

NEW AND NOTEWORTHY LICHEN-FORMING AND LICHENICOLOUS FUNGI, 12

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Seven species new to science are described, illustrated and compared with closely related taxa. Of them, one species, i.e.: *Coppinsidea vernadskiensis* S. Y. Kondr., T. O. Kondratiuk et I. Yu. Parnikoza is from the Argentine Islands, Western Maritime Antarctic Peninsula, *Jackelixia hosseussii* S. Y. Kondr., L. Lökös et J.-S. Hur, from South America (Argentina and Uruguay), *Loekoeslaszloa reducta* Yoshik. Yamam. et S. Y. Kondr. from Eastern Asia (Japan), *Orientophila viticola* S. Y. Kondr., L. Lökös et J.-S. Hur from Eastern Asia (South Korea), *Ovealmbornia ovei* S. Y. Kondr., L. Lökös, I. Kärnefelt et A. Thell, and *Xanthokarroa elsiae* S. Y. Kondr., L. Lökös, I. Kärnefelt et A. Thell from Africa, as well as *Oxneria imshaugii* S. Y. Kondr. from North America. The new combination *Jackelixia australis* (for *Xanthoria parietina* var. *australis* Zahlbr.) is proposed. *Jackelixia hosseussii* is for the first time recorded as host for the lichenicolous fungus *Arthonia anjutii* S. Y. Kondr. et Alstrup. The latter species is for the first time recorded from South America. *Intralichen christiansenii* (D. Hawksw.) D. Hawksw. et Cole is for the first time recorded from South Korea.

Key words: Antarctica, *Arthonia anjutii*, *Coppinsidea*, *Dufourea* clade, *Jackelixia*, Japan, *Intralichen*, *Langeotia*, *Loekoeslaszloa*, *Orientophila*, *Ovealmbornia*, South America, *Xanthokarroa*

INTRODUCTION

A number of new-to-science species from eastern and southern Asia, i.e. South Korea and Japan, as well as from India, were recently described and illustrated (Kondratyuk *et al.* 2016a, b, c, d, e, f, 2017a, b, 2018, 2019a, c, d). During our revision of the lichen collections of 2018–2019 deposited in KW-L and KoLRI several new species were found.

The status of some species is still being clarified and this communication is devoted to results of analysis of taxa of the genera *Coppinsidea*, *Jackelixia*, *Loekoeslaszloa*, *Orientophila*, *Ovealmbornia*, *Oxneria*, and *Xanthokarrooa* from the Asian, South American and the Antarctic continents, as well as to data on a few new taxa discovered within our comparative study during the revision of recent and previous collections kept in the KoLRI, KW-L, LWG and BP.

MATERIAL AND METHODS

Revision of taxa listed below was based on herbarium specimens collected in previous years in Asia and South America and deposited in the herbaria KoLRI, BP, KW-L, as well as on fresh specimens from Antarctica collected during seasonal Antarctic Ukrainian expeditions in 2018 and 2020. The specimens included in the comparative study were examined using standard microscopical techniques and hand-sectioned under a dissecting microscope (Nikon SMZ 645; Nikon, Tokyo, Japan). Anatomical descriptions were based on observations of these preparations under a microscope (Nikon Eclipse E200; Nikon, Tokyo, Japan, and Zeiss Scope, A1; Carl Zeiss, Oberkochen, Germany) with digital camera AxioCam ERc 5s. Section of apothecia were tested with water and with K and IKI (10% aqueous potassium iodide) for identification. For identification of chemical substances of critical taxa standard TLC and HPTLC methods with solvent C were carried out (Orange *et al.* 2010).

RESULTS

Descriptions of taxa

Coppinsidea vernadskiensis S. Y. Kondr., T. O. Kondratiuk
et I. Yu. Parnikoza, *spec. nova*
(Fig. 1)

MycoBank No.: MB 846017

Similar to Biatora vernalis, but differs in having variegated colour of thallus, larger thalline granules, larger and black apothecia, blue-greenish black epihyme-

nium and uppermost hymenium and brownish hypothecium, longer and wider, and 0(–3)-septate ascospores becoming brownish at overmature as well as in its distribution.

Type: Western Coast of Antarctic Peninsula, Argentine Islands, Galindez Island, 'Skelna stinka' (= Rocky wall) of Worle Hill locality, growing on mosses together with *Bryoria*, *Lepraria* and *Cladonia* spp. Coll.: Parnikoza, I. Yu. (IP6), 02.03.2020 (KW-L – holotype); the same locality, [Galindez, Skelny Kupol], Parnikoza, I. Yu. (IP 5), 02.03.2020, as small fragments among *Ochrolechia* sp., growing together with *Pyrenodesmia vernadskiensis* and *Lecidea* sp., *Lepraria* sp. with *Lichenostigma*, (KW-L – isotype).

Thallus consisting of aggregated granules, light grey, whitish grey, greenish grey to brownish grey (and somewhat similar to *Pyrenodesmia vernadskiensis*, see below); thalline granules more or less rounded, in section to 0.15–0.2(–0.4) mm diam./across, almost completely filled out by algal cells.

Apothecia 0.3–1.5(–2.0) mm diam. and to 0.4–0.45(–0.5) mm thick in section, very varying in size, from seem to be immersed into thallus and convex, than to hemispherical and emarginated (or own margin indistinct), regularly rounded and distant or often aggregated in groups (especially along bryophyte branches) and irregular; black, more or less shiny; true exciple badly developed to 36 μm thick in the outermost lateral portion while badly distinct or becoming almost indistinct in basal portion, light or medium brown; hymenium to 140–160(–200) μm high, in the uppermost portion greenish-bluish-blackish, while more or less brownish in the lower portion; subhymenium 150–200 μm thick, dark brown in the upper portion and light brown in the lower portion; ascospores elongate or subcylindrical, sometimes clavate, hyaline at first, however at overmature (especially in the lower portion of hymenium) becoming brownish, simple, and rarely 1–3-septated seen too [general situation, ascospores 0(–3)-septate, while only simple ascospores seen outside asci], with more or less rounded ends (not attenuated), (14.4–)16.8–24(–27.6) \times (3.6–)4.8–6.0(–6.5) μm .

Ecology: Growing on mosses and plant remnants above rocks.



Fig. 1. *Coppinsidea vernadskiensis* (KW-L – holotype – left, KW-L – isotype – right), general habit. Scale: 1 mm. (Photo by S. Kondratyuk)

Distribution: It is so far known only from the type locality, i.e. Western Coast of Antarctic Peninsula, Argentine Islands, Galindez Island.

Etymology: It is named after the type locality, i.e. V. I. Vernadsky Ukrainian Antarctic Station, which is situated on Galindez Island of Argentine Islands, the Maritime Antarctic.

Taxonomic notes: The genus *Coppinsidea* S. Y. Kondr., Farkas et L. Lőkös as monophyletic branch of the Ramalinaceae proposed to include nine species (Kondratyuk *et al.* 2019b). *Coppinsidea vernadskiensis* is supposedly the next member of the same branch, while our efforts to get molecular data on this species were so far still unsuccessful.

Coppinsidea vernadskiensis is similar to *Biatora vernalis* (L.) Fr. growing on mossy tree trunks in old woodlands rarely on sheltered mossy rocks in montane areas of western and Central Europe, but differs in having variegated colour of thallus (*vs* whitish or green-white, often with a varnish-like sheen), in having larger thalline granules (*vs* 80–150 µm diam.), in having larger and black apothecia (*vs* 0.4–0.8 mm diam., pale to testaceous), in having blue-greenish black epihymenium and uppermost hymenium and brownish hypothecium (*vs* without distinct pigmentation in section, except for a pale straw (K+ yellowish) coloured hypothecium), as well as in having longer and wide and 0(–3)-septate (*vs* (10–)12–19 × 3.5–5 µm, 0(–1) septate) ascospores becoming brownish at overmature, as well as in distribution.

Coppinsidea vernadskiensis is similar to *Bilimbia lobulata* (Sommerf.) Hafellner et Coppins recorded also from Antarctic Peninsula (Øvstedal and Lewis Smith 2001) after having black hemispherical emarginated apothecia, and blue-black uppermost portion of hymenium, but differs in having larger apothecia (*vs* to 0.7 mm diam.), in having higher hymenium (*vs* 70–90 µm high), in having longer and 0(–3)-septate (*vs* 14–16 × 5–7 µm, and 1–2-septate) ascospores, as well as in the lack of purplish exciple.

Coppinsidea vernadskiensis can be keyed out also to *Bryobilimbia hypnorum* (Lib.) Fryday, Printzen et S. Ekman recorded from Antarctic Peninsula too (Øvstedal and Lewis Smith 2001), but differs in having larger and 0(–3)-septate (*vs* ca 10 × 6 µm, ovate, simple or 1-septate) ascospores, as well as in the lack of blue 'crystals' in the hymenium.

Coppinsidea vernadskiensis can be similar to *Bacidia johnstonii* C. W. Dodge recorded also from Antarctic Peninsula (Øvstedal and Lewis Smith 2001), but differs in shorter and wider, 0(–3)-septate (*vs* 20–23 × 2.5–3 µm, 5–6-septate) ascospores.

Coppinsidea vernadskiensis is similar to *Pyrenodesmia vernadskiensis* S. Y. Kondr., T. O. Kondratiuk et I. Yu. Parnikoza recently described from Western Coast of Antarctic Peninsula (Kondratyuk *et al.* 2020) in having light grey, greenish grey to brownish grey and much thinner crustose thallus (*vs* thal-

lus fruticose, thalline tufts to 5–7 mm thick), as well as in bryophilous habit, but differs in having whitish grey or greenish grey in the uppermost portions, larger and somewhat plane or pressed from the top thalline portions i.e.: much thinner crustose thallus (*vs* thallus fruticose, thalline tufts to 5–7 mm thick, where thalline portions very thin and forming tree-like branched formations, dark brownish or brownish grey), in having larger and somewhat immersed (and emarginated) apothecia (to 1.5(–2) mm across and very varying in size (*vs* disk plane and own margin well distinct), as well as in having 0(–1–2–3)-septate (*vs* bipolar and hyaline) ascospores becoming brownish at overmature.

Coppinsidea vernalskiensis is similar to *Micarea lignaria* (Ach.) Hedl. after having bluish-greenish black epihymenium, in having black convex to hemispherical emarginated apothecia, and in having small to 0.1–0.3 mm thalline warts and light grey to brownish grey thallus, but differs in having larger apothecia (*vs* 0.2–0.4(–0.6) mm diam. which often aggregated in groups reminding raspberry fruit), in having blue-green epihymenium (*vs* olive, sometimes violet), in having brown subhymenium (*vs* hyaline), and in having 0(–3)-septate and ovoid ascospores (*vs* 3–7-septate, elongated to elongate fusiform).

Coppinsidea vernalskiensis is similar to *Ropalospora lugubris* (Sommerf.) Poelt, a Eurasian montane species, growing on open silicate outcrops, after having high hymenium (i.e. to 120–140 µm high), and after having light grey to brownish thallus, but differs in having smaller thalline areoles (*vs* 0.15–0.8(–2) mm across), in having emarginated convex apothecia (*vs* own margin to 0.7–0.2 mm thick well distinct), in having indistinct or undeveloped true exciple (*vs* well developed, blackish brown in the outermost portion and lighter inner portion), in having blue-green epihymenium (*vs* dirty violet, brownish to olive), in having shorter and narrower, and 0(–3)-septate (*vs* 35–50 × 5–7 µm, 5–6-septate) ascospores which becoming brownish at overmature, as well as in the lack of pruina on thallus, as well as in the lack of a black hypothallus.

Jackelixia hosseussii S. Y. Kondr., L. Lőkös et J.-S. Hur, *spec. nova*
(Figs 2–4)

Mycobank No.: MB 846018

Similar to Jackelixia filsonii, but differs in having much larger size of lobes, which may sometimes form rosette-like regularly rounded thallus, as well as in having longer and wider ascospores and wider ascospore septum.

Type: Argentina: Prov. Cordoba, Dept. Rio Primero 12 km, nō. Santa Rosa auf *Lippia turbinata*, coll. C. C. Hosseus (No. 74), 30.06.1932 (BP 85922 – holotype); the same locality, *Jackelixia hosseussii* damaged by *Xanthoriicola physciae* in parts (BP 47264 – isotype); the same locality, *Jackelixia hosseussii* damaged by *Arthonia anjutii* in parts (BP 47264 – isotype).

Thallus (3–)7–10(–15) mm across, but may form aggregations to several cm across, foliose, dull deep yellow or dull pure yellow to somewhat lighter or whitish yellow in the central portion of thallus (under apothecia), smooth, matt or slightly shiny in places. Lobes about to (1–)3–5 mm long and (0.7–)1.5–2(–3) mm wide, at first more or less distinct in peripheral portions, from very narrow and distinctly branched at initial stage and to more or less indistinct with overlapping edges, horizontally orientated or slightly downwards folded edges, later becoming very indistinct in shape and measurements; more or less closely attached to the substrate; terminal portions somewhat irregularly dissected into smaller portions 0.8–1.2 mm wide and to 1 mm long. Underside white, only at the edges slightly yellow. Hapters of *Xanthodactylon*-type (sensu Kondratyuk *et al.* 2008) to 0.1–0.2 mm wide along the thalline lobe edges (usually at the basis of secondary dissections) sometimes observed, while no rhizines on lower surface found.

Thallus in section to (80–)95–115 μm thick, very thin, more or less the same thickness throughout, or only with slight thickening at the edge, upper cortical layer to 20–25 μm thick, leptodermatous paraplectenchymatous with cell lumina 6–10(–12) μm across, more or less vertically elongated; algal layer to 25–40 μm thick; medullar to 30–40(–50) μm thick sometimes with hyphae bunches to 20–40 μm diam./across (scleroplectenchymatous type); lower cortical layer (12–)15–20 μm thick, mesodermatous paraplectenchymatous of 1–2(–3) layers of rounded cell, lumina of which (2–)3–5(–7) μm diam.

Apothecia to (0.3–)0.5–1.2(–1.5) mm diam., lecanorine, concolorous with thallus, deep yellow or dull deep yellow initially in thalline warts but soon becoming erumpent or sessile, distinctly uplifted above lobe level and distinctly constricted at the basis; thalline margin rather thick, to 0.1–0.13 mm wide, distinctly uplifted level of disc; disc dull brownish yellow, slightly darker of thallus in mature or overmature apothecia; in section zeorine, where true exciple to 25–30 μm thick in the uppermost lateral portion and (5–)10–12 μm thick in

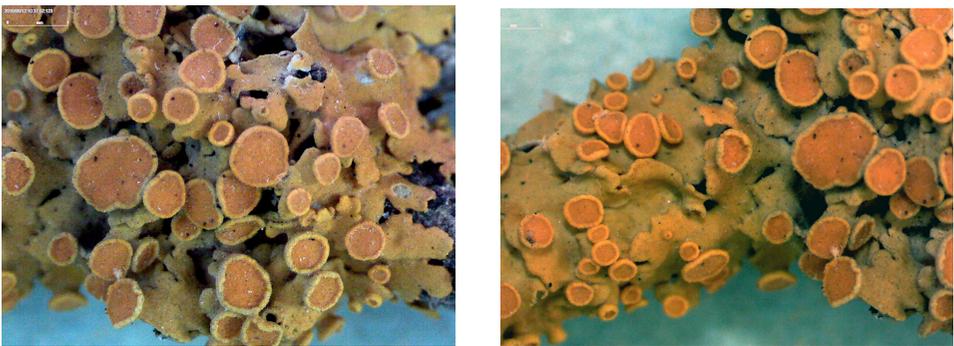


Fig. 2. *Jackelixia hosseussii* (BP 47264), general habit. Scale: 1 mm. (Photo by S. Kondratyuk)

lower lateral and basal portion, with distinct matrix, *textura intricata*; thalline exciple to 50–60 μm thick, with cortical layer to 30–40 μm thick especially well developed on underside, leptodermatous paraplectenchymatous, cell lumina 10–12 μm long/across, somewhat vertically elongated; hymenium 70–75 μm high; paraphyses distinctly swollen towards the tips to 5–7(–7.5) μm diam., subhymenium 12–15 μm thick, very thin, hyaline; asci 8-spored; ascospores oval to fusiform or cigar-like, widened at the septum and with attenuated ends, sometimes somewhat curved, (11–)13–16(–19)[–21] \times (5.5–)6–7(–9) μm in water [42 measurements], and becoming more variable in shape, from long and narrow to rather wide and almost spherical, (12–)15–17(–20) \times (7.5–)8–10(–12) μm in K [40 measurements]; ascospore septum (6–)7–9(–11) μm wide in water and (6–)7–10(–11) in K.

Chemistry: Epihymenium, outer portion of cortical layer of thalline exciple and thallus K+ crimson purple.

Ecology: Growing on bark of rather thin twigs often together with species of the genera *Teloschistes*, *Candelaria*, *Buellia*, and *Physcia*, as well as associated with various species of the following genera: *Parmotrema*, *Rinodina*, *Physconia*, *Caloplaca*, *Heterodermia*, *Phaeophyscia*, and *Lecanora*.

Jackelixia hosseussii found to be damaged by the lichenicolous fungi *Xanthoriicola physciae* (BP 47264) and *Arthonia anjutii* (BP 87354).

Etymology: It is named after well-known German botanist Dr Carl Curt Hosseus (1878–1950) in recognition of his contribution to investigation of South American flora and who has provided type collection of this species.

Taxonomic notes: *Jackelixia hosseussii*, from South American continent (Argentina and Uruguay), is characterised by very small thallus and irregularly developed and horizontally orientated thalline lobes and differs from all other members of the genus *Jackelixia*, a member of the *Dufourea* s. l. clade of the subfamily Xanthorioideae of the family Teloschistaceae, in having much longer and wider ascospores and in having much wider ascospore septum.

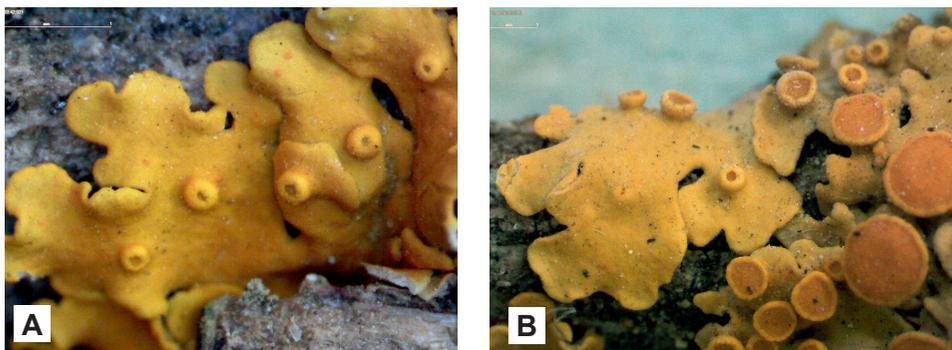
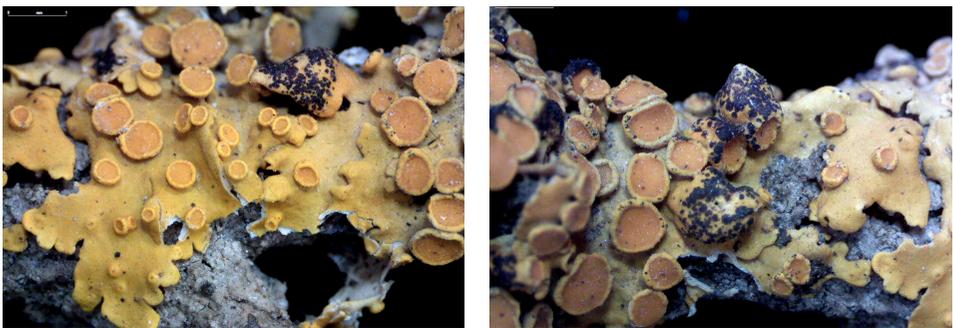


Fig. 3. General habit of thalline lobes of *Jackelixia hosseussii* (A = BP 87354, B = BP 47264). Scale: 1 mm. (Photo by S. Kondratyuk)

Jackelixia hosseussii is similar to the Australian epiphytic lichen *Jackelixia filsonii* (Elix) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell after having small irregularly developed and horizontally orientated (not uplifted and not bent downwards) where apothecia often covering thallus and thalline lobes hardly seen in peripheral zone or between apothecia. However, *J. hosseussii* differs in having much larger size of lobes, which may sometimes form rosette-like regularly rounded thallus, as well as in having very thin true exciple, and in having longer and wider ascospores and wider ascospore septum.

In contrast to all other epiphytic members of the genus *Jackelixia* (i.e. *J. elixii* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. hypogymnioides* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. kangarooensis* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. streimannii* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. whinrayi* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, and *J. yorkensis* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell from Australia, as well as *J. dissectula* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell from Africa, and *J. incavata* (Stirton) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell from New Zealand) *J. hosseussii* differs in having longer and wider ascospores and in having wider ascospore septum (see also Kondratyuk *et al.* 2006, 2009, Kondratyuk and Galloway 1996).

Furthermore, it differs from *J. streimannii*, *J. hypogymnioides* and *J. incavata* in having smaller thallus and in having smaller and flat (not convex) thalline lobes. From *J. elixii*, *J. kangarooensis*, *J. whinrayi* and *J. yorkensis* it differs in having smaller thallus and in having mainly smaller and irregularly developed thalline lobes which do not form distinct peripheral zone without apothecia. In contrast to the African *Jackelixia dissectula*, *J. hosseussii* has smaller thallus and thalline lobes which not widened towards the tips.



Figs 4. General habit of *Jackelixia hosseussii* damaged by *Arthonia anjutii*, isotype, BP 87354. Scale: 1 mm. (Photo by S. Kondratyuk)

From epilithic species of the genus *Jackelixia* (i.e. *J. ligulata* (Körb.) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. angustata* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, *J. australis* (Zahlbr.) S. Y. Kondr. and some other still undescribed taxa) *J. hosseussii* differs in having irregularly developed, horizontally orientated, flat thalline lobes (edges not uplifted and not folded downwards) and in having larger spores and wider ascospore septum.

After somewhat whitish colour thallus it can be compared with the African *Langeottia ottolangei* (S. Y. Kondr., V. Wirth et Kärnefelt) S. Y. Kondr., Kärnefelt, Elix, A. Thell, J. Kim, M.-H. Jeong, N.-N. Yu, A. S. Kondratiuk et J.-S. Hur, which also belongs to the *Dufourea* clade of the subfamily Xanthorioideae of the family Teloschistaceae. However, *Jackelixia hosseussii* differs from *Langeottia ottolangei* in having dull yellow to dull whitish-yellowish and smaller thallus, in having irregularly developed thalline lobes, which often do not form distinct peripheral zone without apothecia, as well as in anatomical characters of apothecia and in measurements of ascospores (Kondratyuk *et al.* 2014, Wirth and Kondratyuk 2010).

Unfortunately, we have not had access to freshly collected specimens that is why this species is still waiting to have its position determined by molecular characters.

The specimen BP 87354 of *Jackelixia hosseussii* found to be richly damaged by *Arthonia anjutii* S. Y. Kondr. et Alstrup originally described from Australian, South African and North American *Teloschistes* spp. (Kondratyuk 1996). *Arthonia anjutii* is especially abundantly damaged the thalline lobes (Fig. 3) and thalline margin of apothecia of *Jackelixia hosseussii* (Fig. 4). *Arthonia anjutii* is for the first time recorded from South America.

During revision of South African and Australian material previously recorded under name *Xanthoria parietina* (L.) Th. Fr. a number of new taxa were proposed (Kärnefelt *et al.* 2002, Kondratyuk *et al.* 2004, 2006, 2009, etc.), which later became members of separate genera *Xanthokarrooa*, *Dufourea*, *Jackelixia* (Fedorenko *et al.* 2009, Kondratyuk *et al.* 2014).

Main part of the Southern Hemisphere members of the *Xanthoria* s. l. (except *Xanthoria parietina* and Australian *Xanthoria coomae* S. Y. Kondr. et Kärnefelt) belong now to the genus *Jackelixia*, which itself is a member of the *Dufourea* s.l. clade of the subfamily Xanthorioideae of the family Teloschistaceae (Kondratyuk *et al.* 2014). There are more than 10 species in the genus *Jackelixia* in Australian continent and one species, i.e. *J. dissectula* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell is presented in South Africa. The genera *Xanthokarrooa* and *Dufourea* include hitherto only South African taxa.

South American material was long time waiting for special revision, while we have had the first data confirming its unique status among other

xanthorioid lichens since early 2000s. At that time we have investigated for the first time H. Osorio's specimens of '*Xanthoria parietina*' from Uruguay kept in Scandinavian herbaria (UPS, LD, etc.). However, this species was waiting for legal description owing to the lack of rich collection which could be selected as type. Unfortunately, numerous H. Osorio's specimens, which now are kept as duplicates in various herbaria of Europe (UPS, LD, KW-L, etc.) included too small specimens to be selected as type in spite of our special search and revision of all available duplicates of H. Osorio's collection. During recent visit of the senior co-author to BP herbarium large number of specimens of this species was found.

Jackelixia australis (Zahlbr.) S. Y. Kondr., *comb. nova* – MycoBank No.: MB 846019 – Basionym: *Xanthoria parietina* var. *australis* Zahlbr., K. svenska Vetensk-Akad. Handl. 57 (no. 6) 49 (1917). – Syn.: *Xanthoria australis* (Zahlbr.) C. W. Dodge, Transactions of the American Microscopical Society 84: 507 (1965); *Dufourea australis* (Zahlbr.) Frödén, Arup et Söchting, Nordic J. Bot. 31(1): 42 (2013).

Loekoeslaszloa reducta S. Y. Kondr., Y. Kusui, Kajiro Hara et
Yoshik. Yamam., *spec. nova*
(Figs 5–7)

MycoBank No.: MB 846020

Similar to Loekoeslaszloa geumohdoensis, but differs in having indistinct or very thin continuous thallus, in having immersed (or crater-like) or semiimmersed smaller and being mostly distant and not coalescing soralia, in having lecanorine or zeorine apothecia, in having K+ reaction of epihymenium and uppermost true exciple, and in different substrate, as well as in the lack of thalline areoles and highly uplifted soledious mass.

Type: Japan: Okinawa: Ginowan-shi, Ginowan Seaside Park, N 26.280006°, E 127.733016°, alt. 5 m a.s.l., on bark of *Casuarina stricta*, growing together with *Buellia* sp. and one more sterile crustose lichen. Coll.: Tadashi Tawada (29081301), 13.08.2019 (KW-L ex OSA-Li – holotype); the same locality, on bark of *Casuarina stricta*, coll.: Tadashi Tawada (29081101), 13.08.2019 (KW-L ex OSA-Li – isotype).

Thallus crustose, from indistinct and probably endophleoidal (while soralia making aspect and well distinct) to continuous (areoles or squamules not developed, [somewhat similar to *Pertusarias*, when shining in places], dark or medium green, greenish grey, indistinct grey to pale green-grey in places, with numerous light grey or whitish grey soralia well contrasting to dark thallus. Soralia 0.1–0.25(–0.3) mm diam., numerous, regularly rounded, distant and scattered or rarely aggregated in groups making [confluent] mass

to 0.3–0.5 mm across; crater like with concave soresdious mass or with more or less semiconvex soresdious mass; soresdious mass white or whitish-greyish well contrasting to darker thallus. Soresdious mass seem to be cut as ‘chopped cabbage’ (probably owing to presence as soresdia as consoredia in the same

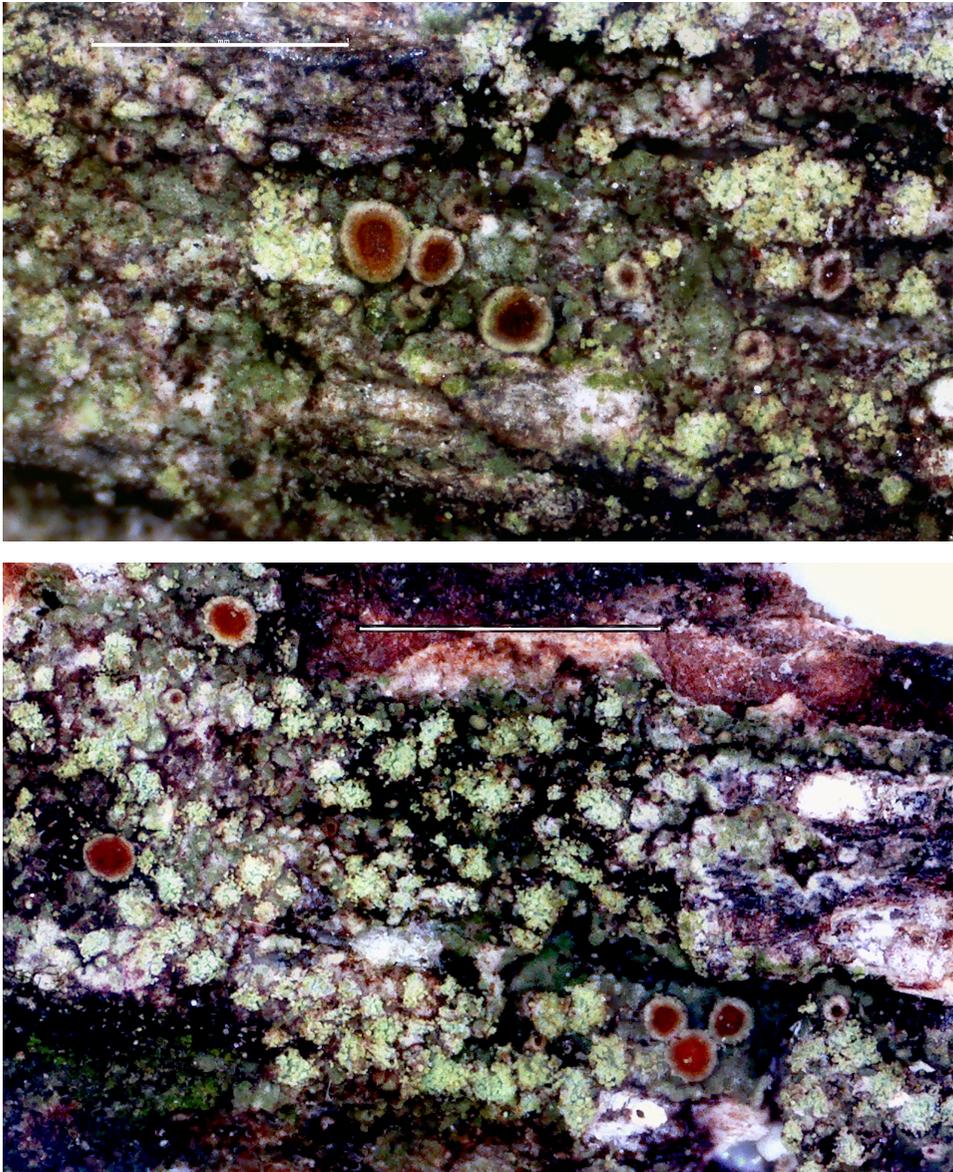


Fig. 5. General habit of thallus of *Loekoeslaszloa reducta* (holotype). (Photo by S. Kondratyuk)

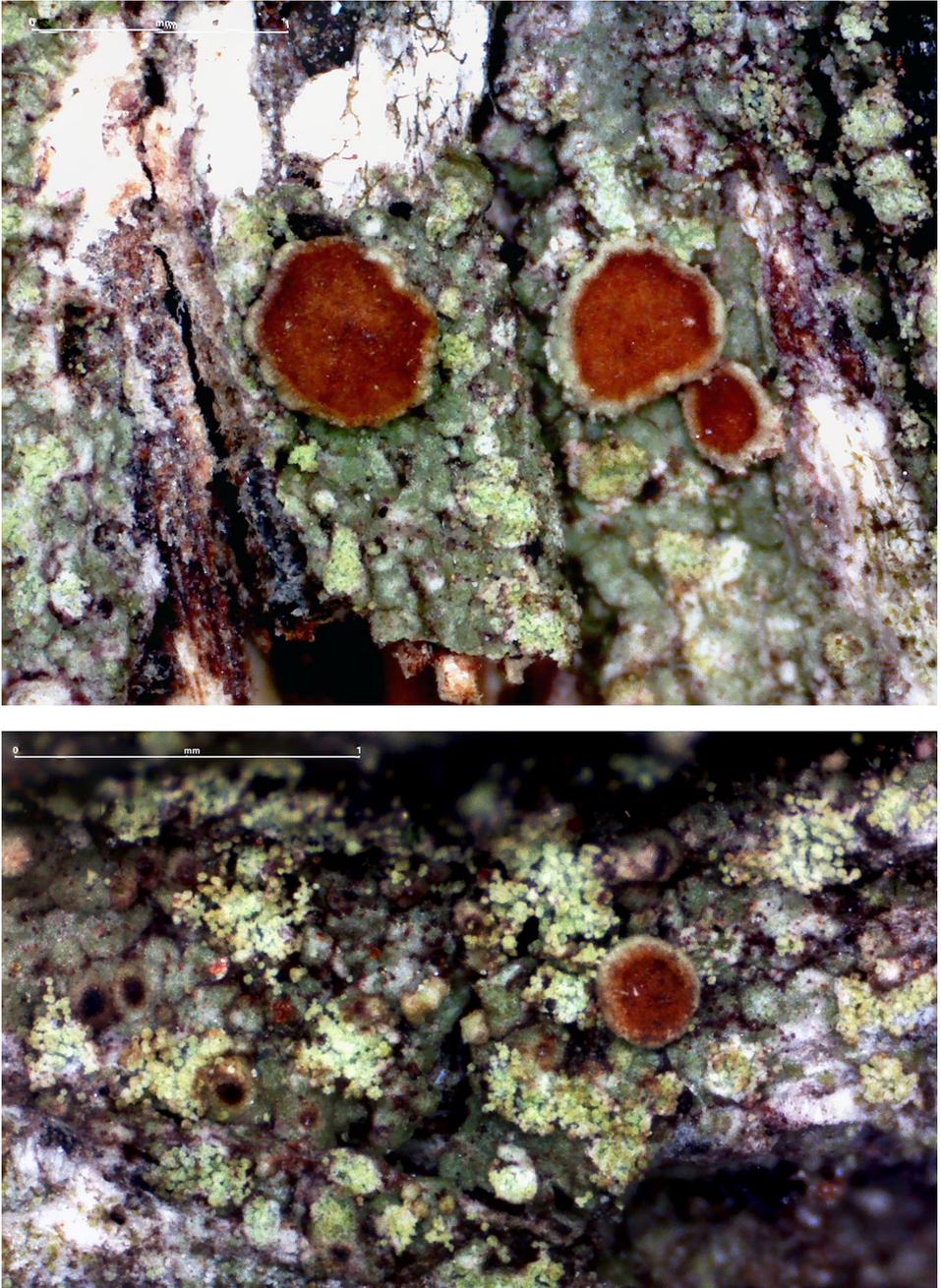


Fig. 6. Enlarged portion of thallus of *Loekoeslaszloa reducta* (holotype) with soralia and apothecia. (Photo by S. Kondratyuk)

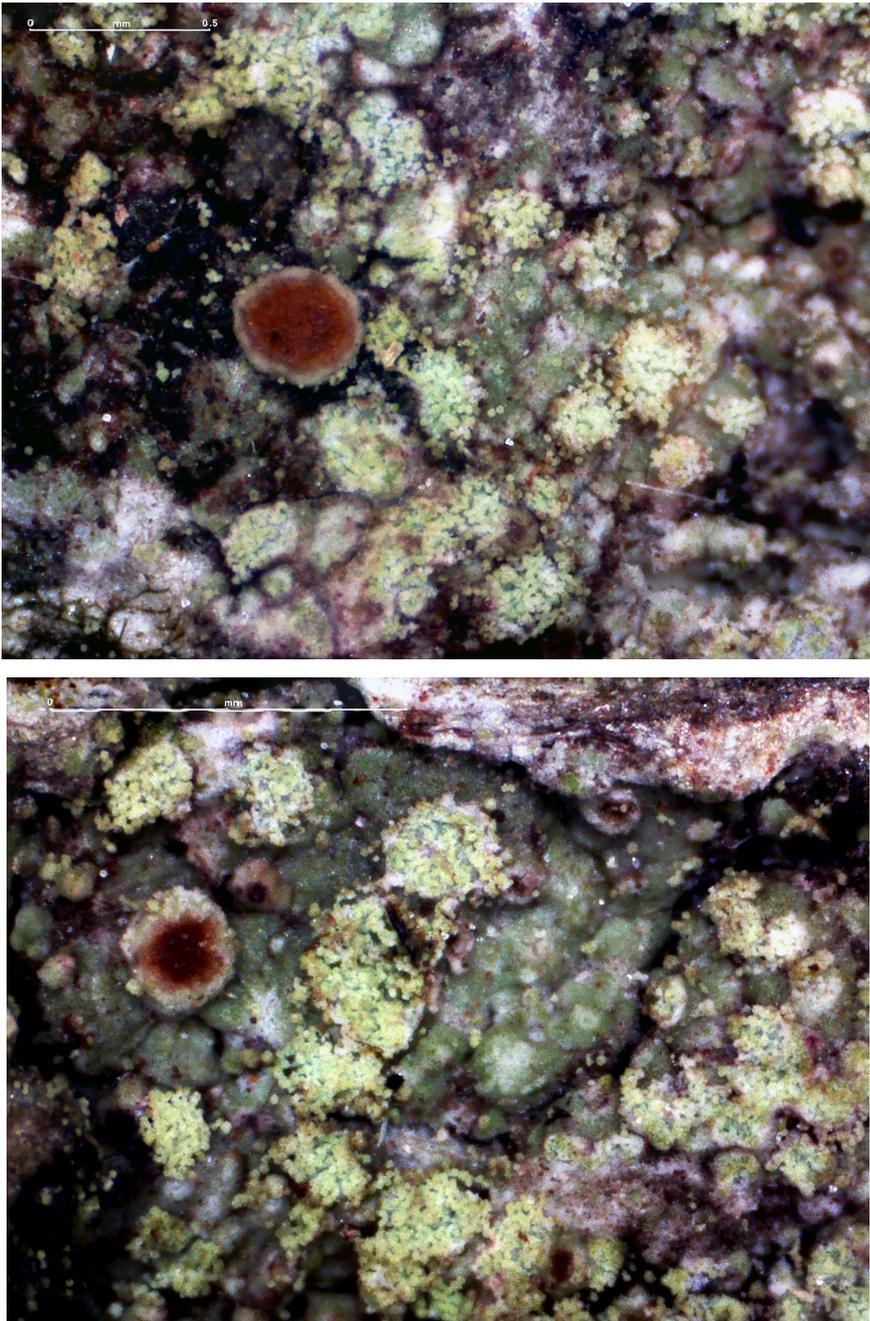


Fig. 7. Enlarged portion of thallus of *Loekoeslaszloa reducta* (holotype) with soralia and apothecia (photo of S. Kondratyuk)

soralia), while soresidious mass of *Buellia* cf. *efflorescens* growing side by side is more or less farinose. Sometimes soresidious mass immersed into thallus or became more or less darker in peripheral portion of soralia similar to *Buellia griseovirens* (but differs in apothecia with brown or brown reddish/orange disc and bipolar ascospores). Soredia with very uneven hyphal wall and rarely with hyphal projections, 15–25(–30)[–40] μm diam.; sometimes consoredia to 30–35(–40) μm diam., consisting of aggregated soredia of 15–20 μm diam. observed too. Soredia and consoredia are observed in soralia at the same time. Hypothallus not observed.

In section thallus to 150–200 μm thick, while below soralia it can be to 20(–50) μm thick only; (so total thickness of thallus varying between (20–)50–150(–200) μm thick); cortical layer to [7.5–](15–)20–25 μm thick, paraplectenchymatous, cell lumina 2.5–3.5 μm diam./across.

Apothecia 0.2–0.5(–0.7) mm diam., but usually very small, 0.2–0.3 mm diam. (to 0.22–0.25 mm thick in section), very numerous, commonly the biggest apothecia present in the thickest, i.e. well-developed, continuous, dark green portion of thallus, lecanorine with green thalline sometimes soresidiate margin, or zeorine, where thalline exciple grey, light grey or dirty whitish grey, very thin and seen mostly at sides, own margin dull brownish orange and disc dark brown to orange brown or reddish orange-brown; regularly rounded, usually distant, rarely in groups; in section apothecia lecanorine, thalline exciple to 100 μm thick, cortical layer to (20–)25–30 μm thick, well developed, the same thickness in lateral and in basal portions, cell lumina 3–6(–7) μm across, more or less rounded, paraplectenchymatous; algal zone to 50–60(–75) μm thick; true exciple 25 μm thick in the upper and lower lateral portions and to 15–25 μm thick in basal portion, *textura intricata* in K; hymenium to 70–75 μm high; upper portion to 20–25 μm thick dark brownish orange; paraphysis tips very thin, not swollen to 2(–2.5) μm wide in K; subhymenium (20–)25–50(–60) μm thick, hyaline; sometimes true exciple in the uppermost lateral portion not developed, while in the lower lateral and basal portion the same thickness and well developed; sometimes crystals in the uppermost lateral portion of true exciple observed and uppermost portion of true exciple more or less reddish brown or dull brown in water (similar to weak reaction with K, but in water!!! 29072211 and 29072213); ascospores usually very rarely observed, widely ellipsoid, widened at septum, usually very variable in measurements and in shape from very thin and long to irregularly ellipsoid and with one end thinner (narrow and wide ascospores are observed in the same ascus), sometimes abortive single ascospores observed, with somewhat thickened ascospore wall (to 1 μm thick in K), 11–17(–20) \times (4.5–)5–8(–10) μm in water and (10–)13–18(–21) \times (4.5–)5–8 μm in K; ascospores septum often not seen in water (better to check in K), (3–)5–9(–10) μm in water and (5–)6–10(–11) μm thick in K.

Conidiomata deeply immersed in thallus, dark brown or light brown at ostiole portion / in the uppermost portion, to 50–75(–100) μm diam., sometimes several conidiomata in the same thalline wart observed; conidia shortly bacilliform / oblong $2\text{--}2.5 \times 0.5\text{--}0.7(\text{--}0.8)$ μm .

Chemistry: Epithymenium and uppermost portion of true exciple K+ bluish or bluish purple on short period remaining bluish with time, sometimes the uppermost lateral portion K+ blackish bluish or dark bluish (crystals dissolving in K).

Ecology: Growing on bark of *Casuarina stricta* often side by side with *Buellia* species.

Distribution: So far known from several localities in Eastern Asia (Japan, Okinawa).

Etymology: The species is named after the very small size of soralia and rather low presence of apothecia.

Taxonomic notes: This species is characterised by very thin continuous dark grey or greenish grey thallus with numerous but very small whitish or whitish grey soralia, as well as in having apothecia of *Rinodina*-like to *Caloplaca haematites*-type, i.e. from dull brownish disk and grey thalline margin (i.e. *Rinodina*-type) to reddish brown disc, and dull brownish or yellow-brown true exciple and whitish grey thalline margin, as well as in growing on bark of coniferous trees (*Casuarina stricta*, etc.).

Loekoeslaszloa reducta is similar to *L. geumohdoensis* in having grey crustose thallus and whitish grey soralia or soredious mass, but differs in having indistinct or very thin continuous thallus (*vs* distinctly areolate), in having immersed (or crater-like) or semiimmersed smaller and being mostly distant and not coalescing soralia (*vs* very often coalescing in larger spots), in having lecanorine or zeorine apothecia with dark brown-orange or reddish orange-brown disc, in having K+ reaction of epithymenium and uppermost true exciple, and in different substrate (i.e. bark of coniferous trees, *vs* back of deciduous trees), as well as in the lack of thalline areoles and in the lack of highly uplifted soredious mass (*vs* with torch-like uplifted soredious mass and distinctly attenuated at the basis soralia). Unfortunately, data on apothecia and conidiomata are still missing for *Loekoeslaszloa geumohdoensis*.

Position of these two taxa of the genus *Loekoeslaszloa* is defined only because data on nrITS sequence data were provided for these specimens at first, while after presence of sorediate crustose thalli this material can be suggested as members of the Lecanoraceae, Lecideaceae, Ramalinaceae or Physciaceae or any another family. Unfortunately, it is still risk that this species was earlier described as sterile member of the other genera in the Physciaceae, Caliciaceae or other families. So it is rather highly likely that earlier species epithet for the species discussed here could be found in future.

Material of *Loekoelaszloa reducta* was several times collected as growing together with members of the genus *Buellia*. It should be mentioned that the first collection of this species was collected as *Buellia* species, too, but only after molecular data in 2018 it was found as member of sister to *Yoshimuria* clade of the Caloplacoideae in 2018 (at that time the genus *Loekoelaszloa* was not described yet). However, when the description of the genus *Loekoelaszloa* was published we have had first fertile specimens of the *L. reducta*, too.

Further specimens examined: Japan: Okinawa: Naha-shi, Ounoyama Park, N 26.205788°, E 127.733016°, alt. 2 m a.s.l., on bark of *Casuarina stricta*, growing together with *Buellia* cf. *efflorescens*. Coll.: Mitsuru Moriguchi (29072213), 22.07.2019 (KW-L ex OSA-Li sub *Buellia* s.l.). – Japan: Okinawa: Naha-shi, Matsuyama Park, N 26.218393°, E 127.677269°, alt. 11 m a.s.l., on bark of *Casuarina stricta*, growing together with *Buellia* sp. Coll.: Y. Kusui (YK-28080401), 04.08.2018 (KW-L ex OSA Li).

Orientophila viticola S. Y. Kondr., L. Lőkös et J.-S. Hur, *spec. nova*
(Figs 8–9)

MycoBank No.: MB 846021

Similar to Orientophila corticola, but differs in having larger thallus, thinner thalline cortical layer, narrower thalline exciple, wider true exciple in the uppermost lateral portion, higher hymenium, thinner subhymenium and without oil, wider ascospores, and wider ascospore septum, as well as in the lack of oil in hymenium and subhymenium.

Type: Republic of Korea: Jeju-do, Jeju-si, Hangyeong-myein, along seashore at Yongsuri, 33° 19' 13.56" N 126° 10' 01.96" E; alt.: 3 m a.s.l., on bark of *Vitex rotundifolia* L. f., growing together with *Fauriea jejuensis*, [apothecia of both *Fauriea jejuensis* and *Orientophila viticola* are infected by lichenicolous fungus *Intralichen christiansenii* (D. Hawksw.) D. Hawksw. et Cole], S. Y. Kondratyuk (212653) and L. Lőkös [together with S.O. Oh, U. Jayalal, S. Joshi, J. S. Park, and J.-S. Hur] (122003), 05.07.2012 (KoLRI 016802 – holotype); the same locality, growing together with *Fauriea jejuensis* and *Arthonia* sp. (122001) (KoLRI 016800 – isotype); the same locality, [*Orientophila viticola* is richly infected by lichenicolous fungus *Intralichen christiansenii* (D. Hawksw.) D. Hawksw. et Cole, which cause darkening and death of thalline areoles and apothecia (while both apothecia with only blackish discs either the whole blackish apothecia)], (122002) (KoLRI 016801 – isotype); the same locality, (122004) (KoLRI 016803 – isotype); the same locality, growing together with *Fauriea jejuensis* and *Caloplaca* aff. *cerina* (122005) (KoLRI 016804 – isotype); the same locality, (122006) (KoLRI 016805 – isotype).

Thallus 0.5–1.5(–2) cm across, but usually aggregated in larger spots to several cm across along the stump of the host plant, very varying from indistinct distant small areoles or of extremely small portions to 0.1 mm across seen near apothecia to rarely as continuous crust with portions to 0.8 mm across, yellow, greyish yellow or whitish yellow to whitish grey in places; seen or well distinct as aggregations of numerous, very small apothecia, varying in

colour from greyish yellow to bright yellow; sometimes scattered areoles to 0.1(–0.15) mm across, but probably future apothecia also observed. Thalline areoles/fragments very deeply immersed into the bark/substrate, areoles to 0.1–0.15(–0.2) mm across seen between apothecia usually at $\times 120$ magnification (but sometimes rather common, as in 122002), rarely more or less semi-convex fragments to 0.3–0.4(–0.5) mm across present (and may be reminiscent *Seawardiella polycarpa*), sometimes as thin yellow continuous thallus seen to 0.5 mm across; thallus in section to (40–)70–100 μm thick, cortical layer to 10–12(–20) μm thick, often with epinecral layer to 5–7(–10) μm thick. Hypothallus mostly indistinct.

Apothecia (0.15–)0.25–0.5(–0.7) mm diam., and 0.2 mm thick in section, very numerous (i.e. to 10 or more apothecia together), biatorine or zeorine, very often sitting directly on bark (no thalline fragments present), more or less distant and regularly rounded to densely aggregated and pressed; thalline margin as whitish yellow portions seen at sides at the highest magnification ($\times 120$) or to 0.1–0.15 mm thick, whitish yellow, especially in crowded apothecia seen; own margin 0.04–0.05 mm wide, very prominent at first and usually slightly higher of level of apothecium disc, concolorous or slightly lighter of disc, deeply yellow or bright yellow; disc plane or slightly concave at first,



Fig. 8. *Orientophila viticola* (KoLRI 016802 – holotype), general habit. Scale: 1 mm. (Photo by S. Kondratyuk)

dull brownish yellow or bright yellow; in section lecanorine or zeorine, thalline exciple to 50–60 μm thick, cortical layer very thin, to 8 μm thick, paraplectenchymatous; algal cells to 15–18 μm diam.; true exciple to 40–50(–80) μm thick in the uppermost lateral portion and 10–30(–40) μm thick in the lower lateral and basal portions, scleroplectenchymatous or paraplectenchymatous with cell lumina 6–10 \times 4 μm ; paraphysis tips to 6–8 μm diam. in water (and to 6.5 μm diam. in K); hymenium to (70–)80–90 μm high, very lax in the uppermost portion; epihymenium 15–20 μm thick, bright yellowish brown; subhymenium 15–20 μm thick, hyaline; ascospores straight or slightly curved, (more of 50 measurements) (8–)9–12(–14) \times (4.5–)5–6.5(–8) μm in water and (7.5–)10–14 \times (4–)5.5–8(–9) μm in K (more of 50 measurements), and ascospore septum (3–)4–6(–8) μm wide in water and (4.5–)6–8(–9) μm wide in K.

Chemistry: thallus (if yellow) K+ purple or (if greyish) K–. Chemistry not investigated with TLC.

Ecology: Growing on bark of *Vitex rotundifolia* in coastal zone growing together with *Fauriea jejuensis*, [apothecia of both *Fauriea jejuensis* and *Orientophila viticola* are often infected by the lichenicolous fungus *Intralichen christiansenii* (D. Hawksw.) D. Hawksw. et Cole].



Fig. 9. *Orientophila viticola* (KoLRI 016802 – holotype), enlarged portion of thallus with apothecia. Scale: 1 mm. (Photo by S. Kondratyuk)

Etymology: It is named after host plant (i.e. *Vitex rotundifolia*) on bark of which it is found.

Distribution: So far known only from the type collection in Eastern Asia (South Korea).

Taxonomic notes: *Orientophila viticola* is similar to recently described *Orientophila corticola* from inland roadside trees of South Korea (Lee and Hur 2020), but differs in having larger thallus (0.5–1.5(–2) cm *vs* (1.2–)3–5 mm across), in having thinner thalline cortical layer (10–12(–20) μm *vs* 7–40 μm thick), in having narrower thalline exciple (to 60 μm thick, *vs* 80–90 μm thick), in having wider true exciple in the uppermost lateral portion (to 40(–70) μm *vs* 20–35 μm thick), in the lack of oil in hymenium and subhymenium, in having higher hymenium (80–90 μm *vs* 50–60 μm high), in having thinner and without oil subhymenium (15–20 μm thick and without oil *vs* 20–50 μm thick with oil), in having wider ascospores ((8–)9–12(–14) \times (4.5–)5–6.5(–8) μm *vs* (7–)9–12(–15.5) \times (3.5–)4.5–5.5(–6.5) μm), and wider ascospore septum ((3–)4–6(–8) μm *vs* (2–)2.5–4.5(–6) μm).

It should be mentioned that in the key to *Orientophilas* (Lee and Hur 2020), material of *Orientophila viticola* was mentioned under *O. diffluens* from bark of small coastal shrubs *Vitis*.

Orientophila viticola is similar to the Australian *Gintarasiella aggregata* (Teloschistoideae), but differs in having not so densely aggregated apothecia. After measurements of yellow apothecia and yellow thallus *O. viticola* is similar to *Cerothallia luteoalba* and to *Athallia cerinella* both from the Xanthorioideae, but differs in having semiimmersed in thallus / substrate apothecia or very closely attached. Furthermore, in contrast to *Athallia pyracea* disc of apothecia of *Orientophila viticola* is dull yellow or dull brownish yellow (*vs* reddish or with pink tinge).

In general thallus is better developed than in *Orientophila diffluens*, continuous, while rather thin and indistinct.

Ovealmbornia ovei S. Y. Kondr., L. Lőkös, I. Kärnefelt
et A. Thell, *spec. nova*
(Figs 10–12)

Mycobank No.: MB 846022

Similar to Ovealmbornia volkmarwirthii, but differs in having longer thal-line lobes and in having secondary lobules, as well as in having wider ascospores.

Type: [South Africa]: Cape Province, Distr. Malmesbury, Saldanha, 50' above the hotel, on twigs of *Acacia* sp. Coll.: Ove Almborn (5033), 18.09.1953 (LD 1471100 – holotype).

Thallus foliose, to 8–17 mm across, often indistinct; thalline lobes 5–7 mm long and 2–3 mm wide, while usually indistinct as far growing along narrow twigs and foliose, where lobes rarely seen in peripheral portions, while in the centre richly covered by apothecia; lobes with rounded terminal portions, sometimes with rather small also rounded secondary sublobules; upper surface dirty greyish or dirty greyish-whitish, somewhat resembling *Physcia* species, only the yellowish brown or brownish orange disc of apothecia identify the material as member of the Teloschistaceae; lower surface waved and wrinkled.

Apothecia to (0.5–)1–1.6(–2.0) mm diam., in section to 0.25 mm thick, highly uplifted and often very numerous and crowded, while mostly rounded, distinctly constricted at the basis or highly uplifted and not constricted at the basis (i.e. stipa with hollow to 0.6 mm diam., if apothecia to 0.8 mm diam. observed) with rather thick and uplifted thalline margins and more or less concave dull yellowish brown or dull brownish orange disc; upper surface of thalline margin (the same as thalline lobes) with whitish farinose granules (as regular bumps or warts or scattered pruina) while among apothecia surface epruinose; cortical layer of thalline exciple on underside 25–36(–40) μm thick, cells vertically elongated, walls very narrow, paraplectenchymatous, cells 7–12(–14) μm across; algal zone with numerous oil cells in lateral portion of thalline exciple (better seen in K); true exciple developed only in lateral portion, to 48 μm thick in the uppermost lateral and to 38 μm thick in lower lateral portion, and disappearing in basal portion or in lower lateral and basal portions; hymenium (45–)50–70 μm high; epihymenium to 25 μm thick, hyaline, K+ purple; underlined by a discontinuous algal layer or by medullary cavity (without hyphae);



Fig. 10. General habit of thallus of *Ovealmbornia ovei* (holotype). (Photo by S. Kondratyuk)



Fig. 11. Enlarged peripheral portion of thallus of *Ovealmbornia ovei* (holotype). (Photo by S. Kondratyuk)

paraphysis tips to (3.6–)4.8–6(–7.2) μm diam. to almost spherical (and to 4.8 μm diam. in K), oil cells in uppermost cells of paraphyses rarely but present; ascospores mostly young, *Xanthodactylon*-type (sensu Kondratyuk *et al.* 2008),



Fig. 12. Enlarged portion with apothecia of *Ovealmbornia ovei* (holotype). (Photo by S. Kondratyuk)

with very narrow septum to 1 μm wide or not developed in water, very rarely bipolar, well developed, (10.8–)13.2–14.4(–15) \times 6–7.2(–7.4) μm in water and 12–16.8(–18.0) \times (7.5–)7.8–8.4(–12) μm in K; septum rather wide, to 6–10.8(–12) μm wide in water and (7.2–)8.4–12 μm wide in K.

Ecology: Growing on twigs.

Distribution: So far known only from the type collection from Africa.

Etymology: It is named after the Swedish lichenologist Ove Almborn (Lund, LD) in recognition of his contribution to recent knowledge on lichen diversity of African continent.

Taxonomic notes: *Ovealmbornia ovei* is similar to *O. volkmarwirthii* S. Y. Kondr., but differs in having longer thalline lobes and in having secondary lobules (5–10 mm long *vs* 3–5 mm long without secondary lobules), as well as in having wider ascospores (6–8 μm *vs* 4–5 μm wide) (Kondratyuk *et al.* 2014).

From *Ovealmbornia bonae-spei* (S. Y. Kondr. et I. Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, I. Kärnefelt, Elix et A. Thell, *O. ovei* differs in having smaller thallus (8–17 mm across *vs* 4–5 cm diam.), and in having narrower ascospores (6–8 μm *vs* more of 10 μm wide).

Ovealmbornia ovei is similar to *O. reginae* S. Y. Kondr., I. Kärnefelt et J.-S. Hur and to species of the genus *Xanthokarrooa* S. Y. Kondr., Fedorenko, S. Stenroos, I. Kärnefelt, Elix et A. Thell, but differs in having white to greyish white thallus (*vs* brownish yellow, reddish orange to brownish red or violet-red in exposed portions, whitish grey in shaded conditions) (Kondratyuk *et al.* 2015).

Ovealmbornia ovei was included in the key to species of the genera *Ovealmbornia* and *Xanthokarrooa* under *Ovealmbornia* sp. 2 in our previous paper (Kondratyuk *et al.* 2015).

***Oxneria imshaugii* S. Y. Kondr., spec. nova**
(Figs 13–17)

Mycobank No.: MB 846023

Similar to Oxneria huculica, but differs in having dull brownish-greyish yellow to dull yellowish thallus, in having small crater-like soralia or phyllidioso-verruculose upper surface of thalline lobes, dissolving into soredious mass, in having whitish-yellowish or dull greyish-yellowish soredious/blastidious mass, as well as by lack of Oxneria huculica-type soralia.

Type: USA: Michigan, Newaygo Co., 12 miles (19 km) WNW of White Cloud, on white oak (*Quercus alba*) along road, with *Oxneria huculica* [which grows side by side and sometimes overgrowing this species (*Oxneria imshaugii*) too], elev. ca 230 ft [70 m], ca 43° 34' N, 86° 02' W, coll.: Henry A. Imshaug (21193), 26 April 1958 (LD 1094926 ex Telosch. Exs. 46 [distributed by Wetmore, University of Minnesota] sub *Oxneria huculica* [as *Xanthoria fallax*] – holotype).



Fig. 13. General habit of thallus of *Oxneria imshaugii* (holotype). (Photo by S. Kondratyuk)

Thallus foliose, often somewhat indistinct [as far covered by *Oxneria* (= *Xanthomendoza*) *huculica* growing side by side in type collection], (7–)12–15 mm across, while single thalli and single lobes seen rarely [in the holotype only a few young thalli found, while mostly growing side by side with (*Oxneria huculica* or as small additions among thalli of the latter species, which is of-

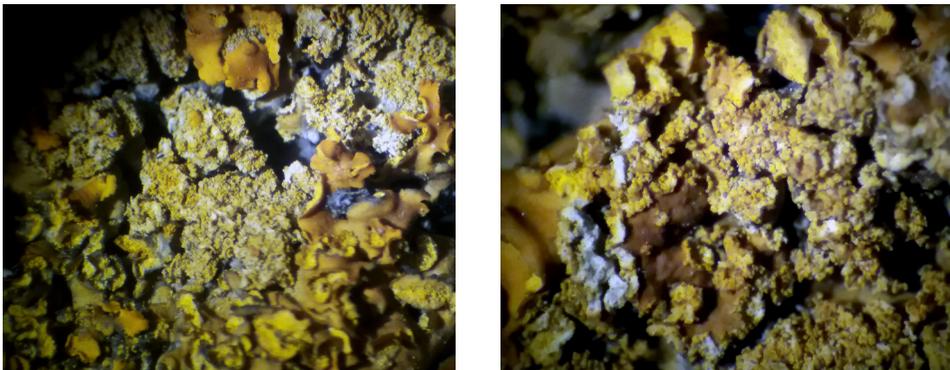


Fig. 14. Enlarged central portion of thallus of *Oxneria imshaugii* (holotype). (Photo by S. Kondratyuk)

ten overgrowing thalli of *O. imshaugii*], dull yellowish or dull greenish yellow-orange, often with totally eroded upper surface into soresidous mass; thalline lobes to 3–5(–6) mm long and rather wide to 2–2.5(–3) mm wide (seen very rarely and mostly in younger thalli), somewhat thick and usually horizontally orientated or slightly bent upwards edges (not bend downwards along the margins like in *Oxneria huculica*), with dull brownish to dark brownish or dull brownish orange, somewhat waving upper surface, soon becoming especially in the centre of thallus entirely covered by lighter, dull yellowish, to dull whitish or dull greyish-yellowish soresidous-isidious mass.

Thalline lobes to 150–170 μm thick in section; the upper surface at first verruculose or phyllidioso-verrucose, simple verruculae to 0.1–0.15 mm diam./across (probably more stable in shade conditions, while in exposed conditions soon becoming dissolving into soresidous/blastidious mass); phyllidia (0.06–)0.075–0.2(–0.5) mm across, orientated horizontally, but uplifted above level of thallus; smaller portions *ca* 0.06–0.1 mm across of variable shape are also observed, often exfoliated.

Soralia crater-like, 0.2–0.5(–0.7) mm across at first with somewhat irregular and with uplifted irregular and with uplifted margins seen more often along the bent upwards edges of thalline lobes, scattered at first, but very soon eroding the whole upper surface of thallus; possibly soralia of *Oxneria ulophyllodes*-type (i.e. on underside of thalline lobes) are also present. Soredia regularly rounded, (20–)25–35(–50) μm diam., with hyphal wall to 4.8–6.0 μm thick and somewhat with very uneven surface but hyaline or somewhat greyish (i.e. without anthraquinones) in section (and K–); rarely soredia of blastidia-type (i.e. with anthraquinones) 30–40(–52) μm diam., or soredia becoming isidious, usually darker coloured, yellow-orange or orange observed; consoredia 35–80(–125) μm diam. or more or less rounded aggregations of

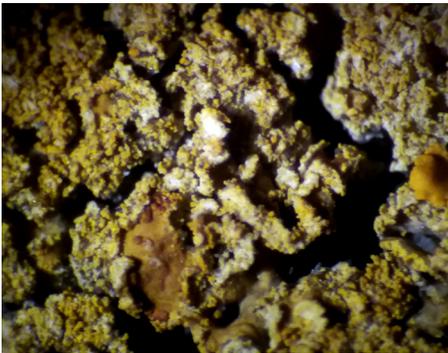


Fig. 15. Enlarged thalline lobes with conidiomata of *Oxneria imshaugii* (holotype). (Photo by S. Kondratyuk)

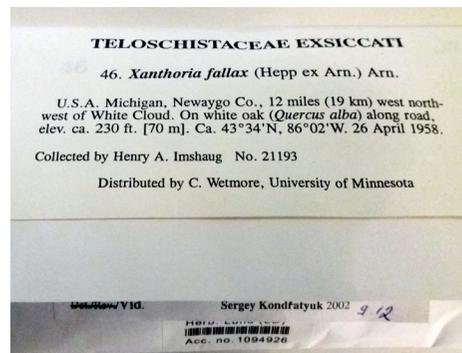


Fig. 16. Original label of LD holotype specimen of *Oxneria imshaugii*

single soredia *ca* (20–)25–35 or (14–)19–25(–35) μm diam./across without parietin and other anthraquinones, too [some soredia are formed in the medulla (below the upper cortex too)]. Soredia, consoredia and exfoliated portions make general aspect of somewhat eroded or sorediate surface from rather plane to rather thick and bulky and in some places somewhat isidiate.

Apothecia not seen. Conidiomata as dull reddish orange or dull orange warts to 0.2 mm diam. rarely observed (were present only on single lobe), while conidia were not checked (because of very scarce specimen).

Ecology: So far known only on bark of white oak (*Quercus alba*).

Etymology: It is named after the well-known American lichenologist Henry A. Imshaug in recognition of his contribution to current knowledge on North American lichens, and who has provided type collection of this species, too.

Distribution: This species is so far known only from the type locality in Michigan, USA in North America.

Taxonomic notes: Differentiation of blastidia and conblastidia of *Oxneria imshaugii* on one side and exfoliated thalline fragments, especially when the latter dissolving into soredious mass (i.e. hereafter phyllidia) is somewhat problematic for this species. However, the presence of phyllidia on the upper surface of the thallus is the diagnostic character of *Oxneria imshaugii*. Phyllidia are mostly elongated 60–200(–250) \times 30–50(–100) μm and somewhat darker pigmented (and with K+ reaction), while soredia and consoredia are mostly



Fig. 17. General habit of thallus of *Oxneria imshaugii* overgrown by *O. huculica*. (Photo by S. Kondratyuk)

regularly rounded and transparent or hyaline in section (and K–). Measurements of soredia and consoredia are done after checking with light microscope, while exfoliated fragments on the upper surface were mostly measured in dissecting microscope only. Blastidia (or soredia of blastidia-type) are very well identified by positive reaction with K (K+red or violet).

The genus *Oxneria* S. Y. Kondr. et Kärnefelt as robust monophyletic branch of the Xanthorioideae includes hitherto nine species, while more than 23 taxa were originally combined to this genus after morphological characters of the thallus, presence of true rhizines and morphology of the conidia (Kondratyuk and Kärnefelt 2003). *Oxneria imshaugii* is the next member of this genus.

Oxneria imshaugii is similar to *Oxneria* (= *Xanthomendoza*) *huculica* S. Y. Kondr., mostly epiphytic lichen known from bark of various deciduous trees rather widely distributed in the Northern Hemisphere (Kondratyuk *et al.* 2010), with which it grows side by side, but differs in having somewhat dull brownish-greyish yellow to dull yellowish thallus (*vs* dull brownish orange, reddish orange to dull orange), in having indistinct and much thicker thalline lobes with somewhat upwards bent edges, in having small crater-like soralia often eroded the whole upper surface of thalline lobe, in having phyllidioso-verruculose upper surface soon dissolving into soredious mass, in having whitish-yellowish or dull greyish-yellowish soredious/blastidious mass (*vs* sorediate mass bright yellow or bright yellow-orange), as well as in the lack of helmet- or crescens-like, i.e.: the *Oxneria huculica*-type, soralia.

Oxneria imshaugii is similar to *Oxneria* (= *Xanthomendoza*) *ulophyllodes* (Räsänen) S. Y. Kondr. et Kärnefelt, a widely distributed lichen species in the Northern Hemisphere, known from various substrates, in having rather thick thalline lobes, which do not bend downwards along the margins, but differs in having upper surface covered by soredious-isidious mass in the centre of thallus, and in the lack of *ulophyllodes*-type soralia on underside of thalline lobes.

The central portion of thallus of *Oxneria imshaugii* can be sometimes similar to fragments of *Oxneria* (= *Xanthomendoza*) *fallax* (Arnold) S. Y. Kondr. et Kärnefelt with numerous isidiate soredia (for example see Vězda, Lich. Sel. Exs. Nr. 225, LD 1424239), rather rare mostly epilithic lichen known from limestone outcrops from France and Germany in Europe (Kondratyuk *et al.* 2010). Furthermore, these two taxa (*O. imshaugii* and *O. fallax*) differ from *O. huculica* in the lack of *Oxneria huculica*-type soralia. However, *Oxneria imshaugii* differs from *O. fallax* in having very indistinct thalline lobes (*vs* thalline lobes strip-like, well defined), in having crater-like soralia, in having upper surface entirely covered by soredia often becoming isidiate (*vs* only some soredia of marginal soralia may be isidiate).

In manner of forming soredious mass *Oxneria imshaugii* is somewhat resembling *Rusavskia sorediata* (Vainio) S. Y. Kondr. et Kärnefelt, but differs in having much wider thalline lobes, in having well developed rhizines, in hav-

ing dull greyish-yellowish thallus, in having rather flat (not uplifted and not so highly uplifted as in *Rusaovskia sorediata*) soredious mass, as well as in the lack of spherical or convex formations dissolving in the soredious mass.

Oxneria imshaugii is similar to *Hypogymnia farinacea* Zopf in having soredious mass on the upper surface of thallus, but differs in having whitish underside of thalline lobes, as well as in having white true rhizines (*vs* underside black and black rhizines), in having bipolar ascospores and in having anthraquinones.

Xanthokarrooa elsiae S. Y. Kondr., L. Lőkös, I. Kärnefelt et A. Thell,
spec. nova
 (Figs 18–19)

Mycobank No.: MB 846025

Similar to Xanthokarrooa karrooensis, but differs in having smaller thallus, flattened (without hollow) thalline lobes, distinctly stipitate apothecia, in having scleroplectenchymatous true exciple, and longer ascospores, and by the lack of Oxneria-type rhizines in the centre of thallus.

Type: [Africa: South Africa: Western Cape:] Uniondale Road, Kanoo koppie, on bark of gnarled shrubs. Coll.: E. Esterhuysen (21269a), 09.03.1953 (LD 1437497 – holotype).

Thallus to 2.5 cm across, grey, dull grey and more or less similar to *Physcia* species; thalline lobes to 3–5(–7) mm long (probably can be longer) and (0.3–)0.5–0.7 mm or to 1.5(–1.8) mm wide in places, narrow and linear, or widened in some places, seem to be convex if uplifted above substrate, while edges downwards folded or more or less flattened (if closely attached to the substrate); forming network-like thallus; underside of thalline lobes more or less without any organs of attachment or with more or less wrinkles, white or dusted by soil particles; rhizines [of *Xanthodactylon*-type] along the thalline edges almost absent / not seen or very rarely seen.

Apothecia 1–2.5(–3) mm diam., often with stipa with hollow and sometimes apothecia (more of 2 mm diam.) with hollow in the centre; stipa to 1–1.3 mm long; upper surface in exposed conditions brownish violetish or pinkish brown with violet dots; cortical layer of thalline exciple very waved, to 25–40 µm thick, paraplectenchymatous, cells to 6–7 µm across; hymenium (48–)50–60 µm high; subhymenium to 25 µm thick; true exciple to 25 µm thick in basal portion to 50 µm wide in uppermost lateral and to 25–30 µm thick in lower lateral portion, scleroplectenchymatous; paraphyses to 6 µm wide in water and to 5(–6) µm wide in K, the uppermost two cells almost spherical; ascospores elongated and ellipsoid, bipolar [the *Xanthodactylon*-type (*sensu* Kondratyuk *et al.* 2008), while ascospores of *Xanthoria*-type not found], 14–

15.6 × 4.8–6.0 μm in water and (12.0–)13.2–18.0 × 4.8–6.5(–7.5) μm in K (more than 15 measurements); septum of medium wide, 4.8–6.0(–7.2) μm wide in water and 4.8–7.2 μm wide in K. Conidiomata not observed.

Ecology: Growing on bark of very thin twigs, and probably in rather shaded conditions.

Distribution: So far known only from the type collection in South Africa.

Etymology: It is named after the African botanist Elizabeth ('Elsie') Esterhuysen (1912–2006), 'the most outstanding collector ever of South African flora' (Prof. Karel Bremer), who has collected the type of this species.

Taxonomic notes: *Xanthokarrooa elsiae* is similar to *X. karrooensis*, but differs in having smaller thallus, flattened (without hollow) thalline lobes, distinctly stipitate apothecia, in having scleroplectenchymatous true exciple, and



Fig. 18. General habit of thallus of *Xanthokarrooa elsiae* in exposed conditions (LD 1437497 – holotype). (Photo by S. Kondratyuk)

longer ascospores (14–15.5 μm vs 12–13 μm long), as well as by the lack of *Oxneria*-type rhizines in the centre of thallus.

Xanthokarrooa elsiae is the second species of the genus, which was originally described as monotypic one (Fedorenko *et al.* 2009).



Fig. 19. General habit of thallus of *Xanthokarrooa elsiae* in shaded conditions (LD 1437497 – holotype). (Photo by S. Kondratyuk)

CONCLUSION

The further data on new and noteworthy lichen-forming and lichenicolous fungi including members of genera *Honeggeria*, *Huriella* and *Orientophila* of the Xanthorioideae, as well as data on several new monophyletic branches of the Teloschistaceae are in progress and will be published elsewhere in the nearest future.

*

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