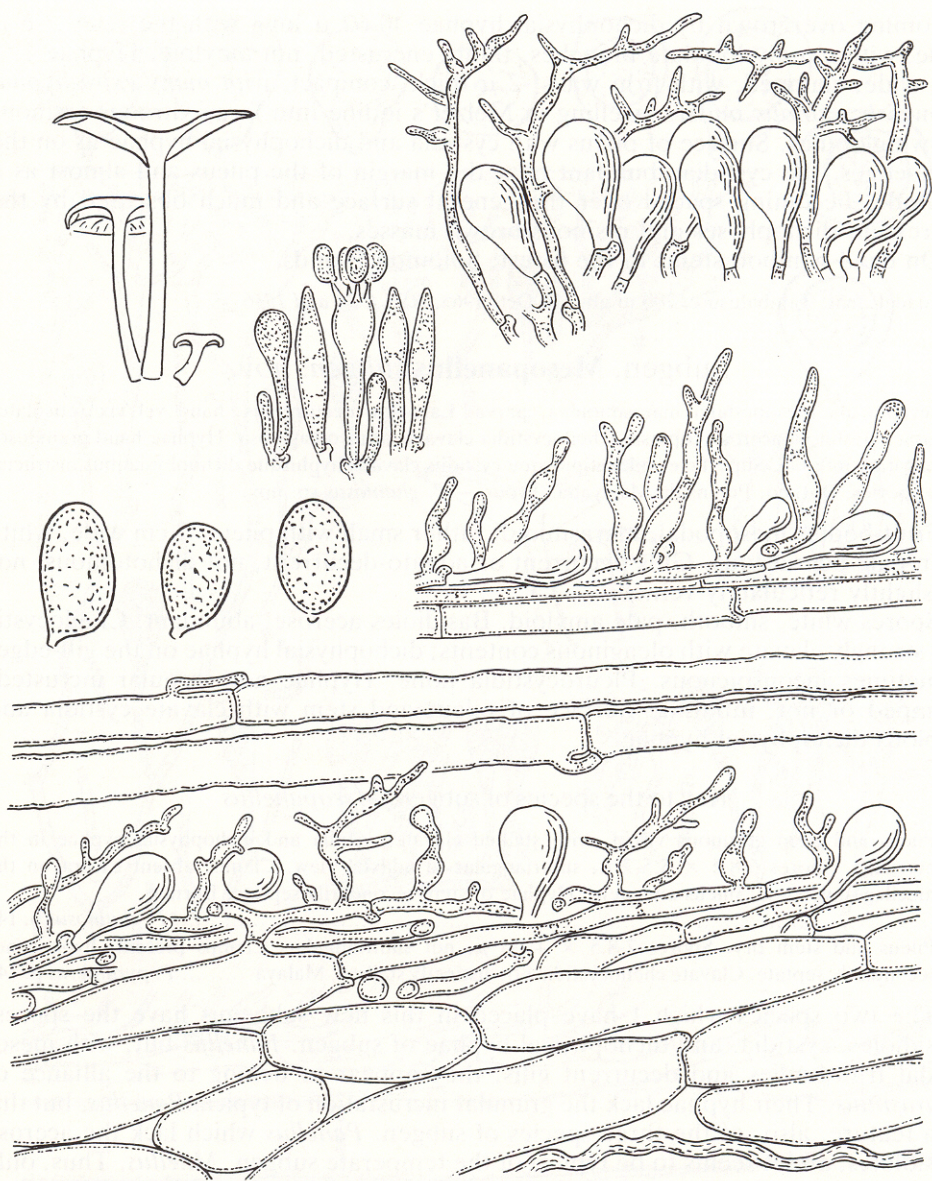


Fig. 25. *Panellus pyruliferus*. Fruit-bodies, $\times 2.5$; spores, $\times 2300$; basidia, cheilocystidia (above, surface of stem (middle drawing), and surface of pileus (below), $\times c. 500$.

***Panellus glutinosus* sp. nov.**

Fig. 24

Pileus -18 mm latus, convexus dein planus vel subumbilicatus, viscido-glutinosus striatus, albus dein pallide subochraceus. Stipes -12 $\times$ 0.5-1.5 mm, centralis, viscidua, albus, ad basim abruptum strigoso-villosus. Lamellae adnato-decurrentes, crassiusculae subgelatinosae, ad basim subreticulatae, albae, acie exsiccata brunneo-gummosa. Caro tenax, ad superficiem pilei stipitisque gelatinosa.

Sporae 6-8.5 $\times$ 5.5-7 μ , subgloboso-subtriangulares, amyloideae. Basidiola acerosa copiosa. Cheilocystidia 30-65 $\times$ 7-13 μ , clavata, intus oleaginoso-guttulata, hyphis dichophysialibus brevibus intermixta. Caulocystidia et pileocystidia similia, hyphis dichophysialibus gelatinosis superantibus. Hyphae inflatae, haud incrustatae; in stipite -17 μ latae, ordine secundo septatae sine fibulis; in pileo -26 μ latae, ? fibulatae; in superficie viscida 1.5-4 μ latae, fibulatae.

Ad ramulos emortuos in silva. Borneo, mt. Kinabalu, *RSNB 5705A* typus, in herb. Corner.

Pileus -18 mm wide, convex then plane to subumbilicate, *glutinous viscid* from the first, striate, *white then pale dingy ochraceous over the centre; margin slightly incurved at first, without veil*. Stem 6-12 $\times$ 0.5-1.5 mm, cylindric, *smeary viscid, white*, at first white pruinose, the abrupt base thinly strigose-villous. Gills adnate to adnato-decurrent, rather *thick, subgelatinous*, with mucilaginous edge, 13-20 primaries -2.5 mm wide, 2-3 ranks, becoming slightly reticulate at the base, *white*, the edge drying brown-gummy. Flesh thin, rather tough, gelatinous at the surface of pileus and stem. Smell slightly fishy.

Spores 6-8.5 $\times$ 5.5-7 μ , white, smooth, pip-shaped but rounded *subtriangular* in adaxial view, with oleaginous contents contracting into a refringent mass in dried spores, pale bluish amyloid. apiculus 0.7-1 μ long. Basidia 24-32 $\times$ 7.5-8.5 μ , with oleaginous contents; sterigmata 4, 5 μ long; basidioles -33 $\times$ 4-6 μ , acerose, abundant; subhymenium narrow, toughly gelatinous, not corticate. Cheilocystidia 30-65 $\times$ 7-13 μ , clavate with long narrow stalk 2.5-4 μ wide, smooth, oleaginous-guttulate, as a sterile edge, arising from the longitudinal subgelatinous hyphae of the gill-edge; with small inconspicuous dichophyses 1.5-3.5 μ wide. Pleurocystidia none. Hyphae monomitic, inflated, without clamps except in the mucilage hyphae on pileus and stem, secondarily septate (at least in the stem) the cells 40-280 $\times$ 3-17 μ in the stem and strictly longitudinal with broad septa; in the pileus radiating with cells -200 $\times$ 3-26 μ , narrow and subgelatinous next to the viscid surface; in the gill-trama as in the pileus but laxly interwoven; turning brownish in Melzer's iodine. Caulocystidia as the clavate cheilocystidia, with more copiously branched mucilaginous dichophyses as the ends of clamped mucilage hyphae 1.5-4 μ wide, bearing the clavate cystidia laterally and forming a mucilaginous layer 70-150 μ thick; the base of the stem with many excrecent 2-4 μ hyphae. Surface of pileus with a mucilaginous layer -400 μ thick, constructed as on the stem but with the mucilage hyphae more or less perpendicular to the surface and the dichophyses less compactly branched. Young pileus with the mucilage layer initiated by excrecent hyphae 1.5-3 μ wide, perpendicular to the surface, developing dichophyses at the ends and the clavate cystidia laterally; not initiated as a compact palisade.

On sticks in the forest, gregarious. Borneo.

Mt. Kinabalu, Mesilau 1600 m alt., 10 March 1964. RSNB 5705A; 16 March 1964, RSNB 5705B; 1 May 1964, RSNB 5705C.

***Panellus pyruliferus* sp. nov.**

Fig. 25

Ex integro albus, aetate flavidulus. Pileus -10 mm latus, convexus dein concavus, laevis, substriatus, siccus. Stipes -12 $\times$ 0.5-1 mm, centralis, pruinosulus, siccus, ad basim subvillosus. Lamellae adnatae vel subdecurrentes, subdistantes, angustae, haud reticulatovenosae. Caro firma, sicca.

Sporae 7-8.5 $\times$ 4.3-5 μ , ellipsoideae, haud subtriangulares, amyloideae. Basidiola acerosa copiosa. Cheilocystidia 29-35 $\times$ 7-8.5 μ , pyriformia, tenuiter tunicata, intus flavidulo-opalescentia, hyphis dichophysialibus superantibus. Caulocystidia et pileocystidia aut clavata ut cheilocystidia aut subcylindrica, subcapitata, -45 $\times$ 5-7 μ , saepe lobulis paucis praedita. Hyphae fibulatae, inflatae, nec incrustatae nec ordine secundo septatae nec gelatinosae; in stipite -17 μ latae; in pileo lamellisque 2-5 μ latae sed prope superficiem pilei 8-20 μ latae.

Ad lignum emortuum in silva. Peninsula Malayana, Pahang, Cameron Highland, *Corner s.n.* 2 Oct. 1966 typus, in herb. Corner.

Entirely white, yellowish in age. Pileus -10 mm wide, convex to concave, smooth, substriate; not viscid; margin slightly incurved at first. Stem 5-12 $\times$ 0.5-1 mm, cylindric, finely pruinose, dry, base slightly thickened and subvillous. Gills adnate to subdecurrent, subdistant, *narrow*, 15-20 primaries 0.3-0.7 mm wide, 1-2 ranks, interstices smooth. Flesh firm, drying hard, inodorous.

Spores 7-8.5 $\times$ 4.3-5 μ , white, smooth, ellipsoid, obtuse, not subtriangular, pale bluish violaceous amyloid. Basidia 29-35 $\times$ 7-8.5 μ ; sterigmata 4, 5 μ long;

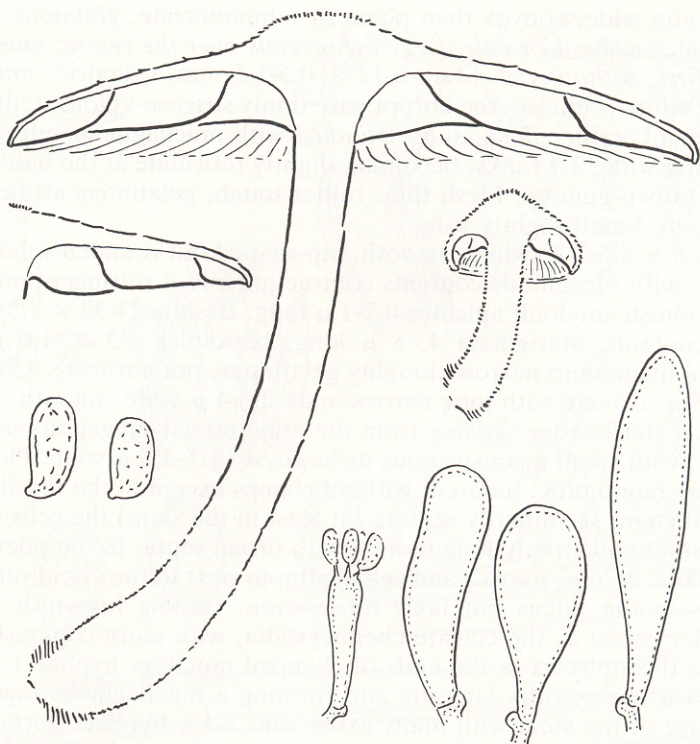


Fig. 26. *Panellus magnus*. Fruit-bodies, $\times 2$; unexpanded fruit-body, $\times 3$; spores, $\times 2500$; basidia and cheilocystidia, $\times 750$.

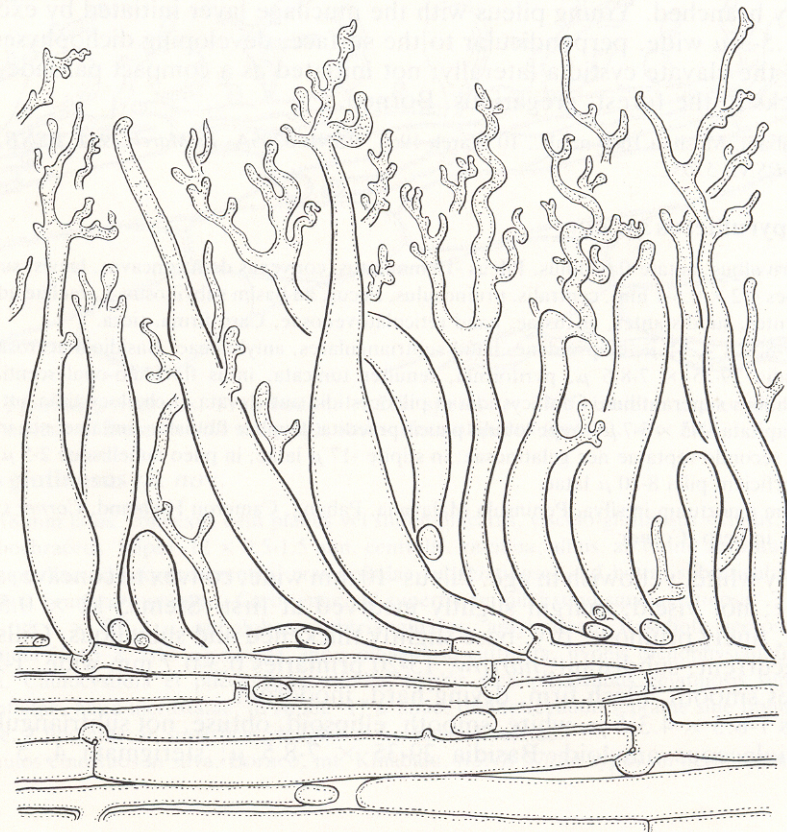


Fig. 27. *Panellus magnus*. Caulocystidia, $\times 500$.

basidioles acerose to subacuminate, abundant. Cheilocystidia $-27 \times 8-15 \mu$, pyriform, thin-walled, smooth, with yellowish opalescent contents, as broad sterile edge to the gill, becoming overgrown by narrow, $1-2.5 \mu$ wide, hyphae with spicate branches. Pleurocystidia none. Caulocystidia of two kinds; clavate as the cheilocystidia, more or less decumbent and scattered; as abundant small subcylindric, subcapitate, or subventricose cells $-45 \times 2.5-5(-7) \mu$, simple or with one or two processes. Pileocystidia as the caulocystidia, of two kinds, but sparser. Hyphae monomitic, clamped, inflating; cells of the stem $60-300 \times 6-17 \mu$, not or scarcely constricted at the broad septa, longitudinal, the walls often finely undulate and uneven, with a few narrow uninflated hyphae; in the pileus mostly uninflated, $2-5 \mu$ wide, interwoven, with firm walls, but near the upper surface with inflated cells $8-20 \mu$ wide; in the gill-trama uninflated, with firm walls. Oleiferous hyphae $3-6 \mu$ wide scattered in all parts.

On dead wood in the forest, gregarious. Malay Peninsula.

Pahang, Cameron Highland 1700 m. alt., 2 Oct. 1966, *Corner s.n.*

Macroscopically this suggests Omphalina or Trogia but the tissue is rather firm and dry. Microscopically it is easily recognised from the small pyriform cystidia with opalescent contents on the gill-edge and surfaces of pileus and stem. It could be looked for in *Marasmiellus* but the amyloid spores do not fit.

Subgen. *Megalopanellus* subgen. nov.

Pileus -9 cm latus, plus minus mesopodalis, furfuraceo-squamulosus. Stipes bene evolutus. Caro tenax, haud gelatinosa, inamyloidea. Basidiola acerosa nulla. Cheilocystidia vix diverticulata. Caulocystidia diverticulis ramoso-lobulatis saepe praedita. Superficies pilei trichodermoidea, sine hyphis dichophysialibus. Hyphae fibulatae, inflatae, superficiales tunicis brunneis et brunneo-incrustatis saepe praedita.

Lignicola, Borneo; typus *Panellus magnus* sp. nov.

This fungus could be squeezed into several genera with smooth amyloid spores, such as *Clitocybula*, *Porpoloma* and *Baeospora*, but it has the essential construction of *Panellus* where it assumes a primitive position in stature, hyphae, and squamulose pileus and stem. None of these points seems to have generic distinction when one considers the latitude in other genera such as *Mycena*, *Pluteus* and *Amanita*. I prefer the large generic concept because so many microgenera are merely transient abstractions from the incompletely known flora of the world. I find in subgen. *Megalopanellus* what one would expect for the derivation of the species with small, lamellate or poroid, fruit-bodies which are the majority. Thus there is a vestige of a trichoderm on the pileus of the lamellate *P. fuscatus*.

Panellus magnus sp. nov.

Figs. 26-29

Pileus 2-9 cm latus, convexo-planus, saepe subumbonatus, siccus, opacus vel prope marginem anguste striatus, fuscus, marginem versus isabellinus, minute fuscofuligineo-furfuraceus vel subsquamulosus. Stipes 3-6 cm $\times$ 3-6 mm, cylindricus vel apicem versus subattenuatus, saepe excentricus, haud lateralis, pallide isabellinus dein e basi abrupto fuscofuligineus, minute fuscofurfuraceus vel squamulosus, apice albopruinosus, sine annulo vel velo. Lamellae sinuato-adnatae vel adnato-decurrentes, confertae, tenues, tenaces, primariae 40-60, 2-4 mm latae, ordinibus 3-4 instructae, acie integra, albae dein isabellinae, aetate fuscofuligineae. Caro in centro pilei -2 mm crassa, plus minusve tenax, subcoriacea, haud gelatinosa, inodora.

Sporae $3.7-6 \times 1.8-2.8 \mu$, albae ellipsoideae, plus minusve intense amyloideae. Cheilocystidia $28-50 \times 5-17 \mu$, subcylindrica, clavata, vel subventricosa, tenuiter tunicata, ex apicibus diverticulis paucis saepe praedita, lamellae acie fertili dispersa. Pleurocystidia nulla vel sparsa ut cheilocystidia. Caulocystidia $30-150 \times 4-17 \mu$, subventricosa, fusiformia, tunicis brunneis, apices versus hyalinae et saepe in diverticulis ramosos vel lobulatos producta. Hyphae monomiticae, fibulatae, inflatae -22μ latae, hyphis angustis



Fig. 28. *Panellus magnus*. Surface of centre of pileus, $\times 500$.

1.5-7 μ latis intermixtis, saepe diverticulis brevibus paucis emittentes, tunicis -0.5 μ incrassatis, sparsim ordine secundo septatae; oleiferae nullae. Superficies pilei trichodermioidea disrupta, hypharum apicibus 0-2 septatis, cellulis apicalibus 45-90 $\times$ 4-20 μ , plerumque clavatis, tunicis brunneis; ex hyphis 4-9 μ latis, tunicis brunneis et saepe brunneo-incrustatis, oriens.

Ad truncos ramosque emortuos in silva montana, frequens, caespitosus, Borneo, mt Kinabalu, RSNB 847 typus, in herb. Corner.

Pileus 2-9 cm wide, conico-convex to *convexo-plane*, often *subumbonate*, dry, *opaque*, or narrowly striate at the margin, *fuscous*, *bistre yellowish towards the margin*, becoming paler on expansion, *minutely fuscous fuliginous scurfy or squamulose*, sparsely towards the pallid smooth margin slightly incurved at first. Stem 3-6 cm $\times$ 3-6 mm, cylindric or slightly attenuate upwards, *often excentric* but not lateral, *pale livid white then fuscous fuliginous from the base upwards*, *minutely fuscous squamulose or scurfy*, innately darker fibrillose from the base to the white pruinose apex; without veil and ring. Gills sinuato-adnate to adnato-decurrent, *crowded, thin, tough*, 40-60 primaries 2-4 mm wide, 3-4 ranks, not dichotomous, edge entire, *white then tinged bistre, fuscous fuliginous in age*. Flesh -2 mm thick in the centre of the pileus, rather tough, especially in the stem, white then concolorous. Inodorous; poisonous according to local inhabitants.

Spores 3.7-6 $\times$ 1.8-2.8 μ , white, smooth, ellipsoid, blue-black amyloid to pale vinaceous amyloid (RSNB 1684, 8006). Basidia 13-22 $\times$ 3.5-4 μ , 4-spored; acerose basidioles absent; subhymenium 10-20 μ thick, composed of 2-3 μ wide interwoven hyphae. Cystidia 28-50 $\times$ 5-17 μ , clavate or subventricose, with or without short processes, smooth, thin-walled, projecting -20 μ or almost wholly immersed, *scattered* on the gill-surface and along the fertile gill-edge. Caulocystidia 30-150 $\times$ 4-17 μ , more or less fusiform or subventricose with firm brown walls and colourless thin-walled apices, often with narrow lobed or branched processes from the apex, less often the processes lateral, forming a disrupted palisade, eventually invested

with dichophysal hyphae $1.5-2\ \mu$ wide. Hyphae monomitic, clamped, inflating, the walls becoming firm and in the stem thickened $-0.5\ \mu$, with cells $35-500 \times 8-22\ \mu$ in the longitudinal hyphae, narrowed to the septa or not, often somewhat uneven in width, occasionally secondarily septate in the stem, often with one or a few short abortive processes but no true binding hyphae, with narrower hyphae $1.5-7\ \mu$ wide interweaving and often rather copiously branched with abortive processes but septate with clamps; no oleiferous hyphae; in the gill-trama, parallel descending, more or less inflated as in the pileus, forming a rather tough tissue, not amyloid. Surface of pileus with a short disrupted pile of hyphal ends with firm brown walls,



Fig. 29. *Panellus magnus*. Hyphae of the stem, that on the right secondary septate with cytoplasm retracted from the apex; $\times 500$.

1-3 cells long, the terminal cells $45-90 \times 4-20 \mu$, generally clavate and subacute, arising from $4-9 \mu$ wide hyphae with firm brown walls and often with more or less annular brown incrustation; the hyphal ends of the pile more or less erect over the centre of the pileus, more or less decumbent and scattered in clusters over the limb.

Frequent, caespitose, on dead standing trunks and fallen wood in montane forest, Borneo.

Mt. Kinabalu 1700-3500 m alt., 16 July 1961, *RSNB* 847; 9 Aug. 1961, *RSNB* 1684; 20 Feb. 1964, *RSNB* 5381; 31 March 1964, *RSNB* 8006.

The tufts of this pallid fungus are a conspicuous sight on the hard dead trunks which abound in the upper forest on mt. Kinabalu; there, oaks, Myrtaceae, *Rhododendron* and podocarps abound with many other kinds of tree, and I was unable to decide what might have been the host-tree. The Dusun people claimed to know it well for they regarded it as poisonous, but I am not convinced that they distinguished it from *Pleurotus decipiens* (Corner 1981). I did not test whether it was phosphorescent. Superficially, this fungus would pass for *Lentinus* in its general sense. The hyphal structure is incipiently dimitic, though not sarcodimitic as in *Trogia*, and the interweaving processes suggest not so much binding hyphae as incipient internal dichophysial hyphae.

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