

## Further contributions to the documentation of lichenicolous fungi from India

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### ABSTRACT

Fifty two rarely collected or otherwise interesting species of lichenicolous fungi are presented, of which three species are described as new to science: *Didymocyrtis rhizoplacae* (on *Rhizoplaca chrysoleuca* from Uttarakhand), *Plectocarpon parmeliarum* (on *Parmelia meizophora* from Uttarakhand) and *Pyrenidium hypotrachynae* (on *Hypotrachyna coorgiana* from Kerala), while 49 species are additions to the known lichenicolous mycobiota of India.

**Keywords:** lichens, lichenicolous fungi, lichenicolous lichens, new records, taxonomy.

### INTRODUCTION

Lichenicolous fungi have received increasing attention within the last decades, and the number of known species has grown considerably. However, the distribution and diversity of these fungi in India are poorly known, and so far 115 species are known from this country (Joshi *et al.*, 2016 a, b, c, d; Joshi *et al.*, 2017 a, b; Singh *et al.*, 2017), excluding *Opegrapha tenuior* Stirt. (parasitic fungus on thelotrematoid lichens according to Stirton, 1879) which is not a lichenicolous fungus as it was growing on bark with conspicuous lenticles giving it a thelotrematoid appearance (Joseph *et al.*, 2018) and some lichenicolous lichens *viz.* *Arthrorhaphis alpina* (Schaer.) R. Sant., *Caloplaca insularis* Poelt, *Diploschistes muscorum* (Scop.) R. Sant., *Lecidella dimelaenophila* Hertel which colonizes *Baeomyces placophyllus* Ach., *Aspicilia* species, *Cladonia* species and *Dimelaena oreina* (Ach.) Norman, respectively. In continuation with our studies on lichenicolous mycota of India, we hereby are reporting 3 new species *viz.* *Didymocyrtis rhizoplacae* sp. nov. (on *Rhizoplaca chrysoleuca*, Uttarakhand), *Plectocarpon parmeliarum* sp. nov. (on *Parmelia meizophora*, Uttarakhand) and *Pyrenidium hypotrachynae* sp. nov. (on *Hypotrachyna coorgiana*, Kerala) along with 49 new records, thus raising the tally of lichenicolous fungi to 167.

### MATERIALS AND METHODS

The present study is based on results of an inspection made by one of the authors (YJ) of lichen collections lodged at herbaria of CSIR-National Botanical Research Institute (LWG) and Kerala Forest Research Institute (KFRI), as well as fresh collections from Banari Devi Forest (Almora district, Uttarakhand) and Munsiyari region (Pithoragarh district, Uttarakhand). Voucher specimens are deposited in the lichenological herbaria of CSIR-National Botanical Research Institute (LWG) and Kerala Forest Research Institute (KFRI). The specimens were identified using standard microscopical techniques. Macroscopical examination was carried out using a dissecting microscope (Olympus SZ2-ILST), and microscopical studies of sections were made using Olympus CX21iLED microscope. Sections were prepared by hand and examined in water, 10% KOH [K] and HNO<sub>3</sub> (N). Amyloid reactions were performed using Lugol's iodine directly [I] or

after a KOH pre-treatment [K/I]. Asci and ascospore measurements were made in water and are followed by the number of measurements (n).

### TAXONOMY

1. *Didymocyrtis rhizoplacae* Y. Joshi & K. Bisht sp. nov.

Fig. 1. a-d

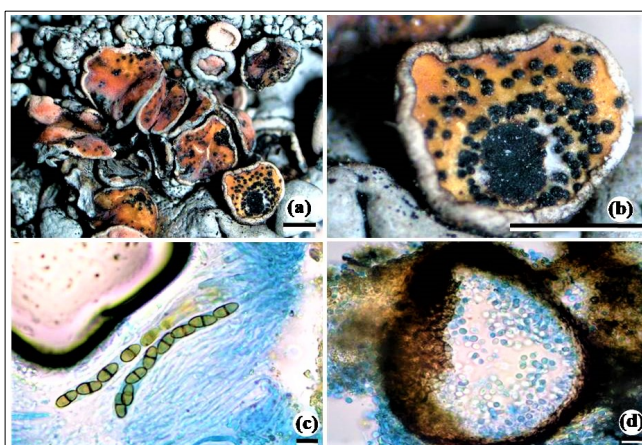
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**DIAGNOSIS:** The species is characterized by having small asci and ascospores, uni to rarely biguttulate conidia and differs from other known species in having different host preference, *i.e.* *Rhizoplaca chrysoleuca* (Sm.) Zopf.

**HOLOTYPE:** INDIA. Uttarakhand, Pithoragarh district, Munsiyari, en route to Burfu-Bilju, 30°22'345" N, 80°10'115" E, alt. 3295 m, on apothecial disc of *Rhizoplaca chrysoleuca*, 21 September 2017, K. Bisht, s.n. (Holotype-LWG 35496).

**ETYMOLOGY:** The epithet refers to the host lichen genus *Rhizoplaca* Zopf. on which the fungus is colonizing.

**DESCRIPTION:** Lichenicolous fungus growing on the apothecial disc of *Rhizoplaca chrysoleuca*, apparently



**Fig. 1. (a-d):** *Didymocyrtis rhizoplacae* (holotype): Perithecia of *D. rhizoplacae* on apothecial disc of *Rhizoplaca chrysoleuca* (Scale = 1 mm). b. Magnified view of the infected apothecial disc (Scale = 1 mm). c. Ascospores (Scale = 10 μm). D) Pycnidia in cross section with conidia (Scale = 5 μm).

parasitic. Ascumata in dense groups on the apothecia of the host, initially almost completely immersed in the apothecial hymenium, finally protruding, subspherical, 90-120 (-150)  $\mu\text{m}$  diam.; wall dark brown, often somewhat paler towards the base, laterally *ca.* 10-15  $\mu\text{m}$  diam., of about 3-4 layers of cells. Paraphysoids 1-1.5  $\mu\text{m}$  diam. Asci 75-80  $\times$  7-8(-10)  $\mu\text{m}$  (n=25), fissitunicate, narrowly cylindrical, with a small ocular chamber, ascus wall I- and K/I-, 8-spored. Ascospores  $\pm$  uniseriate, pale brown, 1-septate, 10-12  $\times$  4-5  $\mu\text{m}$  (n=25), constricted at the septum, with distinct verruculose sculpture visible in light microscopy.

Conidiomata several per apothecial disc, scattered, completely immersed at first, later protruding, dark brown, subspherical to pyriform to subglobose, 80-100(-110)  $\mu\text{m}$  in diam.; wall of conidiomata dark brown in upper part, pale brown towards the base, *ca.* 7-10  $\mu\text{m}$  in diam., composed of several layers of cells, outer cells dark brown, inner cells pale brown. Conidiogenous cells short-ampulliform. Conidia single to rarely biguttulate, guttule near the apex, ellipsoid, (4-)5  $\times$  3  $\mu\text{m}$  (n=25).

**HOST:** Growing on apothecial disc of epilithic *Rhizoplaca chrysoleuca*. Since slight discoloration on the apothecial disc of the lichen infected by the new species was noticed, this fungus may be regarded as a saprophyte.

**DISTRIBUTION:** The species is so far reported from subalpine regions of Uttarakhand where it is parasitizing the thallus of *R. chrysoleuca* along with *Arthonia clemens* (Tul.) Th. Fr., *Lichenocodium lecanorae* (Jaap) D. Hawksw. and *Sphaerellothecium contextum* Triebel. The specimens from Munsiyari region are representing the teleomorphic stage of this new species, while that from Gangotri region represents anamorphic stage.

**REMARKS:** The lichenicolous fungus *Didymocyrtis* Vain. at present comprises of 15 species across the world (Joshi *et al.*, 2016 b; Lawrey and Diederich, 2018) and is represented by 04 species in India [*D. consimilis* Vain., *D. epiphyscia* (Brackel) Hafellner, *D. ramalinae* (Roberge ex Desm.) Ertz, Diederich & Hafellner and *D. thamnollicola* Y. Joshi, R. Bajpai and Upreti].

In having somewhat similar size of ascus and ascospore, the new species resembles to some extent with *D. infestans* (Speg.) Hafellner and *D. xanthomendozae* (Diederich and Freebury) Diederich and Freebury. *D. infestans* differs in having a bigger perithecia (250-350  $\mu\text{m}$  vs 90-120(-150)  $\mu\text{m}$  diam.), different host (*Teloschistes* Norman) and always lack anamorphic stage. Likewise *D. infestans*, *D. xanthomendozae* has a bigger perithecia (180-250  $\mu\text{m}$  vs 90-120(-150)  $\mu\text{m}$  diam) but it used to colonize lichen genus *Xanthomendoza* S.Y. Kondr. and Kärnefelt and always have the anamorphic stage having conidia much bigger than that of new species [(4.5-)5.6-7.1(-8.6)  $\times$  (2.9-)3.3-4.3(-4.6)  $\mu\text{m}$  vs (4-)5  $\times$  3  $\mu\text{m}$ ]. *D. slaptioniensis* (D. Hawksw.) Hafellner and Ertz colonizing lichen genus *Xanthoria* (Fr.) Th. Fr. differs from the new species not only in having different host (*loc. cit.*) but also in having bigger asci and ascospores [(80-)90-110  $\times$  7-10  $\mu\text{m}$  and (11-)13-15  $\times$  (5.5-)6-7  $\mu\text{m}$ , respectively] (Table 1).

**SPECIMENS EXAMINED:** Teleomorphic stage: Uttarakhand, Pithoragarh district, Munsiyari, en route to

**Table 1.** Comparative analysis of some closely related *Didymocyrtis* species (Ertz *et al.* 2015)

Characters	<i>D. infestans</i> in the hymenium and/or thallus	<i>D. rhizoplacae</i> on apothecial disc	<i>D. slaptioniensis</i> in the hymenium, apothecial margin and the thallus	<i>D. xanthomendozae</i> in the host apothecia, more rarely in the thallus
Size of perithecia ( $\mu\text{m}$ )	250-350	90-120(-150)	(150-)200-300	180-250
Asci ( $\mu\text{m}$ )	70-95 $\times$ 7-9(10)	75-80 $\times$ 7-8(-10)	(80-)90-110 $\times$ 7-10	75-110 $\times$ 8-9.5
Size of ascospores ( $\mu\text{m}$ )	10-13(-14) $\times$ 4.5-6	10-12 $\times$ 4-5	(11-)13-15 $\times$ (5.5-)6-7	(10.5-)11-13(-14) $\times$ (5.5-)6-7(-7.5)
Pycnidia	Absent	Present	Present	Present
Size of pycnidia ( $\mu\text{m}$ )	-	80-100(-110)	80-120(-150)	140-160
Number of guttules	-	1(-2) guttules	2 guttules	(1-)2 guttules
Size of conidia ( $\mu\text{m}$ )	-	(4-)5 $\times$ 3	(5-)6-8(-9) $\times$ 2.5-3.5	(4.5-)5.6-7.1(-8.6) $\times$ (2.9-)3.3-4.3(-4.6)
Host	<i>Teloschistes chrysothalamus</i> (L.) Norman ex Tuck. and <i>T. flavicans</i> (Sw.) Norman	<i>Rhizoplaca chrysoleuca</i> (Sm.) Zopf	<i>Xanthoria parietina</i> (L.) Th. Fr.	<i>Xanthomendoza hasseana</i> (Räsänen) Sochting, Kärnefelt & S.Y. Kondr. and <i>X. montana</i> (L. Lindblom) Sochting, Kärnefelt & S.Y. Kondr.
Known distribution	Africa (Canary Islands) and South America (Argentina)	Asia (India)	Europe (Austria, Belgium, England, France, Germany, Italy, Liechtenstein, Luxembourg, Portugal, Switzerland)	Canada (Quebec and Saskatchewan)

Bilju-Milam, 30°22'087" N, 80°10'807" E, alt. 3288 m, on thallus of *Rhizoplaca chrysoleuca*, 21 September 2017, K. Bisht, s.n. (LWG 35497). Anamorphic stage: Uttarkashi district, Gangotri, in route to Gomukh, 3 Km before Bhojwasa, 30°57'06.6" N, 79°02'58.9" E, alt. 3818 m, on apothecial disc of *Rhizoplaca chrysoleuca* growing on rocks, 05 May 2017, R. Bajpai, 17-026995 (LWG).

## 2. *Plectocarpon parmeliarum* Y. Joshi sp. nov. Fig. 2. a-d

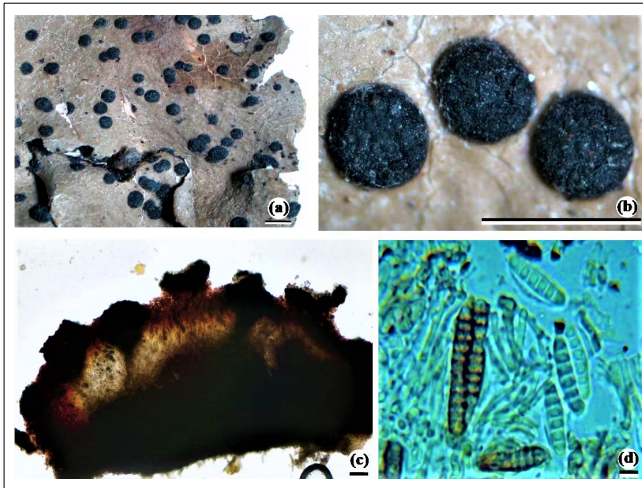
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**DIAGNOSIS:** Similar to *Plectocarpon cladoniae* R. Sant. in having  $\pm$ 5-septate ascospores, but differs from it in several characters, such as, lack of dark brown sterile stromatic tissue which is K+ bluish-black and N-, presence of pigment 5, bigger ascospores and a different host (*Parmelia meiophora* Nyl.).

**HOLOTYPE:** INDIA. Uttarakhand, Uttarkashi district, Govind Wild Life Sanctuary (GWLS), in route to Har ki Dun from Osla, near Khad, 31°08'22.17" N, 78°24'30.56" E, alt. 3222 m, on thallus of *Parmelia meiophora*, 16 June 2012, D.K. Upreti and R. Bajpai, 12-016144 (Holotype-LWG 35499).

**ETYMOLOGY:** The epithet refers to the host lichen genus *Parmelia* Ach.

**DESCRIPTION:** Lichenicolous fungus growing on the thallus of *Parmelia meiophora*, apparently commensalistic. Ascumata stromatic, single or grouped, rounded in surface view, immarginate, convex to rarely flattened, (0.2-)0.6-1(-1.1) mm diam.; surface black, matt to slightly glossy, rough to warted; not visibly damaging the host thallus. Stroma multilocular, sterile stromatic tissue not carbonized, pale to medium orange-brown (without green pigment), K+ bluish-black, N-, with pigment 5 (Meyer and Printzen, 2000), basal part 100-200  $\mu\text{m}$ , composed of brown hyphae. Hymenium hyaline, 70-90  $\mu\text{m}$  high, loculi 110-140  $\mu\text{m}$  wide; hymenial gel I+ red. Epithymenium pale brown, I+ red. Paraphyses abundant, branched and sometimes anastomosed, septate, 2-3  $\mu\text{m}$  thick, apically not distinctly swollen. Asci clavate, 4-spored, (50-)75-85(-90)  $\times$  (12-)12.5-17.5(-18)  $\mu\text{m}$  (n=25), of *Opegrapha*-type, wall K/I-, except for an apical K/I+ blue



**Fig. 2. (a-d):** *Plectocarpon parmeliarum* (holotype): **a.** Stromata of *P. parmeliarum* on thallus of *Parmelia meiophora* (Scale = 1 mm). **b.** Magnified view of a gall (Scale = 1 mm). **c.** Ascumata in cross section in Iodine (Scale = 100 µm). **d.** Brown and hyaline ascospores in water (Scale = 10 µm).

ring. Ascospores hyaline, oblong-fusiform, 5-septate, constricted at the septa, all the six cells are more or less equal in length,  $(25-)\text{27.5-30(-31)} \times (7-)\text{7.5-10(-12.5)} \mu\text{m}$  ( $n = 25$ ); perispore thin, at first hyaline, with a granular-rugose dark brown pigmentation at maturity. Conidiomata not observed.

**HOST:** Growing on thalli of epiphytic *Parmelia meiophora*. Since thallus of lichen infected by the new species is scarcely affected and no deformation or discoloration was noticed, this fungus can be regarded as a commensalist.

**DISTRIBUTION:** So far, the species is reported only from type locality.

**REMARKS:** The lichenicolous genus *Plectocarpon* Fée till now is represented by 38 species across the world (Lawrey and Diederich, 2018), of which only three species are known to have more than 3-septate ascospores, viz. *P. cladoniae* R. Sant., *P. pseudocyphellariae* Diederich and *P. usneae* Diederich and Etayo (Ertz *et al.*, 2005). *Plectocarpon pseudocyphellariae* and *P. usneae* can easily be discerned from the new species by the presence of 6-septate ascospores and different hosts viz. *Pseudocyphellaria* Vain. and *Usnea* Dill. ex Adans., respectively (Table 1). *Plectocarpon cladoniae* the other known species of the genus with 5-septate ascospores differs from the new species in several characters, such as, presence of dark brown sterile stromatic tissue which is K<sup>+</sup> olivaceous and N<sup>+</sup> red-brown, Atra-brown pigment, smaller ascospores [ $20-27 \times 7-8 \mu\text{m}$  vs  $(25-)\text{27.5-30(-31)} \times (7-)\text{7.5-10(-12.5)} \mu\text{m}$ ] and a different host viz. *Cladonia* P. Browne (Table 2).

Generally the species of *Plectocarpon* used to colonize lichens of different genera of *Peltigerales*, but rarely members of *Parmeliaceae* (*Lecanorales*), and this is for the first time it is being reported on *Parmelia*. *Perigrapta* Hafellner, is a genus next to *Plectocarpon* and one of its common species viz. *Perigrapta superveniens* (Nyl.) Haellner, having similar ascumatal features (i.e. ascumatal surface riddled with numerous punctiform holes) and same

**Table 2.** Comparative analysis of some closely related *Plectocarpon* species (Ertz *et al.* 2005)

Characters	<i>P. cladoniae</i>	<i>P. pseudocyphellariae</i>	<i>P. parmeliarum</i>	<i>P. usneae</i>
Sterile stromatic tissue	well developed, dark brown	poorly developed, brown	poorly developed, pale to medium orange brown	poorly developed, reddish brown
K and N reactions of sterile stromatic tissue	K <sup>+</sup> olivaceous, N <sup>+</sup> reddish brown	K <sup>+</sup> olivaceous brown, N <sup>+</sup> dark brown later turning reddish brown	K <sup>+</sup> bluish-black, N <sup>-</sup>	K <sup>-</sup> , N <sup>-</sup>
Atra brown pigment	Present	Present	Absent	Absent
Labyrinthiform ornamentation	Present	±Present	Absent	Absent
Width of locules (µm)	70-140	50-100	110-140	85-105
Asci (µm)	50-70 × 15-20	30-40 × 10-12	(50-)\text{75-85(-90)} × 12.5-17.5	45-55 × 11-14
Number of spores per ascus	4	4	4	4-8
Size of ascospores (µm)	20-27 × 7-8	21-31 × 4-4.5	(25-)\text{27.5-30(-31)} × (7-)\text{7.5-10(-12.5)}	26-30 × 4-5
Number of septa in ascospores	(4-)\text{5}	6	5	(5-)\text{6(-7)}
Perispore	at first hyaline, then with a granulose dark brown pigmentation at maturity	always hyaline, brown pigmentation absent	at first hyaline, then with a granulose dark brown pigmentation at maturity	always hyaline, brown pigmentation absent
Pycnidia	Present	Absent	Absent	Absent
Host	<i>Cladonia</i>	<i>Pseudocyphellaria</i>	<i>Parmelia</i>	<i>Usnea</i>
Known distribution	Europe, North America	Papua New Guinea	India	Rwanda

generic host viz. *Parmelia* need not to be confused with the new species, as the ascospores in *P. superveniens* are not only bigger and narrower than that of new species [ $30-35 \times 4.5-6 \mu\text{m}$  vs  $(25-)\text{27.5-30(-31)} \times (7-)\text{7.5-10(-12.5)} \mu\text{m}$ ] but also have a hyaline perispore with a long caudate appendage at one end. The mature spores of the new species have a dark brown granulose perispore and always lacks the caudate appendage. Besides this, Atra-brown pigment is always present in the carbonized layer of *P. superveniens* which is absent in the new species.

**3. *Pyrenidium hypotrachynae* Y. Joshi sp. nov.** Fig. 3. a-d MycoBank MB 820854

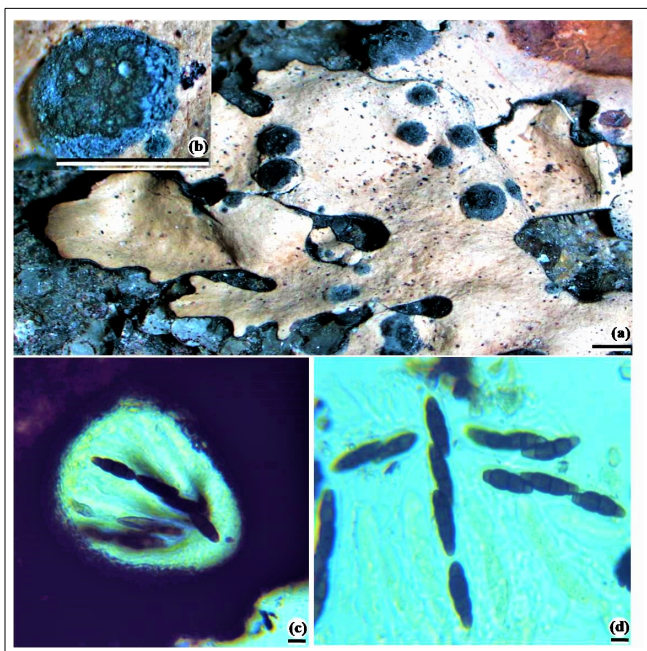
**DIAGNOSIS:** Similar to *Pyrenidium sporopodiorum* Matzer but differs from it in having smaller ascumata [ $(62.5-)\text{70-80(-90)} \times (85-)\text{92-100(-110)} \mu\text{m}$  vs  $110-150 \times 100-120 \mu\text{m}$ ], larger ascospores [ $(22.5-)\text{25-27.5(-28)} \times (5-)\text{7.5-10(-11)} \mu\text{m}$  vs  $(12-)\text{13-15.5-18} \times 5-5.6-6 \mu\text{m}$ ] which are always transversally 3-septate, different host [*Hypotrachyna coorgiana* Patw. and Prabhu. vs *Sporopodiorum* (Zahlbr.) Elix, Lumbsch and Lücking] and different ecology (saxicolous vs foliicolous).

**HOLOTYPE:** INDIA. Kerala, Palakkad district, Silent Valley National Park, Walakkad, on thallus of *Hypotrachyna coorgiana*, s.d., Stephen Sequeira, 23400 (Holotype-LWG 35500).

**ETYMOLOGY:** The epithet refers to the host lichen genus *Hypotrachyna* (Vain.) Hale.

**DESCRIPTION:** Lichenicolous fungus growing on the thallus of *Hypotrachyna coorgiana*, apparently commensalistic. Ascumata perithecioid, semi-immersed or subsessile, aggregated to confluent, only the upper dark brown to black part of the ascumata visible; ovoid to obpyriform in longitudinal section,  $(62.5-)\text{70-80(-90)} \mu\text{m}$  tall,  $(85-)\text{92-100(-110)} \mu\text{m}$  wide; ostiolar channel  $15 \mu\text{m}$  long. Peridium brown to dark brown,  $7.5-10 \mu\text{m}$  wide, composed of 2-5 layers of isodiametric to tangentially elongated cells. Interascal filaments numerous, persistent, 2-3 µm wide, septate, branched and anastomosing, present





**Fig. 3. (a-d):** *Pyrenidium hypotrachynae* (holotype): **a.** Thallus of *Hypotrachyna coorgiana* infected by *P. hypotrachynae* (Scale = 1 mm). **b.** Magnified view of perithecia in clumps (Scale = 1 mm). **c.** Perithecia in cross section in water (Scale = 100 μm). **d.** Ascospores in ascus (60x) (Scale = 10 μm).

between the asci, upper cells of the ostiolar filaments often contain a blue-green pigment. Asci fissitunicate, cylindrical, stipitate, 4-spored, (50-)55-65(-70) × (8.5-)8.7-10(-11) μm (n = 50); with a distinct internal apical beak at the apex. Ascospores initially hyaline, brown at maturity with the end cells often pale brown to subhyaline, ellipsoid, with rounded ends, 3-septate, constricted at the septa, smooth, with oil droplets, without a gelatinous sheath, overlappingly uniseriate in the asci, (22.5-)25-27.5(-28) × (5-)7.5-10(-11) μm (n = 50). Conidiomata not observed.

**HOSTS:** Growing on thalli of epilithic *Hypotrachyna coorgiana*. Since thallus of lichen infected by *Pyrenidium hypotrachynae* is scarcely affected and no deformation or discoloration was noticed, this fungus may be regarded as a commensalist.

**DISTRIBUTION:** So far, the species is reported only from type locality.

**REMARKS:** The lichenicolous genus *Pyrenidium* Nyl. till date is represented by 10 species across the world (Lawrey and Diederich, 2018), of which only 2 species are known to have 4-spored asci, viz. *P. actinellum* Nyl. and *P. sporopodiorum* Matzer. Among them *P. actinellum* is the most common and widely distributed species colonizing various hosts (*Aspicilia calcarea* (L.) Körb., *Baeomyces rufus* (Huds.) Rebert., *Caloplaca teicholyta* (Ach.) J. Steiner, *Diploschistes caesioplumbeus* (Nyl.) Vain., *Fulgensia fulgida* (Nyl.) Szatala, *Lecanora jamesii* J.R. Laundon, *Leptogium teretiusculum* (Flörke) Arnold, *Massalongia carnosa* (Dicks.) Körb., *Peltigera* species, *Phaeophyscia* species, *Physcia* cf. *hispidula* (Ach.) Frey, *Pseudocyphellaria* species, *Solorina crocea* (L.) Ach., *S. saccata* (L.) Ach.,

*Teloschistes* species, *Toninia squalida* (Ach.) A. Massal., and *Trapeliopsis* species) (Hawksworth, 1980, 1983; Matzer and Hafellner, 1990; Triebel *et al.*, 1991; Galloway, 2007) and differs from the new species in having thicker peridium (30-40 μm) and bigger asci (60-90 × 12-18 μm) which occasionally may be 8-spored and have larger (2-)3(-4)-septate ascospores [20-25(-30) × 7-10 μm] (Navarro-Rosinés and Cl. Roux, 2007). *P. sporopodiorum* differs from the new species in having a different host preference viz. *Sporopodium citrinum* (Zahlbr.) Elix, Lumbsch & Lücking, larger ascomata (110-150 × 100-120 μm) and smaller ascospores [(12-)13-15.5(-18) × 5-6 μm] which sometimes are 2-septate and the septum can be oblique (Matzer, 1996).

#### New records

The following forty nine species are new to Indian lichenicolous mycobiota:

**1. *Abrothallus microspermus*** Tul., *Annales des Sciences Naturelles Botanique* **17**: 115 (1852)

**MATERIALS EXAMINED:** Sexual stage: INDIA. Uttarakhand, Pithoragarh district, Burfu, on way to Milam, 30°21'46.93" N, 80°10'54.16" E, alt. 3290 m, on *Flavoparmelia caperata* colonizing *Juniperus indica*, 24 September 2016, Kapil Bisht, s.n. (LWG 35501). Asexual stage as *Vouauxiomyces truncatus* (B. de Lesd.) Dyko and D. Hawksw.: Arunachal Pradesh, Tawang district, around monastery, 27°35'6.5" N, 91°51'27.7" E, alt. 2966 m, on *Flavoparmelia caperata* colonizing bark, 16 June 2015, R. Bajpai, 15-026571 (LWG 33042). Himachal Pradesh, Chamba district, in and around Khajiyar, alt. 2000 m, on *Flavoparmelia caperata* colonizing *Cedrus*, 15 May 2001, D.K. Upreti and S. Nayaka, 01-75450 (LWG). Uttarakhand, Chamoli district, Gwaldam, Bhaguna, on *Flavoparmelia caperata* colonizing bark, 04 May 2015, S. Rawat, s.n. (LWG); Pithoragarh district, Burfu, on way to Milam, 30°21'46.93" N, 80°10'54.16" E, alt. 3290 m, on *Flavoparmelia caperata* colonizing *Juniperus indica*, 24 September 2016, Kapil Bisht, s.n. (LWG 35502).

**2. *Abrothallus welwitschii*** Mont., *Annales des Sciences Naturelles Botanique* **16**: 70 (1851)

**MATERIALS EXAMINED:** INDIA. Tamil Nadu, Sholas, at 8-9 miles Ootacamund-Mysore Road, alt. 2133 m, on thallus of *Sticta fuliginosa* colonizing tree trunk, 30 December 1959, D.D. Awasthi, 4461 (LWG-AWAS). West Bengal, Darjeeling district, Tiger hill, 2286-2590 m, on thallus of *Sticta* cf. *platyphylloides* colonizing bark, 17 April 1960, M.N. Bose, 62.23 (LWG-AWAS).

**3. *Bacidia killiasii*** (Hepp) D. Hawksw., *The Lichenologist* **15** (1): 22 (1983)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Chamoli district, Lata area, alt. 3200 m, on *Peltigera rufescens* colonizing soil, 08 October 2006, S. Rawat, 06-006887/B (LWG).

**4. *Buelliella inops*** (Triebel and Rambold) Hafellner, *Mycotaxon* **84**: 298 (2002)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Bageshwar district, Pindari glacier, Zero point, 30°15'34.5"

N, 79°59'55.7" E, alt. 3881 m, on *Caloplaca flavorubescens* colonizing bark, 07 October 2015, R. Bajpai and M. Tripathi, s.n. (LWG).

**5. *Buellia physciicola*** Poelt and Hafellner, *Beihefte zur Nova Hedwigia* **62**: 155 (1979)

**MATERIAL EXAMINED:** INDIA. Himachal Pradesh, Kangra district, Palampur, alt. 1200 m, on *Phaeophyscia endococcina* colonizing bark, 22 April 2010, R. Khare and S. Mohabe, 10-25359 (LWG 31150).

**6. *Carbonea supersparsa*** (Nyl.) Hertel, *Mitteilungen aus der Botanischen Staatssammlung München* **19**: 442 (1983)

**MATERIAL EXAMINED:** INDIA. Rajasthan, Sirohi district, Mt. Abu, Achalgarh, 24°36'57.21" N, 72°45'59.06" E, alt. 1383 m, on *Lecanora* colonizing rocks, 22 May 2013, Sandeep Yadav, 13-026410 (LWG 32701).

**7. *Cercidospora epicarphinea*** (Nyl.) Grube and Hafellner, *Nova Hedwigia* **51** (3-4): 337 (1990)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Bageshwar district, Phurkia to Pindari glacier, alt. 3500 m, on *Caloplaca* colonizing stones, 23 May 1950, D.D. Awasthi and A.M. Awasthi, 780 (LWG-AWAS 12493).

**8. *Clypeococcum grossum*** (Körb.) D. Hawksw., *Notes from the Royal Botanical Garden Edinburgh* **40**: 379 (1982)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Pithoragarh district, Dharchula block, Byans valley, Kuti village, 30°18.192' N, 80°45.922' E, alt. 3872 m, on *Umbilicaria vellea* colonizing rocks, 01 October 2015, Kapil Bisht, s.n. (LWG 35503).

**9. *Dactylospora protothallina*** (Anzi) Hafellner, *Beihefte zur Nova Hedwigia* **62**: 124 (1979)

**MATERIAL EXAMINED:** INDIA. Kerala, Palakkad district, Silent Valley National Park, Anginda, alt. 2200 m, on *Parmeliella tryptophylla*, s.d., Stephen Sequeira, s.n. (KFRI).

**10. *Dactylospora rimulicola*** (Müll. Arg.) Hafellner, *Beihefte zur Nova Hedwigia* **62**: 126 (1979)

**MATERIAL EXAMINED:** INDIA. Madhya Pradesh, Katni district, Khitauli, on *Lecanora flavidofusca* colonizing bark of *Mangifera indica*, 20 February 2009, G.K. Mishra and S. Mohabe, 09-009927/A (LWG 10612).

**11. *Didymocyrtis consimilis*** Vain., *Acta Societatis pro Fauna et Flora Fennica* **49** (2): 221, 262, 263 (1921)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Uttarkashi district, Gangotri, in route to Gomukh, Chirwasa, near river side, 30°58'40.2" N, 79°01'33.7" E, alt. 3555 m, on *Melanohalea exasperatula* colonizing *Betula* species, 04 May 2017, R. Bajpai, 17-031246 (LWG).

**12. *Didymocyrtis epiphyscia*** Ertz and Diederich, *Fungal Diversity* **74**: 71 (2015)

**MATERIAL EXAMINED:** INDIA. Jammu and Kashmir, Jammu district, University Campus, on way to Department of Environmental Science from guest house, behind gas plant, alt. 305 m, on *Physcia crispa* colonizing *Entrolobium* species, 27 December 2004, M.A. Sheikh and A.K. Raina, 04-004797

(LWG 20258).

**13. *Didymocyrtis ramalinae*** (Roberge ex Desm.) Ertz, Diederich & Hafellner, *Fungal Diversity* **74**: 77 (2015)

**MATERIAL EXAMINED:** INDIA. Kerala, Palakkad district, Silent Valley National Park, Anginda, alt. 2200 m, on thallus of *Ramalina inflata* colonizing twigs, s.d., Stephen Sequeira, 23640 (KFRI).

**14. *Diplolaeviopsis ranula*** Giralt and D. Hawksw., *Mycological Research* **95**: 759 (1991)

**MATERIALS EXAMINED:** INDIA. Himachal Pradesh, Spiti district, Patsio, alt. 3800 m, on *Lecanora garovaglii* colonizing rocks, 04 August 2003, D.K. Upreti and S. Chatterjee, 03-001740 (LWG 15033). Jammu and Kashmir, Anantnag district, Pahalgam, south side, alt. 2000 m, on *Lecanora indica* colonizing rocks, 31 July 2005, M.A. Sheikh, 05-029657 (LWG).

**15. *Endococcus apiciicola*** (J. Steiner) R. Sant., *Thunbergia* **22**: 23 (1994)

**MATERIALS EXAMINED:** INDIA. Kerala, Idukki district, Lockart gap, Munnar, alt. 1600 m, on *Usnea*, 15 January 1998, Stephen Sequeira and Viswam, 008966 (KFRI); Palghat district, Sispara, Silent Valley National Park, alt. 1850 m, on *Usnea dendritica*, 18 April 1998, Stephen Sequeira, 20071 (KFRI).

**16. *Endococcus oreinae*** Hafellner, *Mycotaxon* **84**: 302 (2002)

**MATERIAL EXAMINED:** INDIA. Himachal Pradesh, Kullu district, Kothi, alt. 2500 m, on *Dimelaena oreina* colonizing exposed rocks, 02 August 2002, D.K. Upreti and P.K. Divakar, 02-000007/B (LWG 12347).

**17. *Heterocephalacria physciacearum*** (Diederich) Millanes and Wedin, *Studies in Mycology* **81**: 120 (2015)

**MATERIALS EXAMINED:** INDIA. Jammu and Kashmir, Sonmarg, alt. 1800-2100 m, on *Physcia grisea*, 30 September 1968, D.D. Awasthi and M.Sc. students, 05225 (LWG-LWU). Kerala, Palakkad district, Silent Valley National Park, Poochipara, on *Heterodermia dissecta* var. *koyana*, s.d., Stephen Sequeira, 23250 (KFRI). Uttarakhand, Uttarkashi district, Gangotri, in route to Gomukh, Chirwasa, 30°58'41.06" N, 79°01'35.16" E, alt. 3562 m, on *Physcia gomukhensis* colonizing rocks, 04 May 2017, R. Bajpai, 17-026962 (LWG). 05 May 2017, R. Bajpai, 17-026979 (LWG). 30°57'06.6" N, 79°02'58.9" E, alt. 3818 m, on *Physcia stellaris* var. *intestiniformis* colonizing *Betula* species, 06 May 2017, R. Bajpai, 17-026966 (LWG).

**18. *Karschia talcophila*** (Ach.) Körb., *Parerga lichenologica. Ergänzungen zum Systema lichenum Germaniae*: 460 (1865)

**MATERIALS EXAMINED:** INDIA. Tamil Nadu, Palni hills, Kodai kanal, Pillar rocks area, alt. 2200 m, on *Diploschistes* colonizing rocks, 11 December 1970, K.P. Singh, 70.760 (LWG 16415).

**19. *Lasiosphaeriopsis salisburyi*** D. Hawksw. and Sivan., *Transactions of the British Mycological Society* **74** (2): 373 (1980)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Chamoli district, Govind ghat, alt. 1828 m, on *Peltigera* colonizing soil, 18 October 1964, A. Singh, 86977 (LWG).

**20. *Lawalreea lecanorae*** Diederich, *Mycotaxon* **37**: 308 (1990)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Pithoragarh district, Chandak, in forest near Leprosy hospital, on *Lecanora* colonizing bark, 18 November 1989, D.K. Upreti, 201901 (LWG 9419).

**21. *Lichenocodium erodens*** M.S. Christ. and D. Hawksw., *Persoonia* **9**(2): 174 (1977)

**MATERIAL EXAMINED:** INDIA. Kerala, Idukki district, Anaimundi slope, alt. 2300 m, on *Ramalina inflata*, 15 January 1999, Stephen Sequeira, 22115 (KFRI).

**22. *Lichenothelia rugosa*** (G. Thor) Ertz and Diederich, *Fungal Diversity* **66**: 135 (2014)

**MATERIAL EXAMINED:** INDIA. Kerala, Palakkad district, Thondakulam, on *Diploschistes actinostomus* colonizing rocks, s.d., Stephen Sequeira, 23825 (KFRI).

**23. *Lichenopeltella ramalinae*** Etayo and Diederich, *Bibliotheca Lichenologica* **64**: 101 (1997)

**MATERIAL EXAMINED:** INDIA. Kerala, Palakkad district, Parambikulam Tiger Reserve, Top Slip, alt. 243 m, on *Ramalina*, 02 March 2005, Mohandas, s.n. (KFRI).

**24. *Lichenostigma elongatum*** Nav.-Ros. and Hafellner, *Mycotaxon* **57**: 213 (1996)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Uttarkashi district, in route to Gomukh, near glacier snout, 30°55'43.42" N, 79°04'40.77" E, alt. 4036 m, on *Aspicilia calcarea* growing colonizing rocks, 06 May 2017, R. Bajpai, 17-026967 (LWG).

**25. *Monodictys cellulosa*** S. Hughes, *Canadian Journal of Botany* **36**(6): 786 (1958)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Pauri Garhwal, Khirsu, on *Lecanora leprosa*, 14 October 2004, S. Nayaka and V. Shukla, 04-004760 (LWG 15672).

**26. *Pezizella epithallina*** (W. Phillips and Plowr.) Sacc., *Sylloge Fungorum* **8**: 282 (1889)

**MATERIAL EXAMINED:** INDIA. Arunachal Pradesh, West Kameng district, Bomdila, 27°15'57.5" N, 92°25'18.9" E, alt. 2491 m, on *Peltigera canina* colonizing soil, 17 June 2015, R. Bajpai, 15-026694 (LWG 33215).

**27. *Phaeopyxis punctum*** (A. Massal.) Rambold, Triebel and Coppins, *Notes from the Royal Botanical Garden Edinburgh* **46**: 384 (1990)

**MATERIALS EXAMINED:** INDIA. Himachal Pradesh, Kinnaur district, Chitkul forest area, 4000 m, on *Cladonia pyxidata* colonizing soil, 04 November 2003, D.K. Upreti, R. Srivastava and Prakash, 03-002711C (LWG 006672). Kullu district, Great Himalayan National Park, Dhela, alt. 3000 m, on *Cladonia cartilaginea* colonizing bark of *Quercus semecarpifolia*, 08 September 1999, D.K. Upreti, 99-54041 (LWG 006373). Uttarakhand, Uttarkashi district, Gangotri,

way to Gomukh, on *Cladonia pyxidata* colonizing soil, 04 May 2017, R. Bajpai, 17-026948 (LWG).

**28. *Plectocarpon lichenum*** (Sommerf.) D. Hawksw., *The Lichenologist* **16**(1): 86 (1984)

**MATERIALS EXAMINED:** INDIA. Himachal Pradesh, Shimla district, Rohodu, Larote, in route to Chanshal pass, 4 miles stone, 31°13'43.7" N, 77°57'8.3" E, alt. 2725 m, on *Lobaria kurokawae* colonizing twigs, 26 August 2016, R. Bajpai, 16-030314 (LWG); 8 miles stone, 31°13'47.9" N, 77°57'30.7" E, alt. 2961 m, on *Lobaria pindarensis* colonizing bark, 26 August 2016, R. Bajpai, 16-030330 (LWG).

**29. *Polycoccum tinantii*** Diederich, *Mycotaxon* **37**: 316 (1990)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Nainital district, Ratan College, alt. 2100 m, on *Caloplaca flavorubescens* colonizing *Quercus semecarpifolia*, 24 December 2009, H. Kholia, 09-014802 (LWG 11526). on the way to Naina peak, alt. 2500 m, on *Caloplaca flavorubescens* colonizing *Quercus semecarpifolia*, 26 December 2009, H. Kholia, 09-014414 (LWG 11003). Pauri district, Khirsu, on *Caloplaca flavorubescens* colonizing *Quercus* bark, 18 June 2005, V. Shukla and Y. Joshi, 05-005454 (LWG 008477). Uttarkashi district, Govind Wildlife Sanctuary, on way to Kedarnath, 31°04.133' N, 78°11.360' E, alt. 2314 m, on *Caloplaca flavorubescens* colonizing bark, 15 May 2011, D.K. Upreti, S. Nayaka and R. Bajpai, 11-016033 (LWG 10935).

**30. *Rhizocarpon ochrolechia*** (Poelt and Nimis) Hafellner, *Herzogia* **9**(1-2): 86 (1992)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Uttarakashi district, Govind Wildlife Sanctuary (GWLS), in route to Har-ki-Dun, from Osla, 31°08'22.17" N, 78°24'30.56" E, alt. 3205 m, on *Ochrolechia rosella* colonizing *Abies*, 11 June 2012, D.K. Upreti and R. Bajpai, 12-016167 (LWG 27696).

**31. *Roselliniella cladoniae*** (Anzi) Matzer and Hafellner, *Bibliotheca Lichenologica* **37**: 59 (1990)

**MATERIAL EXAMINED:** INDIA. Kerala, Idukki district, Sylvan Valley, Munnar, alt. 1500 m, on *Cladonia ramulosa*, 20 May 1998, Stephen Sequeira, 008917 (KFRI).

**32. *Sphaerellothecium cladoniae*** (Alstrup and Zhurb.) Hafellner, *Mitteilungen des Naturwissenschaftlichen Vereins für Steiermark* **134**: 96 (2005)

**MATERIALS EXAMINED:** INDIA. Uttarakhand, Bageshwar district, in route to Pindari glacier from Phurkia to Zero point, alt. 3210-3660 m, on *Cladonia pyxidata* colonizing soil, 14 May 2007, Y. Joshi and S. Joshi, 07-015749 (LWG 11228). Uttarkashi district, Gangotri, way to Gomukh, on *Cladonia pyxidata* colonizing soil, 04 May 2017, R. Bajpai, 17-026948 (LWG).

**33. *Sphaerellothecium parmeliae*** Diederich and Etayo, *The Lichenologist* **30**(2): 117 (1998)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Chamoli district, near Badrinath, on way from Mana to Vasudhara, alt.

3340 m, on *Parmelia sulcata* colonizing soil over rocks, 21 August 2007, D.K. Upreti and S. Nayaka, 07-010130 (LWG 13580).

**34. *Sphaerellothecium pumilum*** (Lettau) Nav.-Ros., Cl. Roux and Hafellner, *Revista Catalana de Micologia* **39**: 118 (2018)

**MATERIALS EXAMINED:** INDIA. Uttarakhand, Bageshwar district, near Pindari glacier, Mirtoli to ridge of moraine, alt. 3600 m, on *Physcia albinea* colonizing soil over stones, 11 June 1970, D.D. Awasthi, 7702 (LWG-AWAS 14556); Uttarkashi district, between Gangotri to Gomukh, on *Physcia albinea* colonizing rocks, 24 April 1962, A. Singh 97505 (LWG 20472).

**35. *Sphaerellothecium thamnoliae*** Zhurb., *The Lichenologist* **44**: 164 (2011)

**MATERIAL EXAMINED:** INDIA. Sikkim, North Sikkim, Chubuk, above Thanngu, alt. 4100 m, on thallus of *Thamnolia vermicularis* colonizing soil, 13 August 2004, D.K. Upreti, S. Chatterjee and P.K. Divakar, 04-003938 (LWG 24678).

**36. *Sphaeropezia pertusariae*** (Etayo, Diederich and Coppins) Baloch and Wedin, *Mycologia* **105** (2): 393 (2013)

**MATERIAL EXAMINED:** INDIA. Madhya Pradesh, Rewa district, Baikunthpur, Khamariya, on *Pertusaria leucostoma* colonizing *Acacia* tree trunk, 18 February 2009, G.K. Mishra and S. Mohabe, 09-009134/B (LWG 10527).

**37. *Sphinctrina leucopoda*** Nyl., *Synopsis Methodica Lichenum Omnium hucusque Cognitorum, Praemissa Introductione Lingua Gallica* **1**: 144 (1860)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Champawat district, near guest house Champawat proper, on *Pertusaria* sp. colonizing tree bark, 26 November 2010, Gaurav K. Mishra, 10-015299 (LWG 10520).

**38. *Stigmidium fuscatae*** (Arnold) R. Sant., *Thunbergia* **6**: 17, no. 147 (1988)

**MATERIALS EXAMINED:** INDIA. Jammu & Kashmir, Doda district, Bhaderwah, alt. 2350 m, on thallus of *Acarospora* sp. colonizing rock, August 2017, Vishal Kumar, s.n. (LWG 35504); Kishtwar district, Kishtwar High Altitude National Park, Deharna, alt. 2300 m, on thallus of *Acarospora fuscata* colonizing rock, August 2017, Vishal Kumar, s.n. (LWG 35505); *ibid.*, Sonder, alt. 2019 m, on thallus of *Acarospora fuscata* colonizing rock, August 2017, Vishal Kumar, s.n. (LWG 35506).

**39. *Stigmidium heterodermiae*** Etayo, *Bibliotheca Lichenologica* **84**: 124 (2002)

**MATERIALS EXAMINED:** INDIA. Kerala, Kottayam district, Parathodu, alt. 900 m, on *Heterodermia dissecta* var. *koyana*, s.d., Stephen Sequeira, 23294 (KFRI); Palakkad district, Silent Valley National Park, Walakkad, Cheria, on *Heterodermia obscurata*, s.d., Stephen Sequeira, 234443 (KFRI).

**40. *Stigmidium mycobilimbiae*** Cl. Roux, Triebel and Etayo, *Bulletin de la Société Linnéenne de Provence* **45**: 499 (1994)

**MATERIAL EXAMINED:** INDIA. West Bengal,

Darjeeling district, Darjeeling, Pushok road, 7 miles from Darjeeling, alt. 1950 m, on thallus of *Mycobilimbium hunna*, 06 March 1967, D.D. Awasthi and M.R. Agarwal, 67-175 (LWG 16099).

**41. *Stigmidium squamariae*** (B. de Lesd.) Cl. Roux & Triebel, *Bulletin de la Société Linnéenne de Provence* **45**: 511 (1994)

**MATERIALS EXAMINED:** INDIA. Jammu & Kashmir, Doda district, Bhaderwah, alt. 2350 m, on thallus of *Protoparmeliopsis muralis* colonizing rock, August 2017, Vishal Kumar, s.n. (LWG 35507); Kishtwar district, Kishtwar High Altitude National Park, Marwah, alt. 1900 m, on thallus of *Protoparmeliopsis muralis* colonizing rock, July 2017, Vishal Kumar, s.n. (LWG 35508); *ibid.*, Sonder, alt. 2019 m, on thallus of *Protoparmeliopsis muralis* colonizing rock, July 2017, Vishal Kumar, s.n. (LWG 35509); *ibid.*, Deharna, alt. 2300 m, on thallus of *Protoparmeliopsis muralis* colonizing rock, August 2017, Vishal Kumar, s.n. (LWG 35510).

**42. *Tetramelas pulverulentus*** (Anzi) A. Nordin and Tibell, *The Lichenologist* **37** (6): 497 (2005)

**MATERIALS EXAMINED:** INDIA. Jammu and Kashmir, Leh district, Chumathang valley, Somreri, 20 km before Somreri, on *Physcia* colonizing rocks, 02 August 2012, Jatinder Kumar, 021203 (LWG 13304). Uttarakhand, Chamoli district, Valley of flowers, alt. 3450 m, on *Physcia gomukhensis* colonizing exposed rock, 20 October 1964, A. Singh, 85406/B (LWG 14321); Uttarkashi district, Gangotri, in route to Gomukh, Chirwasa, 30°58'44.8" N, 79°01'26.8" E, alt. 3556 m, on *Physcia dubia* colonizing rocks, 04 May 2017, R. Bajpai, 17-26970 (LWG).

**43. *Tremella everniae*** Diederich, *Bibliotheca Lichenologica* **61**: 77 (1996)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Uttarkashi district, Gangotri, in route to Gomukh, Chirwasa, 30°58'40.2" N, 79°01'33.7" E, alt. 3555 m, on *Evermia mesomorpha* colonizing twigs, 05 May 2017, R. Bajpai, 17-031261 (LWG).

**44. *Tremella parmeliarum*** Diederich, *Bibliotheca Lichenologica* **61**: 125 (1996)

**MATERIALS EXAMINED:** INDIA. Uttarakhand, Almora district, Banari devi forest, alt. 1940 m, on *Parmotrema reticulatum* colonizing bark, s.d., Y. Joshi and party, s.n. (LWG 35511); Almora, on *Parmotrema* colonizing *Pyranantha* twig, s.d., Kapil Bisht, s.n. (LWG 35512).

**45. *Tremella stictae*** Diederich, *Bibliotheca Lichenologica* **61**: 159 (1996)

**MATERIAL EXAMINED:** INDIA. Tamil Nadu, Madurai district, Shaubaganur, Kodaikanal, along hevings path, alt. 1828-1981 m, on *Sticta weigeli* colonizing stones with mosses, 22 December 1959, G. Foreau & D.D. Awasthi, 4296 (LWG-AWAS).

**46. *Verrucaria latericola*** Erichsen, *Annales Mycologici* **41**: 198 (1943)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Chamoli

district, 1/2 Km before Niti, alt. 3430 m, on *Caloplaca saxicola* colonizing exposed rocks, 20 August 2007, D.K. Upreti and S. Nayaka, 07-011217 (LWG).

**47. *Vouauxiomyces ramalinae*** (Nordin) D. Hawksw., *Bulletin of the British Museum for Natural History* **9** (1): 67 (1981)

**MATERIAL EXAMINED:** INDIA. Sikkim, North Sikkim district, Kabi-Tingda, around HSP-II, 27°24.904" N, 88°41.707" E, alt. 3629 m, on *Ramalina conduplicans* colonizing twigs, 22 July 2016, R. Bajpai, 16-030215 (LWG).

**48. *Zwackhiomyces socialis*** (Körb.) Cl. Roux, *Bulletin de la Société Linnéenne de Provence* **60**: 139 (2009)

**MATERIAL EXAMINED:** INDIA. West Bengal, Farakka, Jamtala, on the bank of The Ganges, alt. 33 m, 24°43'50.8" N, 87°55'49.8" E, on *Bacidia rubella* colonizing *Mangifera indica*, 10 July 2015, S. Nayaka, 15-031968 (LWG).

**49. *Zwackhiomyces sphinctrinoides*** (Zwackh) Grube and Hafellner, *Nova Hedwigia* **51** (3-4): 327 (1990)

**MATERIAL EXAMINED:** INDIA. Uttarakhand, Nainital district, on the way to Naina peak, alt. 2500 m, on *Lecanora* colonizing *Quercus semecarpifolia*, 26 December 2009, H. Kholia, 09-014414 (LWG 11003).

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