

## NEW AND NOTEWORTHY LICHEN-FORMING AND LICHENICOLOUS FUNGI 10

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Eight species, new for science, i.e.: *Lobothallia gangwondoana* S. Y. Kondr., J.-J. Woo et J.-S. Hur and *Phyllopsora dodongensis* S. Y. Kondr. et J.-S. Hur from South Korea, Eastern Asia, *Ioplaca rinodinoides* S. Y. Kondr., K. K. Ingle, D. K. Upreti et S. Nayaka, *Letrouitia assamana* S. Y. Kondr., G. K. Mishra et D. K. Upreti, and *Rusavskia indochinensis* S. Y. Kondr., D. K. Upreti et S. Nayaka from India and China, South Asia, *Caloplaca orloviana* S. Y. Kondr. and *Rusavskia drevlyanica* S. Y. Kondr. et O. O. Orlov from Ukraine, Eastern Europe, as well as *Xanthoria ibizaensis* S. Y. Kondr. et A. S. Kondr. from Ibiza Island, Spain, Mediterranean Europe, are described, illustrated and compared with closely related taxa.

*Fominiella tenerifensis* S. Y. Kondr., Kärnefelt, A. Thell et Feuerer is for the first time recorded from Mediterranean Europe, *Huriella loekoesiana* S. Y. Kondr. et Upreti is provided from Russia for the first time, and *H. pohangensis* S. Y. Kondr., L. Lőkös et J.-S. Hur for the first time from China, *Phoma candelariellae* Z. Kocakaya et Halıcı is new to Ukraine, and *Staurothele frustulenta* Vain. is recorded from the Forest Zone of Ukraine for the first time.

Twelve new combinations, i.e.: *Bryostigma apotheciorum* (for *Sphaeria apotheciorum* A. Massal.), *Bryostigma biatoricola* (for *Arthonia biatoricola* Ihlen et Owe-Larss.), *Bryostigma dokdoense* (for *Arthonia dokdoensis* S. Y. Kondr., L. Lőkös, B. G. Lee, J.-J. Woo et J.-S. Hur), *Bryostigma epiphyscium* (for *Arthonia epiphyscia* Nyl.), *Bryostigma lobarzellae* (for *Arthonia lobarzellae* Etayo), *Bryostigma lapidicola* (for *Lecidea lapidicola* Taylor), *Bryostigma molendoi* (for *Tichothecium molendoi* Heufl. ex Arnold), *Bryostigma neglectulum* (for *Arthonia neglectula* Nyl.), *Bryostigma parietinarium* (for *Arthonia parietinaria* Hafellner et Fleischhacker), *Bryostigma peltigerinum* (for *Arthonia vagans* var. *peltigerina* Almq.), *Bryostigma phaeophysciae* (for *Arthonia phaeophysciae* Grube et Matzer), *Bryostigma stereocaulinum* (for *Arthonia nephromiaria* var. *stereocaulina* Ohlert), are proposed based on results of combined phylogenetic analysis based on mtSSU and RPB2 gene sequences.

Thirty-one new combinations for members of the genus *Polyozosia* (i.e.: *Polyozosia actophila* (for *Lecanora actophila* Wedd.), *Polyozosia agardhiana* (for *Lecanora agardhiana* Ach.), *Polyozosia altunica* (for *Myriolecis altunica* R. Mamut et A. Abbas), *Polyozosia antiqua* (for *Lecanora antiqua* J. R. Laundon), *Polyozosia bandolensis* (for *Lecanora bandolensis* B. de Lesd.), *Polyozosia behringii* (for *Lecanora behringii* Nyl.), *Polyozosia caesioalutacea* (for *Lecanora caesioalutacea* H. Magn.), *Polyozosia carlottiana* (for *Lecanora carlottiana* C. J. Lewis et Śliwa), *Polyozosia congesta* (for *Lecanora congesta* Clauzade et Vězda), *Polyozosia eurycarpa* (for *Lecanora eurycarpa* Poelt, Leuckert et Cl. Roux), *Polyozosia expectans* (*Lecanora expectans* Darb.), *Polyozosia flowersiana* (*Lecanora flowersiana* H. Magn.), *Polyozosia fugiens* (for *Lecanora fugiens* Nyl.), *Polyozosia invadens* (for *Lecanora invadens* H. Magn.), *Polyozosia juniperina* (for *Lecanora juniperina* Śliwa), *Polyozosia latzelii* (for *Lecanora latzelii* Zahlbr.), *Polyozosia liguriensis* (for *Lecanora liguriensis* B. de Lesd.), *Polyozosia massei* (for *Myriolecis massei* M. Bertrand et J.-Y. Monnat), *Polyozosia mons-nivis* (for *Lecanora mons-nivis* Darb.), *Polyozosia oyensis* (for *Lecanora oyensis* M.-P. Bertrand et Cl. Roux), *Polyozosia percrenata* (for *Lecanora percrenata* H. Magn.), *Polyozosia persimilis* (for *Lecanora hagenii* subsp. *persimilis* Th. Fr.), *Polyozosia poeltiana* (for *Lecanora poeltiana* Clauzade et Cl. Roux), *Polyozosia prominens* (for *Lecanora prominens* Clauzade et Vězda), *Polyozosia prophetae-eliae* (for *Lecanora prophetae-eliae* Sipman), *Polyozosia salina* (for *Lecanora salina* H. Magn.), *Polyozosia schofieldii* (for *Lecanora schofieldii* Brodo), *Polyozosia sverdrupiana* (for *Lecanora sverdrupiana* Øvstedal), *Polyozosia torrida* (for *Lecanora torrida* Vain.), *Polyozosia wetmorei* (for *Lecanora wetmorei* Śliwa), *Polyozosia zosteriae* (for *Lecanora subfusca* ? *zosteriae* Ach.)) are proposed.

Key words: *Arthonia*, *Bryostigma*, *Caloplaca*, China, *Huriella*, *Ioplaca*, *Letrouitia*, *Lobothallia*, *Myriolecis*, new species, *Phyllopsora*, *Polyozosia*, *Rusavskia*, Russia, South Korea, Spain, taxonomy, Ukraine, *Xanthoria*

## 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, 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 under clarifying and this communication is devoted to results of analysis of taxa of the genera *Caloplaca*, *Ioplaca*, *Letrouitia*, *Lobothallia*, *Phyllopsora*, *Rusavskia*, and *Xanthoria* from the European and Asian continents, as well as to data on a few new taxa discovered within comparative study during revision of recent and previous collections kept in the KoLRI, KW-L, LWG and BP.

*Arthonia dokdoensis* S. Y. Kondr., L. Lőkös, B. G. Lee, J.-J. Woo et J.-S. Hur recently described from South Korea, as well as the whole *Arthonia molendoi* group were found to be positioned within the *Bryostigma* clade (Kondratyuk *et al.* 2019e). Combined phylogenetic tree of the Arthoniaceae based on mtSSU and RPB2 protein coding gene illustrating the *Bryostigma* clade as the robust

monophyletic branch is presented in our previous paper cited. The former *Arthonia molendoi* group is suggested to be kept under *Bryostigma* name until additional/sufficient molecular data will be accumulated for each species of this group. Twelve new combinations for member of the *Bryostigma* clade of the combined phylogenetic tree of the Arthoniaceae based on mtSSU and RPB2 protein coding gene (see Kondratyuk *et al.* 2019e) as well as 31 new combinations for the members of the *Polyozosia* genus of the Lecanoraceae (see Kondratyuk *et al.* 2019b) are proposed.

## MATERIAL AND METHODS

The specimens collected in various areas of South Korea, India and Ukraine in 2017–2019, as well as collections of previous years deposited in KoLRI and other herbaria (BP, KW-L, LE, LWG, VBI) included in comparative study were examined using standard microscopical techniques, hand-sectioned samples were prepared under a dissecting microscope (Nikon SMZ 645; Nikon, Tokyo, Japan). Anatomical descriptions were based on observations of these preparations under microscopes (Nikon Eclipse E200; Nikon, Tokyo, Japan, and Zeiss Scope, A1; Carl Zeiss, Oberkochen, Germany) equipped with digital camera AxioCam ERc 5s. Sections of apothecia were tested with water and with K (10% aqueous solution of potassium hydroxide) and Lugol's IKI test (10% aqueous potassium iodide with iodine) for identification. Standard TLC and HPTLC methods in solvent C were applied (Arup *et al.* 1993, Orange *et al.* 2010) for identification of chemical substances at critical taxa.

## RESULTS

### Descriptions of taxa

*Caloplaca orloviana* S. Y. Kondr., *spec. nova*  
(Figs 1–2)

Mycobank no.: MB 834124.

*Similar to Caloplaca emilii, but differs in having dark lead-grey (not being brown-grey) and smaller and thinner thallus, in having smaller and often indistinct areoles, in lack of blastidia, in having whitish grey thalline exciple.*

Type: Ukraine, Zhytomyr oblast, Narodychi district, 1.5 km to ENE of Loznytsia village, Drevlyansky Nature Reserve, Narodychi research division, on old roof tiles, growing together with *Polyozosia semipallida*, *Phaeophyscia orbicularis*, *Athallia holocarpa*, and *Calogaya decipiens*. Lat.: 51° 07' 41.77" N; Long.:

29° 06' 24.22" E. Coll.: Orlov, O. O., 04.06.2019 (holotype: KW-L 74904); the same locality, growing together with *Polyozosia semipallida*, and *Calogaya decipiens* (isotype: KW-L 74844); the same locality, growing together with *Polyozosia semipallida*, *Phaeophyscia orbicularis*, *Candelariella aurella*, *Calogaya decipiens*, and *Staurothele frustulenta*\* (isotype: KW-L 74850); the same locality (isotype: KW-L 74851; vouchers for DNA SK L62, SK L63); the same locality, growing together with *Acarospora moenium*, *Candelariella aurella*, *Polyozosia semipallida*, *Athallia holocarpa*, *Phaeophyscia orbicularis*, and *Phaeophyscia nigricans* (isotype: KW-L 74854); the same locality, growing together with *Polyozosia semipallida*, *Acarospora moenium*, and *Candelariella aurella* (isotype: KW-L 74855); the same locality, growing together with *Polyozosia semipallida*, *Candelariella aurella*, *Athallia holocarpa*, and *Phaeophyscia orbicularis* (isotype: KW-L 74858); the same locality (isotype: KW-L 74859; vouchers for DNA SK L61); the same locality, growing together with *Acarospora moenium*, *Phaeophyscia nigricans*, *Calogaya decipiens*, *Candelariella aurella*, and *Polyozosia semipallida* (isotype: KW-L 74919).

Thallus mainly 5–10 mm across, from very thin to rather uplifted and convex in the centre; thalline areoles (0.2–)0.3–0.7(–1) mm across, mostly indistinct, but sometimes (see the holotype, KW-L 74904) well developed, regularly rounded or ellipsoid, distant in peripheral zone, plane with somewhat slightly dissected or waved edge, more or less smooth in the centre, but more often surface with numerous verrucules *ca.* 0.1(–0.3) mm across or uplifted portions making impression that thallus completely fine granular / verrucose, and separate areoles badly developed/distinct. Thallus in section from 100 to 150–170  $\mu\text{m}$  thick; cortical layer very thin, 5–10  $\mu\text{m}$  thick, consisting of 1–2 layers of cells; algal zone to 70  $\mu\text{m}$  thick, and white medulla below algal zone to 100–125  $\mu\text{m}$  thick in the thicker portions. Upper surface of areoles very uneven, often seem to be finely areolate (or torn in flap).

Apothecia 0.3–0.5(–0.7) mm diam., and to 0.3 mm thick in section, slightly uplifted above thalline areole level to distinctly attenuated at the basis and sitting above thallus level, often crowded in dense aggregations (KW-L 74904 (holotype) and KW-L 74854), where white side of thalline exciple well seen and well contrasting to thalline margin and disc of apothecia; disc dull orange, true exciple somewhat indistinct, but seen to be zeorine owing to presence of

\* *Staurothele frustulenta* Vain. is for the first time recorded from the Forest Zone of Ukraine here. It was known from the Ukrainian Carpathians (Hazslinszky 1884, Makarevich *et al.* 1982, Oxner 1956, Szatala 1927), from the Forest-Steppe zone (Bielczyk and Kiszka 2000, Bielczyk *et al.* 2005), and from the Steppe zone of Ukraine (Darmostuk and Khodosovtsev 2014, Khodosovtsev and Darmostuk 2017, Khodosovtsev *et al.* 2018a, 2019). It should be mentioned that this taxon (*Staurothele frustulenta*) is recorded by us from calcium containing material (roof tiles), while so far it was known from wet granitic (or siliceous) rock outcrops in Ukraine, while in Europe it is known from dry and somewhat nutrient enriched rocks, concrete or roof tiles.



whitish (well contrasting to both apothecium disc and thalline margin) edge of thalline exciple) or zeorine, where bright or dull yellow-orange own margin (but still well contrasting disc) present (easily distinguished after white thalline edge and bright yellow to orange yellow true exciple and darker dull brown orange disc of apothecia); own margin often concolorous with disc, and indistinct, but edge of own margin well contrasting to whitish edge of thalline exciple. Sometimes (KW-L 74904) four different colours are observed in apothecium, i.e.: white true exciple; bright yellow outer edge of true exciple or inner portion of thalline exciple; dull dark brown orange disc, and all these colours very well contrasting to dark lead-grey thallus and outer portion of the thalline exciple.

Apothecia in section zeorine, thalline exciple to 100–120(–150)  $\mu\text{m}$  thick, completely filled in by algae, cortical layer almost absent (indistinct in water and to 10–12  $\mu\text{m}$  thick in K), cell lumina 3–5  $\mu\text{m}$  diam./across, algal cells to 15–17  $\mu\text{m}$  diam.; true exciple (50–)100–125  $\mu\text{m}$  thick in the uppermost lateral portion, much thinner to 20–25  $\mu\text{m}$  thick in lower lateral portion and to 25–40  $\mu\text{m}$  thick in basal portion, paraplectenchymatous in lateral portion and pseudoprosoplectenchymatous (with matrix and hyphae lumina to 2–4  $\mu\text{m}$  diam., while *textura intricata* in K) in basal portion; hymenium 80–100  $\mu\text{m}$  high, epihymenium 5–10  $\mu\text{m}$  thick, with numerous orange-brown spherical fragments, indistinct in water (undissolving in K crystals, becoming brownish violet in K), paraphyses towards the tips slightly swollen to 2.5–3  $\mu\text{m}$  diam., uppermost cells of paraphyses in K sometimes slightly darker, brownish; subhymenium 50–80(–100)  $\mu\text{m}$  thick, with scarce small oil droplets; ascospores small and wide, often widely bifusiform, end more or less attenuated, distinctly thickened at the septum, often almost spherical, 9–13(–14)  $\times$  6–10  $\mu\text{m}$  in water and (9–)10–13(–16)  $\times$  (6.5–)7–8(–11)  $\mu\text{m}$  in K, septum rather thick, (2.5–)3–7(–7.5)  $\mu\text{m}$  wide in water and (3–)4–7(–10)  $\mu\text{m}$  thick in K. Conidiomata not observed.

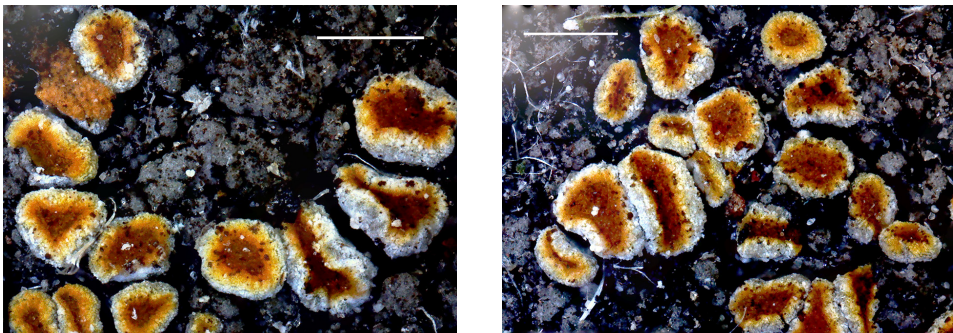


Fig. 1. *Caloplaca orloviana* (holotype), general habit of thallus with numerous apothecia. Scale 1 mm

Sometimes hemispherical subconvex yellow-orange formations to 160  $\mu\text{m}$  diam./across on thalline areoles of *Caloplaca orloviana* are observed. However, these fragments may belong to remnants of thalli of *Candelariella aurella* (Hoffm.) Zahlbr. or *Athallia holocarpa* (Hoffm.) Arup, Frödén et Søchting, which grow before development of *C. orloviana* thallus in the same place.

Chemistry: Uppermost cells in cortical tissue of thallus and thalline exciple contain Sedifolia-grey (grey in water, K+ violet, N+ red, H<sub>2</sub>SO<sub>4</sub>+ red, I+ blue).

Ecology: It is a probably rather aggressive species, very often overgrowing other athalline lichens, such as *Candelariella aurella*, *Athallia holocarpa*, *Acarospora moenium*, *Polyozosia semipallida*, rarely *Staurothele frustulenta*. So, at first steps very often thalline areoles are among apothecia of lichens mentioned above. At the same time such lichens as *Phaeophyscia nigricans*, *P. orbicularis*, *Rusavskia dreolyanica*, *Calogaya decipiens*, *Physcia adscendens* often overgrowing thalli of *Caloplaca orloviana*. So, *C. orloviana* is a typical species of intermediate stage of lichen growth between 'athalline' species and the foliose lichens.

Etymology: It is named after the famous Ukrainian geobotanist, specialist on vascular plants, Olexandr O. Orlov, who has collected this taxon and provided the type collection in our disposition.

Distribution: So far it is known from the type locality in Forest zone of Ukraine, Eastern Europe, where it was found to be very common.

Taxonomic notes: Among more or less concolorous apothecia of *Polyozosia semipallida*, *Athallina holocarpa* and *Candelariella aurella* with which *Caloplaca orloviana* usually observed in type locality, apothecia of *C. orloviana* are easily distinguished after white thalline edge and bright yellow to orange yellow true exciple and darker dull brown orange disc of apothecia.

*Caloplaca orloviana* is similar to *C. emilii* Vondrák, Khodos., Cl. Roux et V. Wirth, a member of the *C. areolata* group, which is known from southern part of Europe, including the closest localities in southern part of Ukrainian Plains

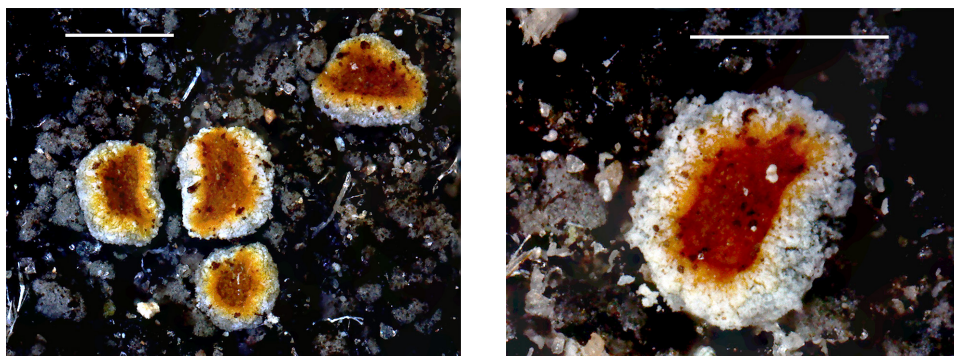


Fig. 2. *Caloplaca orloviana* (holotype), enlarged portion of thallus with zeorine apothecia. Scale 1 mm

(Kherson oblast), but differs in having dark lead-grey (not being brown-grey) and smaller and thinner thallus, in having extremely small and often indistinct areoles or grain-like thallus (vs. areoles or squamules (0.3–)0.6–0.9–1.1(–2.6) mm diam.), in having thinner thallus (vs. 100–500  $\mu\text{m}$  thick), in having smaller apothecia (vs. (0.3–)0.5–0.7–0.9(–1.4) mm diam.); in having whitish grey or whitish (i.e. shades of grey) thalline exciple (well contrasting to thallus and disc, vs. true exciple and disc are the same)); in having true exciple concolorous with disc or indistinct from disc (vs. true exciple usually yellow contrasting with brown or orange disc), in having narrower subhymenium (50–80(–100)  $\mu\text{m}$  vs. hypothecium 100–300  $\mu\text{m}$  thick), in having wider thalline exciple (110–120(–150)  $\mu\text{m}$  vs. *ca.* 10–70  $\mu\text{m}$  wide, in having pseudoprosoplectenchymatous true exciple in basal portion (vs. palisade prosoplectenchyma of thin-walled cells *ca.* 5–12  $\times$  1.5–2.0  $\mu\text{m}$  after Vondrák *et al.* (2013), while it could be called as the *Blastenia* type), in having narrower tips of paraphyses (2.5–3  $\mu\text{m}$  diam. vs. (2.5–)3.0–3.5–4.0(–5.0)  $\mu\text{m}$  diam.), in having smaller and wider range of variation ascospores (9–13(–14)  $\times$  6–10  $\mu\text{m}$  vs. (8–)12–13.5(–15)  $\times$  (5–)7–8(–9.5)  $\mu\text{m}$ ), and wider range of variation of width of ascospores septum ((2.5–)3–7(–7.5)  $\mu\text{m}$  vs. (4–)5–6(–7.5)  $\mu\text{m}$  wide), as well as in the lack of blastidia or any vegetative propagules (vs. simple, globose, dark grey, always present (20–)53–65–95(–210)  $\mu\text{m}$  diam.) (Vondrák *et al.* 2013).

Unfortunately, data on conidia are still missing for *Caloplaca orloviana* (vs. ellipsoid, broadly ellipsoid or tear-shaped, rather uniform in size 2–2.5  $\times$  1.5  $\mu\text{m}$  in *C. emilii*).

*Caloplaca orloviana* is similar to *C. chlorina* (Flot.) H. Olivier, growing on wet and shaded siliceous rocks and rarely on bark of trees more or less widely distributed in the northern hemisphere, in having lecanorine to zeorine apothecia, as well as in having very variegating thalline areoles, but differs in having somewhat indistinct and eblastidiate thallus (vs. areoles well developed, polygonal and flat), in having even colouration of thallus (vs. thallus colour mostly light grey well contrasting to darker dark grey or bluish grey soresidious-isidious mass), in having sessile apothecia (vs. mostly immersed in verrucules of thallus), in the lack of isidia, and shorter and wider ascospores (9–13(–14)  $\times$  6–10  $\mu\text{m}$  vs. 10–15  $\times$  5–7  $\mu\text{m}$ ), as well as in the lack of K reaction (vs. thallus and isidia K+ violet (containing green pigment in thallus)).

*Caloplaca orloviana* is similar to *C. xerica* Poelt et Vězda (= *C. areolata* (Zahlbr.) Clauzade ex Vězda pr. p.), growing on siliceous rock outcrops in xeric conditions together with *Lichinella stipatula*, *Peltula euploca* and *Gonohymenia* spp., and known from Europe and Asia (Pakistan), in having thallus consisting of squamulose areoles loosely attached to the substrate often overlapping, especially in the centre, in having zeorine apothecia, sitting or attenuated at the basis, but differs in having smaller thalline fragments (0.1–0.9 mm across vs.

0.3–2 mm diam.), in having only dark grey thallus (vs. dark grey and green greyish), in the lack of small isidia-like lobules (vs. 0.07–0.2(–0.3) mm across on thalline areole surface); in having well developed thalline exciple (vs. thalline exciple seen only at side) in having zeorine apothecia (vs. the *Athallia holocarpa* or the *A. pyracea* type), in having pseudoprosoplectenchymatous true exciple (vs. paraplectenchymatous true exciple), in having wider and somewhat shorter ascospores ( $9\text{--}13\text{--}(14) \times 6\text{--}10 \mu\text{m}$  vs.  $10\text{--}16 \times 6\text{--}8\text{--}(9) \mu\text{m}$ ), and wider septum ( $(2.5\text{--})3\text{--}7\text{--}(7.5) \mu\text{m}$  vs.  $3\text{--}4 \mu\text{m}$  wide), as well as in the lack of K reaction (vs. thallus and isidia K<sup>+</sup> violet (containing green pigment in thallus)).

*Caloplaca orloviana* is similar to *C. isidiigera* Vězda, an unrelated species with blastidia but with lecanorine apothecia and bacilliform conidia, as well as a (sub-)alpine distribution (Soun *et al.* 2011, Vězda 1978), but differs in having smaller thallus (vs. more of 1–2 cm across), in having distinctly zeorine apothecia (with light grey or whitish grey thalline (well contrasting to dark thallus), deeply yellow-orange own margin and dull orange disc, vs. lecanorine, where thalline concolorous with thallus, i.e. dark grey or lead-grey, and no own margin observed), in having distinctly sessile apothecia (vs. immersed into thalline areole), and more or less larger apothecia (vs. 0.4–0.7 mm diam.), in having more compact thallus (vs. thalline granules 0.07–0.15(–0.2) mm across, very thick to 0.4 mm thick), in having distinctly shorter and wider ascospores ( $9\text{--}13\text{--}(14) \times 6\text{--}10 \mu\text{m}$  vs.  $12\text{--}15 \times 5\text{--}6 \mu\text{m}$ ), and wider septum ( $3\text{--}7\text{--}(7.5) \mu\text{m}$  vs.  $3\text{--}4.5 \mu\text{m}$  wide).

*Caloplaca orloviana* is similar to *C. areolata* (Zahlbr.) Clauzade, without blastidia (= vegetative diaspores) appears to be restricted to the Mediterranean region (whereas the blastidiate *C. emilii* also occurs in isolated localities far to the north). After molecular data of Vondrák with colleagues (2013) *C. emilii* is definitely placed in the *C. xerica* group. It forms a well circumscribed clade (PP = 1.0), sister to *C. areolata*. Both taxa form a well-supported monophyletic group (PP = 0.99).

Very rarely lecanorine apothecia of *Caloplaca cerina* type (i.e. with grey thalline margin and dull brown orange discs), probably as dyeing or apothecia of *C. orloviana* from very shaded conditions were observed, too. However, from the latter species (*C. cerina*) *C. orloviana* differs in having another type of thallus, as well as mostly distinctly zeorine apothecia, as well as in having another type of cortical layer of thalline exciple, as well as in having shorter ascospores ( $9\text{--}13\text{--}(14) \times 6\text{--}10 \mu\text{m}$  vs.  $(12\text{--})14\text{--}16\text{--}(19) \times (5\text{--})6\text{--}8\text{--}(10) \mu\text{m}$ ) and somewhat narrower septum ( $(2.5\text{--})3\text{--}7\text{--}(7.5) \mu\text{m}$  vs.  $6\text{--}7 \mu\text{m}$  wide) (see Kondratyuk *et al.* 2004).

Other specimens examined: Ukraine, Zhytomyr oblast, Narodychi district, 1.5 km to SE of Loznytsia village, Drevlyansky Nature Reserve, Narodychi research division, on old roof tiles, growing together with *Candelariella aurella*, *Polyozosia semipallida*, *Phaeophyscia or-*



*bicularis*, *P. nigricans* and *Calogaya decipiens*. Lat.: 51° 07' 41.77" N; Long.: 29° 06' 24.22" E. Coll.: Orlov, O. O., 04.06.2019 (KW-L 74810 sub *Calogaya decipiens*); the same locality, growing together with *Acarospora moenium* and *Calogaya decipiens* (KW-L 74820 sub *Polyozosia semipallida*); the same locality, growing together with *Calogaya decipiens*, *Phaeophyscia orbicularis*, and *P. nigricans* (KW-L 74838 sub *Polyozosia semipallida*); the same locality, growing together with *Acarospora moenium*, and *Polyozosia semipallida* (KW-L 74845 sub *Caloplaca orloviana*); the same locality, growing together with *Calogaya decipiens*, and *Polyozosia semipallida* (KW-L 74847 sub *Calogaya decipiens*); the same locality, growing together with *Pyrenodesmia teicholyta* (KW-L 74848 sub *Caloplaca orloviana*); the same locality, growing together with *Athallia holocarpa* and *Polyozosia semipallida* (KW-L 74849 sub *Athallia holocarpa*); the same locality, growing together with *Polyozosia semipallida*, *Acarospora moenium*, *Candelariella aurella*, and *Calogaya decipiens* (KW-L 74856 sub *Polyozosia semipallida*); the same locality, growing together with *Calogaya decipiens*, and *Polyozosia semipallida* (KW-L 74857 sub *Caloplaca orloviana*); the same locality, growing together with *Polyozosia semipallida*, and *Calogaya decipiens* (KW-L 74860 sub *Athallia holocarpa*); the same locality, growing together with *Calogaya decipiens*, and *Polyozosia semipallida* (KW-L 74864 sub *Polyozosia semipallida*); the same locality, growing together with *Phaeophyscia nigricans*, *Polyozosia semipallida*, *Phaeophyscia orbicularis*, *Athallia holocarpa*, *Candelariella aurella* and *Calogaya decipiens* (KW-L 74894 sub *Caloplaca orloviana*); the same locality, growing together with *Polyozosia semipallida*, *Calogaya decipiens*, and *Candelariella aurella* (KW-L 74901 sub *Polyozosia semipallida*). – Ukraine: Zhytomyr oblast, Narodychi district, Drevlyansky Nature Reserve, Rozsokhivske research division, in the vicinity of Hannivka village, Lat.: 51° 09' 11.00" N; Long.: 29° 02' 43.11" E, roof of old sheepfold building, on old roof tiles, growing together with *Candelariella aurella* damaged by *Phoma candelariellae* Z. Kocakaya et Halıcı (recorded here for the first time from Ukraine!), *Rusaovskia drevlyanica*, *Polyozosia semipallida*, *Acarospora moenium*, *Phaeophyscia nigricans*, and *Staurothele frustulenta*. Coll.: Orlov, O. O., 20.10.2018 (KW-L 74791 sub *Candelariella aurella*).

***Ioplaca rinodinoides*** S. Y. Kondr., K. K. Ingle, D. K. Upreti et S. Nayaka,  
*spec. nova*  
 (Fig. 3)

Mycobank no.: MB 834125.

*Similar to Caloplaca diphyes, but differs in having smaller apothecia and in having greyish thalline margin, in having larger and especially wider ascospores and in having much wider, as well as in having different host.*

Type: India: Nagaland, Kopima district, Vaisema to Dzukou valley, on rocks, growing together with *Diploschistes* sp. and *Upretia* sp. Lat.: 25° 32' 20.3" N; Long.: 94° 05' 53.8" E; Alt.: 2,397 m a.s.l. Coll.: Ingle, K. K., 22.06.2017 (holotype: LWG-L 17-031119); the same locality, (isotype: LWG-L 17-031118; voucher for DNA SK F14 and SK F15).

Thallus epilithic or /and parasitic, growing on thalli of crustose lichens, forming dark greyish spots among light grey or dull greenish yellow host



thalli. Thallus dark grey, areolate, in section to 144  $\mu\text{m}$  thick, cortical layer to 16–24  $\mu\text{m}$  thick, paraplectenchymatous, thallus cavity totally filled in by algal cells, algal cells to 14.4(–16.6)  $\mu\text{m}$  diam.

Apothecia 0.3–0.35 mm diam., and to 0.12–0.13 mm thick, lecanorine or zeorine in section; thalline exciple to 48–64(–80)  $\mu\text{m}$  thick, cortical layer to 12.8–16(–19.2)  $\mu\text{m}$  thick; true exciple to 32–64  $\mu\text{m}$  thick in the uppermost lateral portion, brownish in the uppermost/outermost portion; to 16  $\mu\text{m}$  wide in middle lateral and basal portions or disappearing or not developed in basal portion; paraphyses tips to 4.8  $\mu\text{m}$  diam., brown (in K to 3.2–4  $\mu\text{m}$  diam., brown); epihymenium brown to 16–19  $\mu\text{m}$  thick, in K–; hymenium 64–80  $\mu\text{m}$  high, with oil droplets or grains; subhymenium 80–96  $\mu\text{m}$  thick, hyaline, with oil agglomerations to 8(–12.8)  $\mu\text{m}$  diam./across (i.e. the *Laundonia* or the *Franzilsia* type); ascospores widely ellipsoid with wide septum, sometimes orange with more or less attenuated ends observed, becoming somewhat greyish in water (similarly to Australian taxon *Caloplaca marchantiorum* S. Y. Kondr. et Kärnefelt), (11–)13–19  $\times$  ((6.5–)8–9.5(–11)  $\mu\text{m}$  in water and (14.5–)16–17.5(–19)  $\times$  (8–)9.5–11(–12.8)  $\mu\text{m}$  in K; ascospores septum (4–)5–8(–9.6)  $\mu\text{m}$  wide in water and (4–)8–9.6(–11)  $\mu\text{m}$  wide in K.

Chemistry: Thallus K– or + dull yellow-brown, almost the same as in water.

Ecology: It grows on rock surface and/or crustose lichens as *Upretia* sp., *Diploschistes* sp., *Ioplaca pindarensis* (Räsänen) Poelt et Hinter., etc.

Etymology: It is named after its similarity with *Rinodina* spp.

Distribution: So far known only from the type locality, India, South Asia.

Taxonomic notes: The genus *Ioplaca* Poelt hitherto thought to be monotypic. However, during this study it was found that it includes at least three taxa of which *I. rinodinoides* is described here.

*Ioplaca rinodinoides* is similar to *Caloplaca diphyes* (Nyl.) H. Olivier, growing on *Lecanora polytropa* on coastal hanging cliffs in Europe (Karelia, Finland),

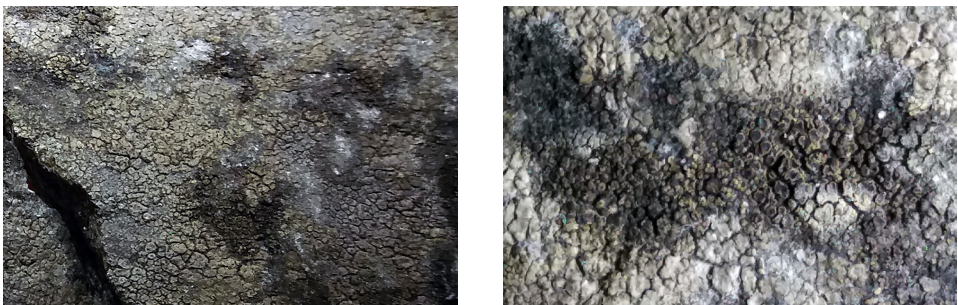


Fig. 3. *Ioplaca rinodinoides* (holotype), general habit of thallus among other crustose lichens (left), and enlarged portion of thallus with apothecia (right)

but differs in having smaller (vs. to 0.7 mm diam.) apothecia and in having greyish thalline margin (vs. black thalline margin), in having larger and especially wider ascospores ((11–)13–19 × ((6.5–)8–9.5(–11) μm vs. 10–15 × 5–7 μm) and in having much wider septum ((4–)5–8(–9.6) μm vs. 2.5–3 μm wide), and as well as in having different host (*Ioplaca* spp. vs. *Lecanora* spp.).

After having areolate greyish thallus *Ioplaca rinodinoidea* is similar to *Caloplaca ochroplaca* Poelt et Hinter., but differs in having dark grey thallus (vs. ochraceous grey), in having greyish to dark grey discs of apothecia (vs. orange), and in having wider ascospores ((11–)13–19 × ((6.5–)8–9.5(–11) μm vs. 13–17 × 6–8.5 μm), as well as in the lack of reaction of apothecium disc and epihymenium with K.

***Letrouitia assamana*** S. Y. Kondr., G. K. Mishra et D. K. Upreti, *spec. nova*  
(Fig. 4)

Mycobank no.: MB 834126.

*Similar to Letrouitia parabola, but differs in having submuriform and much narrower ascospores, in having 2–4 spored asci and in having (1–)2–4 ascospore locules with 1 vertical septa, as well as in having darker true exciple in inner portion.*

Type: India: Assam, Dima Hasao district, Ethnic village 16 km from New Haflong, on bark, alt. 530 m a.s.l. Coll.: Mishra, G. K., 31.03.2017 (holotype: LWG-L 17-029667; voucher for DNA SK F53); the same locality, (isotype: LWG-L 17-029668; voucher for DNA SK F52); the same locality, (isotype: LWG-L 17-029687; voucher for DNA SK F50).

Thallus to 96–112 μm thick in section, cortical layer to 12–13(–16) μm thick, paraplectenchymatous, cell lumina to 3.2–5 μm diam., lower part of medulla sometimes with hyphae orientated in one direction, prosoplectenchymatous portion below algal layer; algal layer to 28–35 μm thick, algal cells 8–16 μm diam. more or less rounded and thick walled.

Apothecia to 0.9–1.4 mm diam. and to 240–320(–450) μm thick in section, disc plane, to slightly concave, biatorine, algae not present in apothecium section, true exciple to 100–120 μm thick, where outermost portion to 64 μm thick brown orange, inner portion to 24–32(–50) μm thick, hyaline of palisade paraplectenchymatous type, cell lumina rounded or vertically elongated (better seen in K), than inner portion very thick to (48–)56–96(–112) μm thick, greyish of air bubbles or irregular oil agglomerations to 6.4–8 μm across, not dissolving in K (but better seen in K), and the most inner portion hyaline to (24–)32–40 μm thick, scleroplectenchymatous; hymenium to 100–120 μm

high, epihymenium (9.6–)12–24  $\mu\text{m}$  thick, dark brown orange; subhymenium (50–)64–80  $\mu\text{m}$  thick, dull yellow-brownish; asci 4–6 spored, paraphyses tips very narrow to 1.6–2.4(–4)  $\mu\text{m}$  thick, richly broom-like branched; ascospores narrowly ellipsoid, hyaline becoming sometimes orange, with 4(–5) spiral-like cells, with more or less attenuated or rounded ends, with 4–5(–8)[–12] cells (in water and to (7–)8–11(–12) in K) with (4–)5–6(–7) transverse septa, locules becoming submuriform, with 1 longitudinal septum in (1–)3–4 locules only, 22.4–24(–27.2)  $\times$  9.6–11.2(–12)  $\mu\text{m}$  in water and 24–27.2  $\times$  11.2–14.4  $\mu\text{m}$  in K.

Chemistry: Outermost portion of true exciple K+ dark brown or blackish brown to violet brown.

Ecology: It grows on bark of tree.

Etymology: It is named after type locality, i.e. Assam, India, South Asia.

Distribution: So far known only from the type locality in India, South Asia.

Taxonomic notes: *Letrouitia assamana* is positioned in somewhat transitional position between *L. transgressa* and *L. parabola*. *Letrouitia assamana* is similar to *L. parabola* (Nyl.) R. Sant. et Hafellner in having 6–8 primary locules, but differs in having submuriform and much narrower ascospores (22.5–24(–27)  $\times$  9.5–11(–12)  $\mu\text{m}$  vs. 25–35  $\times$  12–18  $\mu\text{m}$ ), and in having 2–4 spored asci (vs. 6–8 spored), in having darker true exciple in inner portion, in having (1–)2–4 locules with only 1 vertical septum (vs. each locule with 1–2 septa) (Hafellner 1983).

*Letrouitia assamana* is similar to *L. transgressa* (Malme) Hafellner et Bellem., but differs in having submuriform cells (vs. transversely septate, with 8–12 primary locules), in having shorter and narrower ascospores (22.5–24(–27)  $\times$  9.5–11(–12)  $\mu\text{m}$  vs. 25–60  $\times$  11–20  $\mu\text{m}$ ) (Hafellner 1983).

*Letrouitia assamana* is similar to *L. magenta* Ekanayaka et K. D. Hyde, recently described from Thailand, but differs in having continuous thallus (vs. granulose), in having darker brown orange and thicker outermost portion of



Fig. 4. *Letrouitia assamana* (holotype), general habit of thallus (left), and enlarged portion of thallus with apothecia (right). Scale 0.5 mm

true exciple (to 64  $\mu\text{m}$  thick vs. hyaline to 25–35  $\mu\text{m}$  thick), in having 4–6 spored asci (vs. 8-spored), in having shorter and narrower ascospores (22.5–24(–27)  $\times$  9.5–11(–12)  $\mu\text{m}$  vs. 28–45  $\times$  10–15  $\mu\text{m}$ ), as well as in having less number of transverse septa (4–5(–8) vs. 6–9) (Ekanayaka *et al.* 2019).

Other specimen examined: India: Assam, Dima Hasao district, Jatinga, on way to Dihmngi, 12 km from New Haflong, on bark, alt. 580 m a.s.l. Coll.: Mishra, G. K., 31.03.2017 (LWG-L 17-029685; voucher for DNA SK F51).

***Lobothallia gangwondoana*** S. Y. Kondr., J.-J. Woo et J.-S. Hur, *spec. nova*  
(Figs 5–7)

Mycobank no.: MB 834127.

*Similar to Lobothallia radiosa, but differs in the lack of distinct differentiation of areoles in peripheral and central portions of thallus, in having brownish grey / cacao grey thallus, in having wider thalline lobes / areoles, in having smaller apothecia, in having much thicker thallus and very convex thalline areoles, in having shorter and wider ascospores, as well as in the lack of white pruina.*

Type: Republic of Korea: Gangwon-do Province, Jeongseon-gun, Imgyemyeon, Bongsan-ri, around the Amnae-Bridge, on siliceous rock outcrops, growing together with *Aspicilia* spp. and *Jasonhuria* cf. *bogilana*. Lat.: 37° 28' 53.87" N; Long.: 128° 49' 53.80" E; Alt.: 478 m a.s.l. Coll.: Woo, J.-J. (171605), 28.03.2017 (holotype: KoLRI 052624); the same locality, growing together with *Jasonhuria* cf. *bogilana*. Coll.: J.-J. Woo (171606), 28.03.2017 (isotype: KoLRI 052625).

Thallus from very small semiconvex to very convex, regularly rounded and distant simple areoles to 1.5–2.5(–3.5) mm across to aggregations of areoles to 1–1.5(–2) cm across, very thick, slightly brownish grey or cacao grey, to very large size distinctly areolate; marginal areoles sharply becoming closely attached and thinner in peripheral zone / edge of thallus, but very convex to 2–3 mm thick from the thallus edge. Marginal areoles from rounded to more or less elongate, as irregularly (mostly) as radially (rarely) orientated and do not form marginal lobate portion and not contrasting to areolate centre of thallus, rarely more or less widened towards the tips; areoles in the centre and in the marginal zone to (0.5–)0.8–1.8(–4) mm wide and to (1.2–)1.5–3.3(–4) mm long if distinctly elongated, but they are elongated as radially as along thallus edge or rock crevices, or more or less rounded and very convex in the centre to 2–3 mm diam./across, sometimes one end of areole can be dissected once (or rarely twice); fertile areoles to 1–1.7(–2.3) mm across and to 1(–2) mm



thick; cracks between areoles well distinct, to 0.3 mm wide, surface of rock often seen.

Thallus in section to 0.75–0.9(–1.1) mm thick, cortical layer to 20–25  $\mu\text{m}$  thick, mesodermatous paraplectenchymatous, cell lumina 5–7(–9)  $\mu\text{m}$  diam./across, the same paraplectenchymatous inclusions between algal clusters observed too, algal zone 100–150  $\mu\text{m}$  thick, algae in vertically elongated clusters 40–70  $\mu\text{m}$  wide/diam., algal cells to 15–17  $\mu\text{m}$  diam., medullary layer below algal zone with oil / crystals / air bubbles – hardly seen to 150–500(–750)  $\mu\text{m}$  thick.

Apothecia very variegating in shape, from (0.3–)0.4–0.5 mm diam., punctiform to irregularly shaped, when immersed, to regularly rounded with distinct thalline margin when uplifted; hymenium to 70–80  $\mu\text{m}$  high; subhymenium 70–80  $\mu\text{m}$  thick, underlined by algal zone; epihymenium dark brownish to 10–15  $\mu\text{m}$  thick; paraphyses to 5–7(–8)  $\mu\text{m}$  diam., where 2–3 the uppermost cells becoming brownish; asci *ca.* 52  $\times$  15–17(–30)  $\mu\text{m}$ , ascospores widely ellipsoid to spherical, (7–)8–10(–13)  $\times$  (6–)8–10  $\mu\text{m}$ .

Chemistry: Cortical layer and medulla (especially the nearest to algal zone portion) K<sup>+</sup> yellow to red (norstictic acid present, with crystals in section).

Ecology: It is growing together with *Aspicilia* spp., *Phaeophyscia esslingerii* and *Jasonhuria* cf. *bogilana* on siliceous rocks.

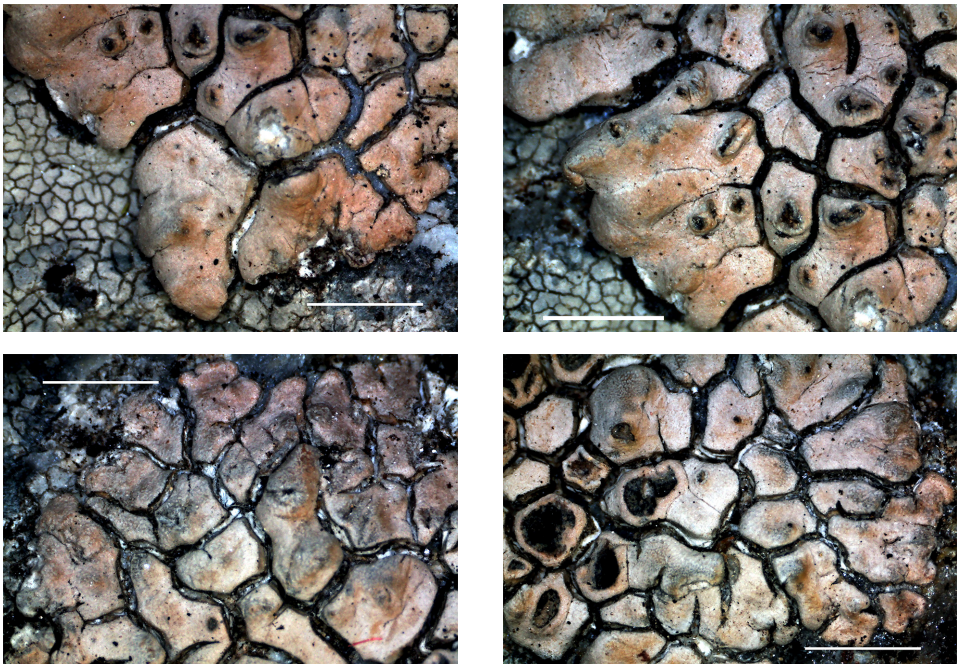


Fig. 5. *Lobothallia gangwondoana* (holotype), enlarged marginal and central thalline areoles. Scale 2 mm





Fig. 6. *Lobothallia gangwondoana* (holotype), enlarged single remote fertile thalline areoles (left) and central portion of areolate thallus (right). Scale 2 mm

**Etymology:** It is named after country province, i.e. Gangwon-do Province of Republic of Korea, Eastern Asia, where the type collection was done.

**Distribution:** It is so far known from the type locality, i.e. Gangwon-do Province of Republic of Korea, Eastern Asia.

**Taxonomic notes:** *Lobothallia gangwondoana* is similar to *L. radiosa* (Hoffm.) Hafellner in having norstictic acid, but differs in the lack of distinct differen-

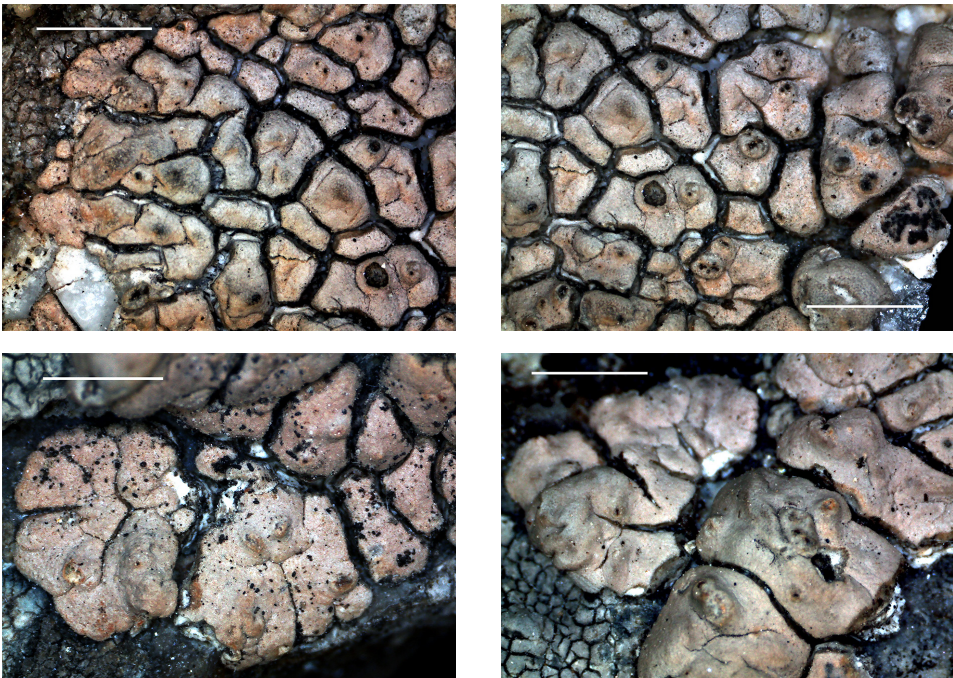


Fig. 7. *Lobothallia gangwondoana* (isotype 171507), enlarged marginal and central thalline areoles. Scale 2 mm

tiation of areoles in peripheral and central portions of thallus (vs. cracked-areolate towards the centre, radiating and placodioid-lobate at margins), in having brownish grey / cacao grey (vs. medium grey) thallus, in having wider thalline lobes / areoles (1–1.7(–2.3) mm vs. 0.4–1(–1.5) mm wide), in having smaller apothecia ((0.3–)0.4–0.5 mm vs. 0.5–1.5 mm diam.), in having much thicker thallus and very convex thalline areoles (to 0.7–0.8(–0.9) mm vs. rather thin, 0.25–0.5 mm thick, lobes slightly convex), in having shorter and wider ascospores (7–)8–10(–13) × (6–)8–10 μm vs. 10–15 × 6–9 μm) (after Wirth *et al.* 2013 and Fletcher *et al.* 2009), as well as in the lack of white pruina.

Separate rounded distant convex areoles to 1.5–2.5(–3.5) mm across (independent from larger thallus) were often observed in lichen collection investigated. And it is very difficult to predict to which taxon they belong (especially if they belong to *Lobothallia*) if they are sterile.

Other specimen examined (paratype): Republic of Korea: Gangwon-do Province, Jeongseon-gun, Imgye-myeon, Bongsan-ri, around the Amnae-Bridge, growing together with *Phaeophyscia esslingerii*. Lat.: 37° 28' 53.87" N; Long.: 128° 49' 53.80" E; Alt.: 478 m a.s.l. Coll.: Woo, J.-J. (171604), 28.03.2017 (KoLRI 052623).

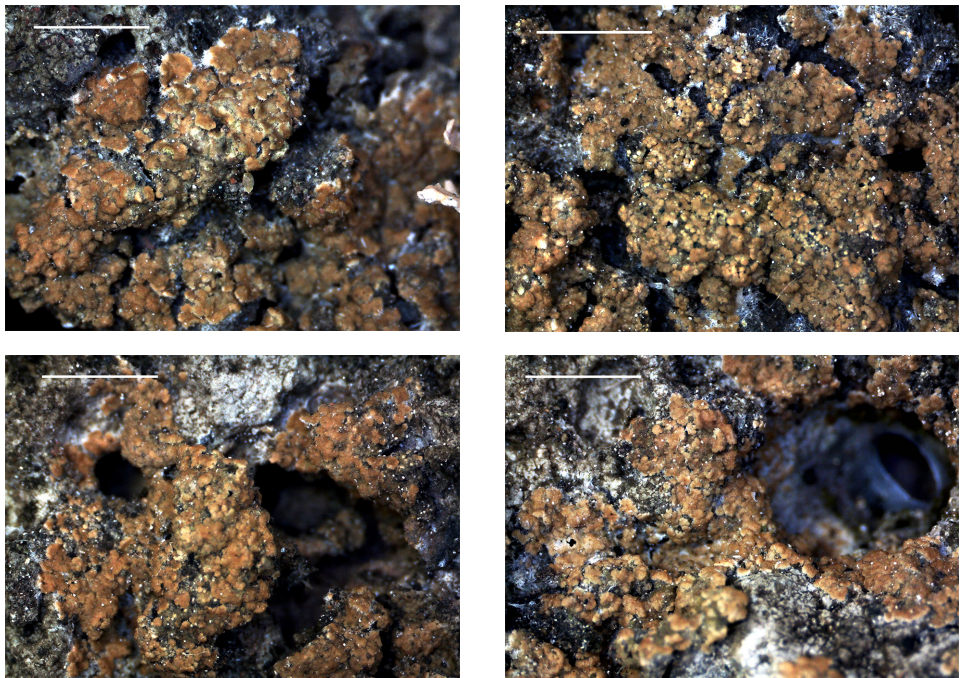


Fig. 8. *Phyllopsora dodongensis* (holotype), general habit of thallus (top), and thalline portion among undulations of tuff rock surface (bottom). Scale 2 mm



*Phyllopsora dodongensis* S. Y. Kondr. et J.-S. Hur, *spec. nova*  
(Figs 8–10)

Mycobank no.: MB 834128.

*Species is characterised by dull green to brownish grey or light to dark brownish areolate thallus, with well distinct overlapping areoles, often being dissolving in soredia, and white hypothallus.*

Type: Republic of Korea: Gyeongsangbuk-do, Ulleungdo Island, Ulleung-gun, Ulleung-eup, Dodong-ri, Dodong Port, on tuff rocks along sea coast, growing together with *Ramalina* and *Verrucaria* spp. Lat.: 37° 28' 59.9" N, Long.: 130° 54' 40.7" E; Alt: 20 m a.s.l. Coll.: Kondratyuk, S. Y., Lőkös, L. (162012), 11.07.2016 (holotype: KoLRI 040250; voucher for DNA SK H30); the same locality, growing together with *Anaptychia* sp., *Verrucaria* sp., *Orientophila fauriei*, *Catillaria ulleungdoensis*, 162009 (isotype: KoLRI 040247 sub *Anaptychia*; voucher of *Phyllopsora dodongensis* for DNA SK H29); the same locality, growing together with *Verrucaria* sp., and *Catillaria ulleungdoensis*, 162010 (isotype: KoLRI 040248).

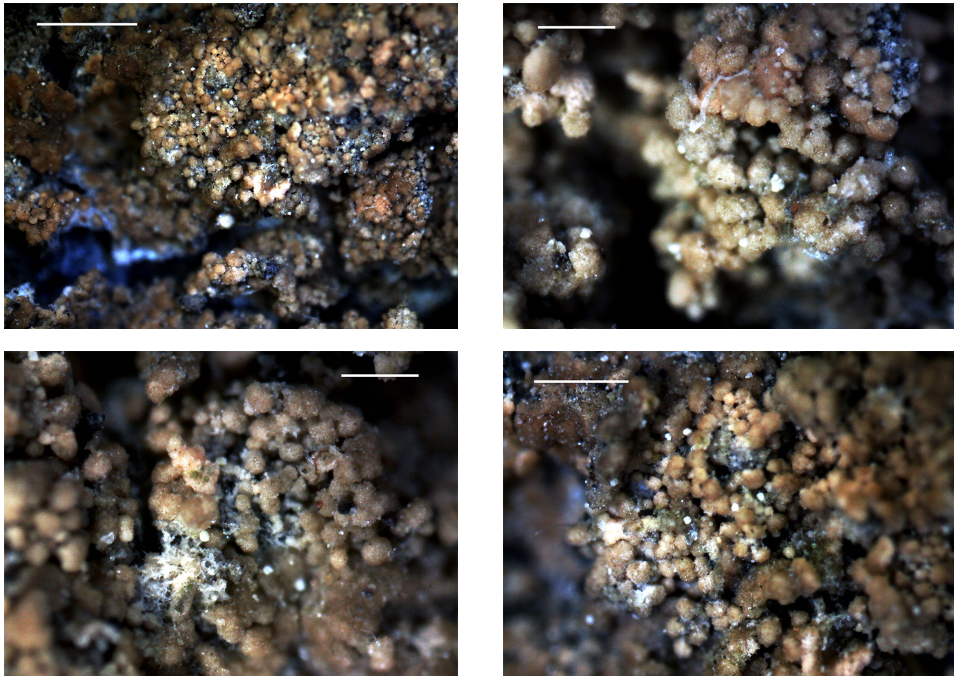


Fig. 9. *Phyllopsora dodongensis* (holotype), enlarged sorediate portions of thallus. Scale 1 mm (left top) and 0.25 mm (the others)

Thallus well defined as dark green spots or sometimes indistinct on uneven surface of tuff rock, mostly of closely attached or overlapping areoles, forming continuous crust, dark green when fresh and to dark brownish grey or dark brown after keeping in herbarium, in the centre often becoming phylloidious/soredious. Thalline portion of more or less continuous crust to 2–3 mm

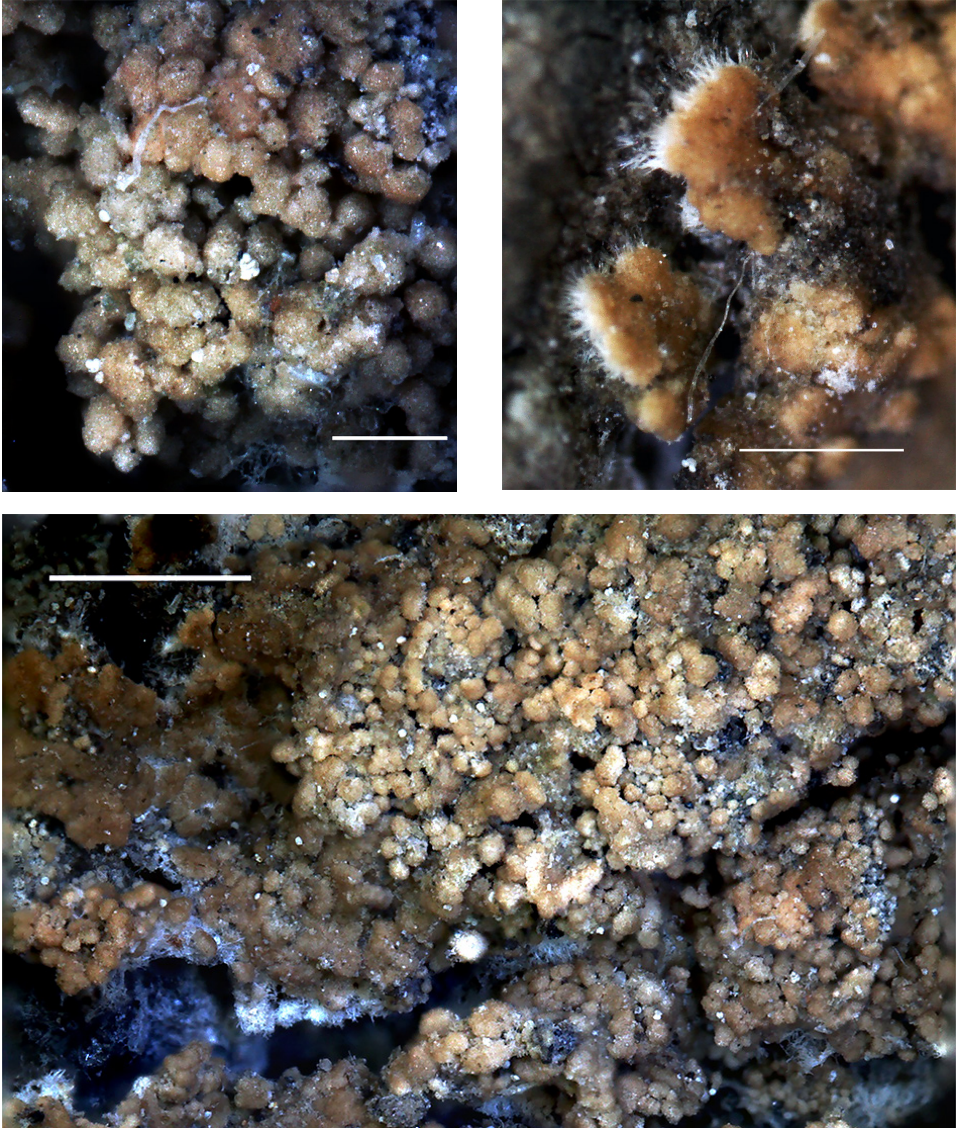


Fig. 10. *Phyllopsora dodongensis* (holotype), enlarged thalline areoles with white hypothalrus. Scale 1 mm (bottom) and 0.25 mm (top)



across, and sometimes somewhat indistinct owing to very undulating surface of tuff rock surface. Areoles (0.2–)0.35–0.75(–0.9) mm wide / across, well distinct owing to overlapping by one side (general habit reminiscent the *Hypocenomyce scalaris* thallus) somewhat rounded to bifurcate branched sometimes, with more or less sorediate aggregations to 1 mm across in the centre of thallus observed; finger-like formations / phyllidia to 0.15–0.2 mm long and 0.1–0.13 mm diam. / wide along areole margin are also seen; marginal phyllidia often with whitish cilia or whitish hyphal net on soredious formations. Hypothallus white, well contrasting to dark brownish grey or light brown surface of thallus, often projecting to 0.1 mm long in marginal areoles.

Soredia\* or soredious granules *ca.* (0.07–)0.08–0.15(–0.2) mm diam. / across, more or less rounded, concolorous with thalline areoles, dull dark green when fresh and becoming dark brownish grey to light or dark brown after keeping in herbarium.

Apothecia and conidiomata not known so far.

Ecology: It grows on siliceous tuff rock in coastal zone.

Etymology: It is named after the type locality, i.e. Dodong Port locality in Ulleungdo Island, Republic of Korea, Eastern Asia.

Distribution: So far it is known only from the type locality in South Korea, Eastern Asia.

Taxonomic notes: Species is characterised by dull green to brownish grey or light to dark brownish areolate thallus, with well distinct overlapping areoles, often being with phyllidia and dissolving in soredia in the centre, as well as white hypothallus. The phenomenon of dissolving thalline areoles into soredia is not well known so far among members of the genus *Phyllopsora*.

After molecular data (see Kondratyuk *et al.* 2019c) species is a member of the *Phyllopsora loekoessii* group including two more epilithic East Asian species, i.e. *P. loekoessii* S. Y. Kondr., E. Farkas, S.-O. Oh et J.-S. Hur and *P. agonimioides* (J. P. Halda, S.-O. Oh et J.-S. Hur) S. Y. Kondr., D. Liu et J.-S. Hur.

It should be mentioned that material of *Phyllopsora dodongensis*, described here, incorrectly was mentioned as *Phyllopsora sunchonensis* (S. Y. Kondr. et J.-S. Hur) S. Y. Kondr., L. Lőkös et J.-S. Hur in the same branch of the *Phyllopsora* genus of the phylogenetic tree of the Ramalinaceae in paper mentioned.

So far, all three species of the *Phyllopsora loekoessii* group are known only from Eastern Asian region. Records of *Phyllopsora loekoessii* from African continent (Kistenish *et al.* 2019) may belong to another taxon, which was illustrated in our previous paper (Kondratyuk *et al.* 2019c).

Sorediate / blastidiate material of *Phyllopsora sunchonensis* (S. Y. Kondr. et J.-S. Hur) S. Y. Kondr. et J.-S. Hur, field name 'green sorediate crust / Ba-

\* Soredia are very rarely recorded for *Phyllopsora* species, so this species is somewhat unique in the *Phyllopsora loekoessii* group (sensu Kondratyuk *et al.* 2019c), why we do not hesitate to describe it as separate taxon of this genus.



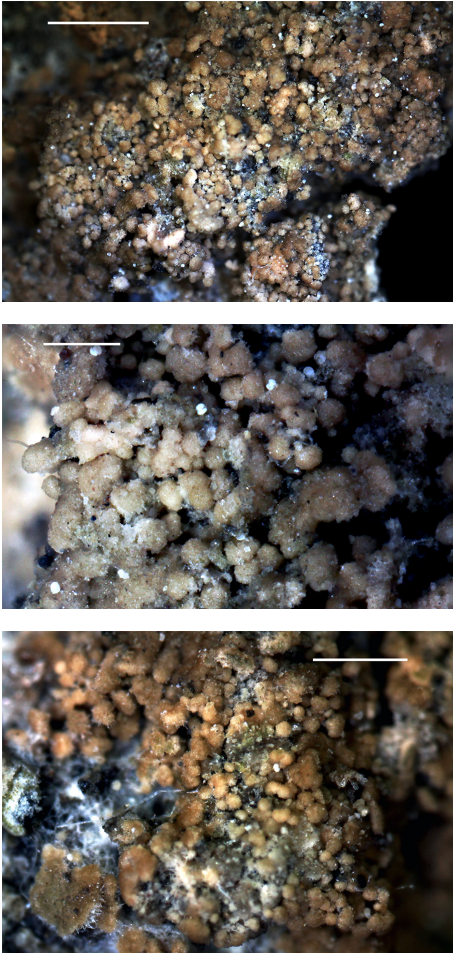


Fig. 11. *Phyllopsora dodongensis* (holotype), enlarged thalline areoles forming phyllidia and soredia. Scale 1 mm (top), 0.25 mm (middle) and 0.5 mm (bottom)

*cidia* sp. /*Agonimia* sp.' was especially revised in 2019 after publishing new combination *Phyllopsora sunchonensis*. It was found that there are two separate taxa, i.e. an epiphytic material consisting completely of sorediate mass in inland areas of South Korean mainland and an epilithic material having as thalline areoles as soredious mass in islands of Korean archipelago. The epiphytic material was described as *Agonimia sunchonensis* S. Y. Kondr. et J.-S. Hur (Kondratyuk *et al.* 2018). Later a new combination *Phyllopsora sunchonensis* was proposed based on molecular data for the epilithic sorediate green crust (Kondratyuk *et al.* 2019c). Thus, conclusion about position of sorediate *Phyllopsora* species in the *Phyllopsora loekoesii* group (Kondratyuk *et al.* 2019c) in fact belongs to still undescribed taxon, which is proposed here to describe as *Phyllopsora dodongensis*. Unfortunately, the new combination as *Phyllopsora sunchonensis* based on *Agonimia sunchonensis* was proposed incorrectly.

The status of *Agonimia sunchonensis* is still waiting for checking with molecular data, while it is most likely that combination *Phyllopsora sunchonensis* will not be confirmed in future.

***Rusavskia drevlyanica* S. Y. Kondr. et O. O. Orlov, *spec. nova***  
(Figs 12–13)

MycoBank no.: MB 834130.

*Similar to Rusavskia elegans, but differs in having smaller and thinner thallus, in having narrower, and more or less plane thalline lobes forming network; in having smaller and distinctly zeorine apothecia; in having thinner true exciple, in*

having shorter ascospores, in having narrower ascospores septum, as well as in different ecology and distribution.

Type: Ukraine: Zhytomyr oblast, Narodychi district, Drevlyansky Nature Reserve, Rozsokhivske research division, in the vicinity of Hannivka village, roof of old sheepfold building, on old roof tiles, growing together with *Calogaya decipiens*, *Phaeophyscia nigricans*, *Candelariella aurella*, and *Polyozosia semipallida*. Lat.: 51° 09' 11.00" N; Long.: 29° 02' 43.11" E. Coll.: Orlov, O. O., 20.10.2018 (holotype: KW-L 74787); the same locality, growing together with *Calogaya decipiens*, *Phaeophyscia nigricans*, *Polyozosia semipallida*, *Acarospora moenium*, and *Phaeophyscia* aff. *orbicularis* (isotype: KW-L 74790); the same locality, growing together with *Acarospora moenium*, *Calogaya decipiens*, *Caloplaca orloviana*, *Candelariella aurella*, *Lecanora* sp., *Phaeophyscia nigricans*, *Ph. orbicularis* and *Staurothele frustulenta* (isotype: KW-L 74816); the same locality, growing together with *Calogaya decipiens*, *Candelariella aurella*, *Polyozosia semipallida*, *Phaeophyscia nigricans*, *Ph. orbicularis*, *Acarospora moenium*, and *Staurothele frustulenta* (isotype: KW-L s.n.); the same locality, growing together with *Calogaya decipiens*, *Candelariella aurella*, *Polyozosia semipallida*, *Phaeophyscia orbicularis* and *Acarospora moenium* (isotype: KW-L s.n.).

Thallus to 2–3 cm across, rarely larger of 3 cm in diam., rosette-like; thalline lobes well developed, and distinctly seen, to 5–8(–10) mm long and 0.3–0.5(–0.7) mm wide along the whole length\*, not touching by sides each other, forming somewhat network-like thallus in the centre or throughout, thalline lobes seem to be flat (= plane), while in section cavity and somewhat undulations of the lower cortex on underside can be seen. Lobes at first narrow and plane (= flat), somewhat distant each other and forming net-like thallus, rarely or later becoming shorter and wider with thalline edges more or less bent downwards (while it can be also similar to *Rusaovskia elegans*, and it was previously included into *R. elegans*); the secondary lobules the same wide (0.3–0.5 mm); branched especially in the terminal portion, total width with all secondary lobules to 1.5–3(–4) mm towards the tips; distinctly seen, not compressed. Upper surface seems to be pseudocyphellate; underside white.

Thallus in section to 125–150 µm thick (however, undulations of lower cortex make impression that thallus in section is much thicker); the upper cortical layer very thin (15–20 µm), to very thick (up to 125 µm), inverted conical in vertical section scleroplectenchymatous portions dividing algal zone may make impression that cortex is much thicker; algal zone to 50 µm thick, usually divided into clusters by hyphae of cortex, algal cells to 10–12 µm diam.;

\* Lobes seem to be to 0.5–0.7 mm wide, while edges downwards folded, and in section reach to 1 mm wide.

pseudocypbellae not confirmed in section of thallus; medulla often compact to 50–70  $\mu\text{m}$  thick; lower cortex to 15–20  $\mu\text{m}$  thick, palisade or paraplectenchymatous, where cell lumina 5–7  $\mu\text{m}$  across vertically elongated. Rhizines or any organs of attachment absent.

Apothecia 0.3–1(–1.7) mm diam., and 0.3–0.4 mm thick in section, with plane disc, distinctly attenuated at the basis, often button- or lamp-like, slightly or distinctly arising level of thallus; when very numerous making aspect of thallus (similarly to *Massjukiella polycarpa*); zeorine (better seen at  $\times 50$  or higher magnification), where disc, own margin and thalline margin concolorous; own margin very thin, while distinct and mostly entire; thalline margin often crenulate; in section zeorine, thalline exciple to 75–100(–150)  $\mu\text{m}$  thick with cortical layer to 15–20  $\mu\text{m}$  thick in lateral portion and to (30–)40–50  $\mu\text{m}$  thick on underside of apothecium, leptodermatous or mesodermatous paraplectenchymatous to somewhat pseudoprosoplectenchymatous, cell lumina 7–10(–17)  $\mu\text{m}$  across, algal clusters to 150  $\mu\text{m}$  diam., algal cells 12–17  $\mu\text{m}$  diam.; true exciple very badly developed, to (20–)30–40  $\mu\text{m}$  thick in the uppermost lateral portion and to 10–15  $\mu\text{m}$  thick in lower lateral and basal portions, paraplectenchymatous or *Blastenia* type; hymenium (60–)70–80  $\mu\text{m}$  high, epihymenium sometimes with crystals (not dissolving in K, but becoming purple/pink), paraphyses tips to 5(–7)  $\mu\text{m}$  diam. in water (and to 4  $\mu\text{m}$  diam. in K); subhymenium (10–)25–35  $\mu\text{m}$  thick, hyaline; ascospores mostly young and very variable in shape within the same section/apothecium, from widely ellipsoid to almost spherical, while adult bipolar ascospores smaller and more or less the same widely ellipsoid shape (7–)8–11(–14)  $\times$  (5–)5.5–8(–9)  $\mu\text{m}$  in water and (9–)10–13(–14)  $\times$  (5–)5.5–8(–10)  $\mu\text{m}$  in K, ascospore septum (2–)3–4(–6)  $\mu\text{m}$  thick in water and (3–)4–7  $\mu\text{m}$  in K.

Chemistry: Epihymenium K<sup>+</sup> purple, while very rich in crystals K<sup>+</sup> bluish purple, hymenium K<sup>+</sup> purple; outermost portions of true exciple in lateral portion K<sup>+</sup> purple or sometimes blackish or dark violet or purple.

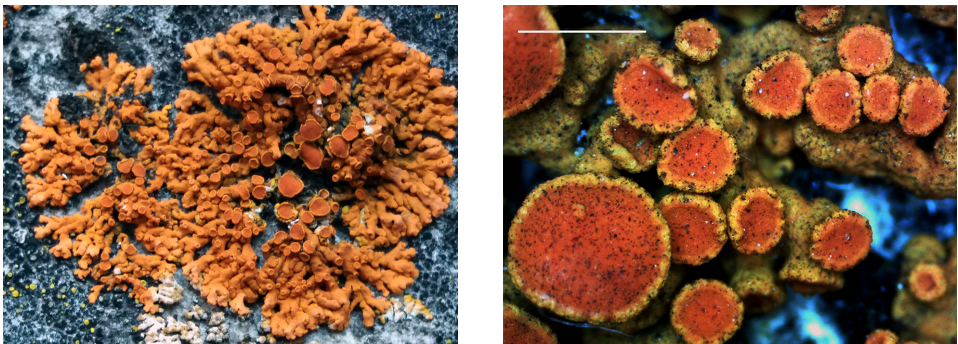


Fig. 12. *Rusavskia drevlyanica* (holotype), general habit of thallus (left) and enlarged portion with apothecia (right). Scale 1 mm



Ecology: It grows on roof tiles, together with *Acarospora moenium*, *Calogaya decipiens*, *Caloplaca orloviana*, *Candelariella aurella*, *Lecanora* sp., *Phaeophyscia nigricans*, *Ph. orbicularis* and *Staurothele frustulenta*.

Etymology: It is named after Drevlyansky Nature Reserve, i.e. Ukraine, Eastern Europe, where type collection was done, and where this taxon is especially abundant.

Distribution: It is known so far from Forest zone of Ukraine, represented very abundantly in the type locality, while may be much widely distributed in the Eastern European region.

Taxonomic notes: *Rusavskia drevlyanica* is similar to *R. elegans* (Link) S. Y. Kondr. et Kärnefelt, rather variable and probably still complex taxon (see Kondratyuk 2004), to which it was previously included, but differs in having slightly / mostly smaller (to 2(-3) cm across vs. 2-4 or more cm diam.), and thinner thallus (thalline lobes 100-150  $\mu\text{m}$  vs. to 300  $\mu\text{m}$  thick in section), in having narrower (0.3-0.5 mm vs. 0.5-1 mm wide (while they are almost the same long, i.e.: 5-8(-10) mm vs. 6-7 mm)), and in having more or less plane (not subconvex or very convex as in *R. elegans*) thalline lobes; in having smaller and distinctly zeorine (0.3-0.7(-1.3) mm diam., vs. 1-2 mm diam., and le-

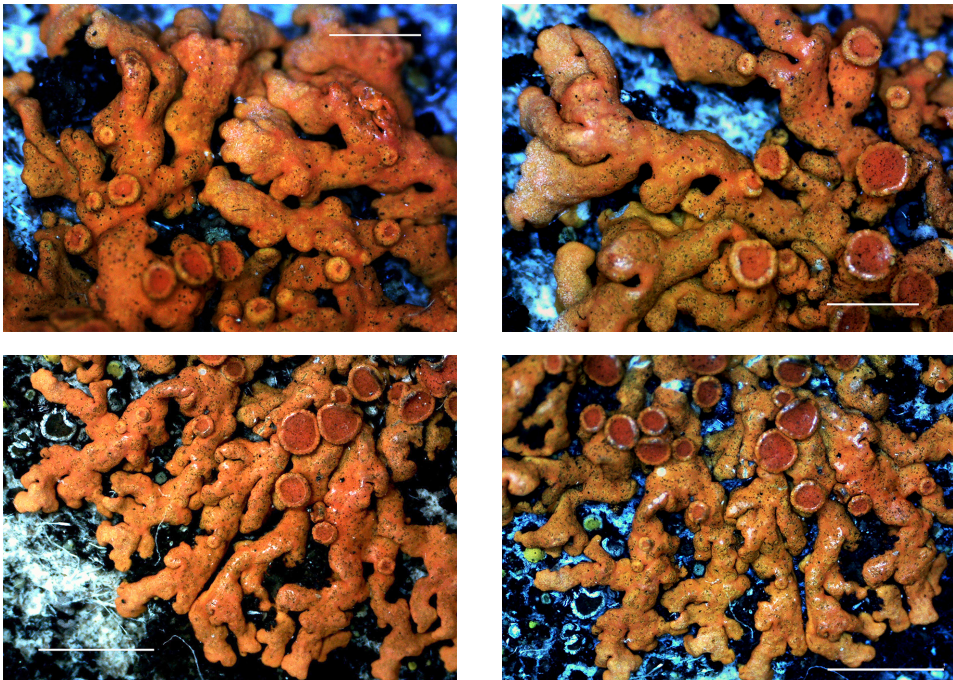


Fig. 13. *Rusavskia drevlyanica* (holotype), enlarged terminal portion of thalline lobes. Scale 1 mm

canorine) apothecia; in having thinner true exciple (to (20–)30–40  $\mu\text{m}$  thick in the uppermost lateral portion and to 10–15  $\mu\text{m}$  thick in lower lateral and basal portions, vs. to 400–450  $\mu\text{m}$  thick in lateral portion and to 90–110(–120)  $\mu\text{m}$  thick in basal portion, scleroplectenchymatous), in having shorter ascospores (vs. more or less the same measurements in ascus) ((7–)8–11(–14)  $\times$  (5–)5.5–8 (–9)  $\mu\text{m}$  vs. (9–)11–16  $\times$  (5.5–)6–8(–8.5)  $\mu\text{m}$ , after Kondratyuk 2004, Hitsch *et al.* 2009, Lindblom 1997), and in having narrower septum ((2–)3–4(–6)  $\mu\text{m}$  thick vs. 5–6  $\mu\text{m}$  wide after Kondratyuk 2004, while 1.6–4.3(–5)  $\mu\text{m}$  wide after Lindblom 1997), as well as in different ecology (on limestone or calcium containing artificial material, roof tiles, concrete, etc., vs. on siliceous rocks) and in different distribution (Ukrainian Plains, Eastern Europe vs. Arctic and Antarctic regions and alpine zone) (Kondratyuk 2004, Hitsch *et al.* 2009, Lindblom 1997).

*Rusavskia dreolyanica* is similar to *Zeroviella esfahanensis* S. Y. Kondr., B. Zarei-Darki et J.-S. Hur known from alpine and cold deserts of Eurasia in having flat (not convex) thalline lobes, in having pseudocyphellae and plane apothecium disc, as well as distinctly attenuated at the basis of apothecia, but differs in having longer and narrower thalline lobes (5–8(–10) mm vs. 3–5(–7) mm long and 0.3–0.5(–0.7) mm vs. (0.5–)0.7–1.5 mm wide), and not being widened towards the tips (vs. distinctly widened towards the tips to 1.5–2 mm wide), in having smaller apothecia (0.3–1 mm vs. 1–1.5 mm diam.), in having badly developed true exciple ((20–)30–40  $\mu\text{m}$  vs. 50–70(–96)  $\mu\text{m}$  wide) in the uppermost lateral portion, in having wider ascospores septum (3–4(–6)  $\mu\text{m}$  vs. 2.2–3.5(–4)  $\mu\text{m}$  wide) as well as in ecology (calcium containing materials vs. siliceous rocks) and geography (Ukrainian Plains, Eastern Europe, vs. alpine and cold deserts of Eurasia) (Kondratyuk *et al.* 2015).

When the genus *Zeroviella* S. Y. Kondr. et J.-S. Hur was introduced (Kondratyuk *et al.* 2015) one line with plane (not convex) narrow thalline lobes was selected for the new taxon *Zeroviella esfahanensis* S. Y. Kondr., B. Zarei-Darki et J.-S. Hur.

However, two more lichen species, i.e. one on limestone or calcium containing materials in the Ukrainian Plains (Eastern Europe) (here described as *Rusavskia dreolyanica*), as well as with long narrow lobes known from several Asian countries (described as *Rusavskia indochinensis* S. Y. Kondr., D. K. Upreti et S. Nayaka below in this paper, too) were selected for the further special revision.

Vondrák *et al.* (2019) have provided molecular data on several taxa of the genus *Rusavskia* S. Y. Kondr. et Kärnefelt, but all of them were mentioned as *Rusavskia* sp., and detailed descriptions of specimens mentioned were hitherto not provided.



Additional specimens examined: Ukraine: Zhytomyr oblast, Narodychi district, Drevlyansky Nature Reserve, Rozsokhivske research division, in the vicinity of Hannivka village, 500 m to N of village, roof of old sheepfold building, on old roof tiles, growing together with *Calogaya decipiens*, *Acarospora moenium*, *Candelariella aurella*, and *Physcia adscendens*. Lat.: 51° 09' 11.00" N; Long.: 29° 02' 43.11" E. Coll.: Orlov, O. O., 07.07.2018 (KW-L 74779); the same locality, growing together with *Calogaya decipiens*, *Acarospora moenium*, *Polyozosia semipallida*, and *Candelariella aurella* (KW-L 74780 sub *Calogaya decipiens*); the same locality, growing together with *Calogaya decipiens*, *Phaeophyscia nigricans*, *Ph. orbicularis* and *Staurothele frustulenta* (KW-L 74781 sub *Calogaya decipiens*); the same locality, growing together with *Polyozosia semipallida*, *Phaeophyscia nigricans*, *Acarospora moenium* (KW-L 74783); the same locality, growing together with *Polyozosia semipallida*, *Acarospora moenium*, *Staurothele frustulenta*, *Candelariella aurella*, *Phaeophyscia nigricans* (KW-L 74784); the same locality, growing together with *Candelariella aurella*, *Polyozosia semipallida*, *Staurothele frustulenta*, *Calogaya decipiens*, *Acarospora moenium*, *Phaeophyscia nigricans*, *Ph. orbicularis*, and *Verrucaria nigrescens* (KW-L 74785 sub *Candelariella aurella*); the same locality, growing together with *Calogaya decipiens*, *Staurothele frustulenta*, *Polyozosia semipallida*, and *Acarospora moenium* (KW-L 74788 sub *Calogaya decipiens*). – Ukraine: Zhytomyr oblast, Narodychi district, Drevlyansky Nature Reserve, Rozsokhivske research division, in the vicinity of Hannivka village, roof of old sheepfold building, on old roof tiles, growing together with *Candelariella aurella* damaged by *Phoma candelariellae* (recorded here for the first time from Ukraine!), *Caloplaca orloviana*, *Polyozosia semipallida*, *Acarospora moenium*, *Phaeophyscia nigricans*, and *Staurothele frustulenta*. Coll.: Orlov, O. O., 20.10.2018 (KW-L 74791 sub *Candelariella aurella*); the same locality, growing together with *Calogaya decipiens*, *Phaeophyscia nigricans*, *Ph. orbicularis*, *Polyozosia semipallida*, *Candelariella aurella*, and *Acarospora moenium* (KW-L 74792 sub *Acarospora moenium*; KW-L 74793 sub *Candelariella aurella*); the same locality, Hannivka village, on old pine-tree fence, growing together with *Candelariella aurella*. Coll.: Kondratyuk, S. Y. (21803) and Orlov, O. O., 22.06.2018 (KW-L 74691 sub *Rusavskia*); the same locality, Hannivka village, on old roof tiles, growing together with *Phaeophyscia nigricans*, *Candelariella aurella*, and *Acarospora moenium*. Coll.: Orlov, O. O., 23.06.2018 (KW-L s.n. sub *Acarospora moenium*); the same locality, growing together with *Polyozosia dispersa*, and *Candelariella aurella* (KW-L s.n.); the same locality, growing together with *Phaeophyscia nigricans*, *Ph. orbicularis*, and *Acarospora moenium* (KW-L s.n. sub *Acarospora moenium*); the same locality, growing together with *Phaeophyscia orbicularis*, and *Calogaya decipiens* (KW-L s.n. sub *Calogaya decipiens*); the same locality, growing together with *Acarospora moenium*. Coll.: Orlov, O. O., 24.05.2018 (KW-L s.n.). – Ukraine, Zhytomyr oblast, Narodychi district, 1.5 km to ENE of Loznytsia village, Drevlyansky Nature Reserve, Narodychi research division, on old roof tiles, growing together with *Polyozosia semipallida*, *Candelariella aurella*, and *Acarospora moenium*. Lat.: 51° 07' 41.77" N; Long.: 29° 06' 24.22" E. Coll.: Orlov, O. O., 04.06.2019 (KW-L 74910 sub *Polyozosia semipallida*); the same locality, growing together with *Calogaya decipiens*, *Candelariella aurella*, and *Acarospora moenium* (KW-L 74918); the same locality, growing together with *Candelariella aurella*, and *Acarospora moenium* (KW-L 74846); the same locality, growing together with *Phaeophyscia nigricans*, *Ph. orbicularis*, *Polyozosia semipallida*, *Calogaya decipiens*, *Physcia adscendens*, and *Candelariella aurella* (KW-L 74891 sub *Phaeophyscia orbicularis*); the same locality, growing together with *Acarospora moenium* and *Phaeophyscia nigricans* (KW-L 74898).

*Rusavskia indochinensis* S. Y. Kondr., G. K. Mishra, S. Nayaka et D. K. Upreti, *spec. nova*  
(Figs 14–15)

MycoBank no.: MB 834132.

*Similar to Zeroviella papillifera, but differs in the lack of isidia-like formations.*

Type: India: Uttarakhand, Chamoli district, 17 km before Malari, way to Niti, alt. 2,462 m, on exposed rock. Coll.: Upreti, D. K., Nayaka, S. (07-011210), 19.08.2007 (holotype: LWG, voucher for DNA SK E08).

Thallus to several cm across, only fragment of thalli so far observed. Thalline lobes to 3–5(–7) mm long and 0.5–0.7 mm wide close to the centre of thallus and almost the same or slightly wider (to 0.8–1 mm) towards the tips (while from the underside view to 0.7–0.9 mm wide, because lobe edges bent downwards), usually branched or dissected into fen-like directed secondary sublobules to 2–3 mm long and 0.7–0.8 mm wide (the same wide as main lobules); secondary sublobules branched or dissected into the further level of sublobules almost the same width (*ca.* 0.5–0.8 mm wide), almost not widened towards the tips or only slightly widened but well contrasting to other lobes owing to yellowish or whitish yellow colour; total width of the thalline lobes with all secondary lobules (up to 5–7 secondary sublobules) to 3 mm wide. Upper surface matt, sometimes with distinct pseudocyphellae, deep yellow especially towards the tips, sometimes with very scarce whitish pruina, at largest magnification surface seem to be eroded; to greyish or greenish yellow or whitish yellow towards the centre (or below overlapping younger tips); more or less flat; underside white, only towards the tips yellow, very undulating.

In section thickness of thallus very varying from (200–)250 to 300(–450)  $\mu\text{m}$  and much more if underside is undulating; upper cortical layer to 20–40

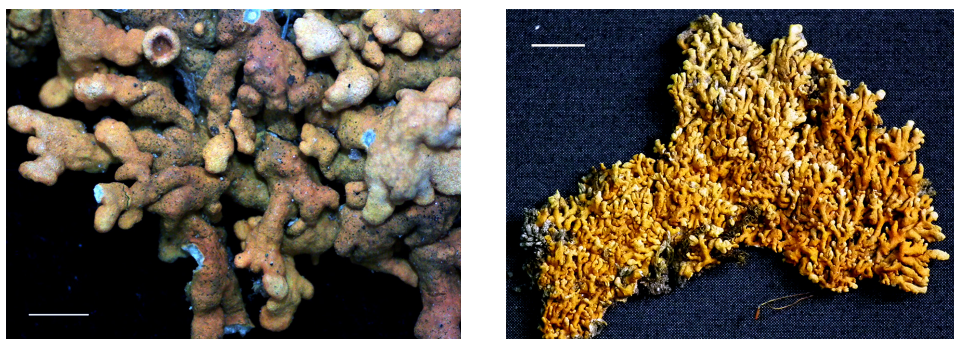


Fig. 14. *Rusavskia indochinensis* (holotype), general habit. Scale 1 mm

(–50)  $\mu\text{m}$  thick, very irregularly developed, scleroplectenchymatous with hyphae lumina to 2–2.5  $\mu\text{m}$  diam. (especially in places of pseudocyphellae); algal zone mostly not continuous, to 50–60  $\mu\text{m}$  thick, with gapes to 100(–200)  $\mu\text{m}$  wide without algal cells; medullary cavity sometimes with scleroplectenchymatous tissue filling up the whole cavity between algal and lower cortical layer or with separate hyphae to 2.5–3.5  $\mu\text{m}$  diam. or hyphae bunches; lower cortical layer to 15–20(–25)  $\mu\text{m}$  thick, palisade plectenchymatous or mesodermatous paraplectenchymatous, cell lumina 3–4(–5)  $\mu\text{m}$  across. No special organs for attachment to the substrate observed.

Apothecia rather small, (0.4–)0.5–0.8 mm diam., lecanorine to zeorine, highly uplifted above the thalline lobe surface and constricted at the basis, thalline margin to 0.2–0.25 mm wide, highly uplifted level of disc, bright yellow to dull yellow, own margin / true exciple *ca.* 0.1 mm wide dull brownish orange, highly uplifted above disc level, or hardly seen only along the inner side of thalline edge; and disc dark or dull brownish orange to dull brownish yellow sometimes with weak yellowish pruina.

Ecology: It grows on siliceous rock outcrops.

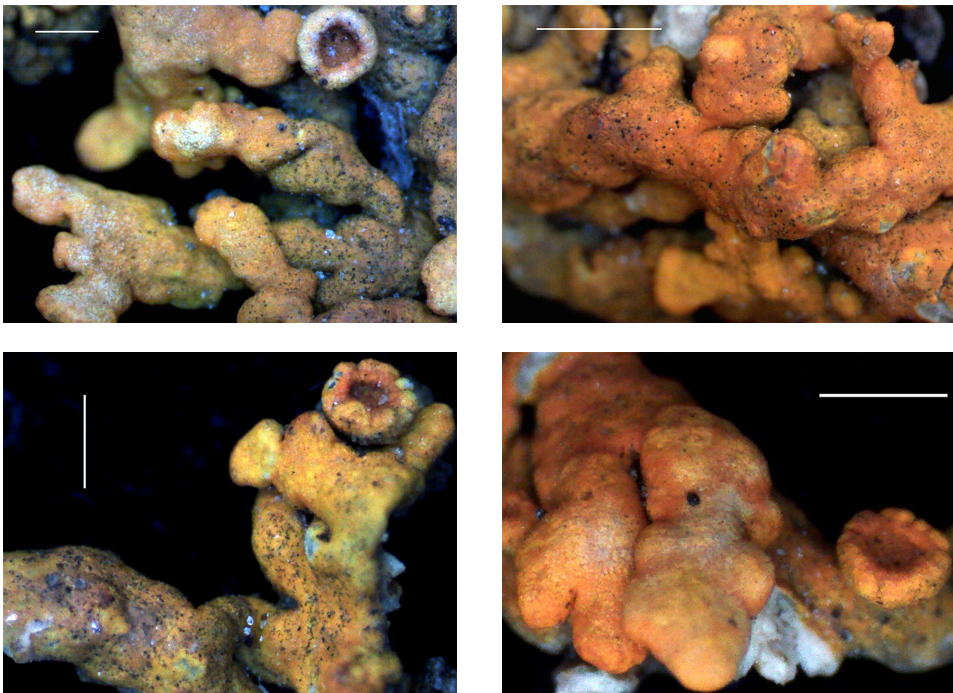


Fig. 15. *Rusavskia indochninensis* (holotype), enlarged thalline lobes. Scale (upper left – 0.5 mm, the others – 1 mm)

**Etymology:** It is named after southern part of Asian continent from where this taxon so far known.

**Distribution:** It is known from scattered and distant localities in southern part of Asia (India and China) so far.

**Taxonomic notes:** *Rusavskia indochinensis* is similar to members of the genus *Zeroviella* (i.e. *Z. digitata*, *Z. domogledensis* and *Z. papillifera*) especially after having pseudocyphellae, but differs in the lack of isidia-like formations.

In having somewhat palmate terminal portions of the thalline lobes (sometimes they are divided in terminal portions into 5–7 sublobules in *R. indochinensis*) it is similar to *Zeroviella digitata* (S. Y. Kondr.) S. Y. Kondr. et Hur, endemic species of southeastern Europe (Ukrainian Crimea), but differs in having much larger measurements of lobes and secondary sublobules, as well as in the lack of isidia-like formations.

After ITS nrDNA phylogeny it is still member of the *Rusavskia* branch. However, after having pseudocyphellae and after general habit it is very similar to species of the genus *Zeroviella*. May be the further accumulation of molecular data on Asian taxa of these two genera as well as data on another genes of *Rusavskia indochinensis*, its status within *Rusavskia* / *Zeroviella* clade will be clarified more precisely. After nrITS phylogeny specimens J23, J25, J54 of *Rusavskia indochinensis* are forming separate branch within the *Rusavskia* clade.

Chinese specimens (KoLRI 024035, KoLRI 024037) were included with some hesitation since they were not included in molecular study so far. They differ in having initial papilla-like formations and may belong to the *Zeroviella papillifera* complex. Further molecular study of this Chinese material will clarify the status of the mentioned specimens. Status of Indian specimens is confirmed by ITS phylogeny of the xanthorioid lichens.

**Other specimens examined:** India: Himachal Pradesh, Kullu district, Kasol village, on way to Manikaran, on a rock with mosses. Lat.: 32° 0.795' N; Long.: 77° 19.319' E; Alt.: 1,777 m a.s.l. Coll.: Bajpai, R. (13-019788) 01.06.2013 (LWG, voucher for DNA SK E09 and voucher for photos). – China, Qinghai province, Magon, Yaushishang, on rock. Lat.: 38° 23' 55.2" N; Long.: 99° 39' 24.3" E; Alt.: ca. 3,173 m a.s.l. Coll.: Oh, S.-O., Han, S. K., Hur, J.-S. (CH 140139), 26.07.2014 (KoLRI 024035 sub *Xanthoria* cf. *elegans*); the same locality, (CH 140141), (KoLRI 024037); and the same locality, (CH 140165), (KoLRI 024061 sub *Xanthoria* cf. *elegans*).

***Xanthoria ibizaensis*** S. Y. Kondr. et A. S. Kondratiuk, *spec. nova*  
(Figs 16–17)

MycoBank no.: MB 834134.

*Similar to Xanthoria monofoliola, but differs in having wide thalline lobes slightly waved in peripheral zone, but closely attached in the centre and for making film-like (the Xanthoria parietina / juniperina type) type of thallus, in having oil*



droplets in paraphyses tips, in having medium long but rather narrow ascospores, as well as in having wide ascospore septum.

Similar to *Xanthoria parietina*, but differs in having wide thalline lobes slightly waved in peripheral zone, but closely attached in the centre, in having smaller apothecia, in having oil droplets in paraphyses tips, in having medium long but rather narrow ascospores, as well as in having wide ascospore septum.

Type: Spain. Balearic Islands, Ibiza Island (Eivissa in Catalan), SW part of island (side facing to Isla de es Vedra), to W of Es Cubells settlement, on very narrow twigs of shrubs (*Pistacia lentiscus*), growing together with *Fominiella tenerifensis* and *Arthonia* sp. Lat.: 38° 52' 39" N; Long.: 1° 13' 31" E; Alt.: 71 m a.s.l. Coll.: Kondratiuk, A. S., 2018 (holotype: KW-L s.n.; voucher for DNA SK M12); the same locality, growing together with *Ramalina* spp. (isotype: KW-L s.n.).

Thallus rather small, 8–15 mm across / diam., often aggregated in larger groups; thalline lobes to 3 mm long and to 1.5–2 mm wide in the peripheral zone, central portion (similarly to *Xanthoria parietina*) covered by densely aggregated apothecia. Thallus in section to 100 µm thick, with paraplectenchymatous upper and lower cortical layers, both to 20 µm thick.

Apothecia mostly small to 0.7–0.9(–1.7) mm diam., and to 0.18 mm thick in section, distinctly attenuated at the basis, stipe to 100 µm diam. sometimes well observed, in section biatorine or zeorine, where thalline exciple is developed only below hymenium level; thalline exciple to 80 µm thick, cortex to 20–30 µm thick (on underside sometimes undulating, and cavities below true exciple in the thalline exciple observed), paraplectenchymatous, cell lumina 7–10 µm across (similar to the *Massjukiella* type, see Fedorenko *et al.* (2012), but with slightly smaller cell lumina) and cell walls to 1.5(–2) µm thick; true exciple to 30–50(–70) µm thick in the uppermost lateral portion, to 40 µm wide

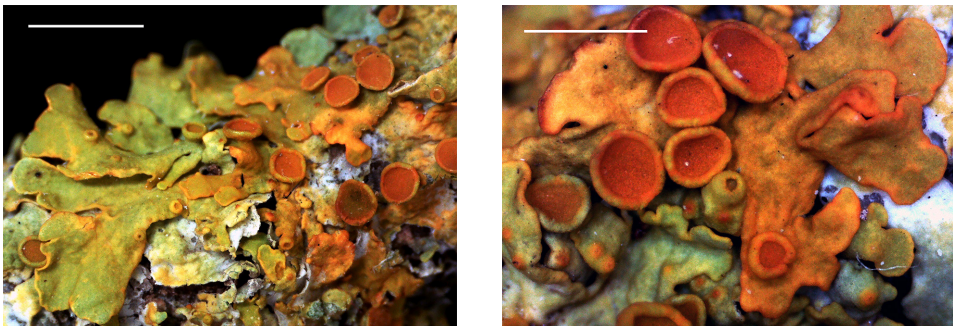


Fig. 16. *Xanthoria ibizaensis* (holotype), general habit of thallus (left), and enlarged terminal portion of thalline lobe (right). Scale 2 mm (left) and 1 mm (right)

in lower lateral portion and to 10–12.5(–20)  $\mu\text{m}$  thick in basal portion, scleropectenchymatous, hyphae lumina to 1  $\mu\text{m}$  diam.; algal zone below level of true exciple, with clusters to 40–60  $\mu\text{m}$  diam., often with white oil grains; algal cells to 15–17.5  $\mu\text{m}$  diam., in medulla of thalline exciple numerous scleropectenchymatous bands (stripes) to 25  $\mu\text{m}$  thick observed; hymenium 45–50  $\mu\text{m}$  high; subhymenium to 10  $\mu\text{m}$  thick; paraphyses tips to 5–6  $\mu\text{m}$  diam. in K, oil droplets hardly seen in water, better seen in K, to 3–3.5  $\mu\text{m}$  diam., on the uppermost or the second cells (rarely in both cells); ascospores narrowly bacilliform to bifusiform, with rather wide ascospore septum 9–13(–15)  $\times$  (4.5–) 4.8–5.5(–7)  $\mu\text{m}$  in water ( $n = 43$ ) and (10–)11–15  $\times$  5–6(–7.5)  $\mu\text{m}$  in K ( $n = 39$ ), ascospore septum (4–)5–7(–8)  $\mu\text{m}$  in water and (5.5–)7–10(–11)  $\mu\text{m}$  wide in K.

Ecology: Growing on bark of very narrow twigs of *Pistacia lentiscus*, often together with *Fominiella tenerifensis*, *Ramalina* sp. and *Arthonia* sp.

Etymology: It is named after Ibiza Island, Balearic Islands, Spain, Europe.

Distribution: So far known only from the type locality, i.e. Ibiza Island, Balearic Islands, Mediterranean Basin of Europe.

Taxonomic notes: The rosette-like (one layer or so called *Xanthoria parietina* / *juniperina* type) thallus consisting of wide lobes slightly waved in peripheral zone, but closely attached to the substrate in the centre, as well as medium long and very narrow ascospores, wide ascospores septum and presence of oil droplets in paraphyses tips are the diagnostic characters of this species.

After ITS data obtained from the holotype it is positioned in outermost position to all groups of the genus *Xanthoria*, i.e. the *X. parietina*, the *X. coomae* and the *X. monofoliola* groups of the *X. parietina* subclade, in somewhat intermediate position between all these three groups and the *X. calcicola* branch.

After morphological characters it is similar to *Xanthoria microspora* B. de Lesd., to *X. monofoliola* S. Y. Kondr. et Kärnefelt and to one more still not described taxon from Eastern Europe in having small thalli, in having thalline lobules of medium size in length, and in having narrow ascospores, as well as

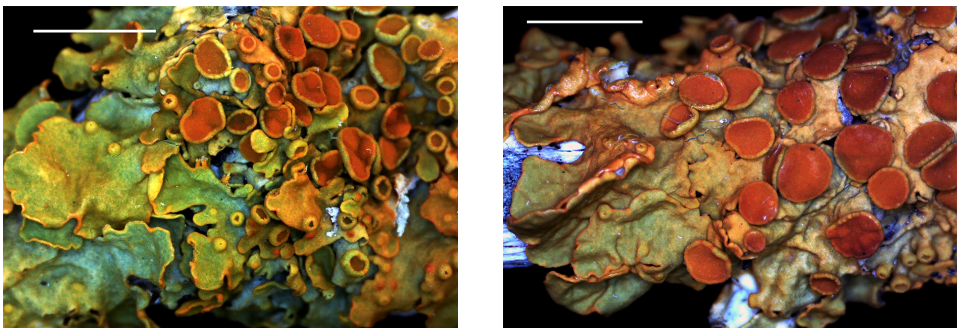


Fig. 17. *Xanthoria ibizaensis* (isotype), general habit of thallus with numerous apothecia in the centre (left), and enlarged marginal thalline lobe (right). Scale 2 mm

in having small apothecia and narrow thalline margin of apothecia, but differs in having much wider flat thalline lobes, which do not show tendency to be uplifted or overlapping, while the lobe tips are more or less waved (more waved than in *X. parietina*), in having rosette-like and flat (= one layer) film type of thallus, in having much wider thalline lobes or with wider range of variation of width, in having much wider ascospore septum.

It is similar to *Xanthoria parietina*, *Jackelixia elixii* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell, as well as *J. dissectula* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Fedorenko, S. Stenroos, Kärnefelt et A. Thell after forming distinctly rosette-like thallus, but differs in positioning within the *Xanthoria* clade, and in having much smaller thalli, smaller thalline lobes, which usually more or less distant and do not form entire film-like thallus, as well as in having smaller apothecia with very narrow thalline margin, in having distinctly narrower ascospores, as well as in having wider septum (see also Kondratyuk *et al.* 2006).

Unfortunately, two isotype specimens are damaged by lichenicolous fungus (*Polycoccum* sp.).

#### New combinations

The following twelve new combinations for species of the *Bryostigma* clade of the phylogenetic tree of the Arthoniaceae based on combined analysis based on mtSSU and RPB2 protein coding gene (see Kondratyuk *et al.* 2019e), as well as 31 new combinations for species of the *Polyozosia* genus of the Lecanoraceae (see Kondratyuk *et al.* 2019c) are proposed.

***Bryostigma apotheciorum*** (A. Massal.) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834135. – Basionym: *Sphaeria apotheciorum* A. Massal., Ric. auton. lich. crost. (Verona): 26 (1852). ≡ *Arthonia apotheciorum* (A. Massal.) Almq., K. svenska Vetensk-Akad. Handl., ny följd 17(6): 58 (1880).

***Bryostigma biatoricola*** (Ihlen et Owe-Larss.) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834136. – Basionym: *Arthonia biatoricola* Ihlen et Owe-Larss., in Ihlen *et al.*, Symb. bot. upsal. 34(1): 107 (2004).

***Bryostigma epiphyscium*** (Nyl.) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834137. – Basionym: *Arthonia epiphyscia* Nyl., Flora, Regensburg 58: 361 (1875).

***Bryostigma dokdoense*** (S. Y. Kondr., L. Lőkös, B. G. Lee, J.-J. Woo et J.-S. Hur) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834178. – Basionym: *Arthonia dokdoensis* S. Y. Kondr., L. Lőkös, B. G. Lee, J.-J. Woo et J.-S. Hur, Mycobiology 47(4): 358 (2019).



***Bryostigma lobariellae*** (Etayo) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834138. – Basionym: *Arthonia lobariellae* Etayo, *Opera Lilloana* 50: 91 (2017).

***Bryostigma lapidicola*** (Taylor) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834140. – Basionym: *Lecidea lapidicola* Taylor, in Mackay, *Fl. Hibern.* 2: 124 (1836). ≡ *Arthonia lapidicola* (Taylor) Branth et Rostr., *Bot. Tidsskr.* 3: 245 (1869).

***Bryostigma molendoi*** (Heufl. ex Arnold) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834141. – Basionym: *Tichothecium molendoi* Heufl. ex Arnold, *Verh. zool.-bot. Ges. Wien* 14: 462 (1864). ≡ *Arthonia molendoi* (Heufl. ex Arnold) R. Sant., *Thunbergia* 3: 2 (1986).

***Bryostigma neglectulum*** (Nyl.) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834142. – Basionym: *Arthonia neglectula* Nyl., *Flora, Regensburg* 57: 13 (1874).

***Bryostigma parietinarium*** (Hafellner et Fleischhacker) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834143. – Basionym: *Arthonia parietinaria* Hafellner et Fleischhacker, in Fleischhacker et al., *Fungal Biology* 120(11): 1343 (2016).

***Bryostigma peltigerinum*** (Almq.) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834144. – Basionym: *Arthonia vagans* var. *peltigerina* Almq., *K. svenska Vetensk.-Akad. Handl., ny följd* 17(6): 57 (1880). ≡ *Arthonia peltigerina* (Almq.) H. Olivier, *Bull. Acad. Intern. Géogr. Bot.* 27: 213 (1917).

***Bryostigma phaeophysciae*** (Grube et Matzer) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834145. – Basionym: *Arthonia phaeophysciae* Grube et Matzer, *Bibl. Lichenol.* 68: 10 (1997).

***Bryostigma stereocaulinum*** (Ohlert) S. Y. Kondr. et J.-S. Hur, *comb. nova* – MycoBank no.: MB 834146. – Basionym: *Arthonia nephromiaria* var. *stereocaulina* Ohlert, *Schr. Phys.-Ökon. Ges. Königsberg* 11: 49 (1870). ≡ *Arthonia stereocaulina* (Ohlert) R. Sant., *Lichens and Lichenicolous Fungi of Sweden and Norway* (Lund), p. 18 (1993).

***Polyozosia actophila*** (Wedd.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834147. – Basionym: *Lecanora actophila* Wedd., *Mém. Soc. Imp. Sci. Nat. Cherbourg* 19: 268 (1875). ≡ *Myriolecis actophila* (Wedd.) M. Bertrand et Cl. Roux, in Nimis, *The lichens of Italy, A second annotated catalogue*, p. 19 (2016).

***Polyozosia agardhiana*** (Ach.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834148. – Basionym: *Lecanora agardhiana* Ach., *Syn. meth. lich.* (Lund), p. 152 (1814). ≡ *Myriolecis agardhiana* (Ach.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., *Fungal Diversity* 78(1): 300 (2015).

***Polyozosia altunica*** (R. Mamut et A. Abbas) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834149. – Basionym: *Myriolecis altunica* R. Mamut et A. Abbas, in Mamut et al., *Bryologist* 122(3): 380 (2019).

***Polyozosia antiqua*** (J. R. Laundon) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834150. – Basionym: *Lecanora antiqua* J. R. Laundon, *Lichenologist* 42(6): 631 (2010). ≡ *Myriolecis antiqua* (J. R. Laundon) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., *Fungal Diversity* 78(1): 300 (2015).

***Polyozosia bandolensis*** (B. de Lesd.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834151. – Basionym: *Lecanora bandolensis* B. de Lesd., *Bull. Soc. bot. Fr.* 101: 223 (1954). ≡ *Myriolecis bandolensis* (B. de Lesd.) M. Bertrand, Cl. Roux et Nimis, in Nimis, *The lichens of Italy, A second annotated catalogue*, p. 19 (2016).

***Polyozosia behringii*** (Nyl.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834152. – Basionym: *Lecanora behringii* Nyl., *Flora, Regensburg* 68: 439 (1885). ≡ *Myriolecis behringii* (Nyl.) Hafellner, in Hafellner and Türk, *Stapfia* 104(1): 173 (2016). ≡ *Lecanora zosteræ* var. *behringii* (Nyl.) Śliwa (as ‘beringii’), *Polish Bot. J.* 52(1): 60 (2007).

***Polyozosia caesioalutacea*** (H. Magn.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834153. – Basionym: *Lecanora caesioalutacea* H. Magn., *Lich. from Central Asia*, p. 85 (1940). ≡ *Myriolecis caesioalutacea* (H. Magn.) R. Mamut, in Mamut et al., *Bryologist* 122(3): 380 (2019).

***Polyozosia carlottiana*** (C. J. Lewis et Śliwa) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834154. – Basionym: *Lecanora carlottiana* C. J. Lewis et Śliwa, *Bryologist* 115(3): 376 (2012). ≡ *Myriolecis carlottiana* (C. J. Lewis et Śliwa) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., *Fungal Diversity* 78(1): 300 (2015).

***Polyozosia congesta*** (Clauzade et Vězda) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834155. – Basionym: *Lecanora congesta* Clauzade et Vězda, *Portug. acta biol., Sér. B* 9: 331 (1969). ≡ *Myriolecis congesta* (Clauzade et Vězda) M. Bertrand et Cec. Roux, in Nimis, *The lichens of Italy, A second annotated catalogue*, p. 19 (2016).

***Polyozosia eurycarpa*** (Poelt, Leuckert et Cl. Roux) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834156. – Basionym: *Lecanora eurycarpa* Poelt, Leuckert et Cl. Roux, in Poelt and Leuckert, *Bibl. Lichenol.* 58: 319 (1995). ≡ *Myriolecis eurycarpa* (Poelt, Leuckert et Cl. Roux) Hafellner et Türk, *Stapfia* 104(1): 173 (2016).

***Polyozosia expectans*** (Darb.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834157. – Basionym: *Lecanora expectans* Darb., *Nat. Antarkt. Exp. 1901–1904, Nat. Hist.* 5: 5, tab. I, fig. 2 (1910). ≡ *Myriolecis expectans* (Darb.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., *Fungal Diversity* 78(1): 300 (2015).

***Polyozosia flowersiana*** (H. Magn.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834158. – Basionym: *Lecanora flowersiana* H. Magn., Acta Hort. Gotoburg 19 (2): 38 (1952). ≡ *Myriolecis flowersiana* (H. Magn.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia fugiens*** (Nyl.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834159. – Basionym: *Lecanora fugiens* Nyl., Flora, Regensburg 56(19): 289 (1873). ≡ *Myriolecis fugiens* (Nyl.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia invadens*** (H. Magn.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834160. – Basionym: *Lecanora invadens* H. Magn., Lichens Central Asia 1: 87 (1940). ≡ *Myriolecis invadens* (H. Magn.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia juniperina*** (Śliwa) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834161. – Basionym: *Lecanora juniperina* Śliwa, Lichen Flora of the Greater Sonoran Desert Region (Tempe) 2: 231 (2004) ≡ *Myriolecis juniperina* (Śliwa) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia latzelii*** (Zahlbr.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834162. – Basionym: *Lecanora latzelii* Zahlbr., Öst. bot. Z. 60: 13 (1910). ≡ *Myriolecis latzelii* (Zahlbr.) Cl. Roux, in Nimis, The lichens of Italy, A second annotated catalogue, p. 19 (2016).

***Polyozosia liguriensis*** (B. de Lesd.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834163. – Basionym: *Lecanora liguriensis* B. de Lesd., Bull. Soc. Bot. France 46: 175 (1949). ≡ *Myriolecis liguriensis* (B. de Lesd.) Cl. Roux, in Nimis, The lichens of Italy, A second annotated catalogue, p. 19 (2016).

***Polyozosia massei*** (M. Bertrand et J.-Y. Monnat) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834164. – Basionym: *Myriolecis massei* M. Bertrand et J.-Y. Monnat, in Bertrand et al., Bryologist 121(3): 256 (2018).

***Polyozosia mons-nivis*** (Darb.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834165. – Basionym: *Lecanora mons-nivis* Darb., Wiss. Ergebn. Schwed. Südpol.-Exp., 1901–1903 4(11): 9 (1912) [1919]. ≡ *Myriolecis mons-nivis* (Darb.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia oyensis*** (M. Bertrand et Cl. Roux) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834166. – Basionym: *Lecanora oyensis* M.-P. Bertrand et Cl. Roux, Bull. Inf. Ass. Franç. Lichén. 36(2): 108 (2011). ≡ *Myriolecis oyensis* (M. Bertrand et Cl. Roux) M. Bertrand et Cl. Roux, in Nimis, The lichens of Italy, A second annotated catalogue, p. 19 (2016).

***Polyozosia percrenata*** (H. Magn.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834167. – Basionym: *Lecanora percrenata* H. Magn.,



Lich. from Central Asia, p. 88 (1940).  $\equiv$  *Myriolecis percrenata* (H. Magn.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia persimilis*** (Th. Fr.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834168. – Basionym: *Lecanora hagenii* subsp. *persimilis* Th. Fr. (as '*hagenii*'), Lich. Scand. (Upsaliae) (1): 251 (1871).  $\equiv$  *Myriolecis persimilis* (Th. Fr.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).  $\equiv$  *Lecanora persimilis* (Th. Fr.) Arnold, Flora, Regensburg 55: 77 (1872).

***Polyozosia poeltiana*** (Clauzade et Cl. Roux) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834169. – Basionym: *Lecanora poeltiana* Clauzade et Cl. Roux, Beih. Nova Hedwigia 79: 188 (1984).  $\equiv$  *Myriolecis poeltiana* (Clauzade et Cl. Roux) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia prominens*** (Clauzade et Vězda) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834170. – Basionym: *Lecanora prominens* Clauzade et Vězda, Revta Fac. Ciên. Univ. Lisboa, Sér. 2, C 14(1): 49 (1966).  $\equiv$  *Myriolecis prominens* (Clauzade et Vězda) Cl. Roux et Nimis, in Nimis, The lichens of Italy, A second annotated catalogue, p. 20 (2016).

***Polyozosia prophetae-eliae*** (Sipman) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834171. – Basionym: *Lecanora prophetae-eliae* Sipman, Bibl. Lichenol. 96: 275 (2007).  $\equiv$  *Myriolecis prophetae-eliae* (Sipman) Sipman et Cl. Roux, in Nimis, The lichens of Italy, A second annotated catalogue, p. 20 (2016).

***Polyozosia salina*** (H. Magn.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834172. – Basionym: *Lecanora salina* H. Magn., Bot. Notiser: 229 (1926).  $\equiv$  *Myriolecis salina* (H. Magn.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia schofieldii*** (Brodo) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834173. – Basionym: *Lecanora schofieldii* Brodo, Botany 88(4): 353 (2009).  $\equiv$  *Myriolecis schofieldii* (Brodo) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia sverdrupiana*** (Øvstedal) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834174. – Basionym: *Lecanora sverdrupiana* Øvstedal, Nova Hedwigia 37(4): 685 (1983).  $\equiv$  *Myriolecis sverdrupiana* (Øvstedal) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

***Polyozosia torrida*** (Vain.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834175. – Basionym: *Lecanora torrida* Vain., Ark. Bot. 8(4): 45 (1909).  $\equiv$  *Myriolecis torrida* (Vain.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

*Polyozosia wetmorei* (Śliwa) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834176. – Basionym: *Lecanora wetmorei* Śliwa, Lichen Flora of the Greater Sonoran Desert Region (Tempe) 2: 283 (2004). ≡ *Myriolecis wetmorei* (Śliwa) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

*Polyozosia zosteræ* (Ach.) S. Y. Kondr., L. Lőkös et Farkas, *comb. nova* – MycoBank no.: MB 834177. – Basionym: *Lecanora subfusca* ? *zosteræ* Ach., Syn. meth. lich. (Lund), p. 158 (1814). ≡ *Myriolecis zosteræ* (Ach.) Śliwa, Zhao Xin et Lumbsch, in Zhao et al., Fungal Diversity 78(1): 301 (2015).

### Rare species

*Huriella loekoესiana* S. Y. Kondr. et Upreti – It is for the first time reported for Russia on the basis of voucher Vondrák 18682 mentioned as *Squamulea* sp. in (Ekanayaka *et al.* 2019, Vondrák *et al.* 2019). Ekanayaka with colleagues (Ekanayaka *et al.* 2019) have illustrated the highest level of support of branch with *Squamulea subsoluta* SK 694 (100803 KoLRI 012491) GenBank accession number KJ133481, and specimens from Russia mentioned as *Squamulea* sp. Vondrák 18682 GenBank accession number MG954160 (Vondrák *et al.* 2019). However, as far voucher SK 694 is the holotype of the recently described *Huriella loekoესiana* (Kondratyuk *et al.* 2017a) this Russian specimens is *Huriella loekoესiana*, too.

*Huriella pohangensis* S. Y. Kondr., L. Lőkös et J.-S. Hur – It is for the first time reported for China, Yunnan Province on the basis of voucher HKAS 102112 GenBank accession number MK499351 (Ekanayaka *et al.* 2019). After data of Ekanayaka with colleagues (Ekanayaka *et al.* 2019) this specimen is positioned in the same branch with Korean specimens 161904 (KoLRI 40141 GenBank accession numbers KY614410), 161998 (KoLRI 40236 GenBank accession numbers KY614409), and 162000 (KoLRI 40238 GenBank accession numbers KY614408), which are voucher specimens of *Huriella pohangensis* (Kondratyuk *et al.* 2018). Thus Chinese specimen HKAS 102112 is *Huriella pohangensis*, too.

### CONCLUSION

The further members of the genera *Orientophila*, *Squamulea*, *Xanthoria*, and others of the Teloschistaceae, as well as data on the representatives of the other families will be presented in next issue of the Notes.

\*

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