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Cover: Life and death in one night - wolf hunting the hare. Mixed media—gouache, acrylics, pen & colour pencils. © Dupati Poojitha.

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COMMUNICATION

Six new reports of corticioid fungi from India

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Abstract: The objective of the present paper is to describe and illustrate six species of corticioid fungi collected from four tehsils of the Chamba District of Himachal Pradesh (India). The described species, *Brevicellicium exile* (H.S.Jacks.) K.H.Larss. & Hjortstam, *Kurtia magnargillacea* (Boidin & Gilles) Karasiński, *Physodontia lundellii* Ryvarden & H.Solheim, *Rhizochaete violascens* (Fr.) K.H.Larss., *Sistotrema coroniferum* (Höhn. & Litsch.) D.P.Rogers & H.S.Jacks, and *Tubulicrinis cinctus* G.Cunn. are new additions to corticioid fungi reported from India.

Keywords: Agaricomycetes, Basidiomycota, diversity, northwestern Himalaya, taxonomy.

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Competing interests: The authors declare no competing interests.

Author details: Dr. Poonam is currently working as assistant professor, Department of Botany, Government Post Graduate College, Chamba (Himachal Pradesh). She has worked on the taxonomy of corticioid fungi from district Chamba for hes PhD research work. He has thoroughly surveyed district Kullu and collected 486 specimens of the corticioid fungi. She has described and illustrated 191 taxa including 20 new records for India and 43 first reports for Himachal Pradesh. Dr. Avneet Pal Singh, assistant professor, Department of Botany, Punjabi University, Patiala is a mycologist and works on the taxonomy, histo-pathology and evaluation of corticioid and polyporoid fungi (Agaricomycetes, Basidiomycota). He actively engaged in the research work for more than two decades and has published about eighty research papers describing nearly three hundred and ten taxa based on morphological and DNA sequence based molecular phylogenetic studies. He has to his credit two new genera and twenty two new species of corticioid and poroid fungi. Dr. Gurpaul Singh Dhingra retired as professor from Department of Botany, Punjabi University, Patiala (Punjab) and has more than three decades of teaching and research experience. His area of specialization is mycology and plant pathology with special interest in corticioid and poroid fungi. He and has described large number of new genera and species of these fungi form different parts of India. He has worked on the antidiabetic, CNS and anticancer activity of medicinally important poroid fungi.

Author contributions: Poonam has thoroughly surveyed the study area and collected the corticioid specimens. She has worked out the morphological details of the collected specimens and prepared the standard descriptions along with illustrations. Avneet Pal Singh has explored the taxonomic literature for identity of the worked out specimens and identified the worked out specimens. He has also contributed to the draft of manuscript and photography of the specimens described presently. Dr. Gurpaul Singh Dhingra is an expert in the field of taxonomy of corticioid fungi and confirmed the identification. He critically analyzed the draft and made valuable suggestions.

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INTRODUCTION

Corticioid fungi are a group of higher fungi (Basidiomycota, Agaricomycetes) that mostly grow in association with different forms of wood substrate. These are also referred to as crust fungi because of the formation of macroscopic sporophores with unilateral hymenium that are mostly resupinate or sheet-like. The hymenial surface is usually smooth, occasionally varies from tuberculate, ridged, warted, toothed, to merulioid. The colour of the hymenophore mostly ranges from whitish to shades of grey, yellow, orange, red, or brown. The sporophores are quite diverse with reference to hyphal type, ancillary structures, shape and size of basidia and basiodiospores. On the basis of morphological features most of corticioid fungi were earlier placed in the family Corticiaceae (Aphyllophorales). The molecular phylogenetic studies indicated the family to be an unnatural group. Hence, these fungi have been currently distributed into twelve orders of the class Agaricomycetes (Agaricomycotina, Basidiomycota).

Corticioids are ecologically significant because of their role in the recycling of wood and agricultural residues. These fungi breakdown different kinds of organic matter, decompose soil components and regulate the balance of carbon and other nutrients for maintaining soil health (Tong et al. 2022). The members of corticioid fungi have ability to produce extracellular enzymes and actively transform carbon and other nutrients, water, and oxygen along a highly branching hyphal network (Boddy 1991; Cragg et al. 2015). The secretion of lignin or cellulose decaying enzymes makes this group capable of colonizing different types of wood in a forest ecosystem and are responsible for white or brown rot, respectively.

Four tehsils of the Chamba District (Himachal Pradesh, India) were thoroughly surveyed for the collection of sporophore specimens of corticioid fungi. These were identified as *Brevicellicium exile* (H.S. Jacks.) K.H.Larss. & Hjortstam, *Kurtia magnargillacea* (Boidin & Gilles) Karasiński, *Physodontia lundellii* Ryvarden & H.Solheim, *Rhizochaete violascens* (Fr.) K.H.Larss., *Sistotrema coroniferum* (Höhn. & Litsch.) D.P.Rogers & H.S.Jacks, and *Tubulicrinis cinctus* G.Cunn. on the basis of macroscopic and microscopic features and their comparison with the published literature (Eriksson & Ryvarden 1973; Eriksson et al. 1981, 1984; Hjortstam et al. 1988; Boidin et al. 1991; Bernicchia & Gorjón 2010; Hakimi et al. 2013; Manoharachary et al. 2022; fungifromindia.com 2024; Mycobank 2024). The species documented presently are new records for India.

MATERIAL AND METHODS

During the years 2013–2018, extensive fungal excursions were carried out in four tehsils of the Chamba District of Himachal Pradesh (India) for the purpose of gathering sporpohore specimens of corticioid fungi. The sporophores were gently separated from the substrate using a chisel and hammer. All the collected specimens were thoroughly cleaned and dried either in sun or on an electric drier. The macroscopic characteristics of the sporophores were observed and noted with the help of a hand lens. Kornerup & Wanscher (1978) was referred for the colour citation. The microscopic features were examined by preparing crush mounts and free-hand cut sections in 3%, 5%, and 10% potassium hydroxide (KOH) solution. The microscopic preparations were stained in cotton blue (1% in lactophenol), congo red (1% in distilled water), phloxine (1% in distilled water), and Melzer's reagent (0.5 g iodine, 1.5 g potassium iodide, 20 g chloral hydrate and 20 ml distilled water). Details of the microscopic structures were outlined as line diagrams using a camera lucida at different magnifications (100x, 400x, and 1,000x) of the compound microscope. Taxonomic descriptions comprising the macro and microscopic features were prepared and subsequently compared with the literature for identification. The specimens of these corticioid species were deposited in the Herbarium, Department of Botany at Punjabi University, Patiala (PUN).

RESULTS

Brevicellicium exile (H.S.Jacks.) K.H.Larss. & Hjortstam, Mycotaxon 7(1): 118 (1978). (Image 1)

Corticium exile H.S.Jacks., Canadian Journal of Research 28(6): 721 (1950).

Sporophore resupinate, effused, adnate, ≤160 µm thick in section; hymenial surface smooth both in fresh and dry state; yellowish white to pale yellow both in fresh and dry state; margins fibrillose, paler concolorous when determinate.

Hyphal system monomitic. Generative hyphae subhyaline, septate, clamped, smooth, thin-walled; subicular hyphae horizontal, ≤2.5 µm wide, less branched; subhymenial hyphae vertical, ≤4.5 µm wide, richly branched, almost isodiametric. Sphaerocysts spherical, 10– 12 × 6– 7 µm, thin-walled, with basal

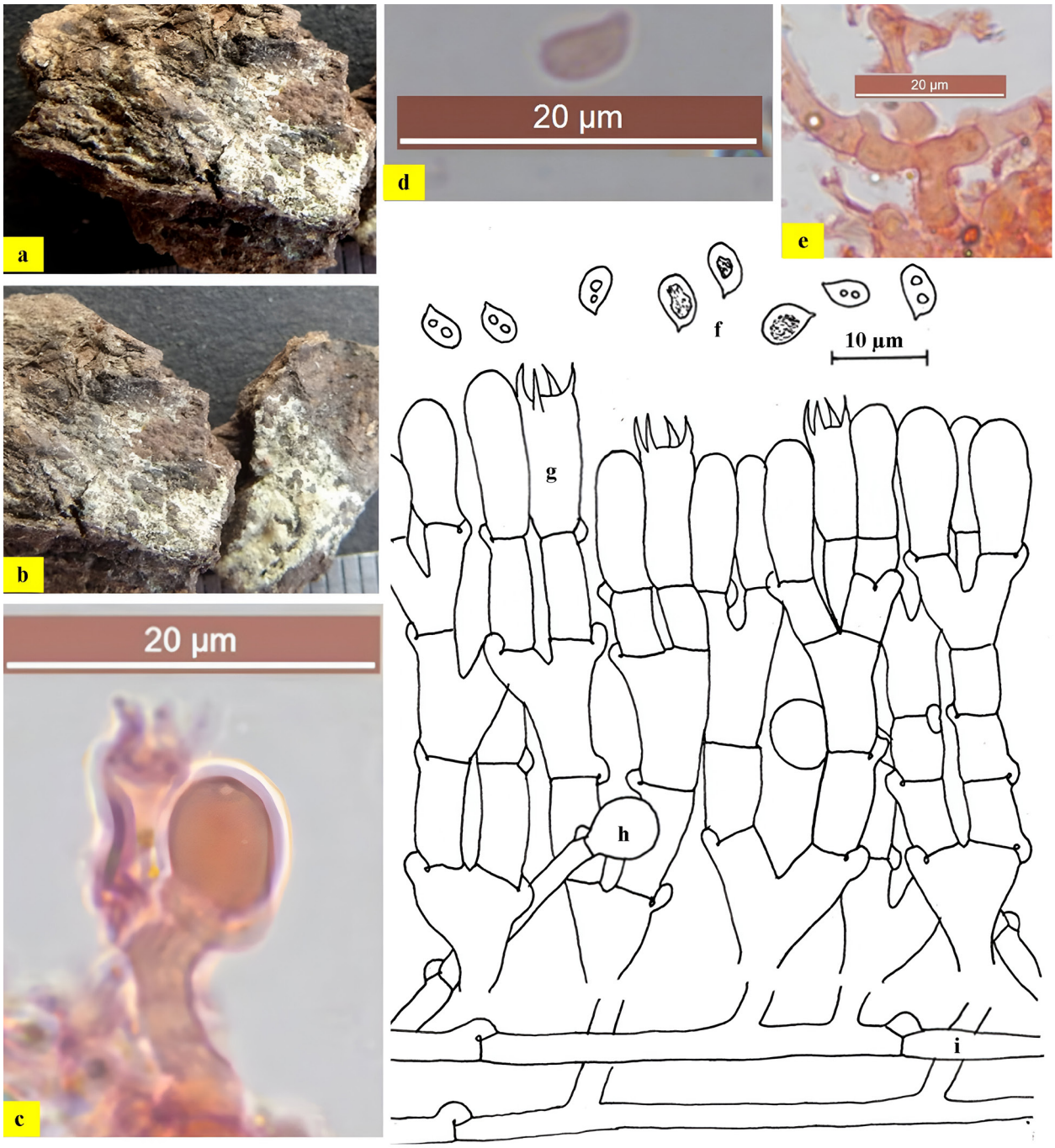

Image 1. ***Brevicellicium exile*****: a–b—Sporophore showing hymenial surface Fresh (a) and Dry (b) | c–e—Photomicrographs showing sphaerocyst (c), basidiospore (d), and generative hyphae (e) | f–i—Line diagrams depicting the outline of basidiospores (f), basidium (g), sphaerocyst (h), and generative hyphae (i). © Poonam.**

clamp. Basidia cylindrical, 11– 13 × 5.5– 6.7 µm, basally clamped, four sterigmate; sterigma ≤ 5 µm long. Basidiospores ellipsoid to broadly ellipsoid, distinctly apiculate, 4.5–5.5 × 2.8–3.5 µm, thin-walled, smooth, acyanophilous, inamyloid, with oily contents.

Collection examined: India, Himachal Pradesh: Chamba, Dalhousie, Jandrighat, on stump of *Cedrus deodara*, Poonam 9198 (PUN), 05 November 2013.

Remarks: *Brevicellicium exile* is peculiar in having smooth hymenial surface, basally clamped sphaerocysts and ellipsoid to broadly ellipsoid basidiospores. *Brevicellicium olivascens* (Bres.) K.H.Larss. & Hjortstam differs in having grandinioid to slightly hydnoid hymenophore and subglobose to somewhat angular

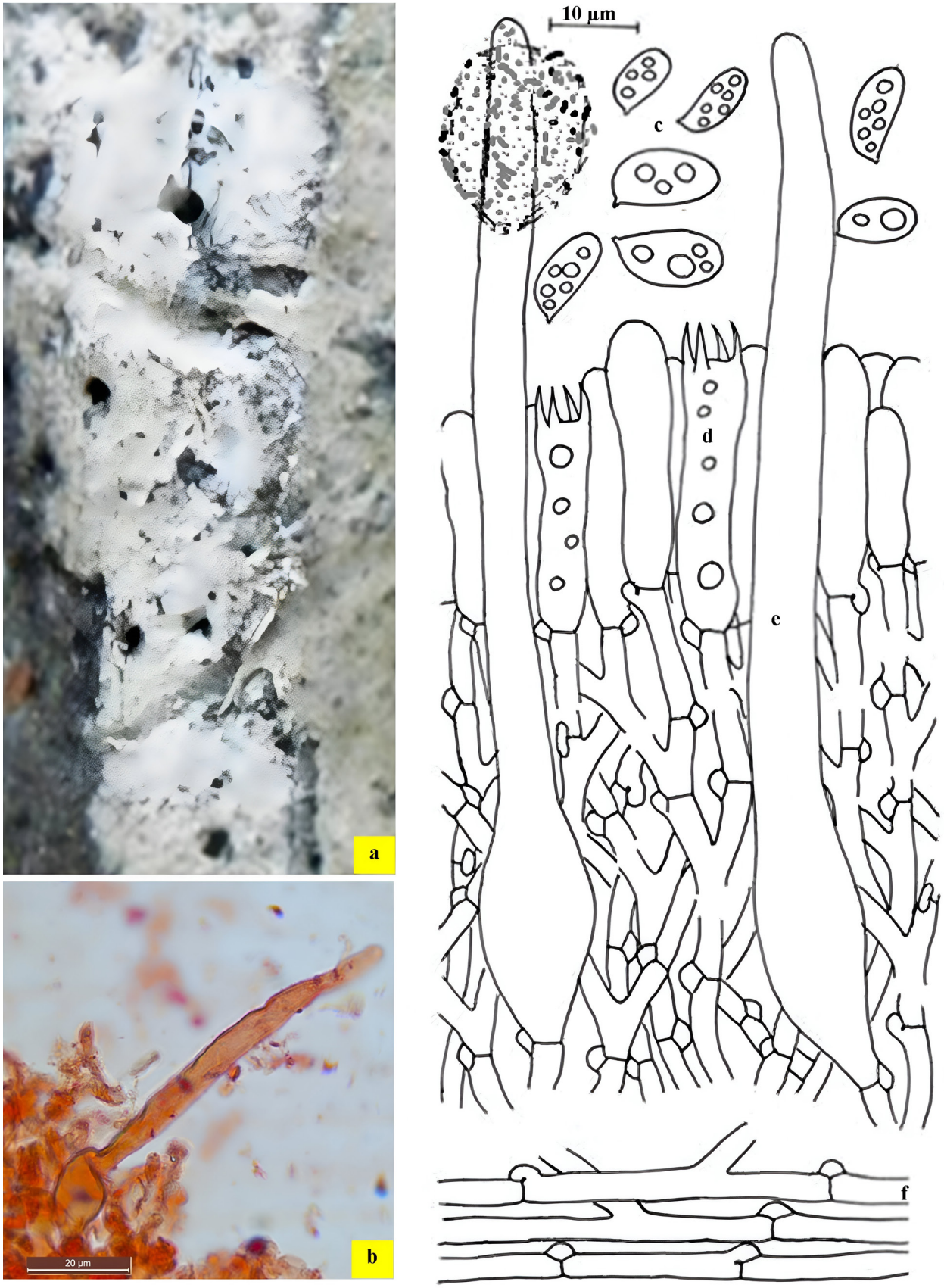

Image 2. *Kurtia magnargillacea*: a—Sporophore showing hymenial | b—Photomicrograph showing a cystidium | c–f—Line diagrams depicting the outline of basidiospores (c), basidium (d), cystidium (e), and generative hyphae (f). © Poonam.

basidiospores (Bernicchia & Gorjón, 2010). Earlier it has been reported from Belgium, France, United Kingdom, Sweden, Italy, Denmark, Norway, Finland and Spain (Mycobank 2024).

Kurtia magnargillacea (Boidin & Gilles) Karasiński, Index Fungorum 141: 1 (2014). (Image 2)

Hyphoderma magnargillaceum Boidin & Gilles, Cryptogamie Mycologie 12(2): 113 (1991).

Sporophore resupinate, effused, adnate, ≤200 µm thick in section; hymenial surface smooth both in fresh and dry state; yellowish white to greyish-yellow both in fresh and dry state; margins fibrillose, paler concolorous when determinate.

Hyphal system monomitic. Generative hyphae ≤3 µm wide, subhyaline, septate, clamped, thin-walled, smooth; subicular hyphae horizontal, less branched; subhymenial hyphae vertical, richly branched. Cystidia subfusiform, basally widened, narrowing towards apex, 122–135 × 12–14 µm, thin-walled, with basal clamp, with resinous deposits at the tip; projecting ≤40 µm out of the hymenium. Basidia clavate to subclavate, with suburniform constriction to sinuous, 23–31 × 6–7.2 µm, basally clamped, with oily contents, four sterigmate; sterigma ≤5 µm long. Basidiospores subcylindrical to ellipsoid to broadly ellipsoid, distinctly apiculate, 7.2–12 × 3.8–6.2 µm, thin-walled, smooth, acyanophilous, inamyloid, with oily contents.

Collection examined: India, Himachal Pradesh: Chamba, Bharmour, Holi, on a dried branch of *Picea smithiana*, Poonam 10101 (PUN), 23 August 2015.

Remarks: *Kurtia magnargillacea* is characteristic of having subfusiform cystidia with resinous deposits at the tip and subcylindrical to ellipsoid to broadly ellipsoid basidiospores. *Hyphoderma argillaceum* (Bres.) Donk differs from *K. magnargillacea* in having comparatively smaller basidiospores. Earlier, it had been described only from France (Boidin & Gilles 1991; Mycobank 2024).

Physodontia lundellii Ryvarden & H.Solheim, Mycotaxon 6(2): 375 (1977). (Image 3)

Sporophore resupinate, effused, adnate, soft, ceraceous, ≤280 µm thick in section; hymenial surface grandinioid to hydnoid both in fresh and dry state; yellowish-white to greyish-yellow when fresh, yellowish-white to light yellow on drying; margins fimbriate, paler concolorous when determinate.

Hyphal system monomitic. Generative hyphae subhyaline, septate, clamped, smooth; subicular hyphae horizontal, ≤4.5 µm wide, less branched, thin- to thick-walled, sometimes with ampullate septa; subhymenial hyphae vertical, ≤2.8 µm wide, richly branched, thin-walled. Ancillary elements of two kinds. Gloeocystidia shape variable, usually oblong to clavate to sometimes with a narrow, terminal protuberance, 16–36 × 8–10 µm, frequent in the hymenium, subhymenium, and trama of the aculei, with basal clamp, thin-walled, oily contents not stained in sulphovanillin. Cystidia subulate to subfusiform, 38–52 × 6.3–7.5µm, thin-walled, basally clamped, without oily contents; projecting ≤10 µm out of the hymenium. Basidia clavate to subclavate, 12–15 × 4.5–6 µm, basally clamped, four sterigmate; sterigma ≤3 µm long. Basidiospores ellipsoid to broadly ellipsoid, distinctly apiculate, 3.6–5 × 2.7–3.6 µm, thin-walled, smooth, acyanophilous, inamyloid.

Collections examined: India, Himachal Pradesh: Chamba, Udaipur, Chihma, on sticks of *Pinus roxburghii*, Poonam 10100 (PUN), 6 September 2018.

Remarks: The genus *Physodontia* is described only on the basis of *P. lundellii* which is peculiar in having grandinioid to hydnoid hymenial surface, two types of cystidial elements and ellipsoid to broadly ellipsoid basidiospores. Earlier it has been reported from Sweden, Finland, and Norway (Mycobank 2024).

Rhizochaete violascens (Fr.) K.H.Larss., Nova Hedwigia 103(3–4): 562 (2016). (Image 4)

Himantia violascens Fr., Observationes mycologicae 1: 211 (1815)

Sporophore resupinate, effused, loosely adnate, pellicular, ≤500 µm thick in section; hymenial surface smooth to cracked, turns reddish violet on putting 3% KOH solution; orange white to greyish orange when fresh, pale orange to greyish-orange to brownish-orange on drying; margins fibrillose due to presence of rhizomorphs, paler concolorous.

Hyphal system monomitic. Generative hyphae subhyaline, septate, clamped, thin-walled; subicular hyphae horizontal, ≤5 µm wide, less branched, encrusted with crystalline encrustation, subiculum light brown but turns reddish-violet in 3% KOH solution; subhymenial hyphae vertical, ≤3 µm wide, richly branched, smooth in the subhymenial zone. Rhizomorphs usually unbranched, ≤22 µm wide. Individual hyphae ≤3.3 µm wide, septate, clamped. Basidia clavate, 20–24 × 4.5–6.5 µm, basally clamped, four sterigmate; sterigma ≤4.2 µm long. Basidiospores ellipsoid, distinctly apiculate, 5.5–7.5 × 2.4–3.4 µm, thin-walled, smooth, acyanophilous, inamyloid.

Collection examined: India, Himachal Pradesh, Chamba, Churah, Bhandal, on the stump of *Picea smithiana*, 10103 (PUN), 15 August 2014.

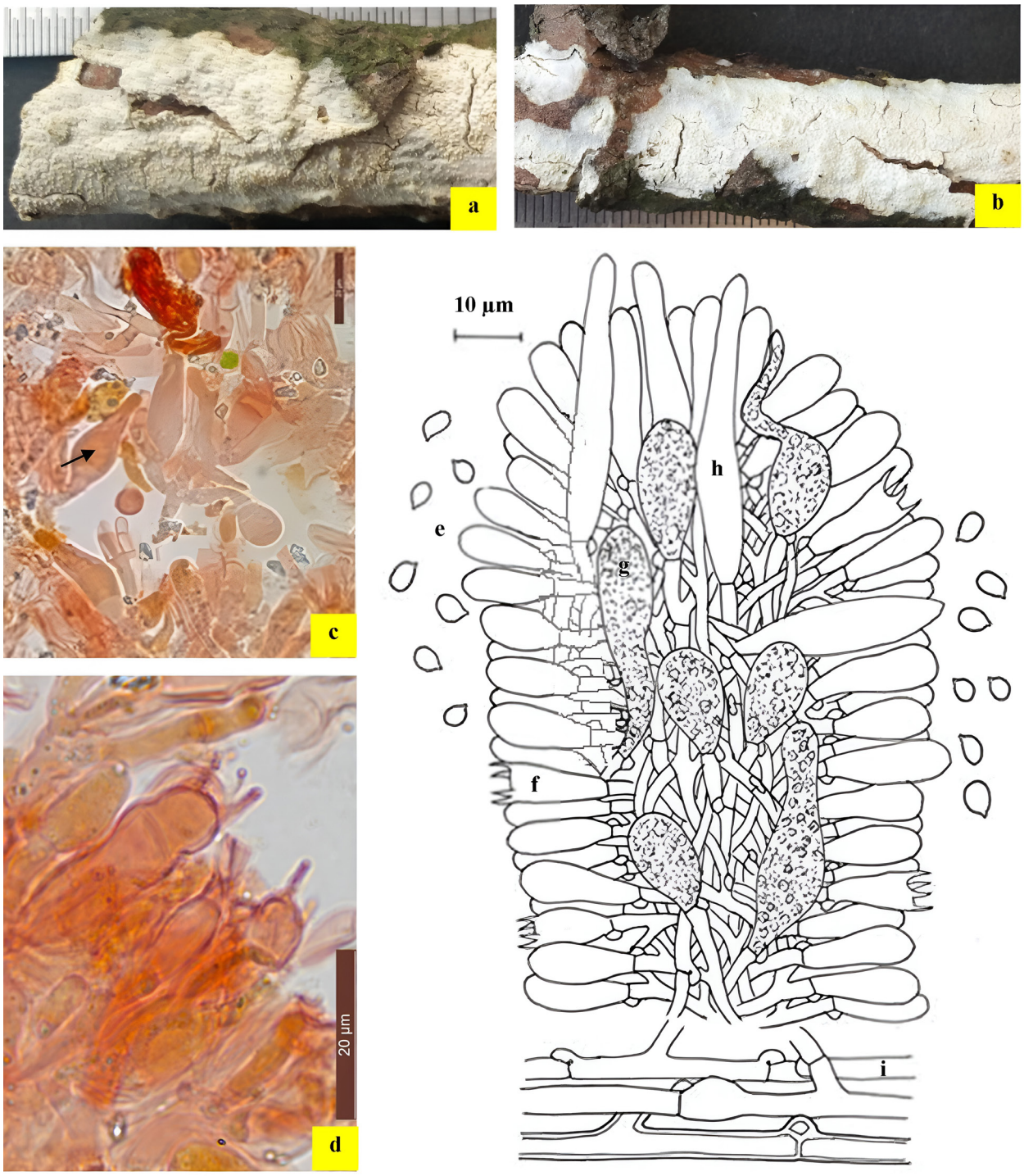

Image 3. ***Physodontia lundellii***: a–b—Sporophore showing hymenial surface Fresh (a) and Dry (b) | c–d—Photomicrographs showing cystidia (c) and basidia (d) | e–i—Line diagrams depicting outline of basidiospores (e), basidium (f), gloeocystidium (g), cystidium (h), and generative hyphae (i). © Poonam.

Remarks: *Rhizochaete violascens* is characteristic in having smooth to cracked hymenial surface, unbranched rhizomorphs, and ellipsoid basidiospores. It differs from the rest of the species of the genus *Rhizochaete* in lacking cystidial elements. The previous reports of *R. violascens* are from Belarus, Denmark, Estonia, Finland, France, Germany, Italy, Norway, Netherland, Russia, Spain, and Switzerland (Mycobank 2024).

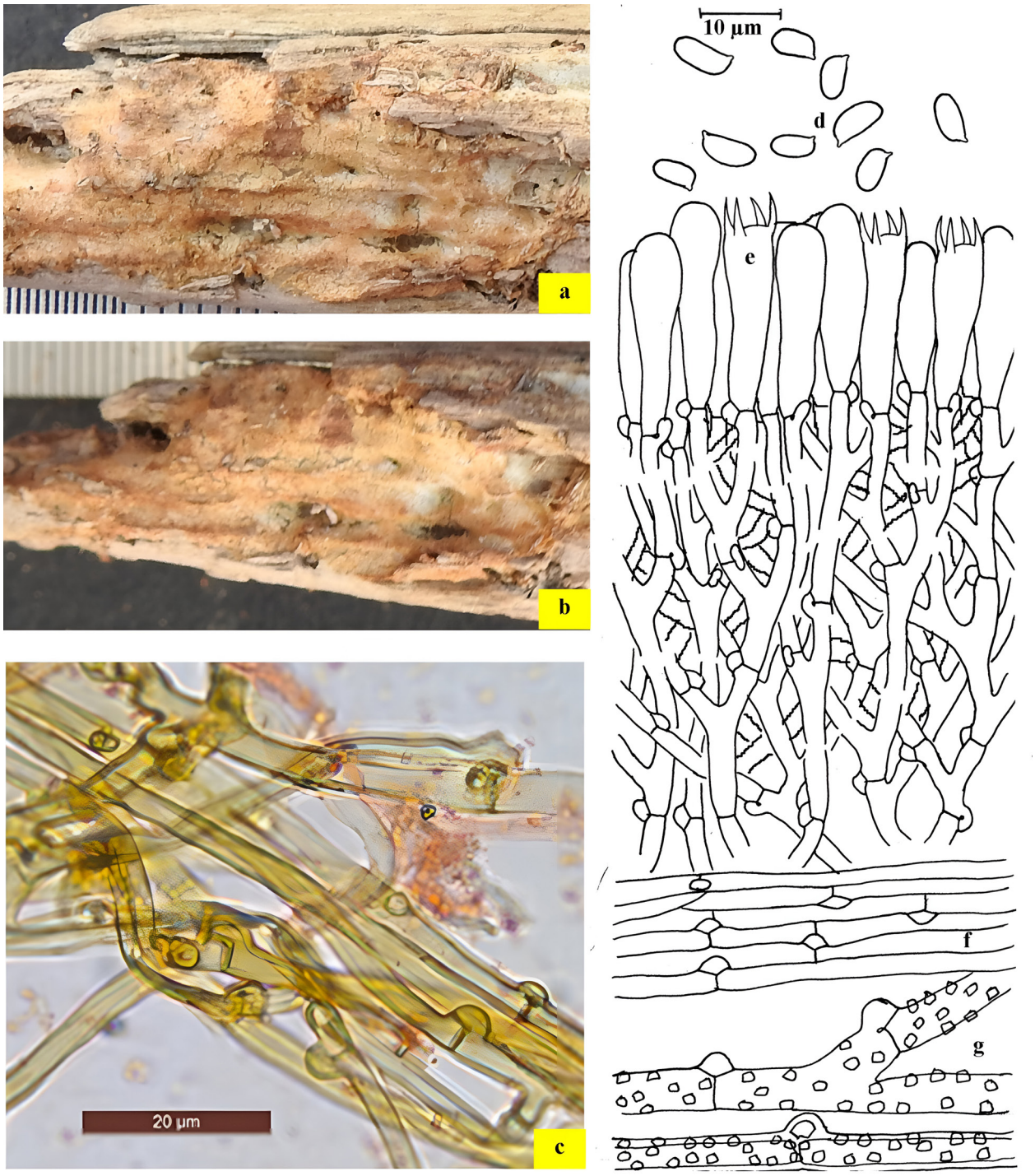

Image 4. ***Rhizochaete violascens*****: a– b. Sporophore showing hymenial surface Fresh (a) and Dry (b) | c—Photomicrograph showing hyphal strands | d–g—Line diagrams depicting outline of basidiospores (d), basidium (e), hyphal strands (f), and generative hyphae (g). © Poonam.**

Sistotrema coroniferum (Höhn. & Litsch.) D.P.Rogers & H.S.Jacks., Farlowia 1(2): 282 (1943). (Image 5)

Gloeocystidium coroniferum Höhn. & Litsch., Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften Math.-naturw. Klasse Abt. I 116: 825 (1907).

Sporophore resupinate, effused, loosely adnate, pellicular, ≤200 µm thick in section; hymenial surface smooth to tuberculate both in fresh and dry state; greyish-white to yellowish-white when fresh, yellowish-

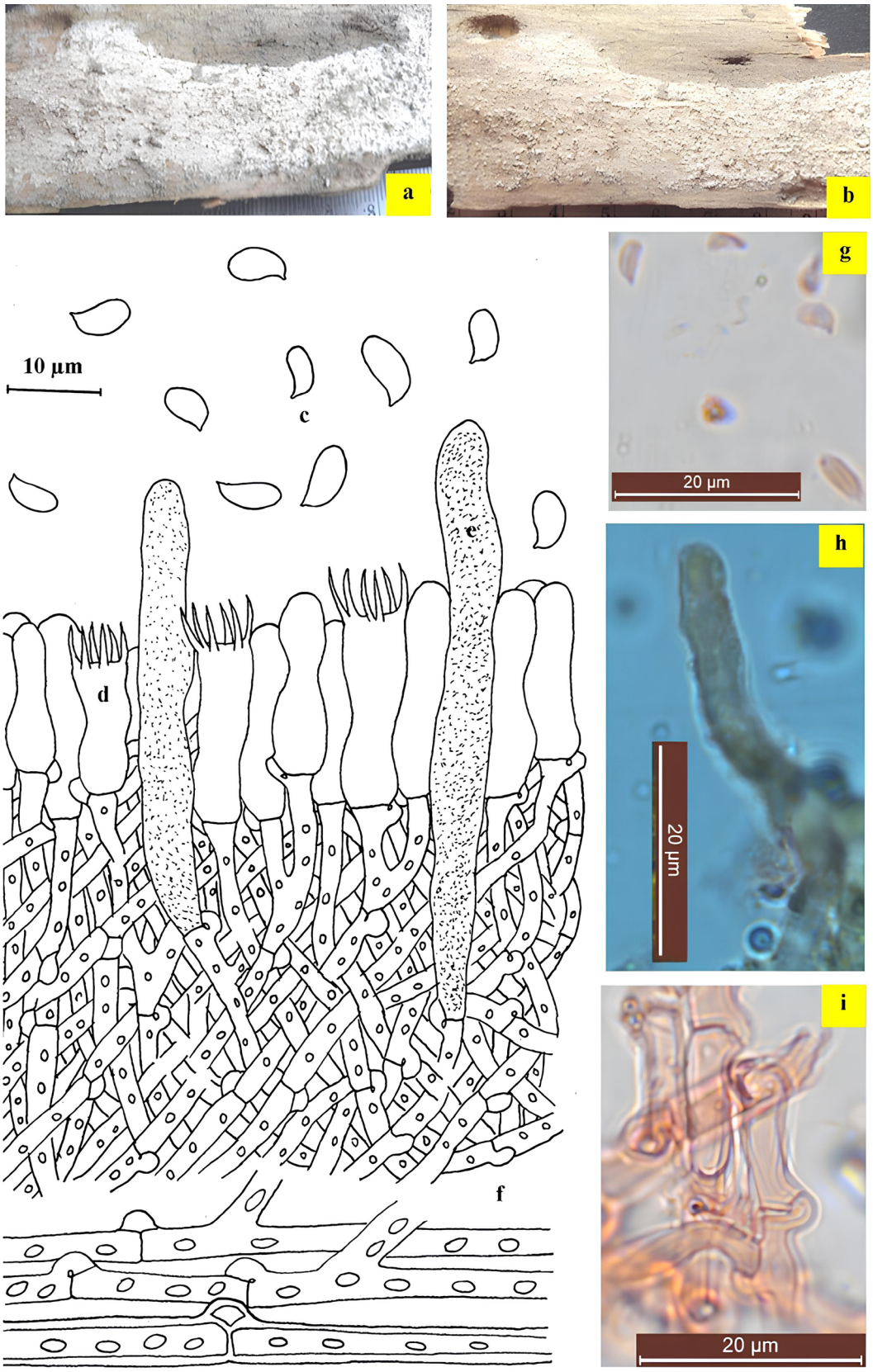

Image 5. *Sistotrema coroniferum*: a–b. Sporophore showing hymenial surface Fresh (a) and Dry (b) | c–f—Line diagrams showing the outline of basidiospores (c), basidium (d), cystidium (e), and generative hyphae (f) | g–i—Photomicrographs showing basidiospores (g), cystidium (h), and generative hyphae (i). © Poonam.

white to greyish-yellow on drying; margins pruinose, paler concolorous when determinate.

Hyphal system monomitic. Generative hyphae subhyaline, septate, clamped, smooth, with oily contents; subicular hyphae horizontal, ≤5 µm wide, less branched, thick-walled; subhymenial hyphae vertical, ≤4 µm wide, occasionally with ampullate septa, richly branched, thin-walled. Gloeocystidia subcylindrical, flexuose, 48–66 × 5.5–6.6 µm, with basal clamp, smooth, thin-walled, oily contents not stained in sulfovanillin; projecting ≤20 µm out of the hymenium. Basidia suburniform to urniform, 14–22 × 5.5–6.1 µm, basally clamped, six sterigmate; sterigma ≤4 µm long. Basidiospores suballantoid to allantoid, distinctly apiculate, 5.5–7.8 × 2.2–3.4 µm, thin-walled, smooth, acyanophilous, inamyloid.

Collections examined: India, Himachal Pradesh: Chamba; Hardaspura colony, on stump of *Populus ciliata*, Poonam 9203 (PUN), 4 November 2015; Hardaspura colony, on stump of *Populus ciliata*, Poonam 10107 (PUN), 4 November 2015.

Remarks: *Sistotrema coroniferum* is peculiar in having six sterigmate basidia, suballantoid to allantoid basidiospores along with subcylindrical flexuose gloeocystidia. *Sistotrema sernanderi* (Litsch.) Donk differs in having four sterigmate basidia and subcylindrical to suballantoid basidiospores. It has been earlier reported from Austria, Caucasus, Germany, Estonia, France, Slovakia, United Kingdom, Belgium, Sweden, Italy, Denmark, Norway, Switzerland, Finland, and Spain (Mycobank 2024).

Tubulicrinis cinctus G.Cunn., Bulletin of the New Zealand Department of Industrial Research 145: 332 (1963) (Image 6)

Sporophore resupinate, effused, adnate, ≤200 µm thick in section; hymenial surface smooth both in fresh and dry state; yellowish-grey to grey when fresh, pale yellow to greyish-yellow on drying; margins fibrillose, paler concolorous when determinate.

Hyphal system monomitic. Generative hyphae subhyaline, septate, clamped, smooth; subicular hyphae horizontal, ≤3.2 µm wide, thin- to thick-walled, less branched; subhymenial hyphae vertical, ≤ 2.4 µm wide, richly branched, thin-walled. Lyocystidia cylindrical, 61–89 × 8–10 µm, with rooting base, lumen narrow, capillary ending abruptly into a widened thin-walled apex, with basal clamp, encrusted with crystalline deposits at the apex that dissolve in 3% KOH solution, slightly amyloid. Basidia clavate, 12–22 × 5.6–7.2 µm, somewhat stalked, constricted, basally clamped, four sterigmate; sterigma ≤4 µm long. Basidiospores 4.8–6.4 × 3.2–4.8 µm, subglobose, distinctly apiculate, thin-walled, smooth, acyanophilous, inamyloid.

Collections examined: India, Himachal Pradesh: Chamba, Churah, Bhandal, on stump of *Pinus wallichiana*, Poonam 10106 (PUN), 15 August 2014; Churah, Bhandal, on stump of *Pinus wallichiana*, Poonam 10752 (PUN), 15 August 2014.

Remarks: *Tubulicrinis cinctus*, a new report of corticioid fungi from India, is peculiar in having cylindrical, rooted, lyocystidia with crystalline encrustation at the apex and subglobose basidiospores. *Tubulicrinis globisporus* K.H. Larss. & Hjortstam is different in having comparatively larger and strongly amyloid cystidia (Hjortstam et al. 1988). The previous reports are from Russia, Caucasus, Sweden, Norway, and Turkey (Mycobank 2024).

CONCLUSIONS

During the course of present studies, six corticioid species have been added to the account of corticioid fungi from India. Of these, the genus *Physodontia* has been recorded for the first time from India. These six species have been described on the basis of morphological features. In the future attempt will be made to supplement the comprehensive morphological observations with DNA sequence based molecular phylogenetic analysis. The polyphasic approach would definitely authenticate the morphology based identification and may also form the basis for the proposal of some novel taxa.

REFERENCES

Bernicchia, A. & S.P. Gorjón (2010). *Corticiaceae s.l. Fungi Europaei 12*. Edizioni Candusso. Alassio. Italia, 1008 pp.

Boddy, L. (1991). Importance of wood decay fungi in forest ecosystems. In: Arora, D.K., B. Raj, K.G. Mukerji & G.R. Knudsen (eds.). *Handbook of Applied Mycology, Vol. 1: Soil and Plants*. Marcel Dekker, New York. *Coolia* 36(4): 507–539.

Boidin, J. & G. Gilles (1991). Basidiomycètes Aphyllophorales de l'île de la Réunion. XVI : Les genres *Hyphoderma*, *Hyphodermopsis*, *Chrysoderma* nov. gen. et *Crustoderma* - Aphyllophorales Basidiomycetes from Reunion Island. XVI: The genus *Hyphoderma*, *Hyphodermopsis*, *Chrysoderma* nov. gen. and *Crustoderma*. *Crytogamie Mycologie* 12(2): 97–132.

Boidin, J., P. Lanquetin & G. Gilles (1991). Les *Peniophoraceae* de la zone intertropicale (*Basidiomycetes*, *Aphyllophorales*). *Bulletin de la Sociètè Mycologique de France* 107(3): 91–156.

Cragg, S.M., G.T. Beckham, N.C. Bruce, T.D.H. Bugg, D.L. Distel, P. Dupree, A.G. Etxabe, B.S. Goodell, J. Jellison, J.E. McGeehan, S.J. McQueen-Mason, K. Schnorr, P.H. Walton, J.E.M. Watts & M. Zimmer (2015). Lignocellulose degradation mechanisms across the tree of life. *Current Opinion in Chemical Biology* 29: 108–119.

Eriksson, J. & L. Ryvarden (1973). The Corticiaceae of North Europe *Vol. 2*. Fungiflora. *Oslo* 59–286.

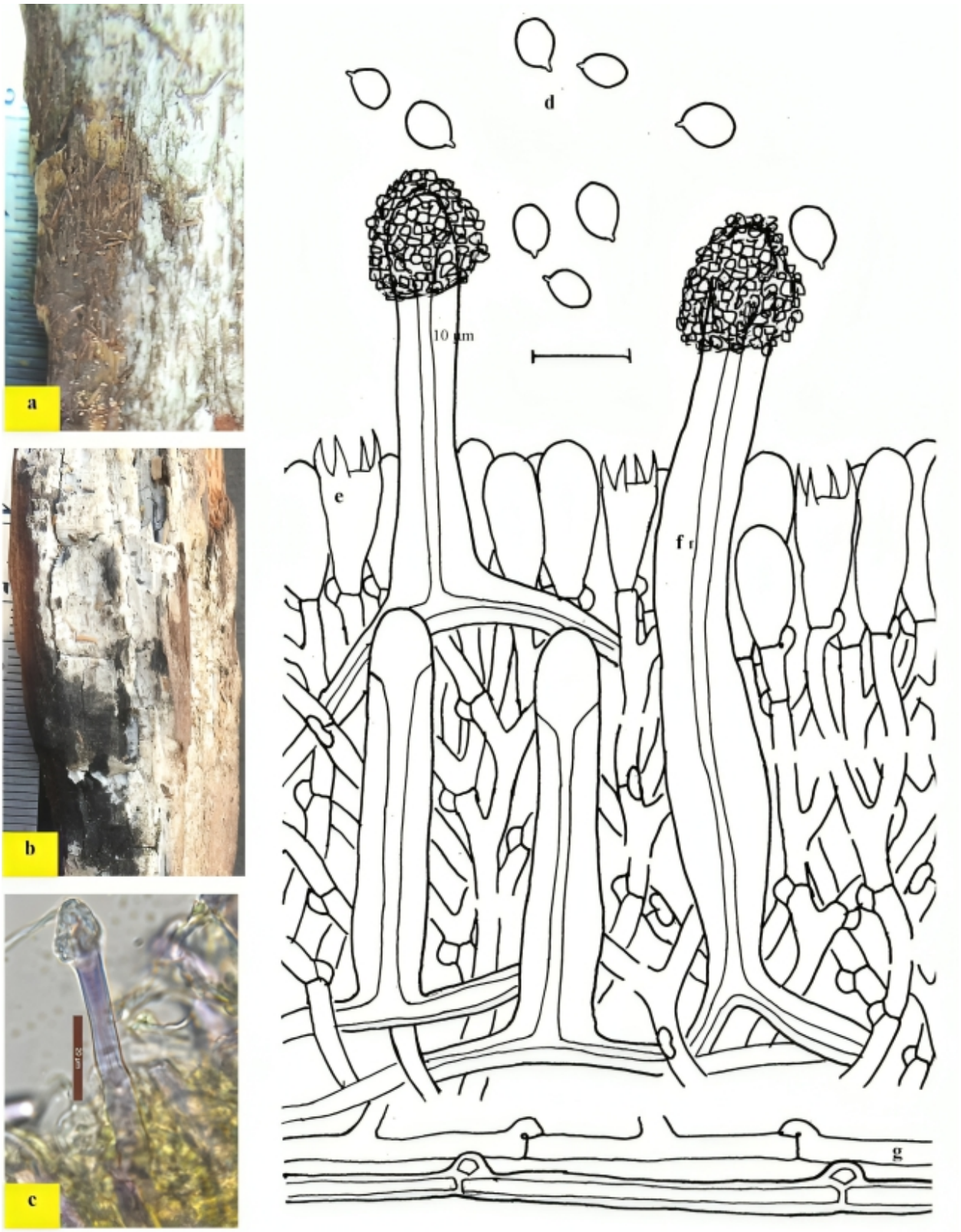

Image 6. ***Tubulicrinis cinctus***: a–b—Sporophore showing hymenial surface Fresh (a) and Dry (b) | c—Photomicrograph showing lyocystidium | d–g—Line diagrams depicting outline of basidiospores (d), basidium (e), lyocystidum (f), and generative hyphae (g). © Poonam.

Eriksson, J., K. Hjortstam & L. Ryvarden (1981). The Corticiaceae of North Europe Vol. 6, pp. 1051–1276. Fungiflora, Oslo.

Eriksson, J., K. Hjortstam & L. Ryvarden (1984). The Corticiaceae of North Europe Vol. 7, pp. 1281–1449. Fungiflora, Oslo.

Fungifromindia.com (2024). http://www.fungifromindia.com/fungiFromIndia/databases/IAD/.Indian Aphyllofungal Database. Accessed on 20 November 2024.

Hakimi, M.H., J.G. Vaidya, K. Ranadive, Jamaluddin & P.K. Jite (2013). *Resupinate Aphyllophorales of India*. Scientific Publishers Jodhpur, Rajasthan, 280 pp.

Hjortstam, K., K.H. Larsson & L. Ryvarden (1988). *The Corticiaceae of North Europe Vol. 8*, pp. 1450–1631. Fungiflora, Oslo.

Kornerup, A. & J.H. Wanscher (1978). *Metheun's Handbook of Colours, 3rd Edition*. Metheun and Co. Ltd. London, 252 pp.

Manoharachary, C., N.S., Atri, T.P. Devi (2022). *Bilgrami's Fungi of India List and References (1988–2020)*. Today and Tomorrow's Printers and Publishers, New Delhi.

Mycobank (2024). Fungal databases. Nomenclature and species bank. http://www.mycobank.org. Accessed on 20 November 2024.

Tong, L., L. Cui, X. Song, X. Cui, Y. Wei, L. Tang, Y. Mu & Z. Xu (2022). Wood decay fungi: an analysis of worldwide research. *Journal of Soils and Sediments* 22: 1688–1702. https://doi.org/10.1007/s11368-022-03225-9

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