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A new species of the genus *Corneriella* from India supported by morphological and molecular data

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Abstract

Corneriella indica sp. nov. is described from Kerala State, India. Comprehensive description, photographs, and comparisons with phenetically similar species are provided. Maximum likelihood analysis conducted on a concatenated dataset comprising ITS, nLSU, nSSU and *rpb2* of the Tricholomataceae supported the generic placement and species validity of *C. indica*. Conspicuous cheilocystidia, one of the defining features of the genus, are missing in *C. indica* but the lamella edges are still sterile and composed of projecting tramal hyphae with cystidioid terminal elements.

Key words: Agaricales, Basidiomycota, phylogeny, taxonomy

Introduction

Corneriella Sánchez-García (2014: 1007) (Tricholomataceae, Agaricales, Basidiomycota) is a recently described genus sister to *Porpoloma* Singer (1952: 198) and *Dennisiomyces* Singer (1955: 225) (Sánchez-García *et al.* 2014). Currently the genus comprises four tropical species, *Corneriella bambusarum* (Desjardin & Hemmes 2001: 97) Sánchez-García (2014: 1000) (≡ *Porpoloma bambusarum* Desjardin & Hemmes 2001: 97) described from Hawaii, *Corneriella humicola* (Corner 1994: 109) Sánchez-García (2014: 1000) (≡ *Cantharellula humicola* Corner 1994: 109) described from Malaysia, and two undescribed species from Puerto Rico and Brazil (Sánchez-García *et al.* 2014). *Corneriella* is characterized by putatively saprotrophic species occurring on soil and humus, tricholomatoid basidiomata not changing color when cut or bruised and adnexed to sinuate or decurrent, sometimes forked lamellae that are initially pale and becoming darker. Additionally, the genus has smooth, thin-walled and amyloid basidiospores, conspicuous, versiform, thin-walled cheilocystidia, a hymenium devoid of pleurocystidia, a cutis-type pileipellis with suberect to erect terminal cells and hyphae with clamp connections (Sánchez-García *et al.* 2014).

During ongoing studies on agarics of Kerala State, India, we came across an agaric that we initially thought to be a species of *Porpoloma*. Subsequent molecular phylogenetic analysis, however, revealed it to be more closely related to *Corneriella* than to *Porpoloma*. It is formally described here as a new species of *Corneriella*.

Materials and Methods

Morphological studies

Light microscopic observations were made on material stained with 1% aqueous solutions of both phloxine and Congo red and mounted in 3% aqueous KOH. Melzer's reagent was used to observe whether the basidiospores and tissues were amyloid. For evaluation of the range of spore-size, 20 basidiospores each from one specimen of each collection cited were measured. Basidiospore measurements include both the mean and the standard deviation for both the length and the width, together with the range of spore quotient (Q, length/width ratio) and its mean value (Qm). Color codes from both Kornerup & Wanscher (1978) (e.g., 5E7) and the Online Auction Color Chart (Anonymous 2004) (e.g.,

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OAC768) accompany color names in the description. The examined collections are deposited at Kew (Mycology) Herbarium and the Kew accession numbers (e.g., K(M) 190587) are indicated.

DNA extraction, PCR and sequencing

Genomic DNA was extracted from dried specimens following Izumitsu *et al.* (2012). PCR reactions were performed with primer pairs ITS1 and ITS4 for ITS (White *et al.* 1990) and LROR and LR7 (Vilgalys & Hester 1990) for nLSU. The amplification reaction mixture (final volume 30 µL) contained the following: 15 µL of EmeraldAmp GT PCR Master Mix, 6 µL of ddH_2O, 3 µL of 10 µM primers (ITS1 & ITS4; LROR & LR7) and 3 µL of template DNA. PCR reactions were performed in a GeneAtlas™ Thermal cycler (Astec, Fukuoka, Japan). Thermal profile of PCR was 2′ 95°C, 1′ 50° C, 1′ 72°C; 34 cycles of 30″ 94°C, 1′ 50°C, 1′ 72°C, and a final extension step of 10′ 72°C. The PCR products were examined on 1.0% agarose gel, stained with ethidium bromide and visualized under a UV transilluminator. Amplified PCR products were purified using column purification (GeneJet™ PCR Purification Kit, Thermo Fisher Scientific, Mumbai, India) as per manufacturer's guidelines and were subjected to automated DNA sequencing on ABI3730xl DNA Analyzer (Applied Biosystems, Foster City, CA, USA) using the same primers used for PCR. The generated sequences were edited manually using BioEdit sequence alignment editor version 7.0.9.0 (Tom Hall, Ibis Biosciences, Carlsbad, CA, USA). The edited sequences were then used for BLAST search in the GenBank database (www.ncbi.nlm.nih.gov). The newly generated sequences were deposited in GenBank (ITS: KM886378; nLSU: KJ944172). GenBank accession numbers, specimen/strain numbers, and scientific names of fungi used in the phylogenetic analysis are provided in Table 1.

TABLE 1. Taxa used in the phylogenetic analysis, specimen/herbarium numbers, and GenBank accession numbers.

Species name	Voucher number[1]	ITS	nLSU	nSSU	RPB2
Albomagister sp.2	MSG137 (TENN:068776)	KJ417247	KJ417178		KJ424363
Albomagister sp.2	MSG136 (TENN:068775)	KJ417248			KJ424364
Albomagister sp.2	AHS14872 (MICH:058090)	KJ417249			
Albomagister sp.3	ECV4202 (TENN:065323)	KJ417250	KJ417179		KJ424365
Albomagister subaustralis (A.H. Sm. & Hesler) Sánchez-García, Birkebak & Matheny	ECV4049 (TENN:064621)	KJ417251	KJ417180		KJ424366
Albomagister subaustralis	MGW676 (TENN:064620)	KJ417252	KJ417181	KJ417255	KJ424367
Albomagister subaustralis	WBU11 (TENN:066902)	KJ417253			
Albomagister subaustralis	LRH14423 (TENN:014423)	KJ417254			
Albomagister subaustralis	LRH23221 (TENN:023221)	KJ417255			
Albomagistersubaustralis	LRH39069 (TENN:039069)	KJ417256			
Albomagister subaustralis	LRH20463 (TENN:020463)	KJ417257			
Albomagister subaustralis	LRH18628 (TENN:8018628)	KJ417258			
Albomagister subaustralis	LRH22663 (TENN:022663)	KJ417259			
Albomagister subaustralis	LRH23195 (TENN:023195)	KJ417260			
Albomagister subaustralis	LRH17951 (TENN:017951)	KJ417261			
Albomagister subaustralis	AHS10844 (MICH:010951)	KJ417262			

...Continue on next page

TABLE 1. (Continued)

Species name	Voucher number[1]	ITS	nLSU	nSSU	RPB2
Albomagister subaustralis	SAT1221702 (TENN:067343)	KJ417263			
Clitocybe nebularis (Batsch) P. Kumm.	PBM2259		DQ457658	DQ437681	DQ470833
Corneriella bambusarum (Desjardin & Hemmes) Sánchez-García	DED5462 (NY)	KJ417264	KJ417185		KJ424370
Corneriella bambusarum	DED6572 (NY:0775752)	KJ417265			
Corneriella humicola (Corner) Sánchez-García	DED7871	KF291051	KF291052	KF291053	
***Corneriella indica* Raj & Manim.**	**AR920 (K(M):19058)**	**KM886378**	**KJ944172**		
Corneriella sp.	PR-4733 (CFMR)	KF306336	KF306337		KF306338
Corneriella sp.	PR-3995 (CFMR)	EF421106	AF261395		AF421013
Corneriella sp.	JPF943A (K(M):188911)	KJ417324	KJ417234		
Dennisiomyces glabrescentipes Singer	JPF1000A (K(M):188910)	KJ417326	KJ417235		
Dennisiomyces griseus	Dennis-293 (K(M):160882)	KJ417325			
Dennisiomyces sp. 1	BZ-916 (CFMR)	KF291063	KF291064		KF291066
Dennisiomyces sp. 2	PR-4763 (CFMR)	KJ417269	KJ417191		
Dennisiomyces sp. 3	PR-4764 (CFMR)	KJ417270			
Dennisiomyces sp. 4	PR-6334 (CFMR)	KJ417271	KJ417192	KJ417258	
Dennisiomyces sp. 4	PR-6613 (CFMR)	KJ417268	KJ417190	KJ417257	
Dennisiomyces sp. 5	BPL244 (TENN:067232)		KJ417186		KJ424371
Dennisiomyces sp. 5	PBM3862 (TENN:067469)		KJ417187		KJ424372
Dennisiomyces sp. 5	BPL254 (TENN:067388)	KJ417266	KJ417188		KJ424373
Dennisiomyces sp. 5	PBM3861 (TENN:067462)	KJ417267	KJ417189		KJ424374
Dennisiomyces sp. 5	DLNC15-05 (TENN:061833)	KJ417327	KJ417239		
Dennisiomyces sp. 5	DLTN34-05 (TENN:061851)	KJ417328			
Entoloma sinuatum (Bull.) P. Kumm.	TJB5349		AY691891	AY657007	KJ424375
Leucopaxillus albissimus (Peck) Singer	Landeros 7/8/A (XAL)	KJ417272	KJ417194		
Leucopaxillus albissimus	(DAOM:182713)		AF261393		
Leucopaxillus albissimus	F9693 (FH:00301850)	KJ417273			
Leucopaxillus albissimus	Singer-301900 (FH:00301900)	KJ417274			
Leucopaxillus alboalutaceus (F.H. Møller & Jul. Schäff.) F.H. Møller	LAS00/082 (GB:0065210)	KJ417275	KJ417195	KJ417261	KJ424377
Leucopaxillus alboalutaceus	LAS88/79 (GB:0065215)	KJ417245			
Leucopaxillus alboalutaceus	GC-97076	JQ639147			
Leucopaxillus amarus (Alb. & Schwein.) Kühner	TFB54925 (TENN:040325)	KJ417276			
Leucopaxillus amarus	Mos63/271 (TENN:037007)		KJ417196		
Leucopaxillus amarus	LGD5690 (IBUG)	KJ417277			
Leucopaxillus amarus	BW122201 (WTU:F-8827)	KJ417278	KJ417197		
Leucopaxillus amarus	Smith-15870 (MICH:0073741)	KJ417279			

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TABLE 1. (Continued)

Species name	Voucher number[1]	ITS	nLSU	nSSU	RPB2
Leucopaxillus amarus	Cooke 22708 (FH:00301878)	KJ417280			
Leucopaxillus cerealis (Lasch) Singer	LAS01/031 (GB:0110964)	KJ417281			KJ424378
Leucopaxillus cerealis	(GB:0068895)	KJ417282	KJ417198	KJ417262	KJ424379
Leucopaxillus cerealis	LAS04/012 (GB:065211)	KJ417283			KJ424380
Leucopaxillus cerealis	LAS01/147 (GB)	KJ417246	KJ417241		
Leucopaxillus cerealis	AVL20112 (TO)	JQ639148	JQ639149		
Leucopaxillus cf. *masakanus* Pegler	TJB8321 (CORT)	KJ417284			
Leucopaxillus eucalyptorum (Cleland) Grgur.	REH9110 (NY:01115433)	KJ417285	KJ417199		
Leucopaxillus eucalyptorum	RHP8368 (TENN:055040)	KJ417286	KJ417200		
Leucopaxillus gentianeus (Quél.) Kotl	EL291/11 (GB)	KJ417287	KJ417201		KJ424381
Leucopaxillus gentianeus	(TENN:05616)		AF261394		
Leucopaxillus gracillimus Singer & A.H. Sm	Guzman-34476 (XAL)	KJ417288			
Leucopaxillus gracillimus	TJB8315 (CORT)	KJ417289			
Leucopaxillus laterarius (Peck) Singer & A.H. Sm.	PBM3060 (TENN:063507)	KJ417290	KJ417202	KJ417263	
Leucopaxillus laterarius	TFB56010 (TENN:044433)	KJ417291	KJ417203		
Leucopaxillus laterarius	RHP29877 (TENN:029877)	KJ417292	KJ417204		
Leucopaxillus laterarius	ALC178 (IBUG)	KJ417293			
Leucopaxillu slaterarius	VR1717 (IBUG)	KJ417294			
Leucopaxillus lilacinus Bougher	PBM3584 (TENN:066653)	KJ417295	KJ417205	KJ417264	KJ424382
Leucopaxillus monticola (Singer & A.H. Sm.) Bon	AVL20111 (TO)	JQ639156			
Leucopaxillus paradoxus (Costantin & L.M. Dufour) Boursier	TK04/091 (GB:0110968)	KJ417296	KJ417206	KJ417265	KJ424383
Leucopaxillus tricolor (Peck) Kühner	TFB13462 (TENN:061725)	KJ417323	KJ417207	KJ417266	KJ424384
Porpoloma portentosum Singer	MES531 (FL)	KJ417298	KJ417210		KJ424386
Porpoloma portentosum	REH5788 (NY)	KJ417299	KJ417211		KJ424387
Porpoloma portentosum	Singer-M149 (MICH: 011834)	KJ417300			
Porpoloma sejunctum Singer	(CONC:F0416)	KJ417301	KJ417212		KJ424388
Porpoloma sejunctum	Singer-M256 (MICH:01183)	KJ417302			
Porpoloma sejunctum	Environmental sample	JX316261			
Porpoloma sp. 2	PBM3441 (TENN:065358)	KJ417303	KJ417213	KJ417269	KJ424389
Porpoloma sp. 1	PBM3238 (TENN:065473)	KJ417304	KJ417214	KJ417270	KJ424390
Porpoloma terreum Singer	REH5830 (NY)	KJ417305	KJ417215		KJ424391
Porpoloma terreum	(CONC:F0030)	KJ417306	KJ417216		
Porpoloma terreum	Singer-M372 (MICH:011746)	KJ417307			
Porpoloma terreum	Environmental sample	JX316283			
Porpoloma terreum	Environmental sample	JX316318			
Porpoloma terreum	Environmental sample	JX316344			

...Continue on next page

TABLE 1. (Continued)

Species name	Voucher number[1]	ITS	nLSU	nSSU	RPB2
Pseudotricholoma metapodium (Fr.) Sánchez-García & Matheny	AH22102006 (K(M))	KJ417308	KJ417219	KJ417271	KJ424394
Pseudotricholoma metapodium	LAS06/134 (GB:066422)	KJ417309	KJ417220		KJ424395
Pseudotricholoma metapodium	EL155/09 (GB)	KJ417310			KJ424396
Pseudotricholoma umbrosum (A.H. Sm. & M.B. Walters) Sánchez-García & Matheny	TFB5481 (TENN:052643)	KJ417311	KJ417221		
Pseudotricholoma umbrosum	REH4796 (NY:505218)	KJ417312	KJ417222		KJ424397
Pseudotricholoma umbrosum	TJB7179 (CORT)	KJ417313	KJ417223		
Pseudotricholoma umbrosum	Wehmeyer-640 (MICH:012331)	KJ417314			
Pseudotricholoma umbrosum	PBM3267 (TENN:064489)	KJ417315	KJ417224		KJ424398
Singerocybe adirondackensis (Peck) Sánchez-García & Matheny	PBM3320 (TENN:064660)		HQ728530	HQ728531	HQ728532
Tricholoma elegans G. Stev.	PBM3142 (TENN:063711)	KJ417316	KJ417226		
Tricholoma equestre (L.) P. Kumm		HM590872			
Tricholoma flavovirens (Alb. & Schwein.) S. Lundell		EU186310			
Tricholoma inamoenum (Fr.) Gillet			AY293215	AY293161	
Tricholoma matsutake (S. Ito & S. Imai) Singer		AB188557	U62964	U62538	
Tricholoma myomyces (Pers.) J.E. Lange	KMS589	DQ825428	U76459	DQ367422	DQ367436
Tricholoma palustre A.H. Sm.	PBM2494		AY700197	AY757267	DQ484055
Tricholoma saponaceum (Fr.) P. Kumm.	PBM2514 (CUW)	DQ494700	AY647209	AY654883	
Tricholoma sp.	PBM3141 (TENN:063710)	KJ417317	KJ417227	KJ417272	
*Tricholoma*sp.	PBM3085 (TENN:063664)	KJ417318	KJ417228	KJ417273	
Tricholoma sp.	RHP13062 (TENN:061065)		KJ417229	KJ417274	
Tricholoma sp.	SAR1290		AF042592	AF287839	
Tricholoma subresplendens (Murrill) Murrill	SAT1027901 (TENN:065679)	KJ417319	KJ417230	KJ417275	
Tricholoma viridiolivaceum G. Stev.	PBM3093 (TENN:063670)	JF706316	JF706317	JF706318	JF706319
Undet. gen.	ECV4038 (TENN:064609)	KJ417320	KJ417231	KJ417276	KJ424399
Undet. gen.	MBP080609 (TENN:064359)	KJ417321	KJ417232	KJ417277	KJ424400
Undet. gen.	MSG144 (TENN:068777)	KJ417322	KJ417233		KJ424402

[1] Collector numbers followed by herbarium accession numbers in parentheses.

Sequence alignment and phylogenetic analyses

Nuclear ribosomal large subunit (nLSU) and internal transcribed spacer (ITS) sequences were added to a previously concatenated dataset of the Tricholomataceae that included nLSU, ITS, nuclear ribosomal small subunit (nSSU) and the second largest subunit of RNA polymerase II (*rpb2*) sequences (Sánchez-García *et al.* 2014). Alignments were manually adjusted in AliView (Larsson 2014). Regions of the ITS dataset with ambiguous alignments were excluded. Unsampled gene regions were coded as missing data. The alignment was separated in five partitions: (1) ITS, (2) nLSU and nSSU, (3) rpb2 first position, (4) rpb2 second position, and (5) rpb2 third position as suggested by PartitionFinder 1.0.1 (Lanfear et al. 2012). Maximum Likelihood (ML) analysis was performed using RAxML 7.9.1 (Stamatakis 2006), implementing the GTR+GAMMA+I model, and executing 1000 rapid ML bootstrap replicates. *Clitocybe nebularis* (Batsch 1789: 25) P. Kumm. (1871: 124), *Entoloma sinuatum* (Pers. 1801: 329) P. Kumm. (1871: 98) and *Singerocybe adirondackensis* (Peck 1872: 77) Zhu L. Yang & J. Qin (2014: 1022) were used as outgroups following Sánchez-García *et al.* (2014). The aligned sequence data matrix has been deposited in TreeBase (http://purl.org/phylo/treebase/phylows/study/TB2:S16480).

Results

Taxonomy

Corneriella indica Raj & Manim., *sp. nov.* Figs. 1, 2 A–F
MycoBank MB 809233

FIGURE 1. *Corneriella indica* (K(M)190587, holotype). Basidioma. Scale bar: 10 mm. Photo: Taken by Mr K. N. Anil Raj.

Etymology:—The specific epithet refers to India, the country where this species was first observed.

Diagnosis:—Tricholomatoid basidiomata with a brown pileus with appressed-fibrillose surface, thick lamellae with dark brown edges, a sterile lamella edge composed of projecting tramal hyphae with cystidioid terminal elements, subglobose and amyloid basidiospores, and a cutis-type pileipellis disrupted by trichodermal patches are the diagnostic features of this species. Differing from *Corneriella bambusarum* (Desjardin & Hemmes) Sánchez-García in having an appressed-fibrillose pileus, adnate to subdecurrent lamellae with a dark brown lamella edge, a sterile lamella edge composed of projecting tramal hyphae with cystidioid terminal elements, and slightly gelatinized pileipellis and stipitipellis hyphae.

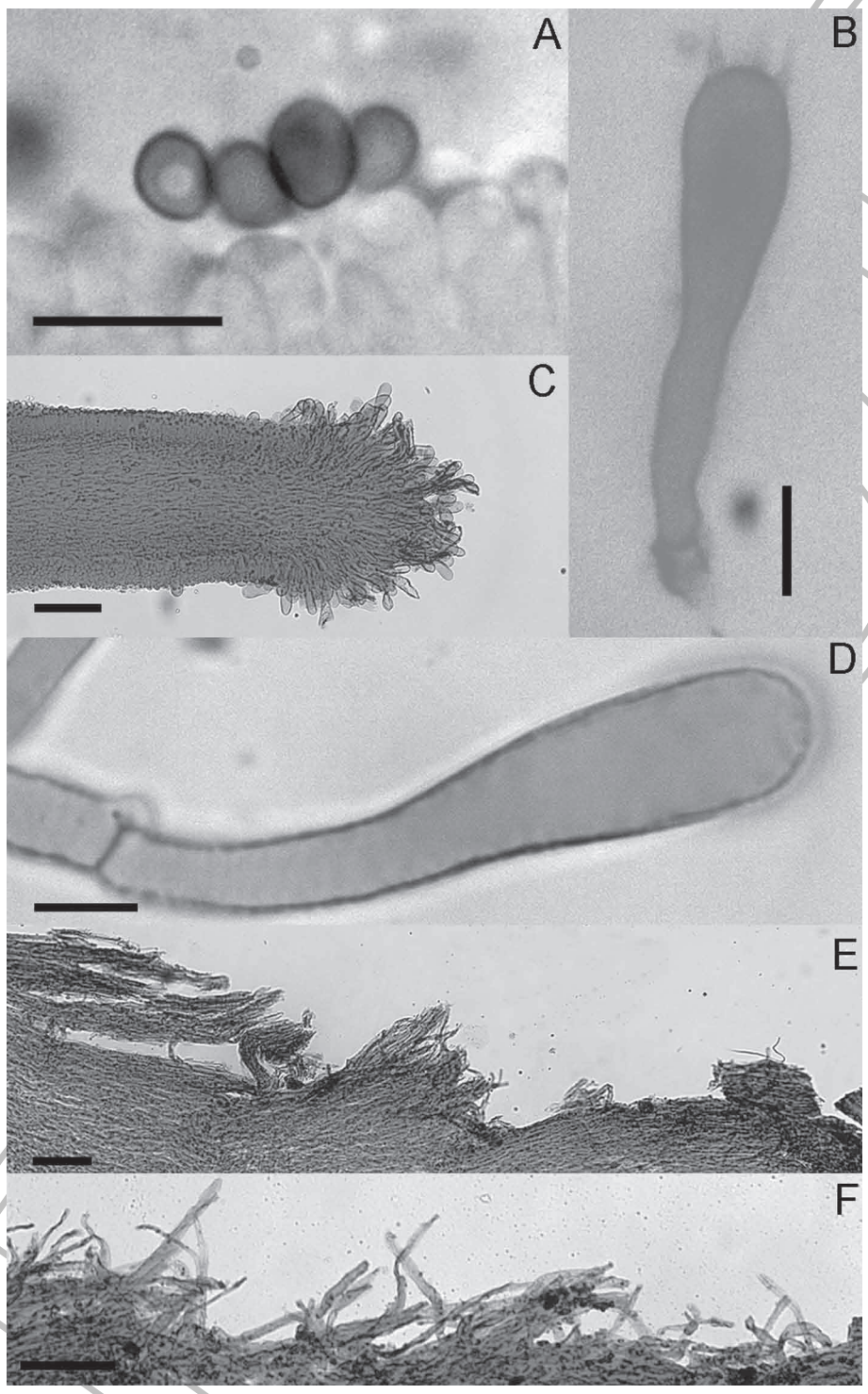

FIGURE 2. *Corneriella indica* (K(M)190587, holotype), a. Basidiospores. b. Basidium. c. Lamella edge showing projecting tramal hyphae with cystidioid terminal elements. d. Cystidioid terminal element of lamellar trama. e. Pileipellis. f. Stipitipellis. Scale bars: 10 µm. Photos: Taken by Ms K. P. Deepna Latha.

Basidiomata small to medium-sized, tricholomatoid. Pileus 16–56 mm diam., hemispherical or convex when young, becoming somewhat campanulate and finally plano-convex with a broad umbo; surface dark brown (7F4)/(OAC635) at the center and on the fibrils and grayish brown (7E3)/(OAC626) elsewhere when young, becoming brownish orange (6C3)/(OAC669) or brown (6F4)/(OAC636, OAC639) at the center and light brown (6D4)/(OAC660, OAC661) towards the margin with age; not hygrophanous, not pellucid-striate, initially slightly recurved-squammulose towards the margin and densely appressed-fibrillose elsewhere, becoming entirely appressed-fibrillose with age; margin slightly incurved and finely appendiculate when young, becoming somewhat straight and crenate with age. Lamellae adnate to subdecurrent, rather thick, occasionally furcate in both directions, crowded, initially orange gray (6B2)/(OAC676),

becoming brownish gray (6D2, 7C2)/(OAC627) or grayish brown (6E3)/(OAC723), with lamellulae of 3-6 lengths, up to 4 mm wide; edge entire when very young, becoming crisped with age, initially concolorous with the sides, becoming dark brown (6F6)/(OAC639) or brownish gray (7D2, 7E2)/(OAC626, OAC627). Stipe 32–67 × 5–11 mm, central, terete or slightly compressed, equal or slightly tapering towards the base, fibrous, solid; surface grayish brown (5D3, 5E3)/(OAC662) or brownish gray (7E2)/(OAC627), appressed-fibrillose all over, densely so when young, finely pruinose toward the apex; base whitish, with scanty basal mycelium. Context soft, up to 6 mm wide, off-white or orange gray (6B2)/(OAC676). Odor and taste not distinctive.

Basidiospores 4–7 × 3–5 (5.10±0.81 × 4.33±0.83) µm, Q = 1–1.5, Qm = 1.19, subglobose, thin-walled, hyaline, amyloid. Basidia 18–31 × 5–7 µm, clavate, thin-walled, hyaline or very pale yellow, 4-spored; sterigmata up to 3.5 µm long. Lamella edge sterile, composed of projecting tramal hyphae with cystidioid terminal elements; terminal elements 46–85 × 9.5–17 µm, narrowly clavate, slightly thick-walled, with a grayish brown plasmatic pigment and faint spiral encrustations. Cheilocystidia absent. Pleurocystidia absent. Lamellar trama subregular, broad, inamyloid, composed of a central part made of inflated (5–20 µm), short-celled, hyaline elements flanked on either side by a zone of narrow (2.5–6 µm) hyphae with a brownish wall pigment. Pileus trama interwoven; hyphae composed of inflated elements 41–90 × 5–20 µm, gelatinized, thin-walled, with a pale yellow wall pigment, inamyloid. Pileipellis a cutis disrupted by trichodermal patches; hyphae slightly gelatinized, thin-walled; terminal elements cystidioid, 70–122 × 8–13 µm, narrowly clavate, thin-walled, with a pale yellow wall pigment and yellowish brown plasmatic contents, with faint spiral encrustations. Stipitipellis a disrupted cutis; hyphae 7–9 µm wide, slightly gelatinized, pale yellow or pale yellowish gray, thin-walled. Caulocystidia absent. Clamp connections seen on all hyphae.

Habitat:—scattered or in small groups, on soil, among decaying litter on forest floor, from a moist deciduous forest, on the bank of Peechi Dam reservoir where the major tree species include *Terminalia* spp., *Tectona grandis* L.f. and *Wrightia tinctoria* R.Br. and the undergrowth consists mainly of *Chromolaena odorata* (L.) R.M. King & H. Rob., *Helicteres isora* L., and *Glycosmis pentaphylla* (Retz.) DC.

Geographical distribution range:—known only from Kerala (India).

Type:—INDIA. Kerala State: Thrissur District, Peechi Forest, 1 November 2011, *K. N. Anil Raj*, *AR920* (holotype K(M)190587!).

Additional specimens examined:—*Corneriella indica*: INDIA. Kerala State: Thrissur District, Peechi Forest, 16 June 2011, *K. N. Anil Raj, AR633* (K(M)190588!); *Corneriella bambusarum*: USA. Hawaii, Oahu, Manoa Valley: Manoa Falls Trail, 8 January 1992, *D.E. Desjardin 5462*! (NY: Isotope). Maui, Koolau State Forest Reserve, Na'ili'iliha'ele Trail, 28 August 1996, *D.E. Desjardin 6572*! (NY: Paratype).

Comments:—Phenetically, this agaric enters into the concept of *Corneriella* as circumscribed by Sánchez-García *et al.* (2014) owing to its tricholomatoid fruit bodies occurring on soil with smooth, thin-walled, amyloid basidiospores, a hymenium devoid of pleurocystidia, a cutis-type pileipellis disrupted by trichodermal patches and hyphae with clamp connections. However, conspicuous cheilocystidia, one of the defining features of the genus, are missing in the Indian species. Nonetheless, the lamella edges are still sterile and composed of projecting tramal hyphae with cystidioid terminal elements. This microscopic feature of *C. indica* is unique among the species of the genus.

Corneriella bambusarum, originally described from the Hawaiian Islands by Desjardin & Hemmes (2001) and the type species of the genus, has a pileus with somewhat similar size, shape and color, furcate lamellae, amyloid and almost similar-sized basidiospores (5.4–7 × 4.2–5.2 µm) and clamp connections. However, *C. bambusarum* has a granulose pileus, adnexed or sinuate lamellae of different color, ovate to broadly ellipsoid basidiospores, true and versiform cheilocystidia, non-gelatinized pileipellis hyphae devoid of encrustations and a different habitat. *Corneriella humicola* (Corner 1994) differs in having a fetid odor in mature basidiomata, subtomentose to scurfy-pruinose pilei, distinctly decurrent, narrower (1-2.5 mm) lamellae, and versiform cheilo- and caulocystidia.

In addition, the molecular phylogenetic analysis recovers this taxon as part of *Corneriella* (Fig. 3) as an independent lineage separated from other species of the genus and shows that *C. indica* is sister to *C. humicola* and *C. bambusarum*.

As *Corneriella* is a very recently described genus based on previously described species, there is the possibility that someone has recorded the present species under some other name from this region. However, as far as we know, there are no authentic previous records of either *Porpoloma* or *Cantharellula* from both India and adjacent Sri Lanka (Manjula 1983; Pegler 1986; Natarajan *et al.* 2005; Farook *et al.* 2013). Also, extensive searches in the literature on agarics of the region (e.g., Sathe & Daniel 1980; Sathe & Deshpande 1980; Sathe & Kulkarny 1980; Pegler 1986; Mohanan 2011) did not reveal a previously published species description matching that of *C. indica*. Corner (1994) had described only one species of *Cantharellula, C. humicola,* from Malaysia.

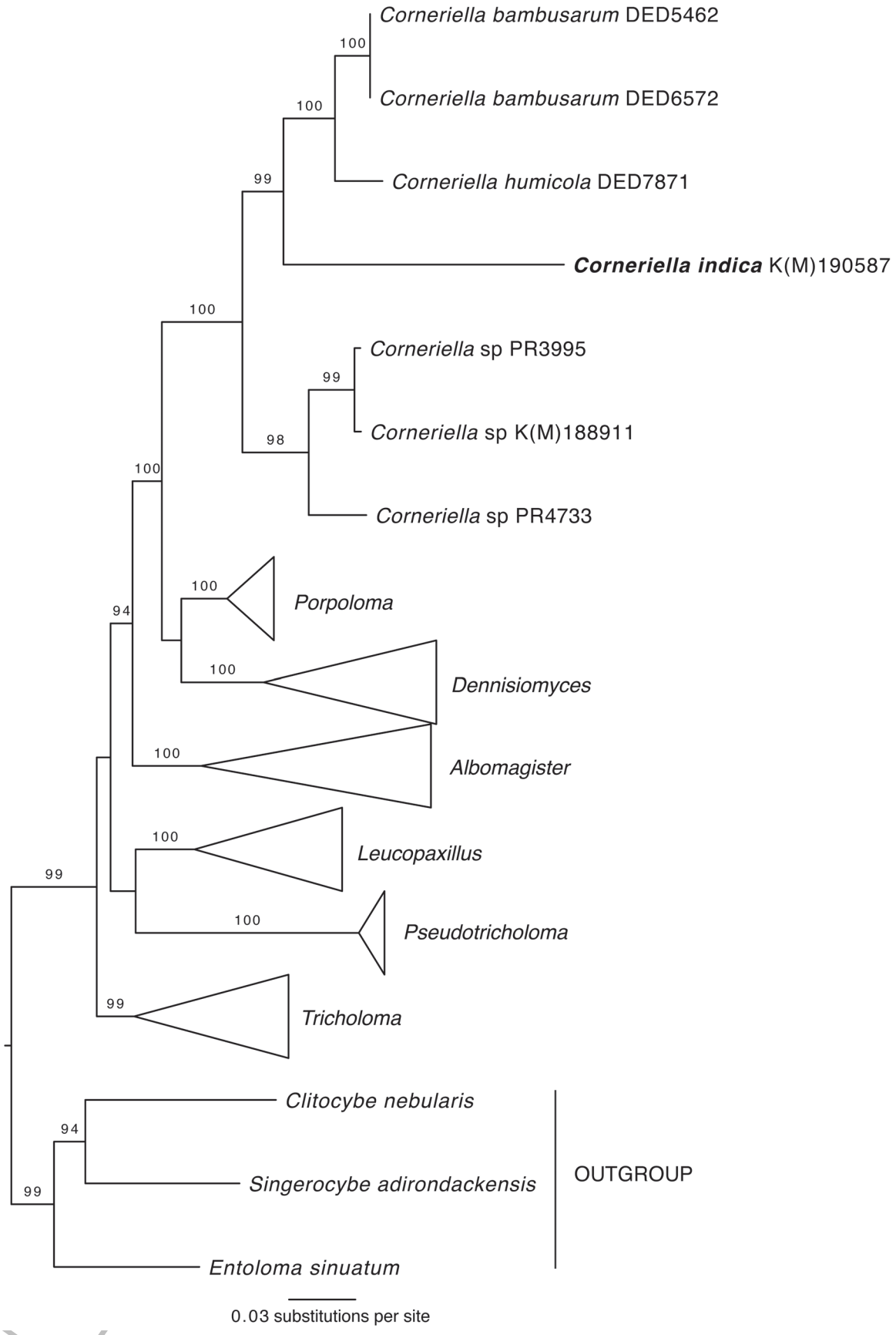

FIGURE 3. Maximum likelihood (ML) phylogram (based on a concatenated dataset comprising ITS, nLSU, nSSU, *rpb2*) of the Tricholomataceae showing the placement of *Corneriella indica*. Bootstrap values ≥ 70% are indicated. *Clitocybe nebularis*, *Entoloma sinuatum* and *Singerocybe adirondackensis* are used for outgroup purposes.

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