

## New and Interesting Records of Lichenicolous Fungi from the TNS Herbarium: Part I

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**ABSTRACT.** – The paper documents 62 species of lichenicolous fungi and one algicolous fungus found in the TNS lichen herbarium. *Abrothallus hypotrachynae*, *Cornutispora pittii*, *Lichenopeltella cetrariae*, *L. uncialicola*, *Phaeospora catolechia*, *Polycoccum microcarpum*, *Sclerococcum porphyreum*, *Stigmidium joergensenii* and *S. subcladoniicola* are newly reported for Asia; *Talpapellis beschiana* is newly reported for South America. Additionally, we report new records from the following countries: Australia (*Abrothallus cladoniae* s.l.), Bhutan (*Lichenostigma maureri* and *Tremella everniae*), China (*Sclerococcum ahtii* and *Stigmidium microcarpum*), Costa Rica (*Karschia talcophila*), Dominican Republic (*Karschia talcophila*), Japan (*Abrothallus microspermus*, *Catillaria stereocaulorum*, *Cercidospora stereocaulorum*, *C. trypteliza*, *Clypeococcum cetrariae*, *Endococcus nanellus*, *Epicladonia stenospora*, *Epigloe soleiformis*, *Lasio-sphaeriopsis stereocaulicola*, *Lichenocodium erodens*, *L. usneae*, *Lichenopeltella cladoniarum*, *Nesolechia cetrariicola*, *Opegrapha stereocaulicola*, *Phaeospora* cf. *arctica*, *Polycoccum trypteliioides*, *Raesaenenia huuskonenii*, *Roselliniella cladoniae*, *Roselliniopsis tartaricola*, *Sclerococcum ahtii*, *Stigmidium arthrorhaphidis*, *S. beringicum*, *S. hafellneri*, *S. microcarpum*, *S. microspilum*, *S. stereocaulorum*, *S. tabacinae*, *Talpapellis beschiana*, *Tremella everniae* and *Zwackhiomyces berengerianus*), Malaysia (*Arthonia stereocaulina* and *Roselliniella stereocaulorum*), Nepal (*Corticifraga peltigerae*, *Epicladonia stenospora*, *Lichenothelia rugosa* and *Roselliniella cladoniae*), North Korea (*Epicladonia stenospora* and *Roselliniella cladoniae*), Papua New Guinea (*Catillaria stereocaulorum* and *Pyrenidium actinellum* s.l.), Peru (*Polycoccum trypteliioides*), South Korea (*Clypeococcum cetrariae* and *Endococcus nanellus*), Taiwan (*Abrothallus parmeliarum*, *Epicladonia stenospora*, *Lichenocodium lecanorae*, *Nesolechia oxyspora*, *Pyrenidium actinellum* s.l. and *Sclerococcum ahtii*), Thailand (*Nesolechia oxyspora*), the U.S.A., all from Hawaii (*Plectocarpon cladoniae*, *Sphaerellothecium cinerascens* and *Stigmidium subcladoniicola*). Additionally, *Lichenothelia rugosa* and *Pyrenidium actinellum* s.l. are also new to Hawaii, U.S.A.; *Abrothallus peyritschii*, *Sphaerellothecium minutum* and *S. cf. parmeliae* are new to the Sakhalin Region of Russia. *Abrothallus cladoniae* s.l. is first reported from *Cladia*, and *Cornutispora pittii* from *Cladonia*.

**KEYWORDS.** – Biodiversity, biogeography, floristics, lichen parasites, natural history collection.

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### INTRODUCTION

The National Museum of Nature and Science (TNS) in Japan was founded in 1877 (National Museum of Nature and Science 2018). The lichen herbarium at TNS comprises more than 250,000 specimens that include important collections made by widely recognized and productive lichenologists such as Yasuhiko Asahina, Syo Kurokawa, and Hiroyuki Kashiwadani among others. While the majority of specimens were collected in Japan, the herbarium covers a wide geographic area from the polar regions to

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the tropics. The specimens housed in TNS have been used mainly to study taxonomy of lichens (e. g., Asahina 1950, 1952, 1956; Kurokawa 1962; Kashiwadani 1975; Ohmura 2001; Moon et al. 2006), inventories of chemical substances (e. g. Asahina & Shibata 1954; Nuno 1969, 1971), and ecological studies including monitoring of air pollution and radionuclides (Ohmura et al. 2013, 2015; Dohi et al. 2015). However, because the lichenicolous fungi growing on lichen specimens deposited in TNS have received scant attention in the past, we initiated a project to detect and identify them. This contribution presents the first results of our project, mainly reporting new host records and range extensions for lichenicolous fungi growing on *Cladonia*, *Sphaerophorus*, *Stereocaulon* and parmelioid lichens.

## MATERIALS AND METHODS

The study is based on specimens of lichenicolous fungi found by the first author on lichen specimens in TNS. Newly identified lichenicolous fungi are kept in the specimen packets of the host lichens. Microscopical examination was carried out using a Stemi 2000-CS dissecting microscope and a Zeiss Axio Imager A1 compound microscope with interference contrast, fitted with an AxioCam MRc5 digital camera. Hand-made sections of fruiting bodies and thallus were studied in water, 10% KOH, Lugol's iodine, directly or after 10% KOH pre-treatment, or brilliant cresyl blue. Measurements were taken from water mounts and are indicated as (minimum–){X–SD}–{X+SD}(–maximum), where ‘minimum’ and ‘maximum’ are the extreme observed values, ‘X’ the arithmetic mean and ‘SD’ the corresponding standard deviation, followed by the number of measurements (n). The length/breadth ratio is indicated as L/B and given in the same way. Lichen nomenclature follows Index Fungorum (2019).

## NEW AND INTERESTING RECORDS

### ***Abrothallus cladoniae* R.Sant. & D.Hawksw. s.l.**

NOTES. – This species is known from scattered reports throughout the Holarctic (Hafellner & Türk 1995, Hawksworth 1990, Kocakaya et al. 2016, Santesson et al. 2004, Tsurukau et al. 2016), and also from New Zealand (Zhurbenko & Pino-Bodas 2017). It is here newly documented for Australia and from the genus *Cladia*.

*Specimen examined.* – AUSTRALIA. SOUTH AUSTRALIA: Kangaroo Island, 18 km SSE of Cape Borda, mouth of De Male River, 35°43'S, 136°46'E, elev. 20 m, on *Cladia schizopora* (podetia), 30.ix.1994, *H. Streimann 55123* (TNS).

### ***Abrothallus hypotrachynae* Etayo & Diederich**

NOTE. – This species is known from the South, Central and North America (Etayo 2002, 2010, 2017; Flakus & Kukwa 2012, Lendemer & Knudsen 2008) and Laurimacaronesia (Hafellner 2008). It is here newly documented from Taiwan and Asia.

*Specimen examined.* – TAIWAN. TAICHUNG CITY MUNICIPALITY: Mt. Nanhuta Shan, route between Ssu-yuan and To-chia-tun Shan, elev. 2700–2950 m, on *Hypotrachyna* sp. (thallus), 11.xi.1989, *H. Kashiwadani 36056c* (TNS).

### ***Abrothallus microspermus* Tul.**

NOTE. – This species is widely distributed in the Holarctic (Brackel 2014), and is here newly documented for Japan.

*Specimen examined.* – JAPAN. HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Sugadaira Montane Research Center, Sugadaira-Kogen, Ueda-city, 36°31'30"N, 138°21'01"E, on *Flavoparmelia caperata* (thallus), 22.iii.2017, *Y. Ohmura 11242* (TNS).

### ***Abrothallus parmeliarum* (Sommerf.) Nyl.**

NOTES. – This is a common cosmopolitan species (Brackel 2014), which is here newly documented from Taiwan. *Parmelia niitakana* is a new host species.

*Specimen examined.* – TAIWAN. CHIAYI COUNTY: Mt. Shin-Kao-San, elev. 3600–3900 m, on *Parmelia niitakana* (thallus) 2.i.1964, *S. Kurokawa 393* (TNS).

***Abrothallus peyritschii* (Stein) I.Kotte**

NOTES. – This species is widely distributed in the northern hemisphere (Brackel 2014), but was only recently documented for Japan (Zhurbenko et al. 2015). It is here reported for the first time from the Sakhalin Region of Russia.

*Specimens examined.* – **JAPAN.** HOKKAIDO. ISHIKARI PROVINCE: Mt. Ashibetsu, on *Vulpicida juniperinus* (thallus), 25.vii.1935, *M. Sato 81* (TNS). HONSHU. KAGA PROVINCE (ISHIKAWA PREFECTURE): Mt. Haku-san, Oguchi-mura, elev. 2550 m, on *V. pinastri* (thallus), 1.vi.1967, *H. Kashiwadani 3332* (TNS). SHIMOTSUKE PROVINCE (TOCHIGI PREFECTURE): trail between Mt. Akanagi and Mt. Nyoho, Nikko, elev. 2200 m, on *V. pinastri* (thallus), 6.viii.1981, *H. Shibuichi 6636* (TNS). **RUSSIA.** SAKHALIN REGION: Sakhalin Island, Mt. Suzuya, on *V. juniperinus* (thallus), 19.vii.1932, *M. Sato 7* (TNS).

***Arthonia molendoi* (Frauenf.) R.Sant.**

NOTE. – This species was formerly known from Japan on the basis of a single collection made on Hokkaido and growing on *Rusavskia elegans* (Tadome et al. 2018). Here we report a second collection, also from Hokkaido.

*Specimen examined.* – **JAPAN.** HOKKAIDO. KUSHIRO PROVINCE: Shimokuchoro-iwainai, Tsurui-mura, Akan-gun, on *Gyalolechia flavorubescens* (thallus), 4.ix.1992, *H. Kashiwadani 36858* p.p (TNS).

***Arthonia stereocaulina* (Ohlert) R.Sant.**

NOTES. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010) and is also known in South America from a single report from Region XII (Magallanes and Chilean Antarctica) of Chile (Etayo & Sancho 2008). It is here newly reported from Malaysia and Southeast Asia. We also report a second collection from a different region of Chile.

*Specimens examined* (all on phyllocladia and occasionally stems of saxicolous *Stereocaulon* spp.). – **CHILE.** REGION X (LOS LAGOS). LLANQUIHUE PROVINCE: ca. 40 km SE of Puerto Montt, around Chapo Lake, elev. 250 m, 18.xi.1981, *H. Kashiwadani 18058* (TNS). OSORNO PROVINCE: Parque Nacional Puyehue, E end of Puyehue Lake, elev. 350–500 m, 23.xi.1987, *H. Kashiwadani 34902* (TNS). **MALAYSIA.** SABAH: Borneo, Mt. Kinabalu, between Kambaranga Radio Station and Waterfall, elev. 2000–2146 m, 17.v.1963, *Z. Iwatsuki 623a* (TNS).

***Catillaria stereocaulorum* (Th.Fr.) H.Olivier**

NOTES. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010), and is also known from South America (Etayo & Sancho 2008). It is here newly reported from Japan and Papua New Guinea. *Stereocaulon brassii*, *S. commixtum*, *S. curtatum* and *S. dendroides* are likely new host species (see Zhurbenko 2010). It is noteworthy that one of the specimens examined (*Moon 562b*) has unusually long and narrow ascospores, (19.4–)20.7–24.3(–24.6) × (3.0–)3.3–3.6(–4.0) μm, L/B = (5.3–)5.7–6.9(–7.2) (n = 11) in our material vs. (10.5–)13.5–17.5(–19) × (3.5–)4–5.5(–6.5) μm, L/B = (2.1–)2.6–4.2(–4.9) reported in Zhurbenko (2010).

*Specimens examined.* – **JAPAN.** HOKKAIDO. NEMURO PROVINCE: Shiretoko Peninsula, Mt. Rausu, elev. 1500 m, on *Stereocaulon dendroides* (phyllocladia), 5.vii.1970, *M. Togashi s.n.* (TNS). HONSHU. SHIMOTSUKE PROVINCE (TOCHIGI PREFECTURE): Konsei Pass, Nikko, elev. 2100 m, on *S. curtatum* (phyllocladia), 7.viii.1981, *H. Shibuichi 6655* (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Mt. Ontake, Sennin Waterfall, elev. 1850 m, on *S. commixtum* (phyllocladia, occasionally stems), 12.x.1968, *M. Togashi s.n.* (TNS). UZEN PROVINCE (YAMAGATA PREFECTURE): Azuma Mts., around Tengu-iwa, 37°44'N, 140°09'E, elev. 2000 m, on *S. curtatum* (phyllocladia), 24.viii.1995, *K.H. Moon 562b* (TNS); Higashitagawa-gun, route between summit of Mt. Gassan and Tamugimata, elev. 1750 m, on *S. dendroides* (phyllocladia), 1.viii.1967, *H. Kashiwadani 9107* (TNS). **PAPUA NEW GUINEA.** WESTERN HIGHLANDS PROVINCE: between Pindaunde Lakes and summit of Mt. Wilhelm, elev. 4400 m, on *S. brassii* (phyllocladia), 31.xii.1973, *H. Kashiwadani 11330* (TNS).

***Cecidiomyces santessonii* U.Braun & Zhurb.**

NOTE. – This species was formerly known from two collections made on Macquarie Island in Tasmania (Zhurbenko & Braun 2012). A third collection is reported here from mainland Tasmania.

*Specimen examined.* – AUSTRALIA. TASMANIA: Mt. Wellington, elev. 1200 m, on saxicolous *Stereocaulon* sp. (stems), 10.i.1974, *M. Togashi et al. s.n.* (TNS).

***Cercidospora stereocaulorum* (Arnold) Hafellner**

NOTES. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010) and is also known from South America (Etayo 2010). It is here newly documented from Japan, and *Stereocaulon curtatum* is a new host species.

*Specimen examined.* – JAPAN. HOKKAIDO. NEMURO PROVINCE: Shiretoko Peninsula, Mt. Rausu, elev. 1500 m, on *Stereocaulon curtatum* (stems), 5.vii.1970, *M. Togashi s.n.* (TNS).

***Cercidospora tryppetheliza* (Nyl.) Hafellner & Obermayer**

NOTE. – This species is widely distributed in both hemispheres (Hafellner & Obermayer 1995), and is here newly reported from Japan.

*Specimen examined.* – JAPAN. HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Minami-Alps-city, along the route between Ohtakigashira and Kitazawa Pass, 35°43'59.7"N, 138°12'04.3"E, on *Arthrurhaphis citrinella* (thallus), 5.ix.2012, *Y. Ohmura 9312 & A. Frisch* (TNS).

***Clypeococcum cetrariae* Hafellner**

NOTE. – This species is widely distributed in the Holarctic (Brackel 2014), and is here newly reported from Japan and South Korea.

*Specimens examined.* – JAPAN. HOKKAIDO. ISHIKARI PROVINCE: eastern side of Mt. Tomuraushi, elev. 1700 m, on *Flavocetraria nivalis* (thallus), 20.vii.1969, *M. Togashi s.n.* (TNS). KITAMI PROVINCE: route between Mt. Mitsumine and Mt. Sashirui, Shari-gun, elev. 1400–1550 m, on *F. cucullata* (thallus), 14.viii.1983, *H. Kashiwadani 20002 & Y. Endo* (TNS). HONSHU. MUTSU PROVINCE (AOMORI PREFECTURE): Shimokita Peninsula, Sai-mura, summit of Mt. Nuidoiwa, on *Cetraria laevigata* (thallus), 3.viii.1956, *S. Kurokawa 56360* (TNS). SOUTH KOREA. GANGWON PROVINCE: Mt. Kumgang, Mt. Shinsun-bong, on *C. laevigata* (thallus), 1.viii.1916, *T. Nakai s.n.* (TNS-L-126706). HAM KYONG NAM PROVINCE: Mt. Seoil-bong, on *Flavocetraria cucullata* (thallus), 16.viii.1939, *M. Sato s.n.* (TNS), on *F. nivalis* (thallus), *M. Sato s.n.* (TNS).

***Cornutispora ciliata* Kalb**

NOTE. – This is a cosmopolitan species (Brackel 2014), which was formerly known in Japan from a single collection made in Honshu on *Lecanora* sp. (Zhurbenko et al. 2015). We report a second collection from Honshu here.

*Specimen examined.* – JAPAN. HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): route between Fuji-Yoshida-guchi and 5-gome, Mt. Fuji, elev. 2300 m, in hymenium of *Raesaenentia huuskonenii* growing on *Bryoria trichodes*, 26.ix.1953, *K. Togashi s.n.* (TNS-L-128365).

***Cornutispora lichenicola* D.Hawksw. & B.Sutton**

NOTE. – This is a common cosmopolitan species (Brackel 2014), which was formerly known in Japan from a single collection made in Honshu on *Lecanora* sp. (Zhurbenko et al. 2015). Here we report a second collection from Honshu, this time growing on a foliose lichen.

*Specimen examined.* – JAPAN. HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Ueda-shi, Sugadaira Montane Research Center, 36°31'26.7"N, 138°20'50.4"E, elev. 1335 m, on *Flavoparmelia caperata* (thallus), 22.iii.2017, *H. Masumoto s.n.* (TNS).

***Cornutispora pittii* D.Hawksw. & Punith.**

NOTES. – To date, this species has been reported only from Australia (Punithalingam 2003) and Bolivia in South America (Flakus & Kukwa 2012). Here it is newly reported from Asia based on a collection from Thailand. *Cladonia* is also a new host genus for the fungus.

*Specimen examined.* – THAILAND. PISANUKLOK PROVINCE: Lan Hin Taek, Phu Hin Rong Kla National Park, 16°58'36"N, 101°02'24"E, elev. 1065 m, on *Cladonia* sp. (podetial squamules), 22.ii.1998, *K.H. Moon 2142b & H. Kashiwadani* (TNS).

***Corticifraga peltigerae* (Fuckel) D.Hawksw. & R.Sant.**

NOTE. – This species is widely distributed in both hemispheres (Brackel 2014), and is here newly reported from Nepal.

*Specimen examined.* – **FEDERAL DEMOCRATIC REPUBLIC OF NEPAL.** PROVINCE NO. 3: Langtang Valley, W of Syabru, elev. 2050 m, on *Peltigera* sp. (thallus), 3.xi.1988, *T. Iwashina* 437 (TNS).

***Endococcus nanellus* Ohlert**

NOTE. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010), and is here newly reported from Japan and South Korea. We also report additional collections from Far Eastern Russia and the United States.

*Specimens examined.* – **JAPAN.** KYUSHU. HIZEN PROVINCE (NAGASAKI PREFECTURE): Unzen, Mt. Myoken-dake, on *Stereocaulon nigrum* (phyllocladia), 31.viii.1958, *Y. Asahina* & *M. Togashi* s.n. (TNS). **RUSSIA.** SAKHALIN REGION: Sakhalin Island, on *S. tomentosum* (phyllocladia, stems), 21.vii.1932, *Y. Asahina* 32621-B (TNS), 8.x.1930, *S. Otagiri* s.n. (TNS). **SOUTH KOREA.** JEJU PROVINCE: [without location], on *S. vesuvianum* (phyllocladia), 31.v.2001, *K.H. Moon* 6024 (TNS). **U.S.A.** HAWAII. HAWAII COUNTY: Hawaii Island, 0.5 km SE of Puu Nanaia, 19°04'N, 155°42'W, elev. 600 m, on *Stereocaulon* sp. (phyllocladia), 3.vi.1999, *H. Kashiwadani* 41935b (TNS).

***Epicladonia stenospora* (Harmand) D.Hawksw.**

NOTES. – Distinct gall formation was observed in several specimens we examined (*Kurokawa* 520579, *Kashiwadani* 13393 and *Kashiwadani* 43941), which is not typical for this species according to Hawksworth (1981) and Zhurbenko & Pino-Bodas (2017). This species is common and widely distributed in both hemispheres (Brackel 2014, Zhurbenko & Pino-Bodas 2017), and is here newly reported from Japan, Nepal, North Korea and Taiwan.

*Specimens examined.* – **FEDERAL DEMOCRATIC REPUBLIC OF NEPAL.** PROVINCE NO. 3: Langtang Valley, W of Nudama Dhang, elev. 3850 m, on *Cladonia* sp. (naked stems of podetia), 9.xi.1988, *T. Iwashina* 570 (TNS). **JAPAN.** ETCHU PROVINCE (TOYAMA PREFECTURE): Mt. Etchusawa-dake, elev. 2400 m, on *C. cyanipes* (phyllocladia), 27.vii.1976, *H. Kashiwadani* 13393 (TNS). **HONSHU.** SHINANO PROVINCE (NAGANO PREFECTURE): Kita-Azumi-gun, Mt. Tsubakuro, on *C. cornuta* (podetial squamules), 13.viii.1952, *S. Kurokawa* 520579 (TNS). **NORTH KOREA.** HMAGYONG-PUKTO PROVINCE: Mt. Manto-san, elev. 1600 m, on *C. rangiferina* (podetia), 3.x.1939, *Y. Kimura* s.n. (TNS). **TAIWAN.** TAITUNG COUNTY: Haituan-gun, route between Tentzu and Kwansan Yako, elev. 2580 m, on *Cladonia* sp. (podetial squamules), 1.iii.1991, *H. Kashiwadani* 43941 (TNS).

***Epigloe soleiformis* Döbbeler**

NOTE. – This is a non-lichenized fungus associated with algal films that grows over decomposing bryophytes, lichens, humus or rotten wood (Döbbeler 1984). It is sometimes treated along with lichenicolous fungi. We located a specimen of this species during our work and it is here newly reported from Japan.

*Specimen examined.* – **JAPAN.** HOKKAIDO. TOKACHI PROVINCE: lakeside of Shikaribetsu, elev. 950 m, on cyanobacterial film over *Stereocaulon apocalypticum*, 29.vi.1970, *M. Togashi* s.n. (TNS).

***Karschia talcophila* (Ach.) Körb.**

NOTES. – In the examined specimens we found that the ascospores were somewhat smaller than reported by Hafellner (2004a), viz. (9.6–)11.0–13.0(–14.8) × (5.0–)5.3–6.1(–6.9) μm (n = 60) in our material vs. 11–17(–19) × 6–8(–9) μm. This is a cosmopolitan species (Hafellner 2004a), which is here newly reported from Costa Rica and the Dominican Republic. *Diploschistes chloroleucus* is likely also a new host species.

*Specimens examined.* – **COSTA RICA.** SAN JOSÉ PROVINCE: Cerro de la Muerte, near the peak of Asuncion, on terricolous *Diploschistes* sp. (thallus, occasionally discs of apothecia), 28.iii.1967, *W.L. Culbertson* 12838 (TNS). **DOMINICAN REPUBLIC.** LA VEGA PROVINCE: Cordillera Central, Mt. Alto de la Bandera, elev. 2500 m, on *D. cinereo-caesius* (thallus, occasionally discs of apothecia), 5.viii.1958, *H.A. Imshaug* & *C.M. Wetmore* 3524 (TNS); Cordillera Central, summit of Piquito del Yaque peak, elev. 2600 m, on *D. chloroleucus* (thallus), 9.viii.1958, *H.A. Imshaug* & *C.M. Wetmore* 3682 (TNS).

***Lasiosphaeriopsis stereocaulicola* (Linds.) O.E.Erikss. & R.Sant.**

NOTES. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010) and is also known from Africa and South America (Eriksson & Santesson 1986, Etayo & Sancho 2008). It is here newly reported from Japan.

*Specimen examined.* – JAPAN. HOKKAIDO. KITAMI PROVINCE: Rishiri Island, Mt. Rishiri, on *Stereocaulon vesuvianum* (stems), 12.viii.1970, K. Takahashi 979 (TNS).

***Lichenocodium erodens* M.S.Christ. & D.Hawksw.**

NOTE. – This is a very common species widely distributed in both hemispheres (Brackel 2014), which is here newly reported from Japan.

*Specimens examined.* – JAPAN. HOKKAIDO. TOKACHI PROVINCE: Daisetsu Mts., Mt. Goshiki, elev. 1860 m, on *Vulpicida juniperinus* (discs of apothecia), 7.viii.1980, H. Kashiwadani 16479b & Y. Endo (TNS). HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Kawahake, Kawakami-mura, Minamisaku-gun, elev. 1300 m, on *Flavopunctelia soledica* (thallus), 14.vi.1983, H. Kashiwadani et al. 19869 (TNS).

***Lichenocodium lecanorae* (Jaap) D.Hawksw.**

NOTE. – This is a very common species widely distributed in both hemispheres (Brackel 2014), which is here newly reported from Taiwan.

*Specimens examined* (both on thalli of *Nephromopsis pallescens*). – TAIWAN. CHIAYI COUNTY: Mt. Ali, elev. 2200 m, 30.xii.1963, S. Kurokawa 7c (TNS). HUALIEN COUNTY: Mt. Nan-Fu-Ta-San, elev. 2400–2600 m, 20.i.1964, S. Kurokawa 1016a (TNS).

***Lichenocodium usneae* (Anzi) D.Hawksw.**

NOTE. – This is a common cosmopolitan species (Brackel 2014), which is here newly reported from Japan and Hawaii.

*Specimens examined.* – JAPAN. HOKKAIDO. TOKACHI PROVINCE: Daisetsu Mts., Mt. Goshiki, elev. 1860 m, on *Cladonia amaurocraea* (decaying podetia), 7.viii.1980, H. Kashiwadani 16491 & Y. Endo (TNS). U.S.A. HAWAII. HAWAII COUNTY: Hawaii Island, 2 mi NE of Puu Huluhulu, 19°43'N, 155°27'W, elev. 2150 m, on *Hypotrachyna* sp. (thallus), 30.v.1999, K.H. Moon 3679 (TNS).

***Lichenopeltella cetrariae* (Bres.) Höhn.**

NOTES. – This is a poorly understood species reported by Brackel (2011) from Iceland and Greenland. According to the differences in the ascospore size and septation between *Lichenopeltella cetrariicola* (Nyl.) R.Sant. and *L. cetrariae* presented in Brackel (2011) our material belongs to the latter species, which is here newly reported for Asia from Japan.

*Specimens examined.* – JAPAN. HONSHU. ETCHU PROVINCE (TOYAMA PREFECTURE): Ichinokoshi, Mt. Tateyama, on *Cetraria laevigata* (lobes, mainly their lower parts), 27.vii.1950, S. Kurokawa 50034 (TNS). KAI PROVINCE (YAMANASHI PREFECTURE): Minami-Alps-city, Sensui Pass, on *Flavocetraria cucullata* (lobes), 12.viii.1937, Y. Asahina s.n. (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Kami-Ina-gun, Mt. Senjogatake, on *F. cucullata* (lobe bases), 28.vii.1979, S. Kurokawa 79054 (TNS); Mt. Sannosawa-dake, elev. 2700 m, on *F. cucullata* (lobes), 6.viii.1969, S. Kurokawa 69073 (TNS).

***Lichenopeltella cladoniarum* E.S.Hansen & Alstrup**

NOTE. – This species is known from scattered reports in the northern Holarctic (Brackel 2010, Hansen & Alstrup 1995, Zhurbenko & Pino-Bodas 2017), and is here newly reported from Japan.

*Specimen examined.* – JAPAN. HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Mt. Kitadake, near Kata-no-koya, elev. 3000 m, on *Cladonia arbuscula* (podetia), 4.viii.1967, M. Togashi s.n. (TNS).

***Lichenopeltella uncialicola* Brackel**

NOTE. – This species was previously known from Greenland, Iceland, Austria and Italy (Brackel 2010, 2013; Zhurbenko & Pino-Bodas 2017; Zimmermann & Berger 2018), and is here newly reported from Asia based on a collection from North Korea.

*Specimen examined.* – **NORTH KOREA.** HMAGYONG-PUKTO PROVINCE: Mt. Manto-san, elev. 1600 m, on *Cladonia rangiferina* (podetia), 3.x.1939, *Y. Kimura s.n.* (TNS).

***Lichenosticta alcicorniaria* (Linds.) D.Hawksw.**

NOTE. – This is a common species widely distributed in both hemispheres (Brackel 2014), formerly known in Japan from a single collection made in Hokkaido (Zhurbenko & Pino-Bodas 2017). Here we report additional collections from Japan and extend the distribution into Honshu. We also report two collections from temperate Chile.

*Specimens examined.* – **CHILE.** REGION X (LOS LAGOS). OSORNO PROVINCE: Puyehue National Park, E end of Puyehue Lake, elev. 350–500 m, on *Cladonia* sp. (basal and podetial squamules, mostly their underside), 23.xi.1987, *H. Kashiwadani 34909* (TNS); between Río Negro and Riachuelo, elev. 150 m, on *Cladonia* sp. (underside of basal squamules), 16.xi.1987, *H. Kashiwadani 35439* (TNS). **JAPAN.** HOKKAIDO. KUSHIRO PROVINCE: Akan-gun, Tsurui-mura, around Akanuma Pond, elev. 2 m, on *C. cenotea* (podetia, podetial squamules), 5.ix.1992, *H. Kashiwadani 36747b* (TNS). HONSHU. BINGO PROVINCE (HIROSHIMA PREFECTURE): Hiba-gun, Mt. Hiba, elev. 1100 m, on *C. rangiferina* (podetia), 12.x.1973, *H. Kashiwadani 5461* (TNS). TAMBA PROVINCE (KYOTO PREFECTURE): Amata-gun, Mutobe, 100–200 m, on *C. anomaea* (podetia, podetial squamules), 20.viii.1953, *M. Togashi s.n.* (TNS).

***Lichenostigma maureri* Hafellner**

NOTE. – This is a common cosmopolitan species (Brackel 2014), which is here newly reported from Bhutan.

*Specimens examined.* – **BHUTAN.** GASA DISTRICT: Laum Thang (3900)–Singke La (4950)–Chawa Gassar (4000), on *Evernia* cf. *mesomorpha* (thallus), 19.v.1967, *H. Hara et al. s.n.* (TNS-L-20077). **CHINA.** SICHUAN PROVINCE, ABA PREFECTURE: Songpan County, Huanglong, 32°45'N, 103°49'E, elev. 3100 m, on *E. mesomorpha* (thallus), 8.x.1999, *K.H. Moon 5022b* (TNS). **JAPAN.** HOKKAIDO. KITAMI PROVINCE: Chimikeppu Lake, elev. 300 m, on *E. prunastri* (thallus), 29.vi.1973, *S. Asahina s.n.* (TNS).

***Lichenothelia rugosa* (G.Thor) Ertz & Diederich**

NOTE. – This is a rather common, cosmopolitan species (Brackel 2014, Thor 1985), which is here newly reported from Nepal and from the United States based on a collection from Hawaii.

*Specimens examined.* – **FEDERAL DEMOCRATIC REPUBLIC OF NEPAL.** PROVINCE NO. 2: along Janakpur, Dudhkunda Glacier, elev. 4400 m, on *Diploschistes* sp. (thallus), 14.x.1988, *T. Iwashina 228* (TNS). **U.S.A.** HAWAII. KAUAI COUNTY: Kauai Island, along Kukui Trail, 22°03'N, 159°39'W, elev. 800 m, on *D. actinostomus* (thallus), 23.x.1997, *Y. Ohmura 4036* (TNS).

***Nesolechia cetrariicola* (Linds.) Arnold**

NOTES. – This is a rarely reported holarctic species, which was formerly known in Asia from the Krasnoyarsk Territory of Russia (Zhurbenko & Hafellner 1999) and Mongolia (Zhurbenko et al. in press.). It is here newly reported from Japan.

*Specimens examined* (both on thalli of *Cetraria laevigata*). – **JAPAN.** HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Mt. Maedake, elev. 2900 m, 5.vii.1969, *H. Shibuichi 3893* (TNS); Mt. Yuoh-dake, 21.viii.1958, *S. Kurokawa 58432a* (TNS).

***Nesolechia oxyspora* (Tul.) A.Massal.**

NOTE. – This is a common, cosmopolitan species (Brackel 2014), which is here newly reported from Taiwan and Thailand.

*Specimens examined.* – **FEDERAL DEMOCRATIC REPUBLIC OF NEPAL.** PROVINCE NO. 3: Langtang Valley, between Dhunche and Ramche, on *Hypotrachyna nepalensis* (thallus), 8.ix.1986, *T. Nakaike 4a* (TNS). **JAPAN.** HOKKAIDO. KUSHIRO PROVINCE: Akkeshi-gun, Kokutaiji temple, elev. 10 m, on *Punctelia ruderata* (thallus), 5.viii.2002, *T. Shiba 409* (TNS). HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Minami-Alps-city, Sensui Pass, 35°44'50.8"N, 138°13'54.8"E, elev. 2400 m, on *Menegazzia terebrata* (thallus), 3.ix.2012, *Y. Ohmura 9263 & A. Frisch* (TNS). **TAIWAN.** CHIAYI COUNTY: Mt. Arisan, on *H. cirrhata* (thallus), 14.vii.1935, *M. Ogata 748* (TNS). NANTOU COUNTY: near Pa-tung-kuan, upper part of Lao-nung Chi, on *H. cirrhata* (thallus), 22.iii.1963, *S.*

*Nakanishi 395* (TNS); TAICHUNG CITY MUNICIPALITY: Mt. Nanhuta Shan, route between Ssu-yuan and To-chia-tun Shan, elev. 2700–2950 m, on *Hypotrachyna* sp. (thallus), 11.xi.1989, *H. Kashiwadani 35939* (TNS), *H. Kashiwadani 36058* (TNS), *H. Kashiwadani 36123* (TNS), *H. Kashiwadani 35887b* & *K. Yoshida* (TNS), on *Menegazzia*-like lichen (thallus), *H. Kashiwadani 36056b* (TNS); Mt. Nanhuta Shan, route between To-chia-tun Shan and Sheen-ma-jenn Shan, elev. 2700 m, on *H. cirrhata* (thallus), 12.xi.1989, *H. Harada 10129* (TNS). **THAILAND.** CHIANG MAI PROVINCE: summit of Mt. Doi Chiangdao, elev. 2100 m, on *H. nepalensis* (thallus), 4.i.1966, *M. Tagawa 4305* & *N. Kitagawa* (TNS).

***Opegrapha cladoniicola* Ertz & Diederich**

NOTE. – This species was previously known only from two collections made in Hawaii and Papua New Guinea (Ertz & Diederich 2003, Zhurbenko & Pino-Bodas 2017). Here we report an additional collection from Hawaii, U.S.A.

*Specimen examined.* – U.S.A. HAWAII. MAUI COUNTY: Molokai Island, Pepeopae, 21°07'N, 156°54'W, elev. 1200 m, on *Cladonia* sp. (podetia), 3.xi.1997, *H. Kashiwadani 40027a* (TNS).

***Opegrapha stereocaulicola* Alstrup & D.Hawksw.**

NOTE. – This species is known from scattered reports throughout the northern Holarctic (Alstrup & Hawksworth 1990, Svane & Alstrup 2004, Zhurbenko 2010), and is here newly reported from Japan.

*Specimen examined.* – JAPAN. HONSHU. MUSASHI PROVINCE (SAITAMA PREFECTURE): Chichibu, on *Stereocaulon dendroides* (stems), 27.vii.1933, *Y. Asahina s.n.* (TNS).

***Paragyaliopsis stereocaulicola* (Etayo) Etayo**

NOTE. – This species is known only from several collections made in Bolivia, Costa Rica and Peru (Etayo 2010, Flakus & Kukwa 2012). Here we report two additional collections from Peru.

*Specimens examined* (both on cephalodia, phyllocladia and stems of *Stereocaulon* spp.). – PERU. CUZCO DEPARTMENT. QUISPICANCHI PROVINCE: along the road from Marcapata to Quincemille, elev. 2600–2800 m, 13.ix.1984, *H. Kashiwadani 21758* (TNS), *H. Kashiwadani 21771* (TNS).

***Phaeospora cf. arctica* Horáková & Alstrup**

NOTES. – In the examined material the ascospores are somewhat smaller than was reported in the protologue [(11.8–)12.6–14.2(–15.0) × (4.2–)4.6–5.4(–5.8) μm (n = 32) in our material vs. 15.5–18.5 × 5.5–6.6 μm *vide* Horáková & Alstrup (1994)]. This species is known from scattered occurrences in the northern Holarctic (Horáková & Alstrup 1994, Ihlen & Wedin 2005, Zhurbenko & Santesson 1996, Zhurbenko & Verzhinina 2014). This is the first report from Japan.

*Specimen examined.* – JAPAN. SHINANO PROVINCE (NAGANO PREFECTURE): Mt. Kimpu, elev. 2580 m, on *Flavocetraria cucullata* (thallus), 29.vi.1965, *S. Kurokawa 65263* (TNS).

***Phaeospora catolechiai* Zopf**

NOTE. – To date, this species has been known only from Europe and North America (Zhurbenko 2014). Here we report it for the first time from Asia based on material from Japan.

*Specimen examined.* – JAPAN. HONSHU. ETCHU PROVINCE (TOYAMA PREFECTURE): Mt. Tateyama, Oni Pass, on *Catolechia wahlenbergii* (thallus), 30.vii.1928, *Y. Asahina s.n.* (TNS).

***Plectocarpon cladoniae* R.Sant.**

NOTE. – This species is known from scattered occurrences in the Holarctic (Ertz et al. 2005, Zhurbenko & Pino-Bodas 2017), and is here newly reported from the United States based on a collection from Hawaii.

*Specimen examined.* – U.S.A. HAWAII. HONOLULU COUNTY: O'ahu Island, 2 km W of Kaena, 21°35'N, 158°16'W, elev. 30 m, on *Cladonia* sp. (basal squamules), 23.vi.1999, *H. Kashiwadani 42158* (TNS).

***Polycoccum microcarpum* Diederich & Etayo**

NOTE. – This species was previously known from scattered occurrences in Europe, North America and South America (Brackel 2014, Flakus et al. 2008, Zhurbenko & Pino-Bodas 2017). It is here newly reported from Asia based on material from Japan.



*Specimen examined.* – JAPAN. HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Kitakoma-gun, Mt. Komatsu-dake, elev. 2650 m, on *Cladonia gracilis* ssp. *elongata* (podetia), 16.vii.1974, *H. Shibuichi 5011* (TNS).

***Polycoccum trypethelioides* (Th.Fr.) R.Sant.**

NOTES. – This species is widely distributed in the northern Holarctic (Zhurbenko 2010) and is also known from South America (Etayo & Sancho 2008). It is here newly reported from Japan and Peru. *Stereocaulon commixtum* and *S. curtatoides* are likely new host species.

*Specimens examined.* – CHILE. REGION VIII (BIOBÍO). BIOBÍO PROVINCE: W end of Laguna de la Laja, elev. 1500 m, on saxicolous *Stereocaulon* sp. (phyllocladia, occasionally stems), 3.xii.1987, *H. Kashiwadani 35208* (TNS). JAPAN. HONSHU. MUSASHI PROVINCE (SAITAMA PREFECTURE): Chichibu, Mt. Hafu-san, on *S. dendroides* (stems), 3.v.1968, *M. Fujimoto s.n.* (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Mt. Ontake, Sennin Waterfall, elev. 1850 m, on *S. commixtum* (stems), 12.x.1968, *M. Togashi s.n.* (TNS). KYUSHU. SATSUMA PROVINCE (KAGOSHIMA PREFECTURE): Mt. Kaimon, elev. 940 m, on *S. curtatoides* (stems), 22.viii.1962, *M. Togashi & Nobuki s.n.* (TNS). OHSUMI PROVINCE (KAGOSHIMA PREFECTURE): Yakushima Island, upper stream of Sekiri River, N of Kurio, elev. 700 m, on *S. curtatoides* (stems), 15.x.1969, *M. Fujimoto & H. Izumi s.n.* (TNS); Yakushima Island, Mt. Kuromi-dake, on *S. curtatoides* (stems), 11.x.1962, *M. Togashi s.n.* (TNS), elev. 1700 m, on *S. curtatoides* (phyllocladia, stems), 15.x.1967, *M. Togashi s.n.* (TNS), elev. 1800 m, on *S. curtatoides* (stems), 26.vii.1984, *H. Shibuichi 7625b* (TNS). PERU. CUZCO DEPARTMENT. PAUCARTAMBO PROVINCE: near Paucartambo, Abra Acjanaco, elev. 3400–3500 m, on saxicolous *Stereocaulon* sp. (stems), 17.ix.1984, *H. Kashiwadani 22596* (TNS).

***Pyrenidium actinellum* Nyl. s.l.**

NOTE. – Taken in a broad sense, this is a common cosmopolitan species (Brackel 2014), which is here newly reported from Hawaii in the U.S.A., Papua New Guinea and Taiwan.

*Specimens examined.* – CHILE. REGION X (LOS LAGOS). LLANQUIHUE PROVINCE: between Puerto Varas and Ensenada, along route 225, elev. 20 m, on *Baeomyces* sp. (thallus), 6.xi.1981, *H. Kashiwadani 17154* (TNS). JAPAN. HOKKAIDO. KITAMI PROVINCE: Rishiri-gun, Higashirishiri-cho, Oshidomari, Mt. Rishiri, elev. 1410 m, on *Solorina crocea* (thallus), 18.vii.1974, *M. Inoue 8178* (TNS). HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Shoji-guchi 2-gome, Mt. Fuji, on *Baeomyces rufus* (thallus), 11.viii.1927, *M. Sato s.n.* (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Itoigawa-city, Kitaazumi-gun, Mt. Korenge, elev. 2760 m, on *Solorina crocea* (thallus), 6.viii.1982, *H. Shibuichi 7173* (TNS); on *Protopannaria pezizoides* (thallus), *H. Shibuichi 7170* (TNS). SHIKOKU. IYO PROVINCE (EHIME PREFECTURE): Kamiukena-gun, Ishizuchi Mts., top of Mt. Iwaguro, 33°45'N, 133°09'E, elev. 1700 m, on *Baeomyces placophyllus* (thallus), 8.xi.2013, *Y. Ohmura 10215* (TNS). PAPUA NEW GUINEA. MOROBE PROVINCE: 30 km SE of Wau, Kaisinik, elev. 1900–2000 m, on *Menegazzia* sp. (thallus), 22.xii.1973, *H. Kashiwadani 10720* (TNS). TAIWAN. TAICHUNG CITY MUNICIPALITY: Mt. Nanhuta Shan, route between To-chia-tun Shan and Sheen-ma-jenn Shan, elev. 2500–2900 m, on *Hypotrachyna* sp. (thallus), 11.xi.1989, *H. Kashiwadani 35887a & K. Yoshida* (TNS). U.S.A. HAWAII. HAWAII COUNTY: Hawaii Island, 2 km SSW of Puuanahulu, along Mamalahoa Hwy, 19°48'N, 155°51'W, elev. 600 m, on *Degelia duplomarginata* (thallus), 9.vi.1999, *H. Kashiwadani 41997* (TNS). MAUI COUNTY: Maui Island, Waikamoi Preserve, 0.7 km E of Puu Nianiau, 20°46'N, 156°14'W, elev. 1800 m, on *Diploschistes* sp. (thallus), 16.vi.1998, *Y. Ohmura 5207* (TNS); 0.7 km E of Puu Nianiau, below Hosmer Grove Campground, 20°46'N, 156°14'W, elev. 2000 m, on *Diploschistes* sp. (thallus), 3.vi.1998, *H. Kashiwadani 40553 & K.H. Moon* (TNS).

***Raesaenenia huuskonenii* (Räsänen) D.Hawksw., C.Boluda & H.Lindgren**

NOTES. – This species is widely distributed in the Holarctic, and is rather common in boreal and oroboreal forests (Diederich 2003, Hafellner et al. 1992, Hawksworth 1978, Santesson et al. 2004, Zhurbenko 2009). It is here reported for the first time from Japan.

*Specimen examined.* – JAPAN. HONSHU. KAI PROVINCE (YAMANASHI PREFECTURE): Mt. Fuji, route between Fuji-Yoshida-guchi and 5-gome, elev. 2300 m, on *Bryoria trichodes* (thallus), 26.ix.1953, *K. Togashi s.n.* (TNS-L-128366).

***Roselliniella cladoniae* (Anzi) Matzer & Hafellner**

NOTES. – It is noteworthy that one of the specimens we examined (*Kashiwadani 36747a*) has abnormally long ascospores viz. (26.6–)28.5–36.1(–43.1) × (8.6–)9.8–13.4(–17.5) μm, L/B = (2.0–)2.3–3.3(–4.0) (n = 49). However, the size of the ascospores in that material still corresponds to the range of variation reported for this species by Zhurbenko and Pino-Bodas [2017; (11.8–)18.2–29.0(–38.0) × (7.3–)9.8–13.2(–16.5) μm, L/B = (1.3–)1.7–2.5(–4.0)] and Matzer and Hafellner (1990; 15–52 × 6–17 μm). This is a rather common cosmopolitan species (Zhurbenko & Pino-Bodas 2017), which is here newly reported from Japan, Nepal and North Korea. In Chile it was formerly known only from the Region XII (Magallanes and Chilean Antarctica) (Etayo & Sancho 2008) and extends its known distribution in that country northward.

*Specimens examined.* – **CHILE.** REGION X (LOS LAGOS). OSORNO PROVINCE: 15 km W of Entre Lagos, Parque la Isla, Centro Hidroeléctrico Pilmaiquén, elev. 100 m, on *Cladonia* sp. (podetia), 26.xi.1987, *H. Kashiwadani 35341* (TNS). **FEDERAL DEMOCRATIC REPUBLIC OF NEPAL.** PROVINCE NO. 2: Janakpur, E of Dudhkunda Glacier, elev. 4050 m, on *C. rangiferina* (podetia), 14.x.1988, *T. Iwashina 252* (TNS). PROVINCE NO. 3: Langtang Valley, W of Kyangjin, elev. 3750 m, on *C. rangiferina* (podetia), 9.xi.1988, *T. Iwashina 555* (TNS). **JAPAN.** HOKKAIDO. KUSHIRO PROVINCE: Akan-gun, Tsurui-mura, around Akanuma Pond, elev. 2 m, on *C. cenotea* (podetia, podetial squamules), 5.ix.1992, *H. Kashiwadani 36747a* (TNS). HONSHU. MIKAWA PROVINCE (AICHI PREFECTURE): Minami-shidara gun, Mt. Hooraiji, elev. 500 m, on *C. arbuscula* ssp. *beringiana* (podetia), 24.x.1971, *H. Shibuichi 4583* (TNS). **NORTH KOREA.** HAMKYONGNAM-DO PROVINCE: Mt. Soil-bong, on *C. rangiferina* (podetia), viii.1935, *T. Nakai* (TNS). **U.S.A.** HAWAII. MAUI COUNTY: Molokai Island, Pepeopae, 21°07'N, 156°54'W, elev. 1200 m, on *Cladonia* sp. (podetia), 3.xi.1997, *H. Kashiwadani 40027b* (TNS).

***Roselliniella stereocaulorum* Zhurb., Kukwa & Oset**

NOTE. – This species is known from scattered occurrences in the Holarctic (Zhurbenko et al. 2009), and is here newly reported from Southeast Asia based on a collection from Malaysia.

*Specimen examined.* – **MALAYSIA.** SABAH STATE: Borneo Island, Mt. Kinabalu, between Kambaranga Radio Station and Waterfalls, elev. 2000–2146 m, on saxicolous *Stereocaulon* sp. (stems), 17.v.1963, *M. Mizutani 2424* (TNS).

***Roselliniopsis tartaricola* (Leight.) Matzer**

NOTES. This species was previously known from many reports in Europe and several in Western Asia and North America (Brackel 2014, Hafellner 2004b, Zhurbenko 2017). It is here newly reported from Eastern Asia based on a collection from Japan.

*Specimen examined.* – **JAPAN.** HOKKAIDO. KUSHIRO PROVINCE. Akkeshi-cho, Akkeshi-gun, 42°59'N, 144°33'E, elev. 100 m, on *Pertusaria* sp. growing on bark of decayed *Betula ermanii*, 3.ix.1996, *Y. Ohmura 2765* (TNS).

***Sclerococcum ahtii* (Zhurb. & Pino-Bodas) Ertz & Diederich**

NOTE. – This species is known from many reports throughout northern Holarctic (Pino-Bodas et al. 2017). It is here newly reported from China, Japan and Taiwan.

*Specimens examined* (all on podetia of *Cladonia rangiferina*, mainly on their basal parts). – **CHINA:** “Manchuria”, 8.viii.1943, *M. Takashi s.n.* (TNS). **JAPAN.** HOKKAIDO. NEMURO PROVINCE: Cape Ochiishi, elev. 30 m, 2.ix.1965, *S. Kurokawa 65842a* (TNS). HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): trail between Jumonji Pass and Mt. Kobushi, elev. 2000 m, 7.vii.1959, *S. Kurokawa s.n.* (TNS). **NORWAY.** SVALBARD: Spitsbergen Island, Kongsfjorden, Ossian Sarsfjellet, elev. 0–100 m, 25.vii.1985, *H. Kashiwadani 23210* (TNS). **TAIWAN.** CHIAYI COUNTY: Mt. Shin-Kao-San, elev. 3600–3900 m, 2.i.1964, *S. Kurokawa 358* (TNS).

***Sclerococcum attendendum* (Nyl.) Ertz & Diederich**

NOTE. – This species is widely distributed in the Holarctic and was formerly known in Japan from a single collection made in Honshu, Musaashi Province, growing on *Pilophorus clavatus* (Triebel 1989). Here we report a second collection from Japan, this time growing on *Amygdalaria*.

*Specimen examined.* – **JAPAN.** HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Shimoina-gun, Minamishinano-mura, summit of Mt. Hijiri in Akaishi Mts., elev. 2980–3010 m, on *Amygdalaria elegantior* (cephalodia, thallus), 29.viii.2001, *M. Inoue 29690* (TNS).

***Sclerococcum porphyreum* (Hafellner & Kalb) Ertz & Diederich**

NOTE. – This species was previously known from scattered finds in the Americas (Etayo & Breuss 1998, Hafellner 1985), and is here newly reported from Asia based on a collection from Japan and two collections from Russia.

*Specimens examined* (all on apothecia and thalli of *Brigantiaea ferruginea*). – **JAPAN.** HONSHU. RIKUCHU PROVINCE (IWATE PREFECTURE): Kadoma-guchi, Mt. Hayachine, elev. 900–1300 m, 1.ix.1959, *S. Kurokawa 59270* (TNS). **RUSSIA.** SAKHALIN REGION. Sakhalin Island: Shiratoriko, 21.viii.1932, *M. Sato 29* (TNS); Hoe, 28.vii.1932, *Y. Asahina s.n.* (TNS); Aikawa, Experimental Forest of Tokyo University, 28.vii.1933, *M. Sato 222* (TNS).

***Sphaerellothecium cinerascens* Etayo & Diederich**

NOTE. – This species was previously known from Spain and France in Europe (Etayo & Diederich 1998) and from the Seychelles (Diederich et al. 2017). It is here newly reported from the United States based on material from Hawaii.

*Specimens examined* (both on podetial and basal squamules of *Cladonia* spp.). – **U.S.A.** HAWAII. HONOLULU COUNTY: Oahu Island, Mt. Tantalus, 21°20'N, 157°49'W, elev. 500–600 m, 27.v.1998, *Y. Ohmura 4903* (TNS). KAUAI COUNTY: Kauai Island, Kohua Ridge, along Mohihi Trail, 22°07'N, 159°35'W, elev. 1160–1240 m, 20.x.1997, *H. Kashiwadani 39733* (TNS).

***Sphaerellothecium minutum* Hafellner**

NOTES. – This species, which is widely distributed in both hemispheres, is common on *Sphaerophorus fragilis* and *S. globosus* (Brackel 2014, Hafellner 1993, Zhurbenko 2008). It is here newly reported from the Sakhalin Region of Russia. The species was formerly known in Japan from a single collection made in Hokkaido (Hafellner 1993). We here report several additional collections from Hokkaido.

*Specimens examined* (all on thalli of *Sphaerophorus fragilis*). – **JAPAN.** HOKKAIDO. ISHIKARI PROVINCE: route between Ginsendai Lodge and Mt. Aka-dake, elev. 1750 m, 4.viii.1980, *H. Kashiwadani 16226* & *Y. Endo* (TNS). KITAMI PROVINCE: Shari-gun, route between Mt. Minami-dake and Mt. Iou, elev. 1400 m, 14.viii.1983, *H. Kashiwadani 20085* (TNS); Rishiri-gun, Mt. Rishiri, elev. 1700 m, 12.viii.1970, *H. Kashiwadani 7785* (TNS), elev. 1400 m, 12.viii.1970, *S. Kurokawa 70679* (TNS). NEMURO PROVINCE: Menashi-gun, route between Mt. Sashirui and Futatsuike Pond, elev. 1340–1550 m, 14.viii.1980, *H. Kashiwadani 20070* & *Y. Endo* (TNS). TOKACHI PROVINCE: Kamikawa-gun, Shintoku-cho, trail from Tomuraushi Hot Spring to the top of Mt. Tomuraushi, 43°31'N, 142°51'E, elev. 1800–1900 m, 24.vii.1997, *Y. Ohmura 3557a* (TNS). **RUSSIA.** SAKHALIN REGION: Sakhalin Island, Mt. Suzuya, 19.vii.1932, *F. Fujikawa s.n.* (TNS-L-3879).

***Sphaerellothecium cf. parmeliae* Diederich & Etayo**

NOTES. – The specimen we examined for this study is conspecific with a fungus which was illustrated and described as “*Sphaerellothecium cf. parmeliae*” by Zhurbenko and Zheludeva (2015). This species is widespread in Russia, but so far has not been documented from the Sakhalin Region.

*Specimen examined.* – **RUSSIA.** SAKHALIN REGION: Sakhalin Island, Mt. Suzuya, on *Parmelia omphalodes* (thallus), 19.vii.1932, *F. Fujikawa s.n.* (TNS-L-128367).

***Stigmidium arthrorhaphidis* Hafellner & Obermayer**

NOTES. – The specimens examined differ from the species protologue (Hafellner & Obermayer 1995) in having larger asci [32–45 × 14.5–18 μm (n = 12) in our material vs. 35–40 × 10–12 μm] and larger ascospores [(11.9–)12.6–14.6(–16.4) × (4.4–)4.7–5.3(–5.7) μm (n = 29) in our material vs. (10–)11–12(–13) × 4–4.5(–5) μm]. To date, this species has been reported from China and Nepal (Hafellner & Obermayer 1995), and is here newly reported for Japan.

*Specimens examined* (both on thalli of *Arthrorhaphis cf. alpina*). – **JAPAN.** HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Chino-city, Kita-Yatsugatake Mts., Mugikusa Pass,

36°03'29"N, 138°20'19"E, elev. 2100 m, 5.ix.2014, *Y. Ohmura 10976* (TNS); 8.viii.2015, *Y. Ohmura 10745* (TNS).

***Stigmidium beringicum* Zhurb. & Triebel**

NOTES. – The material of this species that was examined for this study was particularly rich and revealed that compared with the protologue (Zhurbenko & Triebel 2008) the asci are somewhat broader [(44–)50–62(–67) × (11.5–)12.5–16.5(–18) μm (n = 22) in our material vs. (40–)47–60(–70) × (9–)10–13(–15) μm], and the ascospores somewhat larger [(15.5–)17.2–20.8(–24.4) × (4.0–)4.7–5.5(–6.9) μm, L/B = (2.6–)3.2–4.2(–5.1) (n = 100) in our material vs. (14–)16–19(–20) × (3.5–)4–5 μm, L/B = (3.0–)3.4–4.4(–5)]. Further, the ascospores are occasionally pale brown and verruculose when postmature. This species was previously known from the Beringia Region of Russia and the United States where it was found on *Stereocaulon alpinum* and *Stereocaulon* sp. (Zhurbenko & Triebel 2008). We report this species for the first time from Japan. *Stereocaulon commixtum*, *S. curtatum*, *S. curtatoides*, *S. dendroides*, *S. nigrum*, *S. octomerellum* and *S. vesuvianum* are new host species.

*Specimens examined.* – JAPAN. HOKKAIDO. ISHIKARI PROVINCE: Yubari, Mt. Yubari-dake, elev. 1660 m, on *Stereocaulon dendroides* (phyllocladia), 3.viii.1980, *H. Shibuichi 6052* (TNS). HONSHU. AKI PROVINCE (HIROSHIMA PREFECTURE): Sandankyo Gorge, on *S. commixtum* (phyllocladia, stems), 30.x.1955, *M. Togashi s.n.* (TNS). ETCHU PROVINCE (TOYAMA PREFECTURE): Magawa, on *S. nigrum* (phyllocladia), 26.vii.1936, *Y. Asahina s.n.* (TNS). MUSASHI PROVINCE (SAITAMA PREFECTURE): Chichibu, Kuroiwa, on *S. curtatum* (cephalodia, phyllocladia), 26.vii.1933, *Y. Asahina 1237* (TNS), *Y. Asahina 1544* (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Ohmachi-shi, Mt. Eboshi-dake, elev. 2600 m, on *S. octomerellum* (phyllocladia), 17.viii.1968, *H. Shibuichi 3480* (TNS); Chino-shi, Mt. Amida-dake, elev. 2800 m, on *S. curtatum* (phyllocladia), 6.viii.1990, *H. Shibuichi 8866* (TNS). UZEN PROVINCE (YAMAGATA PREFECTURE): Yonezawa-city, Mt. Nishi-Azuma, Tengu-iwa, 37°44'N, 140°09'E, elev. 2000 m, on *S. curtatum* (phyllocladia), 24.viii.1995, *K.H. Moon 562a* (TNS), *K.H. Moon 563* (TNS), *H. Kashiwadani 38662* (TNS), *H. Kashiwadani 38675a* (TNS), on *S. dendroides* (phyllocladia), 11.viii.1979, *H. Kashiwadani 15425* (TNS), on *S. vesuvianum* (phyllocladia), 24.viii.1995, *H. Kashiwadani 38694* (TNS). KYUSHU. OHSUMI PROVINCE (KAGOSHIMA PREFECTURE): Yakushima Island, Mt. Kuromi-dake, elev. 1800 m, on *S. curtatoides* (phyllocladia), 26.vii.1984, *H. Shibuichi 7625a* (TNS).

***Stigmidium hafellneri* Zhurb.**

NOTE. – This species was previously known from Estonia in Europe (Suija et al. 2015) and Russia in Asia (Zhurbenko 2009, Zhurbenko & Kobzeva 2016). It is here newly reported for Japan.

*Specimen examined.* – JAPAN. HOKKAIDO. ISHIKARI PROVINCE: Daisetsu Mts., Takanehara, elev. 1750 m, on *Flavocetraria cucullata* (thallus), 5.vii.1980, *H. Kashiwadani 16528* & *Y. Endo* (TNS).

***Stigmidium joergensenii* R.Sant.**

NOTE. – This species was previously known from Venezuela in South America (Santesson 1989), Greenland (Alstrup et al. 2009) and Italy in Europe (Roux & Triebel 1994). It is here newly reported for Asia based on two collections from Japan.

*Specimens examined* (both on thalli of *Lichenomphalia hudsoniana*). – JAPAN. HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Yatsugadake Mts., 27.vii.1959, *M. Togashi* & *S. Kurokawa s.n.* (TNS); Mt. Shirouma, Hakuba-Ohike, 22.viii.1936, *Y. Asahina s.n.* (TNS).

***Stigmidium microcarpum* Alstrup & J.C.David**

NOTE. – This species is known from scattered localities throughout the Holarctic (Brackel 2014, Zhurbenko 2009), and is here newly reported for China and Japan.

*Specimens examined.* – CHINA. JI LIN SHEN PROVINCE: Da Yang Di, Bai He, Mt. Chanbai, 4 km S of the Chanbai Mountain Ecosystem Station, elev. 1000 m, on *Vulpicida pinastri* (thallus), 14.vii.2007, *H. Kashiwadani 48245* (TNS). JAPAN. HOKKAIDO. ISHIKARI PROVINCE: Mt. Yubari, on *V. juniperinus* (thallus), 5.ix.1972, *S. Kurokawa 72172* (TNS); Furano-city, Mt. Tairoku, elev. 1450 m, on *V. juniperinus* (thallus), 5.viii.1980, *H. Shibuichi 6154* & *K. Yoshida* (TNS). TOKACHI PROVINCE: Mt. Goshiki, elev. 1860 m, on *V. juniperinus* (thallus), 7.viii.1980, *H. Kashiwadani 16479* & *Y. Endo* (TNS). HONSHU. ETCHU PROVINCE (TOYAMA PREFECTURE): Mt. Oyama, Higashi-Ichinokoshi,

elev. 2500–2700 m, on *V. juniperinus* (thallus), 21.viii.1982, *S. Kurokawa 82014b* (TNS). KAI PROVINCE (YAMANASHI PREFECTURE): Minami-Alps city, Sensui Pass, on *Flavocetraria cucullata* (thallus), 12.viii.1937, *Y. Asahina s.n.* (TNS). SHINANO PROVINCE (NAGANO PREFECTURE): Mt. Yoko-dake, Jogo-sawa, on *V. juniperinus* (thallus), 26.vii.1959, *T. Togashi & S. Kurokawa s.n.* (TNS).

***Stigmidium microspilum* (Körb.) D.Hawksw.**

NOTES. – This species is known from many localities throughout Europe (Brackel 2014) and was also reported from Western Asia (Kinalioglu & Aptroot 2017, Zhurbenko 2017), always growing on *Graphis scripta*. It is here newly reported from Eastern Asia based on material from Japan. *Graphis tenella* is also a new host species.

*Specimen examined.* – JAPAN. SHIKOKU. AWA PROVINCE (TOKUSHIMA PREFECTURE): Shodo-gun, Uchinomi-cho, Kankakei, route between ropeway Sancho-station and Kountei, elev. 500 m, on *Graphis tenella* (thallus), 19.xii.1998, *K.H. Moon 3550a* (TNS).

***Stigmidium stereocaulorum* Zhurb. & Triebel**

NOTES. – This species is known from a small number of localities in European and Asian parts of the Russian Arctic (Zhurbenko & Triebel 2008) and in the Austrian Alps (Zimmermann & Berger 2018). It is here newly reported from Japan.

*Specimen examined.* – JAPAN. HONSHU. MUTSU PROVINCE (AOMORI PREFECTURE): Mt. Hakkoda, on *Stereocaulon* sp. (phyllocladia), 16.viii.1935, *F. Fujukawa 1257* (TNS).

***Stigmidium subcladoniicola* van den Boom**

NOTES. – In the specimens cited here, the ascospores were slightly larger than was reported in the protologue [van den Boom 2016; (6.6–)6.8–8.0(–8.8) × (2.4–)2.5–3.3(–3.9) μm (n = 25) in our material vs. (6–)6.5–7 × 2–2.5 μm]. This species was previously known only from the type locality in the Azores, Portugal (van den Boom 2016). Here it is newly reported from Asia based on material from Thailand, and from the United States based on material from Hawaii.

*Specimens examined* (both on podetial squamules and occasionally stems of *Cladonia* spp.). – THAILAND. PISANUKLOK PROVINCE: Phuhinlongkla National Park, Lan Hin Taek, elev. 1065 m, 22.ii.1998, *K.H. Moon 2142a & H. Kashiwadani* (TNS). U.S.A. HAWAII. HAWAII COUNTY: Hawaii Island, Kaopapa, 19°04'N, 155°41'W, elev. 600 m, 3.vi.1999, *H. Kashiwadani 41928* (TNS).

***Stigmidium tabacinae* (Arnold) Triebel**

NOTE. – This species is widely distributed in the Holarctic (Brackel 2014), and is here newly reported from Japan.

*Specimen examined.* – JAPAN. HONSHU. MUSASHI PROVINCE (SAITAMA PREFECTURE): Chichibu-gun, Ohtaki-mura, route between Mikuni Pass and Jyumonji Pass, Azusa-shiroiwa, elev. 1850 m, on *Toninia tristis* ssp. *fujikawae* (thallus), 9.12.1996, *H. Kashiwadani 41757* (TNS).

***Talpapellis beschiana* (Diederich) Zhurb., U.Braun, Diederich & Heuchert**

NOTE. – This is a common species that is widely distributed in the Holarctic (Heuchert et al. 2018). It is here reported for the first time from Japan and also from South America based on a collection from Chile.

*Specimens examined.* – CHILE. REGION IX (ARAUCANÍA). MALLECO PROVINCE: 35 km W of Angol, Nahuelbuta National Park, elev. 1250–1350 m, on *Cladonia* sp. (basal squamules), 29.xi.1987, *H. Kashiwadani 35053* (TNS). JAPAN. HOKKAIDO. TOKACHI PROVINCE: Kato-gun, Shikaoi-mura, Lake side of Nishi-Konuma, elev. 900 m, on *C. amaurocraea* (podetia), 26.vi.1979, *H. Kashiwadani 15177* (TNS); Kato-gun, route between Shikaribetsu and Komadome lakes, elev. 950 m, on *C. uncialis* (podetia), 29.vi.1970, *M. Togashi s.n.* (TNS-L-32710).

***Tremella everniae* Diederich**

NOTE. – This species is known from scattered reports throughout the Holarctic (Brackel 2014), and is here newly reported from Bhutan and Japan.

*Specimens examined.* – BHUTAN. GASA DISTRICT: Laum Thang (3900)–Singke La (4950)–Chawa Gassar (4000), on *Evernia* cf. *mesomorpha* (thallus), 19.v.1967, *H. Hara et al. s.n.* (TNS-L-

128368). **CHINA**. SICHUAN PROVINCE. ABA PREFECTURE: Songpan County, Huanglong, 32°45'N, 103°49'E, elev. 3100 m, on *E. mesomorpha* (thallus), 8.x.1999, *K.H. Moon 5022a* (TNS). **JAPAN**. HONSHU. SHINANO PROVINCE (NAGANO PREFECTURE): Suwa-gun, Mt. Yatsugadake, elev. 1970 m, on *E. esorediosa* (thallus), 22.vii.1972, *H. Kashiwadani s.n.* (TNS).

***Zwackhiomyces berengerianus* (Arnold) Grube & Triebel**

NOTE. – This species is known from scattered reports throughout the Holarctic (Grube & Hafellner 1990, Kukwa & Flakus 2009, Zhurbenko 2017, Zhurbenko & Santesson 1996, Zhurbenko et al. 1995), and is here newly reported from Japan.

*Specimen examined.* – **JAPAN**. HONSHU. AKI PROVINCE (HIROSHIMA PREFECTURE): Togochi-cho, Yamagata-gun, Mt. Osorakan, 34°35'N, 132°08'E, elev. 1320 m, on *Mycobilimbia berengeriana* (thallus), 29.v.1993, *Y. Ohmura 400* (TNS).

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