New and Remarkable Hymenomycetes from Tropical Forests in Indonesia (Java) and Australasia

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Zusammenfassung. Aus Neuseeland, Neu Kaledonien, Neu Guinea und Java werden neue Arten von Boletales (*Boletus perroseus* sp. n. (1), *B. phytolaccae* sp. n. (2)) und Agaricales (*Microcollybia conidiophora* sp. n. (8), *Macrocystidia reducta* Hk. & Capellano sp. n. (11), *Copelandia affinis* sp. n. (14), *Cuphocybe ferruginea* sp. n. (17)) abgebildet und beschrieben. Anhand von frischem topotypischem Material konnten *Xerocomus junghuhnii* (v. Hoehnel) Singer (3), *Vanromburghia silvestris* Holtermann (5) und *Camarophyllus lactarioides* Hennings (7) — alle aus Java — nachuntersucht und deren systematische Stellung diskutiert werden. Neue Standorte werden für *Mycenoporella lutea* v. Overeem (6) in Neu Guinea und Afrika (Gabon) und für *Pulveroboletus frians* Corner (4) in Neu Guinea mitgeteilt. Folgende Agaricales (deren Vorkommen nach bisheriger Kenntnis auf die temperierte Zone der Nord- und Südhemisphäre beschränkt war) sind jetzt auch in tropisch-montanen Wäldern des Fernen Ostens nachgewiesen: *Asterophora parasitica* (Fr.) Singer (9), *A. lycoperdoides* S. F. Gray (10), *Crucispora naucorioides* Horak (12), *C. rhombisperma* (Hongo) comb. nov. (13), *Descolea pretiosa* Horak (15) und *D. gunnii* (Berkeley) Horak (16).

Acknowledgements

My thanks are due to the authorities of the Department of Forest both in New Zealand and Papua New Guinea for the opportunity to study the fungi in these countries. I am indebted to Dr. M. A. Rifai for the facilities offered at the Botanical Garden, Bogor, Indonesia. A travelling grant from the Swiss Society of Natural Sciences financed a collecting trip to New Caledonia and Java (Indonesia) whose interesting fungus flora are still inadaequately studied. Finally I have to thank the Curators in BO, E, FH and K for the loan of type material.

If not otherwise stated the magnifications of the figures are: carpophores (nat. size), spores (×2000), basidia and cystidia (×1000), cuticle (×500, vertical section).

Description of Species (1—17)

1. *Boletus perroseus* Horak sp. n. — Fig. 1

Pileus —35 mm, convexus dein applanatus, roseus, lanatovelutinus. Tubi olivacei, ovali vel rhomboidei, haud cyanescentes, pori rubri. Stipes —30× —5 mm, cylindricus, apicaliter ruber, basim versus perluteus, glaber. Caro haud cyanescens. Sporae 7—9×5—6 µm, ellipsoideae, pallide luteo-brunneae, leves. Cystidia fusoidea. Ad terram in silvis nothofagineis. Nova Caledonia. Typus ZT 77/28.

Pileus —35 mm, convex becoming expanded and applanate, centre sometimes depressed in aged carpophores; pink; fibrillose-woolly or felty all over, dry, sterile margin absent. Tubes —6 mm long, emarginate, often decurrent with short ribs; yellow to olive, margin of oval to polygonal pores distinctly red, not bluing on bruising Stipe —30×—5 mm, cylindric, occasionally tapering towards base, central; red in upper portion becoming deep yellow downwards; smooth to innately fibrillose, any traces of net or granulation absent, dry, solid,

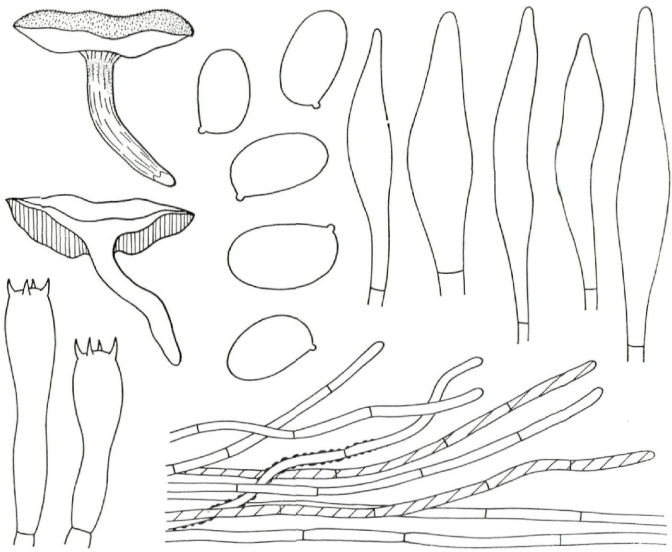


Fig. 1. *Boletus perroseus* Horak (type): carpophore, spores, basidia, cheilocystidia, cuticle

veil remnants absent, single in groups. Context red beneath cuticle of pileus and in apex of stipe, conspicuously yellow in lower parts of stipe, not bluing. Odour and taste not distinctive. Chemical reactions on pileus: KOH — pale yellow.

Spore print brown. Spores 7—9×5—6 µm, ellipsoid to ovate, smooth, pale yellow-brown, membrane thin-walled, inamyloid. Basidia 30—40×8—10 µm, 4-spored. Cheilo- and pleurocystidia 40—60×6—10 µm, fusoid to lageniform, thin-walled, hyaline, rather scattered. Cuticle a cutis or trichoderm of cylindric hyphae (3—5 µm diam.), membrane not gelatinized, brown plasmatic and encrusting pigment present. Clamp connections none.

Habitat. — On soil in *Nothofagus* forest. — New Caledonia.

Material. — New Caledonia: Paita, Mt. Mou, 1150 m, 22. II. 1977, leg. Horak (ZT 77/28, holotype).

The most distinctive character of *B. perroseus* is the peculiar shape of the spores. Ovoid spores are rarely encountered in the Boletaceae and in the Far East there are only two taxa which seem to be close relatives of the New Caledonian bolete, viz. *B. phoeniculus* Corner

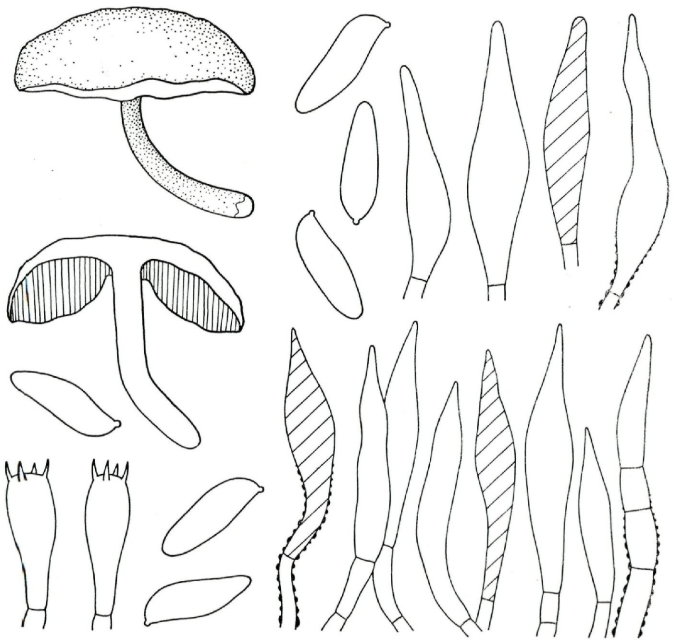


Fig. 2. *Boletus phytolaccae* Horak (type): carpophore, spores, basidia, cheilocystidia, cuticle

(1972; from Malaysia) and *Xerocomus parvulus* Hongo (1963; from Japan).

2. *Boletus phytolaccae* Horak sp. n. — Fig. 2.

Pileus — 40 mm, convexus, vinosus vel purpureus, velutinus vel minutissime fibrillosus. Tubi lutei, pori rhomboidei, concolores, valde cyanescentes. Stipes — 35 × — 5 mm, cylindricus, pileo concolor, granulatus. Caro cyanescens.

Sporae 8.5—11×3—3.5 µm, fusoideae, luteobrunneae. Cystidia fusoidea. Ad lignum putridum in silvis. Nova Caledonia. Typus ZT 77/20.

Pileus —40 mm, hemispheric to convex, pulvinate; deep purple-brown or wine red with brown tinge; velutinous or minutely felty, cuticle not concentrically cracking, dry, sterile margin absent. Tubes —10 mm long, emarginate, deep yellow, immediately bluing after bruising, pores —1 mm diam., polygonal, concolorous with tubes. Stipe —35×—5 mm, cylindric, equal; concolorous with pileus in upper portion, paler or pale brown towards base; dry, pustulose or granulose over whole length, net absent, veil remnants none, solid, single. Context wine red, immediately bluing on bruising of after exposure. Odour and taste not distinctive. Chemical reactions on pileus: KOH — negative.

Spore print brown. Spores 8—11.5×3—3.5 µm, fusoid, smooth, pale yellow-brown, membrane thin-walled. Basidia 20—25×7—9 µm, 4-spored. Cheilo- and pleurocystidia 30—50×7—12 µm, fusoid, hyaline or encrusted with yellow-brown pigment, often also plasmatic pigment present. Cuticle a palisade of erect cylindric hyphae, terminal cells conic or tapering towards apex, membranes not gelatinized, brown (KOH) plasmatic pigment present. Clamp connections none.

Habitat. — On rotten wood in forests dominated by *Nothofagus* spp. — New Caledonia.

Material. — New Caledonia: Paita, Mt. Mou, 1200 m, 20. II. 1977, leg. Horak (ZT 77/20, holotype).

3. *Xerocomus junghuhnii* (v. Hoehnel) Singer 1945 — Fig. 3
Farlowia 2: 297.

Bas. *Boletus junghuhnii* v. Hoehnel 1914: Fragm. Myk. 16: 39 in Sitzber. K. Akad. Wiss. Wien Math. Natw. Kl. 73: 1—107.

Description of topotypic material: Pileus —30 mm, convex becoming plane or umbonate, centre depressed with slightly upturned margin; pale yellow-brown with concolorous or brown, distinct, scurfy to fibrillose, isolated squamules especially around disc; dry, here and there cracking and exposing paler coloured subcuticle, veil remnants absent. Tubes up to 4 mm, broadly adnate to subdecurrent; lemon yellow when young turing yellow with pale olive tinge, pores polygonal, up to 2 mm diam., concolorous, bluing on bruising. Stipe —25×—2.5 mm, cylindric, slender, central; yellow at the apex, below distinctly (wine) red to purple, pale brown towards base; dry, fibrillose, solid, single and cespitose. Context whitish to pale yellow in pileus, red to purple in upper portion of stipe, pale brown towards stipe, slightly cyanescent on exposure.

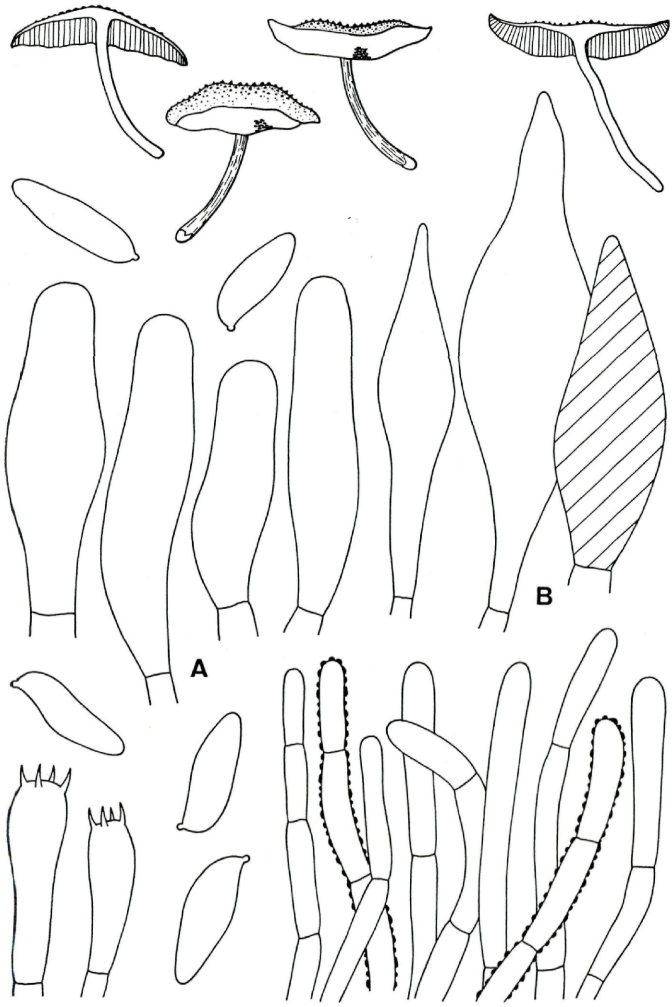


Fig. 3. *Xerocomus junghuhnii* (v. HOEHNEL) SINGER (ZT 77/100): carpophores, spores, basidia, cheilocystidia (A), pleurocystidia (B), cuticle

Odour and taste not distinctive. Chemical reaction on pileus: KOH-negative.

Spore print brown. Spores 10—12×3.5—4 µm, fusoid, pale yellow-brown, smooth, germ pore absent. Basidia 22—35×7—10 µm, 4-spored. Cheilocystidia 35—60×10—16 µm, cylindric to broadly lageniform, membrane hyaline, thin-walled. Pleurocystidia 45—90×8—14 µm, fusoid, membrane thin-walled, hyaline or pale yellow. Cuticle a palisade of erect cylindric hyphae, apex rounded-obtuse, terminal cells 5—10 µm diam., membrane not gelatinized, encrusted with yellow-brown (KOH) pigment. Clamp connections absent on septa.

Habitat. — On soil and on rotten mossy logs in *Castanopsis-Lithocarpus* forests. — Indonesia (Java; type), Borneo (Corner 1972: 211).

Material. — Indonesia: Java, Bogor, Tjibodas, 1908, leg. v. Hoehnel Nr. 1187 (lectotype, FH). — same locality, 1700 m, 14. III. 1977, leg. Horak (ZT 77/100).

Five collections of this Javanese bolete are kept in the v. Hoehnel Herbarium in FH, but none is designated to represent the type (cp. Singer 1945: l. c.). Nr. 1187 is by far the best preserved sample (which very well compares with my topotypic material) and was therefore selected for the lectotype.

4. *Pulveroboletus frians* Corner 1972 — Fig. 4
Boletus in Malaysia, 203

The macroscopic characters of the Papua New Guinean specimens agree in all details with those of the type collection. Our material has the following microscopic data: Spore print brown. Spores 7—8.5×5—5.5 µm, ovoid, occasionally suballantoid, smooth, brown, membrane thin-walled. Basidia 30—36×7—10 µm, 4-spored. Cheilo- and pleurocystidia 50—65×7—12 µm, fusoid, hyaline, thin-walled, pigment absent. Cuticle composed of entangled cylindric hyphae (4—6 µm diam.), membranes not gelatinized, yellow (KOH) pigment encrusting or plasmatic. Clamp connections absent. No chlamydospores observed (cp. Watling 1979: 460).

Habitat. — On soil in forests. — Singapore (type), Malaysia, Borneo, Papua New Guinea (in forests dominated by *Lithocarpus* spp. and *Castanopsis acuminatissima*).

Material. — Papua New Guinea: Morobe district: Bulolo, Heads Hump, 1000 m, 21. X. 1971, leg. Horak (ZT 71/164). — Bulolo, Manki, 1300 m, 22. III. 1972, leg. Horak (ZT 72/269). — Western Highlands, Mt. Hagen, Jimi-Baiyer Divide, 1600 m, 22. VIII. 1975, leg. G. George (ZT 75/492).

This is a striking yellow bolete whose pileus and stipe are com-

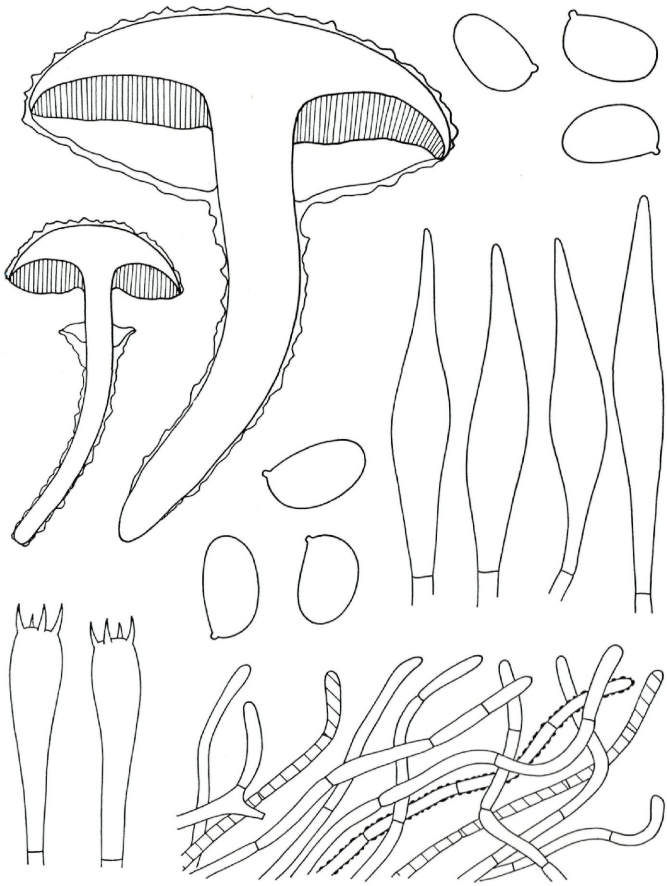


Fig. 4. *Pulveroboletus frians* CORNER (ZT 72/269): carpophores, spores, basidia, cheilo- and pleurocystidia, cuticle

pletely covered by soft floccose patches and squamules of the velum universale. Weathered specimens are readily identified by the rather pale brown, ellipsoid spores which distinguish *P. frians* from the related *P. ravenelii*, a rather common species occurring in Indomalaya (Singapore, Malaysia, Borneo), SE-Asia (Japan, China) and North

America (CORNER 1972: 202). In the field *P. frians* can be separated from its double by the conspicuously orange context in the base of the stipe (still recognized in dried specimens).

5. *Vanromburghia silvestris* HOLTERMANN 1898 — Fig. 5
Mycol. Unters. Trop. 104, t. 11, 2a—d.

For list of synonyms see CORNER (1966: 233).

Habitat. — On soil in forests. — Indonesia (Java; type), Malaysia and Borneo (fide CORNER 1966: l. c.).

Material. — INDONESIA: Java, Bogor, Tjibodas, 1600 m, 15. III. 1977, leg. HORAK (ZT 77/116, topotypic material).

In Java *Vanromburghia silvestris* and *Mycenoporella lutea* v. OVEREEM (see following species) occur together in lowland and mountain forests (type locality for both species is Tjibodas) and it must be warned that weathered specimens of *Vanromburghia* could easily mistaken for *Mycenoporella*. Microscopically the two species are distinct, however, due to the conspicuous, slender, subcapitate hymenial cystidia, the large spores and the peculiar structure of the cuticle of the former species (for complete description see CORNER 1966: l. c.). It should be added that the hymenial cystidia often bear a distinct hyaline, resinous cap and their plasmatic content is strongly refractive (in KOH). Pileocystidia present but scattered (cp. CORNER's key, p. 189).

CORNER (1966: l. c.) underlines that *Vanromburghia* is a puzzling hymenomycete which recalls other genera like *Mycena*, *Stereum Cantharellus* or *Craterellus*. To our opinion there are no great problems to connect *Vanromburghia* also with *Marasmius* (in contradiction with CORNER), *Hydropus* (s. l.), *Heimiomyces* and *Xeromphalina*. Last but not least *V. silvestris* is also related to some representatives of *Trogia* (ss. CORNER 1966), a form genus assembling various heterogenous fungi. From whatever angle seen *Vanromburghia* is a well defined, monotypic (!) genus holding a key position amoung the agaricoid and cantharelloid fungi. It should not be considered a synonym of *Trogia* until more information is available on taxa of similar taxonomically intermediate relationships.

6. *Mycenoporella lutea* v. OVEREEM 1926 — Fig. 6
Icon. fung. malay., H. 14—15: 4
Syn. *Phlebophyllum vitellinum* HEIM 1968a: Cah. de la Maboké 6: 86.

Habitat. — On soil in forests (under fagaceous trees in Indo-malaya and Australasia). — Indonesia (Java), Papua New Guinea, Gabon.

Material. — INDONESIA: Java, Tjibodas, ca. 1400 m, 3. IV. 1936, leg. LÜTJEHARMS (L, tototypic material). — PAPUA NEW GUINEA:

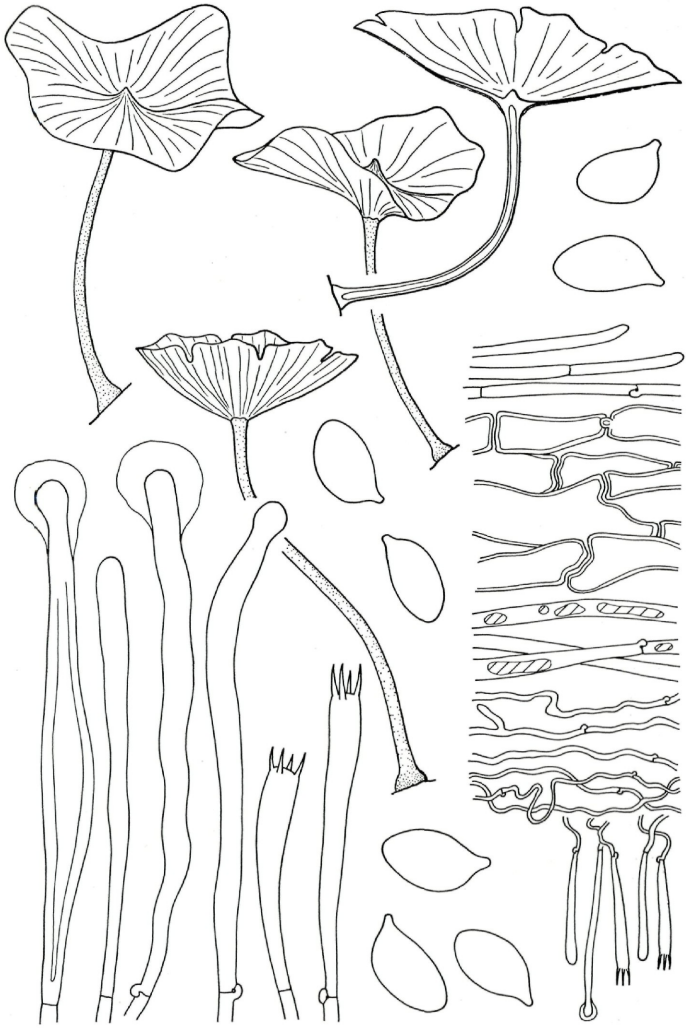


Fig. 5. *Vanromburghia silvestris* HOLTERMANN (ZT 77/116): carpophores, spores, basidia, cystidia, vertical section across pileocutis and hymenium

Morobe district: Bulolo, Manki, 1400 m, 20. V. 1973, leg. HORAK (ZT 73/240).

A rather complete redescription of this species (as observed on pickled topotypic material) has been published by HORAK (1968: 394) but several microscopic characters could not be extracted from these specimens.

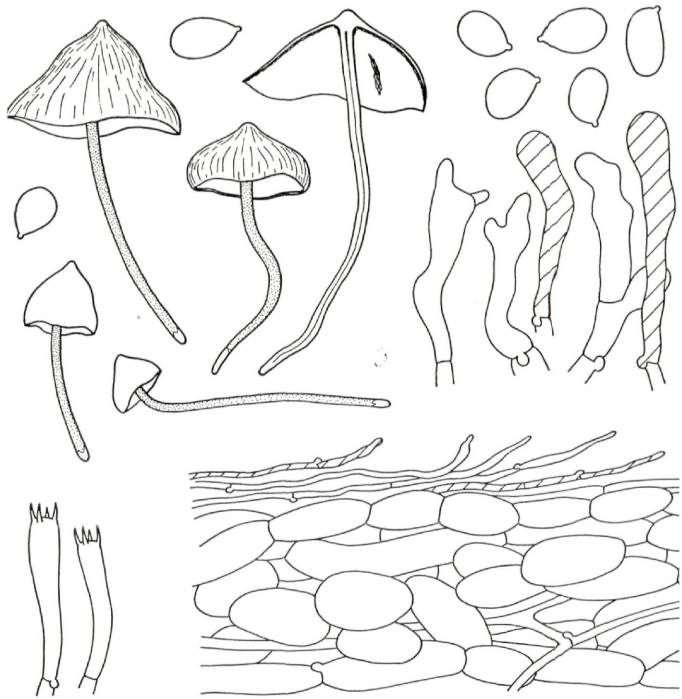


Fig. 6. *Mycenoporella lutea* v. OVEREEM (ZT 73/240): carpophores, spores, basidia, caulocystidia, cuticle

Mycenoporella lutea was found again in Papua New Guinea (under similar ecologic conditions as reported from the type locality) and the result of the thorough examination is illustrated in fig. 6.

Spores are definitely inamyloid and measure about 4.5—5.5× 3—4 µm. Cystidia absent except on the upper portion of the stipe, clavate to diverticulate, yellow plasmatic pigment present. Cuticle

composed of cylindric hyphae (2—4 μm diam.), terminal cells often cystidioid. Subcutis of subglobose to ovate cells with yellow plasmatic pigment. Clamp connections present on septa.

All data published on *Phlebophyllum vitellinum* HEIM (1968a) from Gabon (West-Africa) indicate that this taxon obviously is conspecific with *Mycenoporella lutea*. Accordingly it is treated here as a synonym of *Mycenoporella*.

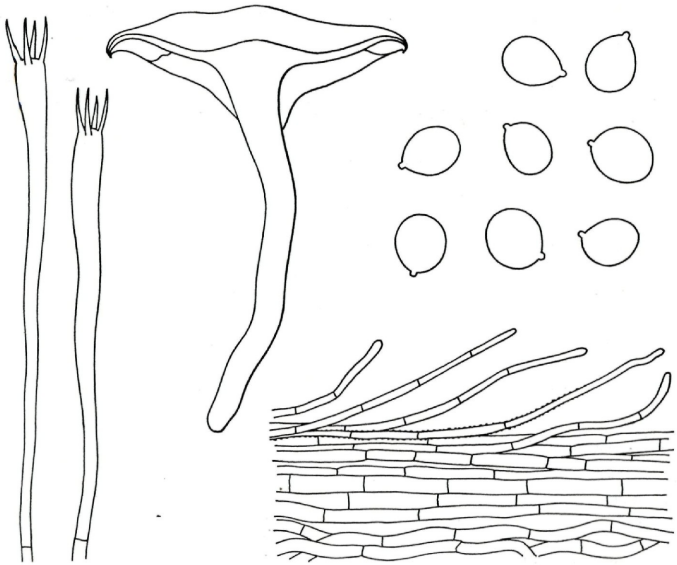


Fig. 7. *Camarophyllus lactarioides* HENNINGS (ZT 77/199): carpophore, spores, basidia, cuticle

7. *Camarophyllus lactarioides* (HENNINGS) comb. nov. — Fig. 7

Bas. *Hygrophorus* (*Camarophyllus*) *lactarioides* HENNINGS 1900: Monsunia 1: 148.

Description of our material (ZT 77/199) collected at the type locality: Pileus —50 mm, convex when young becoming umbonate-expanded, margin strongly inrolled, still incurved in mature specimens; pale brick red with pale red-ochre tinge, reddish brown towards estriate margin or with age; minutely innate-fibrillose, dry, not hygrophanous, veil remnants none. Lamellae (L 14—16, —3) broadly adnate to decurrent-arcuate, often anastomosing at the base, rather

ithck; concolorous with pileus or paler, edge broadly rounded. Stipe —70×—7 mm, cylindric, equal or slightly tapering towards base; concolorous with pileus or paler; minutely fibrillose, rather tough, dry, solid when young becoming fistulose, single in groups.

Context pale brown, tough. Odour pleasant, like fresh bread. Taste mild. Chemical reactions on pileus: KOH — negative.

Spore print white. Spores 4.5—5 (—5.5) µm, globose to subovoid, hyaline, smooth, membrane thin-walled, inamyloid. Basidia 60—85×4—5 µm, unusually long and slender, 4-spored, sterigma up to 7 µm long. Cystidia absent. Cuticle a cutis of repent cylindric hyphae (2—4 µm diam.), membrane not gelatinized, encrusted with pale brown (KOH) pigment; hyphae of subcutis short-celled, irregularely entangled. Clamp connections absent.

Habitat. — On soil in forests (under *Castanopsis* spp. and *Lithocarpus* spp.). — Indonesia (Java).

Material. — Indonesia: Java, Bogor, Tjibodas, 1750 m, 16. III. 1977, leg. Horak (ZT 77/199).

The topotypic material described here represents the third record of *C. lactarioides* (cp. Bresadola 1907). The brick red colour and the characteristic habit of the carpophores are reminding a representative of *Gloeocantharellus* (cf. *G. lateritius*, *G. echinosporus*) but microscopic examination promptly leads to *Camarophyllus*. A significant feature of this Javanese agaric are the very long and slender basidia which can reach up to 85 µm.

8. *Microcollybia conidiophora* Horak sp. n. — Fig. 8

Pileus —6 mm, acuto-conicus, pallidus, glaber. Lamellae adnato-adnexae, angustae, pallidae. Stipes —60×—1 mm, cylindricus vel basim versus attenuatus, pallide brunneus, farinaceus, rhizoidea brunneola et/vel sclerotium nigrum adsunt vel desunt. Sporae 4.5—6×2—2.5 µm, ellipsoideae, hyalinae. Arthroconidia polymorphica adsunt. Ad terram in silvis quercuum. Nova Guinea. Typus ZT 72/376.

Pileus —6 mm, hemispheric, convex or expanded, always with acute and pointed papilla, margin incurved in young specimens; whitish to pale brown; at first mealy (from arthroconidia) becoming smooth, dry, margin not striate, not hygrophanous. Lamellae (L 8—10, 0—2) adnate to adnexed, sometimes emarginate, very narrow or even vein-like (cantharelloid); whitish to pale argillaceous or pale grey. Stipe —60×—1 mm, cylindric, equal or tapering towards base, central; grey or pale brown; mealy to pruinose over whole length (from arthroconidia), with or without pale brown rhizoids, dry, tough, solid, single or cespitose, black sclerotium of irregular shape (—5 mm diam.) present or absent. Context pale brown. Odour and taste not distinctive. Chemical reactions unknown.

Spore print white. Spores 4.5—6×2—2.5 µm, ellipsoid to subcylindric, hyaline, smooth, membrane thin-walled, inamyloid. Arthroconidia originating on tips of cuticular hyphae on pileus and stipe, size and shape varying, hyaline, membrane thin-walled (compare fig. 8). Basidia 14—20×4 µm, 4-spored. Cystidia absent. Cuticle a cutis of repent cylindric hyphae (3—6 µm diam.), terminal cells transformed into irregular arthroconidia which break off at septa. Clamp connections present.

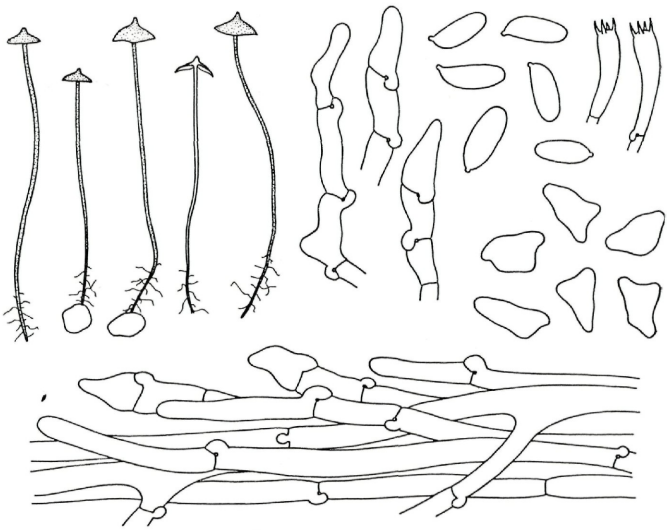


Fig. 8. *Microcollybia conidiophora* HORAK (type): carpophores, spores, arthroconidia, basidia, tips of hyphae (on stipe) with developing arthroconidia, cuticle

Habitat. — On soil in forests (dominated by *Castanopsis acuminatissima* and *Lithocarpus* spp. — Papua New Guinea.

Material. — PAPUA NEW GUINEA: Morobe district: Bulolo, Manki, 1250 m, 7. IV. 1972, leg. HORAK (ZT 72/376, holotype). — Same locality, 1400 m, 30. XI. 1972, leg. HORAK (ZT 73/315).

The most interesting feature of this *Microcollybia* is the occurrence of thallic arthroconidia (WATLING 1979: 457) formed by fragmentation of the hyphae on stipe and pileus. Presence of arthroconidia in *Microcollybia* is only reported for *M. racemosa* (FR.) LENNOX (1979: 191). However, *M. conidiophora* is readily distinguished by the absence of

coremia on side branches of the stipe and by the persistently acutoconic pileus.

9. *Asterophora parasitica* (Fries) Singer 1951 — Fig. 9
Lilloa 22: 171 (comb. inval.)

As illustrated in fig. 9, the Papua New Guinean material corresponds in all macro- and microscopic details with European specimens: Spores 4.5—5.5×3 µm, ovate, hyaline, membrane thin-walled, inamyloid. Basidia 20—26×4—5 µm, 4-spored. Chlamydospores

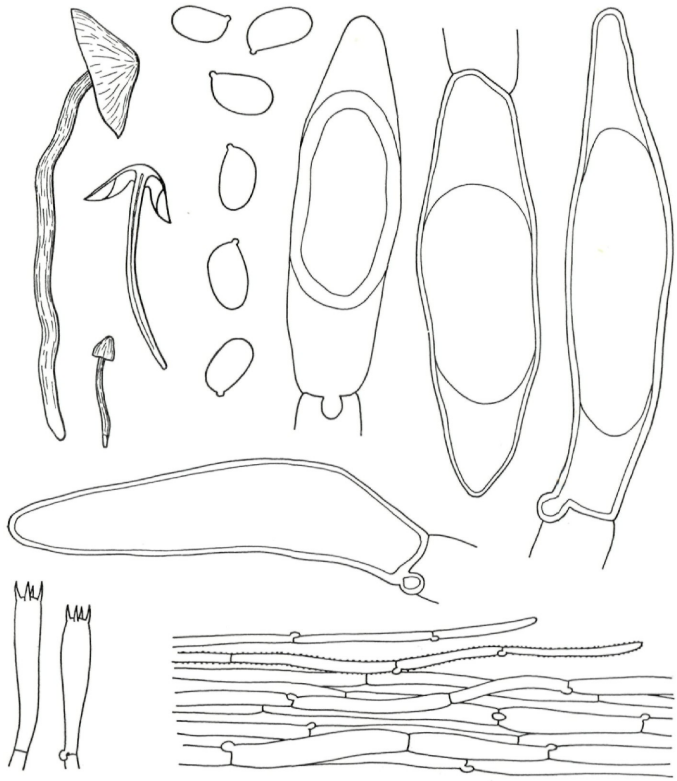


Fig. 9. *Asterophora parasitica* (Fr.) Singer (ZT 71/398): carpophores, spores, basidia, chlamydospores, cuticle

20—45 × 8—10 µm, ellipsoid, apex either obtusely rounded or conic, membrane up to 1 µm diam., pale brown, with large refractive oil drop, clamp connections on basal septum. Cuticle a cutis of repent, cylindric hyphae (2—8 µm diam.), membrane not gelatinized, encrusted with pale brown pigment. Clamp connections numerous.

Habitat. — On rotting carpophores of *Russula* spp., *Lactarius* spp. and rarely on other agarics belonging to *Armillariella* and *Collybia*. — Eurasia, Africa (Morocco: Malençon & Bertault 1975: 65), North America, Papua New Guinea (on rotting Russula spp. aff. sect. Compactae Fr., in montane oak forests).

Material. — Papua New Guinea: Morobe district: Bulolo, Manki, 1400 m, 5. X. 1971, leg. Horak (ZT 71/294). — Eastern Highlands: Goroka, Mt. Michael, Frigano Track, 2300 m, 8. XII. 1971, leg. Horak (ZT 71/398).

This is the first record of that parasitic agaric in the tropical forests of Indomalaya and Australasia. According to present knowledge *A. parasitica* does not occur in Australia or New Zealand despite the fact that potential host fungi are reported from these two countries. For a complete description of this species consult Corner (1966: 158) and Watling (1979: 453).

10. *Asterophora lycoperdoides* S. F. Gray 1821 — Fig. 10
Nat. Arr. Brit. Pl. 1: 253

A. lycoperdoides is characterized by chlamydospores that are covered with coarse conic to crest-like projections (Heim 1968b). In far eastern Eurasia the area of distribution of this species is spreading into Japan and Malaysia. The record published here reports *A. lycoperdoides* for the first time in Australasia.

Habitat. — On rotting carpophores of *Russula* spp., *Lactarius* spp. and rarely observed on other agarics belonging to *Cantharellus*, *Flammulina* or *Armillariella*. — Eurasia, Japan (Imazeki & Hongo 1971: 18), Malaysia (Corner 1966: 157), Africa (Malençon & Bertault 1975: 65), North America, Cuba (fide Corner 1966), Papua New Guinea (on *Russula* sp. aff. sect. Compactae Fr. in lowland and submontane rain forests dominated by either *Anisoptera* or *Castanopsis-Lithocarpus*).

Material. — Papua New Guinea: Morobe district: Bulolo, Watut, 1200 m, 28. IV. 1972, leg. Horak (ZT 72/423). — Bulolo, Manki, 1350 m, 18. IV. 1973, leg. Horak (ZT 73/172). — Markham Valley, Oomsis, 250 m, 19. VII. 1972, leg. Horak (no material preserved).

11. *Macrocystidia reducta* Horak & Capellano sp. n. — Fig. 11; pl. 1

Pileus —30 mm, hemisphaericus vel ovoideus, marginem versus forte inflexus, ochraceobrunneus vel aurantiobrunneus, glabrus. Lamellae adnexae,

rectae, carneobrunneae. Stipes —15× —4 mm, cylindricus, conspicue brevis, pileo concolor, velutinus. Odor saporque pisciodori. Sporae 7.5—10×4.5—5 µm, ovoideae, dilute brunneae, leves, inamyloideae. Cystidia numerosissima, acutofusoidea. Ad terram in silvis. Novazelandia. Typus PDD 27160.

Pileus —30 mm, ovoid to subglobose when young, inrolled to incurved margin enclosing stipe near base, becoming pulvinate in aged

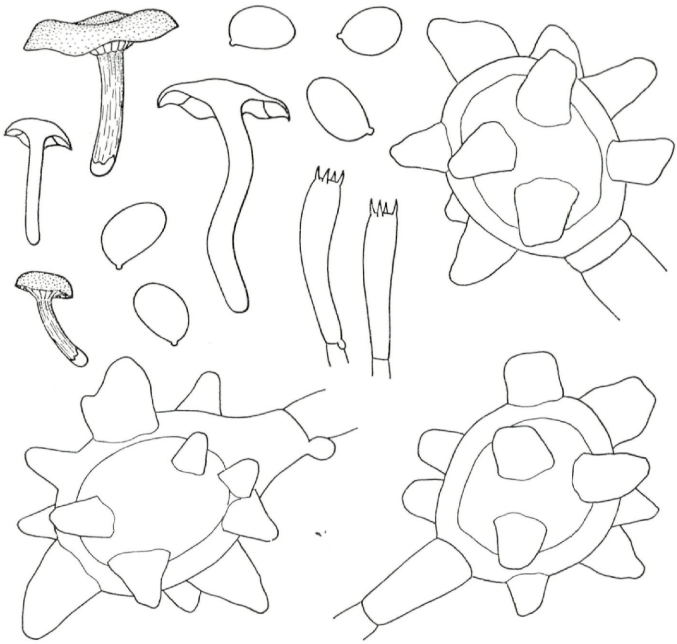


Fig. 10. *Asterophora lycoperdoides* S. F. Gray (ZT 72/423): carpophores, spores, basidia, chlamydospores

specimens, never expanded or up-rolled margin; ochre-brown to orange-brown; dry, smooth to minutely velutinous, margin not striate, not hygrophanous, veil remnants absent. Lamellae adnexed to adnate, crowded, up to 4 mm wide, straight and not anastomosing; pale pink-brown or pale red-brown, edge concolorous, fimbriate. Stipe —15×—4 mm, cylindric, rather short and stout, central; concolorous with pileus; dry, minutely velutinous all over, becoming

fistulose, single in groups. Context pale orange, whitish towards the centre of pileus and stipe. Odour and taste unpleasant, like rotten fish, rancid. Chemical reactions on pileus: KOH- negative.

Spore print not observed. Spores 7.5—10×4.5—5 μm, ovoid to ellipsoid, pale brown, smooth, inamyloid; membrane composed of 4 distinct layers (pl. 1, fig. 1, 2, 3) viz. rather thick endosporium followed

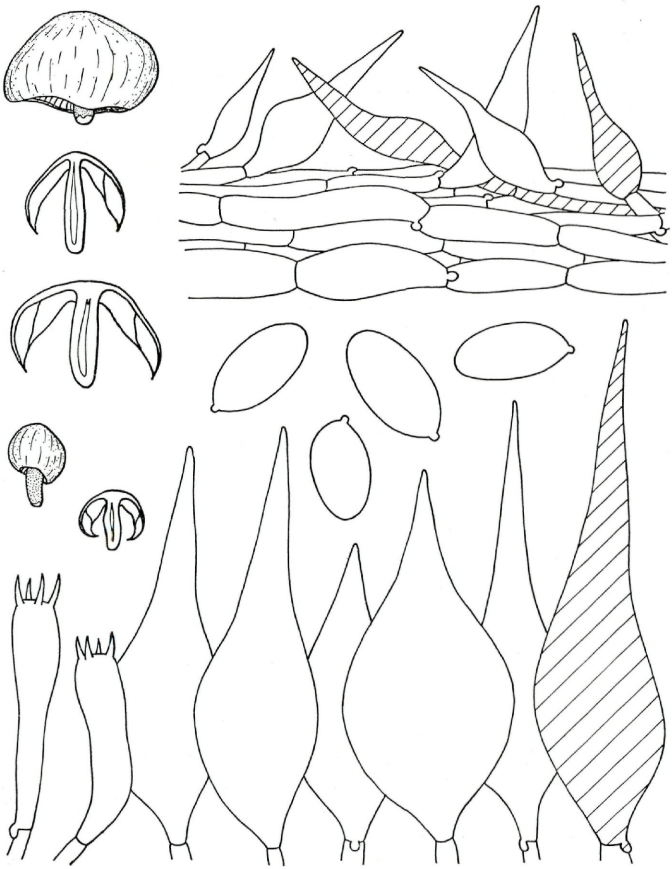


Fig. 11. *Macrocystidia reducta* HORAK & CAPELLANO (type): carpophores, spores, basidia, cheilo- and pleurocystidia, cuticle

by the strongly developed sclerosporium with apparent leptotunica, covered here and there by remnants of a loose perisporium (EM data kindly submitted by A. CAPELLANO, Lyon). Basidia 28—35×6—8 µm, 4-spored. Cheilo-, pleuro- and caulocystidia 40—90×15—30 µm, broadly fusoid with acute apex (awl-shaped), membrane thin-walled, pale yellow plasmatic pigment present. Cuticle a cutis of cylindric to oval cells (5—20 µm diam.), with numerous dermatocystidia morphologically similar to cheilocystidia, grey-yellow (KOH) pigment dissolved in cell-sap. Clamp connections present.

Habitat. — On soil in forests (dominated by *Podocarpus dacrydioides, P. ferrugineus, P. spicatus, Fuchsia excorticata, Melycitus ramiflorus*). — New Zealand.

Material. — NEW ZEALAND: South Island, Canterbury, Banks Peninsula, Kaituna Valley, 24. IV. 1968, leg. HORAK (PDD 27160, holotype; ZT 68/294, isotype).

Macrocystidia JOSSERAND 1933 (HORAK 1968: 360) is a small genus of agarics which are chiefly characterized by pink to red-brown spore print, ellipsoid and smooth spores and conspicuous pointed cystidia occurring almost everywhere on the surface of the carpophores. These typical features are also found in *M. reducta*. However, the New Zealand representative is separated from related species by the subsecotioid carpophores and the ochre-brown colour of pileus and stipe.

The particular micro-structure of the sporal membrane in *Macrocystidia* (*M. cucumis, M. occidentalis*; CAPELLANO 1976) suggested to examine also the spores of *M. reducta*. The EM-micrographs revealed that the spore wall is composed of the following distinct layers: perisporium, leptotunica, sclerosporium and endosporium (pl. 1, 1—3). This type of structure is also found in the remaining species of the genus and therefore *M. reducta* has to be considered a typical member of *Macrocystidia*.

12. *Crucispora naucorioides* HORAK 1971a

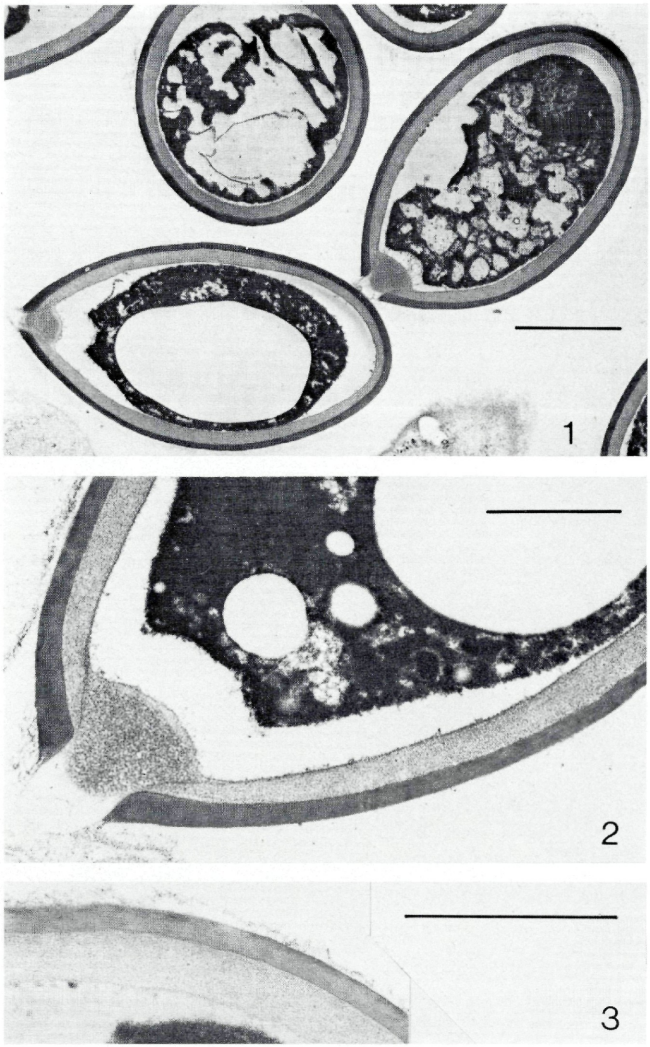
New Zealand J. Bot. 9: 463

Illustrations. — HORAK (1971a: l. c.).

Habitat. — On soil or on rotten wood in forests (under *Castanopsis-Lithocarpus-Ficus* in Papua New Guinea). — New Zealand (type), Papua New Guinea.

Material. — NEW ZEALAND: North Island, Coromandel Peninsula, Kauaeranga Valley, 5. VII. 1968, leg. HORAK (PDD 27001, holotype). — PAPUA NEW GUINEA: Morobe district, Bulolo, Manki, 1350 m, 4. VII. 1973, leg. HORAK (ZT 73/304).

All macro- and microscopic characters observed on the Papua New Guinean material correspond with those of the type. This is only just the second record of *C. naucorioides* so far believed to be endemic



Macrocystidia reducta Horak & Capellano (type): EM-micrographs (taken by A. Capellano) showing cross-sections of the spores and sporemembrane. Scale: 3 μm in fig. 1; 1 μm in fig. 2 and 3

to New Zealand. Based upon this new information it is rather likely that one day this species is also collected in other localities within Australasia (i. e. New Caledonia, Australia). Since the second species in *Crucispora* (*C. rhombisperma*, see below) is known from Japan and Indonesia (Java) *C. naucorioides* could also be expected in Indomalaya and/or eastern Eurasia.

13. *Crucispora rhombisperma* (Hongo) Horak comb. nov.

Bas. *Panaeolina rhombisperma* Hongo 1973: Mem. Shiga Univ. 23: 38.

The morphologic data reported for this outstanding agaric indicate its close relationship to *C. naucorioides* Horak (1971a). Therefore I propose the combination of *P. rhombisperma* into *Crucispora* (see above).

In 1977 I studied v. Overeem's notes and exsiccata kept in the Herbarium (BO) of the Botanical Garden in Bogor, Indonesia. One of the excellent paintings depicts a cluster of small agarics (pileus —20 mm, convex, brown; stipe white, fragile). Unfortunately no authentic material is going with the drawings. However, I fully trust the acurate observations v. Overeem's who added on the same sheet pencil sketches showing the most significant microscopic characters of *C. rhombisperma* (Hongo) Horak, viz. the cruciform spores (without germ pore:) and the capitate cheilocystidia. Despite the lack of exsiccata I have no doubts in fact that this specimens represent the taxon described from Japan (2nd record) and that the fungus has to be considered as the second species in a hitherto monotypic genus.

Relying upon the unpublished notes of v. Overeem in Java occurs still another recently described agaric which has been observed there some decades before Hongo published on that peculiar taxon from Japan. The species in question is *Pseudoconocybe nodulosospora* Hongo 1967 (= *Conocybe nodulosospora* (Hongo) Watling 1976) which is characterized by rust brown nodulose spores bearing an apical (sometimes indistinct) germ pore and lecythiform cystidia both on the edge of the lamellae and amongst the cuticular cells of the pileocutis. Habit, colour and microanatomy of the Javanese collection agree in all details with Japanese specimens examined by myself (ZT 70/314, ex herb. Hongo Nr. 3896).

These two references illustrate positively the mycogeographic relationships between the fungus flora of Japan and that of Indonesia several thousands of kilometers further to the South. I am convinced that more such examples will come to light as soon as there is more comprehensive information available about the Agaricales in that geographic region.

14. *Copelandia affinis* Horak sp. n. — Fig. 12

Pileus —25 mm, hemisphaericus dein convexus vel umbonatoplanus, griseobrunneus olivaceo tinctus, venosus, micaceus. Lamellae adnatae vel adnexae, ventricosae, olivaeogriseae, albofimbriatae. Stipes —85× —3 mm, cylindricus, pallide griseobrunneus, azureoviridis tactu, apicaliter pruinosus. Sporae 9—10×5—6.5×7.5—9 µm, mitraeformes, nigrae, crasse tunicatae, poro germinativo instructae. Cheilocystidia lageniformes, hyalinae. Pleuro-

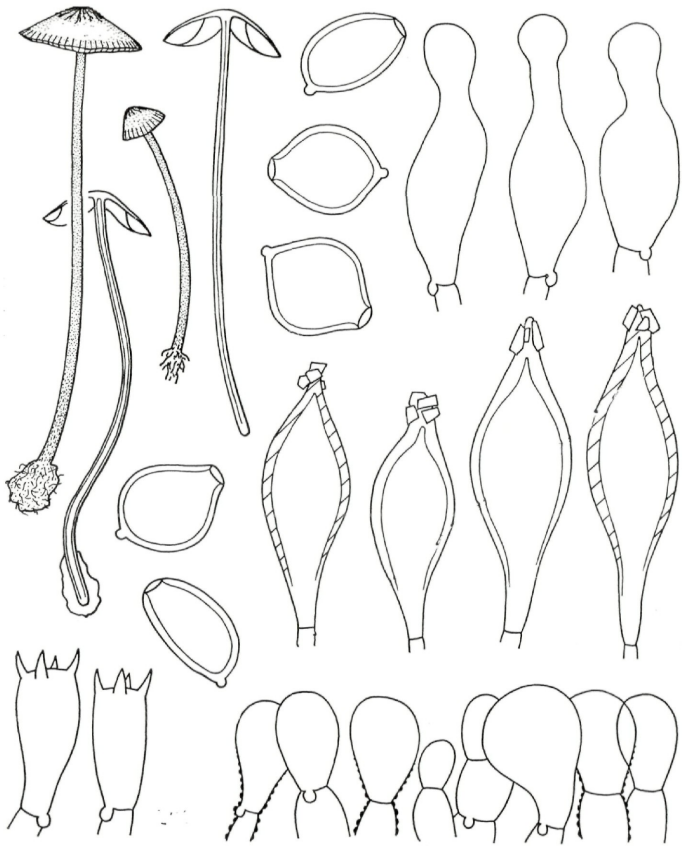


Fig. 12. *Copelandia affinis* Horak (type): carpophores, spores, basidia, cheilocystidia, pleurocystidia, cuticle

cystidia fusoideae, metuloideae, membrana brunnea instructae, incrustatae. Ad terram in silvis. Nova Guinea. Typus ZT 72/121.

Pileus —25 mm, hemispheric when young becoming convex or obtusely umbonate expanded; grey-brown when moist, drying turning paler, strongly hygrophanous, often with olive tinge towards striate margin; dry, conspicuously wrinkled around disc, micaceous, veil remnants absent. Lamellae (L 10—15, —5) adnexed to adnate, ventricose; grey or pale brown with distinct olive tinge, edge white, fimbriate, face often mottled. Stipe —85×—3 mm, cylindric, slender, central; white to pale grey-brown, immediately turning green-blue when bruised, villous base white; dry, pruinose at apex, fibrillose towards base, dry, hollow, brittle, single and cespitose. Context whitish to pale grey-brown, turning green-blue on exposure. Odour and taste not distinctive. Chemical reactions on pileus: KOH — negative.

Spore print black. Spores 9—10×5—6.5×7.5—9 µm, mitriform to limoniform, black, opaque, smooth, membrane thick-walled, broad apical germ pore present. Basidia 18—25×9—11 µm, 4-spored. Cheilocystidia (and caulocystidia) 30—50×9—14 µm, lageniform to broadly fusoid-capitate, membrane hyaline, thin-walled, pigment absent. Pleurocystidia 35—55×10—17 µm, fusoid, metuloid, membrane brown (KOH), apex often encrusted with crystals, numerous. Cuticle composed of globose to clavate cells, membrane thin-walled, hyaline, rarely scattered with dermatocystidia (like pleurocystidia), encrusted with pale brown pigment. Clamp connections present.

Habitat. — On soil among litter in rain forests, occasionally on rotting bark. — Papua New Guinea.

Material. — Papua New Guinea: Morobe district: Bulolo, "Agathis Reserve", 1100 m, 2. II. 1972, leg. Horak (ZT 72/121, holotype). — Bulolo, Nauwata Banda, 1200 m, 25. XI. 1971, leg. Horak (ZT 71/340).

This species is accomodated in *Copelandia* Bresadola 1913 (cp. Horak 1968: 178) and represents the second known taxon in this genus. Although the macroscopic characters strongly remind of those described for *C. cyanescens* (Berk. & Br.) Singer, the two fungi are readily separated be the size of the spores.

15. *Descolea pretiosa* Horak 1971b

Persoonia 6: 245

Illustrations. — Horak (1971b: l. c.).

This species was hitherto known only from its type locality in the Indian Himalaya. With two more collections from montane rain forests in Papua New Guinea its area of distribution ranges now from there into Australasia.

It is noteworthy to emphasize that the Indian material was collected in a forest assoziation dominated by *Abies*, *Pinus* and *Taxus* (in about 2750 m a. s. l.) whereas the Papuan New Guinean specimens grow in pure stands of *Lithocarpus* spp. and *Castanopsis acuminatissima* (Fagales).

Habitat. — On soil in forests. — India (type), Papua New Guinea.

Material. — India: Himachal Pradesh, Simla Hills, Narkanda, 8. VIII. 1964, leg. Maas Geesteranus (L, holotype). — Papua New Guinea: Morobe district: Bulolo, Manki, 1400 m, 20. X. 1971, leg. Horak (ZT 71/169). — Bulolo, Watut, 1300 m, 7. VI. 1973, leg. Horak (ZT 73/310).

16. *Descolea gunnii* (Berkeley) Horak 1971b

Persoonia 6: 242

Bas. *Secotium gunnii* Berkeley ap. Massee 1891: Grevillea 19: 96.

Illustrations. — Horak (1971b: l. c.).

This species is common in New Zealand where it is encountered under various ecologic conditions in coastal and submontane forests. *D. gunnii* (Berk.) occurs both in *Leptospermum* spp. and *Nothofagus* spp. forests and it is suspected to enter at least facultative ectotrophic mycorrhiza with those trees.

Knowing the wide ecologic range and adaptability of this agaric its presence in the *Nothofagus* forests of Papua New Guinea was no great surprise. That record enlarges the area of distribution from New Zealand to Papua New Guinea.

Habitat. — On soil in forests. — New Zealand (type), Papua New Guinea (under *Nothofagus grandis*, *N. carrii*).

Material. — For New Zealand records see Horak (1971b: l. c.). — Papua New Guinea: Morobe district: Wau, Mt. Kaindi, 2300 m, 17. II. 1972, leg. Horak (ZT 72/147).

D. gunnii (Berk.) is closely related to *D. recedens* (Cooke & Massee) Singer (cp. Horak 1971b: 241) until recently only recorded from its type locality in Australia (Mordiallac — now a suburb of Melbourne, Victoria). In 1977 Watling observed this species in several places in New South Wales and Queensland and it appears now that *D. recedens* (Cooke & Massee) is a well established agaric in the forests of eastern and south-eastern Australia.

17. *Cuphocybe ferruginea* Horak sp. n. — Fig. 13

Pileus —90 mm, convexo-umbonatus, obscure brunneus vel castaneus, viscidus, marginem versus e velo obtectus. Lamellae adnatae, crenulatae, ex argillaceo ferrugineae. Stipes —110 × —12 (—25 mm ad basim), cylindricus, subbulbosomarginatus, ochraceoferrugineus vel aureobrunneus, dense squamulis concoloribus minutis instructus. Odor ingratus. Sporae 12.5—15 × 8—9.5 µm,

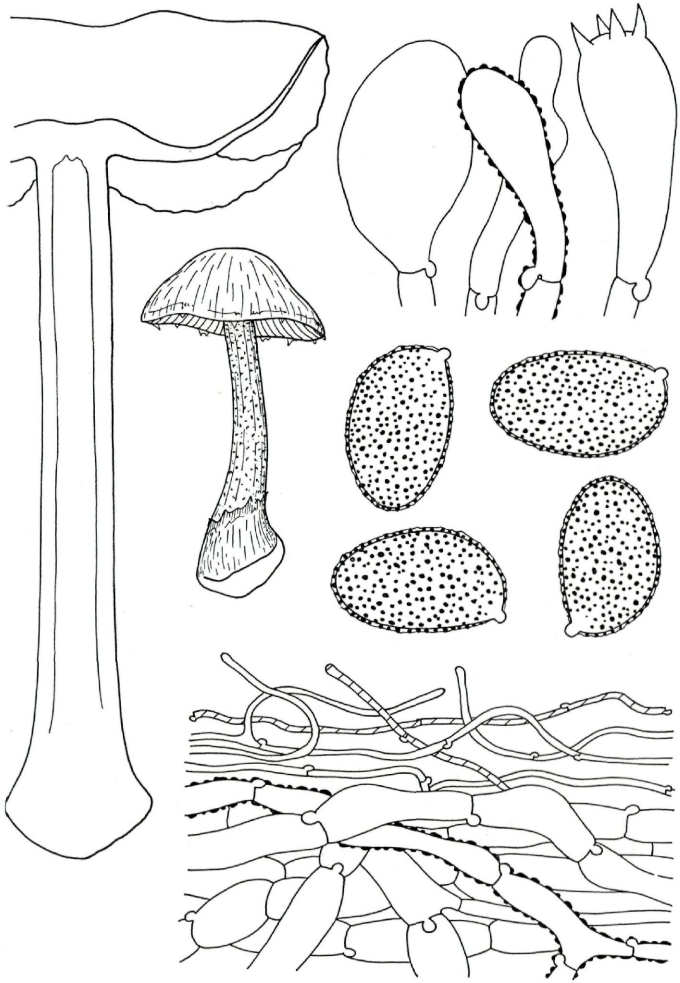


Fig. 13. *Cuphocybe ferruginea* HORAK (type): carpophores, spores, basidium, cheilocystidia, cuticle

ellipsoideae, ferrugineae, verruculosae. Ad terram in silvis fagineis. Nova Guinea. Typus ZT 72/639.

Pileus —90 mm, hemispheric to convex, later becoming broadly umbonate and expanded, aged specimens with upturned margin; date brown, dark brown or red-brown (chest nut brown); viscid to glutinous when moist, radially wrinkled in dry carpophores, not hygrophanous, margin not striate, with fibrillose veil remnants when young, especially along the margin. Lamellae (L 24—36, —5) adnate to adnexed, sometimes emarginate, crowded, ventricose, up to 10 mm wide; argillaceous becoming brown with distinct red-brown or rust brown tinge, edge paler, conspicuously dentate to crenate. Stipe —110×—12 mm, cylindric or attenuated towards apex, base bulbous to marginate (—25 mm diam.), slender, central; yellow-brown to ochre with rust brown tinge; dry, coarsely fibrillose, densely covered with small appressed concolorous squamules from the veil, occasionally with agglutinate girdle-like zone near the base, solid soon becoming hollow, single in groups. Context brown beneath cuticle of pileus and stipe. Odour and taste unpleasant, like burnt hair. Chemical reactions on pileus: KOH — negative.

Spore print rust brown. Spores 12.5—15×8—9.5 µm, ovoid (rarely subamygdaliform), rust brown, densely covered with small warts, perisporium poorly developed, plage none. Basidia 35—50× 10—15 µm, 4-spored, rarely also 2-spored. Cheilocystidia 20—50× 8—25 µm, polymorphic, clavate to lageniform, hyaline, occasionally encrusted with brown pigment. Pleurocystidia absent. Cuticle a cutis of strongly gelatinized, irregularely arranged cylindric hyphae (1—3 µm diam.) subcutis composed of ovoid to subglobose cells, yellow-brown (KOH) encrusting and plasmatic pigment present. Clamp connections numerous.

Habitat. — On soil in forests dominated by fagaceous trees (under *Castanopsis-Lithocarpus* in Papua New Guinea, under *Nothofagus* spp. in New Caledonia. — Papua New Guinea (type), New Caledonia.

Material. — Papua New Guinea: Morobe district: Bulolo, Manki, 1400 m, 20. XI. 1972, leg. Horak (ZT 72/639, holotype). — Bulolo, Manki, 1300 m, 15. XI. 1972, leg. Horak (ZT 72/628). — New Caledonia: Paita, Mt. Mou, 1200 m, 22. II. 1977, leg. Horak (ZT 77/39).

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