

SHORT COMMUNICATION

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Two unusual species of *Physalacria* (Basidiomycetes, Agaricales) collected in New Zealand and Papua New Guinea during mycological expeditions by the National Science Museum, Tokyo

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Abstract Two unusual species of *Physalacria* from New Zealand and Papua New Guinea are described and illustrated. *Physalacria pseudotropica* from South Island in New Zealand and *P. tropica* from Papua New Guinea are recorded for the first time.

Key words New Zealand · Papua New Guinea · *Physalacria pseudotropica* · *Physalacria tropica*

During a study of specimens preserved in the National Science Museum, Tokyo, two unusual species of *Physalacria* were found. Here, the species are described and illustrated.

The description of the macroscopic and microscopic features is based on dried specimens. For microscopic observation, dried basidiomata were placed in 70% ethanol, then transferred to distilled water. Pliable basidiomata were examined in distilled water, 3% KOH plus Congo Red and phloxine, and Melzer's reagent. Spore statistics include \bar{x} , the arithmetic mean of the spore length and spore width (\pm SD) for n spores measured; Q , the quotient of spore length and spore width in any one spore, indicated as a range of variation in n spores measured; and \bar{Q} the mean of Q values (\pm SD).

Physalacria pseudotropica Berthier, *Bibl. Mycol.* 98: 62, 1985. Figs. 1, 2

Basidiomata 0.7–3.0 mm tall, stipitate-capitate. Capitulum 0.3–1.5 mm diameter, hollow, globose to subglobose,

pruinose, grayish-orange after drying. Resinous exudates on apex of hymenial cystidia were observed under the stereoscope. Stipe 0.4–2.0 \times 0.06–0.08 mm, central, cylindrical, with pruinose cushion at the base. Basidiospores 3.8–5.9 \times 2.3–3.4 μm (\bar{x} = 4.9 \pm 0.5 \times 2.9 \pm 0.3 μm ; Q = 1.3–2.1; \bar{Q} = 1.7 \pm 0.2; n = 25), oblong to lacrymoid, smooth, hyaline, thin walled, inamyloid. Basidia 15–25 \times 3.5–5.0 μm , narrowly clavate, 4-spored or rarely 2-spored; sterigmata 2.5–3.5 μm long. Basidioles cylindrical to fusiform. Hymenial gloeocystidia 35–95 \times 10–19 μm , cylindrical to fusiform, obtuse or subcapitate, with resinous exudates adherent to the apex, projecting up to 35 μm beyond hymenial cells; resinous exudates persist after drying, insoluble in Melzer's reagent, and gradually soluble in 3% KOH. Subhymenial hyphae 2–4 μm diameter, subagglutinate to interwoven sparsely, cylindrical, hyaline, thin walled, inamyloid. Lower portion of capitulum composed of a hymeniform layer of fusiform to narrowly lageniform, sometimes rostrate cells; the cells hyaline, thin walled, inamyloid. Stipe tissue monomitic; cortical hyphae 2–4 μm diameter, parallel, cylindrical, smooth, hyaline, thin walled, inamyloid; medullary hyphae 2–6 μm diameter, otherwise similar to cortical hyphae. Stipe base with scattered, curled, and thin to slightly thick walled (up to 0.8 μm diameter) hyphal outgrowths up to 40 μm long and 1.5–3.0 μm diameter. Caulocystidia abundant, conical to fusiform, subcapitate at the apex, with resinous exudates adherent to the apex; conical caulocystidia 17–37 \times 12–23 μm ; fusiform caulocystidia 30–65 \times 9–16 μm . Clamp connections present on the hyphae in all tissues except some stipe tissues.

Habitat and distribution. Caespitose to solitary on decaying wood. New Zealand.

Specimens examined. New Zealand: Mt. Mizery Track along Bald Hill Road in Longwood Forest between Invercargill and Te Anau, South Island, on decaying unidentified wood, Mar. 1, 1992, coll. Y. Doi TNS-F-171685 (TNS); Taupo, Kaimanawa State Forest Park, Kiko Road, North Island, on decaying unidentified wood, May 7, 1987, coll. Y. Doi, TNS-F-101517 (TNS).

Notes. Specimens TNS-F-171685, -101517 accord well with *P. pseudotropica* in having a combination of small

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Fig. 1. *Physalacria pseudotropica* (TNS-F-171685). **A** Basidiomata. **B** Section of hymenium. **C** Basidiospores. **D** Hymenial gloeocystidium. **E** Gloeocystidium with resinous exudate adherent to the apex. **F** Caulocystidia. Bars **A** 0.1 mm; **B-F** 10 μ m

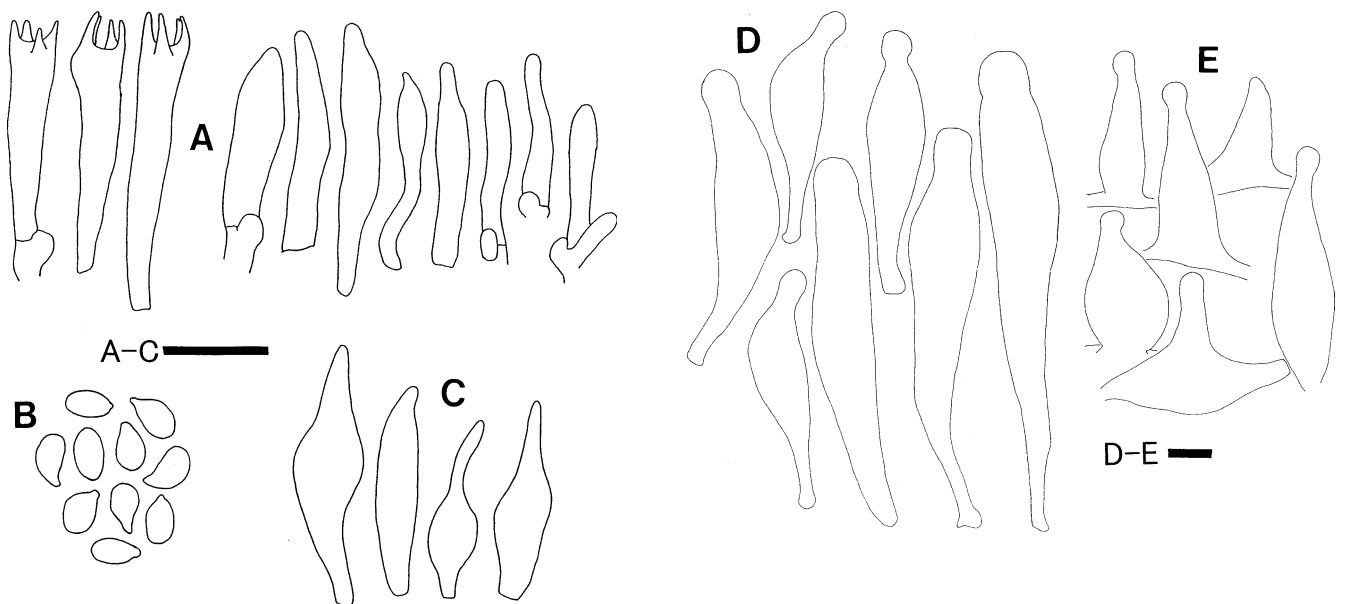
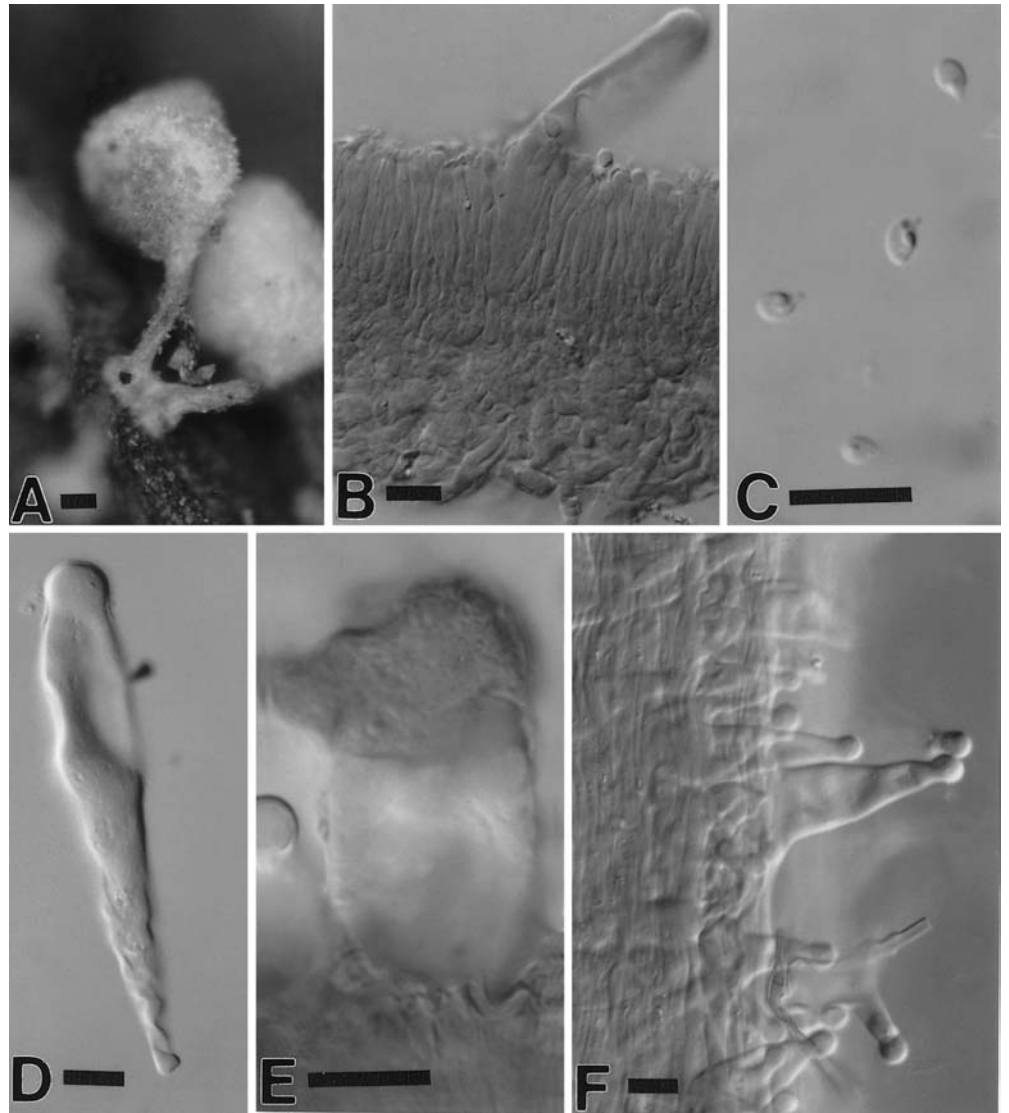


Fig. 2. *Physalacria pseudotropica* (TNS-F-171685). **A** Basidia and basidioles in hymenium. **B** Basidiospores. **C** Cells from sterile capitulum base. **D** Hymenial gloeocystidia. **E** Caulocystidia. Bars **A-E** 10 μ m

baisiospores ($3.8\text{--}5.9 \times 2.3\text{--}3.4\mu\text{m}$), subcapitate hymenial gloeocystidia, and caulocystidia.

Physalacria pseudotropica was only reported from Gisborne (North Island) in New Zealand (Berthier 1985). In this report this fungus is recorded from South Island in New Zealand for the first time.

Resinous exudates of TNS-F-171685, -101517 were observed not only in water but also in Melzer's reagent and 3% KOH. Moreover, these were not soluble in water or Melzer's reagent. Persistence of resinous exudates in *P. pseudotropica* was not mentioned in the original description.

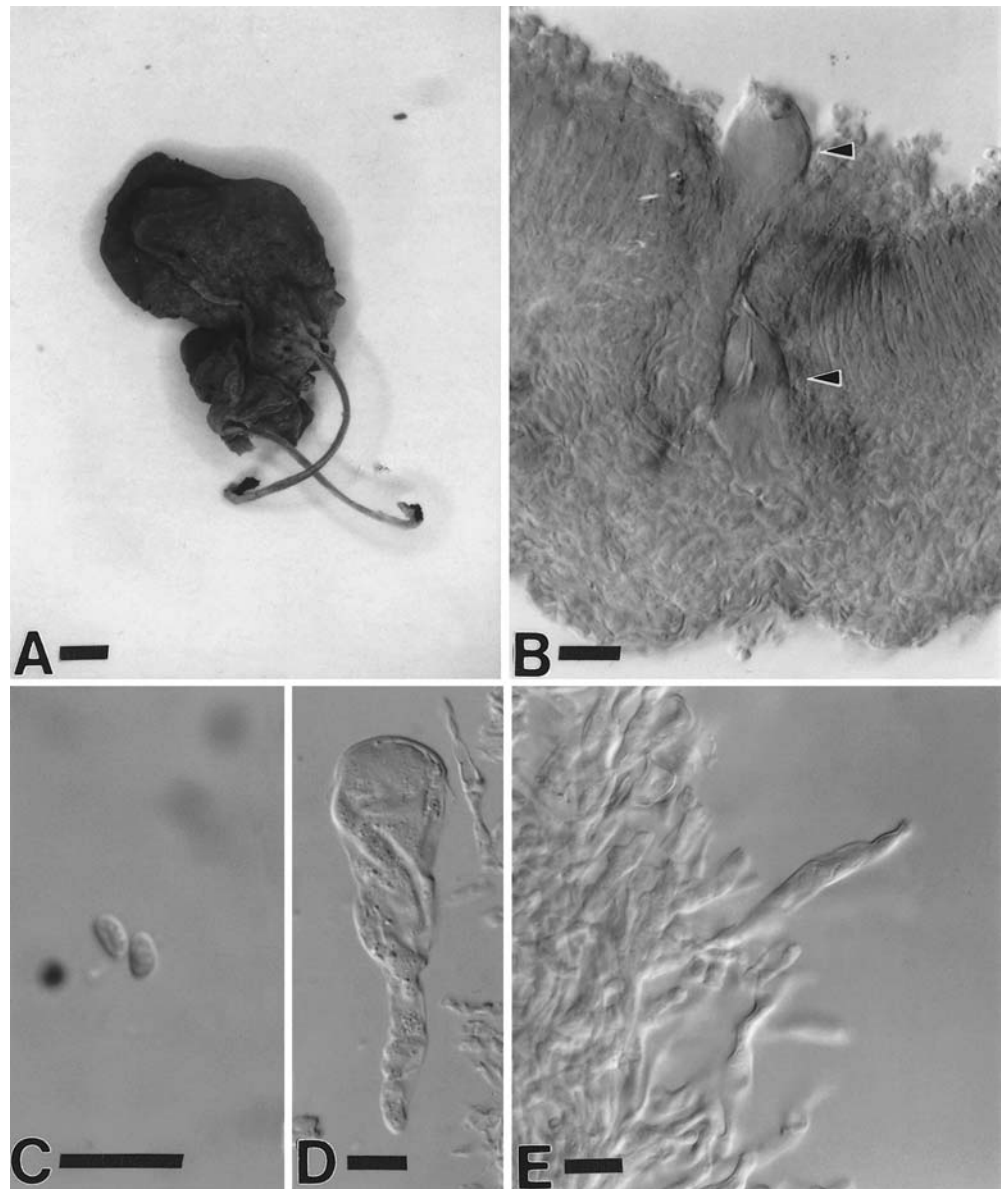
Physalacira tropica Corner, Ann. Bot. Mem. 1: 697. 1950.

Figs. 3, 4

Basidiomata 7–10 mm tall, stipitate-capitate. Capitulum 4–6 mm diameter, hollow, wrinkled, orange-red after drying, with scattered small depressions near the stipe. No

resinous exudates were observed under the stereoscope. Stipe 4–6 \times 0.2–0.3 mm, central, slightly inflated at the base, minutely pubescent at the lower portion. Basidiospores $3.3\text{--}5.3 \times 1.8\text{--}2.7\mu\text{m}$ ($\bar{x} = 4.2 \pm 0.4 \times 2.3 \pm 0.2\mu\text{m}$; $Q = 1.5\text{--}2.4$; $\bar{Q} = 1.8 \pm 0.2$; $n = 25$), oblong to ellipsoid, smooth, hyaline, thin walled, inamyloid. Basidia 15–21 \times 4.0–4.5 μm , narrowly clavate, 4-spored; sterigmata 3 μm long. Hymenial gloeocystidia 29–65 \times 11–22 μm , narrowly clavate to clavate, thin walled, with resinous exudates adherent to the apex, projecting up to 4 μm beyond hymenial cells or immersed; resinous exudates inconspicuous after drying, gradually soluble in Melzer's reagent and soluble in 3% KOH. Subhymenial hyphae 1–3.5 μm diameter, agglutinate, cylindrical, hyaline, thin walled, inamyloid. Lower portion of capitulum composed of agglutinated cells. Stipe tissue monomitic; cortical hyphae and medullary hyphae 2–4 μm diameter, parallel, cylindrical, smooth, hyaline, thin walled, inamyloid; lower portion of stipe

Fig. 3. *Physalacria tropica* (TNS-F-172942). **A** Basidiomata. **B** Section of hymenium and hymenial gloeocystidia (arrowheads). **C** Basidiospores. **D** Hymenial gloeocystidium. **E** Caulocystidia and hyphal outgrowths from lower portion of stipe. Bars **A** 1 mm; **B–E** 10 μm



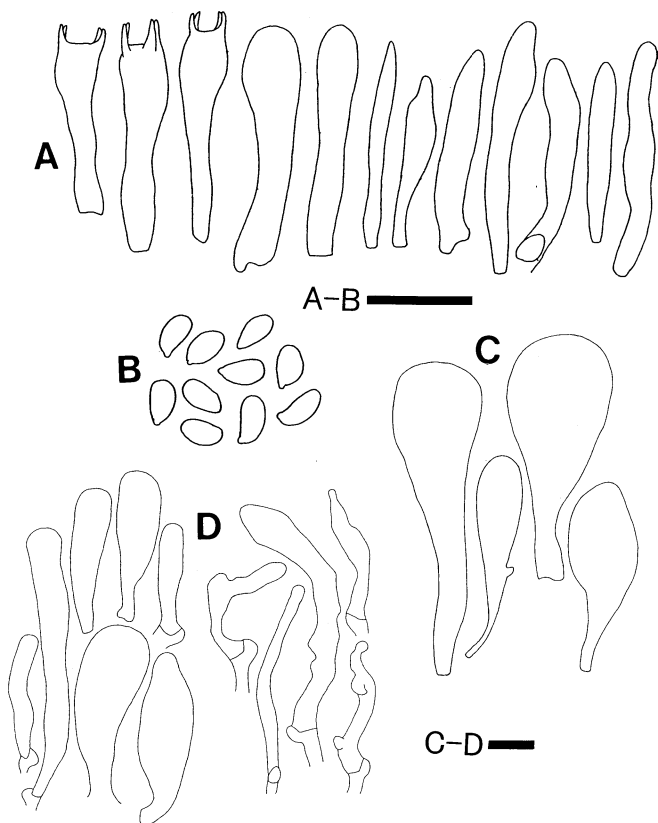


Fig. 4. *Physalacria tropica* (TNS-F-172942). **A** Basidia and basidioles in hymenium. **B** Basidiospores. **C** Hymenial gloeocystidia. **D** Caulocystidia and hyphal outgrowths. Bars **A-D** 10µm

with dense, curled, and thin to slightly thick walled (up to 0.5µm diameter) hyphal outgrowths up to 160µm long and 3.0–5.0µm diameter. Caulocystidia 22–60 × 3–13µm, cylindrical to clavate or fusiform, with resinous exudates adherent to the apex. Clamp connections present in all tissues.

Habitat and distribution. On decaying wood, Cameroon, Malaysia, Papua New Guinea.

Specimen examined. Papua New Guinea: Wau, Morobe district, Dec. 1973 to Jan. 1974, coll. Y. Otani, TNS-F-172942 (TNS).

Notes. *Physalacria tropica* has small openings at the lower portion of the capitulum (Corner 1950; Berthier

1985). In specimen TNS-F-172942, only small depressions were observed at the same position. However, this might suggest that openings are present in fresh basidiomata. In other features, the specimen accords well with *P. tropica* in having a combination of larger basidiomata over 7mm tall, small ellipsoid basidiospores measuring 3.3–5.3 × 1.8–2.7µm, and broadly clavate to clavate gloeocystidia.

Berthier (1985) mentioned that *P. tropica* had two types of hymenial gloeocystidia: larger broadly clavate ones (40–55 × 12–18µm), and smaller narrowly clavate ones (25–30 × 7–10µm). Although both types of gloeocystidia were observed in the specimen TNS-F-172942, its dimension is continuous. Antonín and Mossebo (2002) attributed a single dimension for the gloeocystidia of *P. tropica* collected in Africa. Therefore, we also have attributed a single dimension for the gloeocystidia in TNS-F-172942.

The specimen TNS-F-172942 is also similar to *P. solomonensis* Corner from the Solomon Islands near Papua New Guinea and *P. inflata* (Schwein.) Peck from North America in forming big basidiomata (more than 10mm tall). The former species differs in having narrowly clavate to narrowly cylindrical hymenial gloeocystidia and no opening or depression in the lower portion of the capitulum (Berthier 1985; Corner 1967). The latter species differs in having ventricose-rostrate hymenial gloeocystidia and subhymenial hypha which are interwoven sparsely (Baker 1941).

Physalacria tropica was only reported from Malaysia and Cameroon (Corner 1950; Antonín and Mossebo 2002). In this report, this fungus is recorded from Papua New Guinea for the first time.

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