Three New Monotypic Genera of the Caloplacoid Lichens (Teloschistaceae, Lichen-Forming Ascomycetes)

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Abstract Three monophyletic branches are strongly supported in a phylogenetic analysis of the Teloschistaceae based on combined data sets of internal transcribed spacer and large subunit nrDNA and 12S small subunit mtDNA sequences. These are described as new monotypic genera: Jasonhuria S. Y. Kondr., L. Lőkös et S. -O. Oh, Loekoesia S. Y. Kondr., S. -O. Oh et J. -S. Hur and Olegblumia S. Y. Kondr., L. Lőkös et J. -S. Hur. Three new combinations for the type species of these genera are proposed.

Keywords Caloplacoideae, Gyalolechia, Jasonhuria, Loekoesia, Olegblumia, Pyrenodesmia

The taxonomy of the Teloschistaceae has developed rapidly since 2012. A large number of new genera, based on molecular phylogeny investigations, have been proposed [1-7]. The number of genera in the Teloschistaceae increased from 10 in Kärnefelt [8] to 29 [1] and to presently 67 [5-7, 9, 10]. The family is divided in three, Caloplacoideae Teloschistoideae, and Xanthorioideae [3, 11] or four subfamilies [12].

Three new, monotypic genera were discovered within this study and are described below: Jasonhuria for the Eastern Asian Caloplaca bogilana; Loekoesia for the South Korean Caloplaca austrocoreana; and Olegblumia for the European and North American Caloplaca demissa.

MATERIALS AND METHODS

Specimens were examined using standard microscopical techniques, i.e., hand-sectioned under a Nikon SMZ-645 dissecting microscope (Nikon Corp., Tokyo, Japan), sections were observed under a Nikon E-200 and Olympus BX-51 microscope (Olympus, Tokyo, Japan). Spot test reactions were performed on thalli. Chemicals were extracted in analytical grade acetone in a 1-mL Eppendorf tube. Thin layer chromatography (TLC) was performed using a glass plate coated with TLC Silica gel 60, in solvent system A (toluene : dioxin : acetic acid = 180 : 45 : 5) [13].

Total DNA was extracted directly from the thalli according to Ekman [14] and was purified with DNeasy Plant Mini Kit (Qiagen, Hilden, Germany). The nuclear ribosomal RNA gene region including the internal transcribed spacers 1 and 2 and the 5.8S subunit mtDNA sequences were amplified using the primers ITS1F [15] and ITS4 [16], the 28S large subunit (LSU) using the primer LR5 [17], and the 12S mtSSU using the primers mtSSU1-mtSSU3R and mtSSU2R [2, 18].

The amplification was done using a Takara JP/TP600 PCR machine (Takara Bio Inc., Tokyo, Japan). One initial cycle of 5 min at 94°C was followed by 30 cycles of the following steps: 30 sec at 94°C, 39 sec at 57°C, and 1 min at 72°C. Amplifications were ended with a final cycle at 72°C for 10 min. PCR products were then sent to the sequencing facilities of the Genotech Co. (Seoul, Korea) for cleaning and sequencing. The sequencing was carried out using the
### Table 1. Specimen vouchers used in the phylogenetic analysis with GenBank numbers

| Species name                | Voucher details/References                                                                 | ITS       | LSU       | mt DNA   |
|-----------------------------|-------------------------------------------------------------------------------------------|-----------|-----------|----------|
| Brigantiaea ferruginea      | SK779, Kondratyuk et al. (2013) [5]                                                        | KF264622  | -         | KF264684 |
| Brigantiaea ferruginea      | SK780, Kondratyuk et al. (2013) [5]                                                        | KF264623  | -         | KF264685 |
| Blastenia crenularia        | Gaya et al. (2012) [3]                                                                     | JQ301711  | JQ301489  |          |
| Blastenia ferruginea        | -                                                                                         | KC179416  | KC179163  | KC179493 |
| Blastenia subochracea       | Arup et al. (2013) [1]                                                                    | KC179418  | -         | -        |
| Bryoploca jungermanniae     | Arup et al. (2013) [1]                                                                    | KC179420  | -         | -        |
| Bryoploca sinapisperma      | Arup et al. (2013) [1]                                                                    | KC179421  | -         | KC179495 |
| Bryoploca tesorpera         | Arup et al. (2013) [1]                                                                    | KC179422  | -         | -        |
| Caloploca cerina            | FNM185, Fedorenko et al. (2009, 2012) [2, 18]                                            | EU681284  | EU680863  |          |
| Caloploca pelodella         | SK714, Kondratyuk et al. (2013) [5]                                                       | KF264629  | -         | KF264689 |
| Caloploca furax             | -                                                                                         | HQ444341  | -         | -        |
| Caloploca phaeothamnos      | -                                                                                         | JN813419  | -         | -        |
| Caloploca stillicidorum     | Gaya et al. (2008) [19]                                                                   | EU639607  | -         | -        |
| Caloploca throcophantica    | -                                                                                         | HM38525   | -         | -        |
| Eilifdahlia dahlii          | SK956, Kondratyuk et al. (2014) [6]                                                       | KJ021221  | KJ021252  | KJ021277 |
| Eilifdahlia dahlii          | SK959, Kondratyuk et al. (2014) [6]                                                       | KJ021318  | KJ021253  | KJ021279 |
| Eilifdahlia wirthii         | SK262, Kondratyuk et al. (2014) [6]                                                       | KJ021319  | KJ021254  | KJ021280 |
| Elenkiniana ehenbergii      | Sochting and Figueras (2007) [20]                                                        | DQ888715  | -         | -        |
| Elenkiniana gloriae         | SK750, Kondratyuk et al. (2014) [6]                                                       | KJ021323  | -         | -        |
| Elenkiniana gloriae         | SK611, Kondratyuk et al. (2014) [6]                                                       | KJ021321  | KJ021256  | KJ021282 |
| Elenkiniana gloriae         | SK613, Kondratyuk et al. (2014) [6]                                                       | KJ021322  | -         | KJ021283 |
| Framwilsia bastowii         | SK810, Kondratyuk et al. (2014) [6]                                                       | KJ021324  | KJ021257  | KJ021284 |
| Framwilsia kilcudaeniensis  | SK920, Kondratyuk et al. (2014) [6]                                                       | KJ021326  | KJ021259  | KJ021286 |
| Framwilsia renatae          | SK235, Kondratyuk et al. (2014) [6]                                                       | KJ021329  | -         | KJ021289 |
| Fulgogasparrea decipioidea  | SK689, Kondratyuk et al. (2013) [5]                                                       | KF264644  | -         | KF264695 |
| Gyalolechia aurea           | Arup et al. (2013) [1]                                                                    | KC179434  | KC179196  | KC179330 |
| Gyalolechia canariensis     | Gaya et al. (2008) [19]                                                                   | EU639587  | -         | -        |
| Gyalolechia canariensis     | SK583, Kondratyuk et al. (2014) [6]                                                       | KJ021332  | -         | -        |
| Huneckia pollini            | SK3206, Kondratyuk et al. (2014) [6]                                                       | KJ021336  | KJ021265  | KJ021296 |
| Huneckia pollini            | SK870, Kondratyuk et al. (2014) [6]                                                       | KJ021337  | KJ021266  | KJ021297 |
| Huneckia rheinigeri         | SK3204, Kondratyuk et al. (2014) [6]                                                       | KJ021222  | -         | -        |
| Iolopla pindarensis         | Gaya et al. (2012) [3]                                                                    | JQ301672  | -         | -        |
| Iolopla pindarensis         | -                                                                                         | EU639586  | -         | -        |
| Jasonuria bogilana          | Ko.RI 120454, South Korea: Jeollanam-do, Yeosu-i, Nam-myeon, Geumhoedo, Usil coastal road, 34°30.4001” N, 127°46.3807” E, 1 m alt., on rock U Jayalal, JS Park, JA Ryu (120454), 26 Apr 2012, Ko.RI 015444 | KT220196  | KT220205  | KT220214 |
| Jasonuria bogilana          | Ko.RI 120469, South Korea: Jeollanam-do, Goheung-gun, Geumsan-myeon, Eojeon-ri, Geumhoedo, Simpo coast, 34°26.1609” N, 127°07.1504” E, 20 m alt., on rock, U Jayalal, JS Park, and JA Ryu (120469), 27 Apr 2012, Ko.RI 015459 | KT220197  | KT220206  | KT220215 |
| Jasonuria bogilana          | Ko.RI 120641, South Korea: Jeollanam-do, Yeosu-i, Hwayang-myeon, Imok-ri, Baegla coast, 34°39.0004” N, 127°34.0407” E, 12 m alt., on rock, U Jayalal, JS Park, and JA Ryu (120641), 28 Apr 2012, Ko.RI 015635 | KT220198  | KT220207  | KT220216 |
| Jasonuria bogilana          | Ko.RI 120647, the same locality, U Jayalal, JS Park, and JA Ryu (120647), 28 Apr 2012, Ko.RI 015642 | KT220199  | KT220208  | KT220217 |
| Josefsoetia sorediosa       | SK391, Kondratyuk et al. (2013) [5]                                                       | KF264645  | KF264673  | KF264696 |
| Kaernfia kaernefeltii       | SK321, Kondratyuk et al. (2013) [5]                                                       | KF264652  | KF264680  | KF264703 |
| Leproplaca obliterans       | Arup et al. (2013) [1]                                                                    | KC179449  | KC179207  |          |
| Leproplaca xantholyta       | Arup et al. (2013) [1]                                                                    | KC179451  | KC179208  | KC179542 |
| Leproplaca xantholyta       | Gaya et al. (2012) [3]                                                                    | JQ301670  | JQ301565  | -        |
Three New Genera of Caloplacoid Lichens

fluorescent marker BigDye and an ABI 3730xl sequencing machine (Applied Biosystems, Carlsbad, CA, USA).

The consensus sequence was aligned with all related species sequences retrieved from the GenBank database. The consensus sequences were then deposited into GenBank under the accession numbers KT220196–KT220222 (Table

Table 1. Continued

| Species name             | Voucher details/References                  | ITS   | LSU   | mt DNA   |
|--------------------------|--------------------------------------------|-------|-------|----------|
| Loeckoesia austrocoreana | KoLRI 120511, South Korea: Jeollanam-do, Yeosu-si, Nam-myeon, Yusong-ri, Geu-mohdo, on rock, 34°31'55.03" N, 127°45'55.05" E, alt. 11 m a.s.l., Coll., U Jayalal, JS Park, and JA Ryu (120511), 27 Apr 2012, KoLRI 015502–isotype             | KT220200 | KT220209 | KT220218 |
| Loeckoesia austrocoreana | KoLRI 120523, the same locality (120523), KoLRI 015515–isotype | KT220201 | KT220210 | KT220219 |
| Loeckoesia austrocoreana | SK261, KoLRI 120525-1, the same locality (120525-1), KoLRI 015507–isotype | KT220202 | KT220211 | KT220220 |
| Marchantiana maulensis    | SK994, Kondratyuk et al. (2014) [6]         | KJ023182 | KJ023184 | -        |
| Marchantiana occidentalis | SK981, Kondratyuk et al. (2014) [6]         | KJ021227 | KJ021268 | KJ021303 |
| Marchantiana occidentalis | SK982, Kondratyuk et al. (2014) [6]         | KJ021228 | KJ021269 | KJ021304 |
| Mikhtomia gordejevii     | SK80515, Kondratyuk et al. (2014) [6]       | KJ021231 | -       | KJ021307 |
| Mikhtomia gordejevii     | SK80646, Kondratyuk et al. (2014) [6]       | KJ021232 | -       | KJ021308 |
| Mikhtomia oxnerii        | SK90117, Kondratyuk et al. (2014) [6]       | KJ021233 | -       | KJ021311 |
| Mikhtomia oxnerii        | SK90755, Kondratyuk et al. (2014) [6]       | KJ021234 | -       | KJ021312 |
| Olegblumia demissa       | SK C65, Ukraine: Mykolaiv oblast, Arbuzynka district, right bank of Pivdenny Buh River, lower of Konstantinovka village, about 3–5 km lower along the river from Yuzhnoukrainsk town, near stone rapids on river, SE vertical surfaces of granite outcrops, at the plots 22, 23 and 24, 47°48'23" N, 31°10'10.6" E, alt. ca 18 m a.s.l., Coll., SY Kondratyuk (20311), NM Fedorenko, 17 May 2003 (KW-L 70478) | KT220203 | KT220212 | KT220221 |
| Olegblumia demissa       | Arup and Grube (1999) [21]                | AF353960 | -       | -        |
| Olegblumia demissa       | Arup et al. (2013) [1]                      | -      | KC179172 | KC179505 |
| Olegblumia demissa       | Arup and Grube (1999) [21]                | AF353962 | -       | -        |
| Olegblumia demissa       | Arup and Grube (1999) [21]                | AF353961 | -       | -        |
| Oxneria alfredii         | FNM 152, Fedorenko et al. (2009) [18]      | FNM 152 | -       | -        |
| Pyrenodesmia alozica     | SK747, Kondratyuk et al. (2014) [6]        | KJ021239 | -       | KJ021313 |
| Pyrenodesmia teicholyta  | Vondrák et al. (2012) [22]                | JN641791 | -       | -        |
| Pyrenodesmia teicholyta  | Arup et al. (2013) [1]                     | -      | KC179176 | -        |
| Pyrenodesmia variabilis  | Gaya et al. (2003) [23]                    | AY333224 | -       | -        |
| Ruprophaceae scotoplaica | Arup et al. (2013) [1]                     | KC179457 | KC179235 | KC179573 |
| Rufoplaca tristiuscula   | Arup et al. (2013) [1]                     | KC179460 | KC179237 | KC179575 |
| Seirophora californica   | Arup et al. (2013) [1]                     | KC179643 | -       | -        |
| Seirophora lacunosa      | SK B07, Ukraine: AR Crimea, Arabatskaya strelka, on soil at the fortress, 200 m to NW, 10 Jun 2003, OY Khodosovsev (KW-L 70478 sub Lichenium xanthoriae) | KT220204 | KT220213 | KT220222 |
| Seirophora villosa       | Martin and Winka (2000) [24]               | AF098407 | -       | -        |
| Teleschistes flavicans   | FNM-139, Fedorenko et al. (2009, 2012) [2, 18] | EU681363 | -       | EU680955 |
| Teleschistes flavicans   | Arup et al. (2013) [1]                     | KC179317 | KC179253 | KC179594 |
| Usnochroma carphinea     | Arup et al. (2013) [1]                     | KC179468 | KC179259 | KC179598 |
| Usnochroma carphinea     | -                                          | U639595  | -       | -        |
| Usnochroma carphinea     | Gaya et al. (2012) [3]                     | JQ301548 | -       | -        |
| Usnochroma carphinea     | Gaya et al. (2012) [3]                     | JQ301560 | -       | -        |
| Variospora alpigena      | Arup and Grube (1999) [21]                | AF353956 | -       | -        |
| Variospora latzeli       | Vondrák et al. unpublished                | JN13418  | -       | -        |
| Variospora velana        | Arup et al. (2013) [1]                     | KC179476 | KC179263 | KC179605 |
| Xanthocarpia ochracea    | SK637, Kondratyuk et al. (2014) [7]        | KJ133483 | -       | -        |
| Xanthoria parietina      | FNM-177, Fedorenko et al. (2009, 2012) [2, 18] | EU681289 | -       | EU680868 |
| Xanthoria paretina       | Gaya et al. (2012) [3]                     | -       | JQ301589 | -        |
| Yoshimuria galbina       | SK704, Kondratyuk et al. (2014) [6]        | -       | -       | KJ023197 |
| Yoshimuria cerussata     | SK768, Kondratyuk et al. (2014) [6]        | KJ021248 | -       | -        |
| Yoshimuria spodoplaica   | SK725, Kondratyuk et al. (2014) [6]        | KJ021249 | -       | KJ023194 |
1. Phylogenetic analysis was performed using the ITS region and LSU gene of nrDNA and 12S SSU mtDNA sequences of the treated fungi retrieved from the GenBank database and the 5 lichen-forming fungi investigated in this study. Sequence alignment was conducted in BioEdit and a phylogenetic tree was generated by the maximum parsimony, minimum evolution, and maximum likelihood analysis methods performed in MEGA 5.0 [25] with the number of bootstrap trials set to 1,000.

Altogether 27 sequences on nrDNA and mtDNA are submitted to GenBank.

RESULTS AND DISCUSSION

Description of taxa.

Jasonhuria S. Y. Kondr., L. Lőkös et S.-O. Oh, gen. nov.

MycoBank No. MB 812929.

Thallus saxicolous, crustose, grey to greyish white; cortex paraplectenchymatous. Apothecia bioterrine to lecanorine; disc orange-brown to brownish red or rust-red; thalline margin concolorous with the thallus; proper margin black, true exciple paraplectenchymatous, outer region aeruginose pigmented. Conidia ellipsoid. Constituents: atranorin, gyrophoric and lecanoric acids (major compounds), parietin (traces).

Type species: Jasonhuria bogilana (Y. Joshi et Hur) S. Y. Kondr., L. Lőkös, J. Kim, A. S. Kondratiu et S.-O. Oh.

Thallus saxicolous, crustose, areolate to cracked areolate, grey to greyish white. Cortex paraplectenchymatous, necral layer absent. Apothecia bioterrine to lecanorine, adnate to sessile; disc orange-brown to brownish red to rust-red, plane to convex, epruinose; thalline margin concolorous with the thallus; proper margin black. Hymenium hyaline, hypothecium hyaline, without oil-droplets; true exciple paraplectenchymatous, outer region 2 aeruginose pigmented. Paraphyses thin, with a few swollen cells at the top. Asci 8-spored, ascospores polarilocular, ellipsoid, ascospore septum of medium width. Pycnidia present, ostiole black. Conidia ellipsoid.

Chemistry: Thallus and medulla K+ yellow, C−, Pd−, UV−. Apothecial discs K+ red, C−, Pd−. Ostiolar tissue of pycnidia and aeruginose region of proper exciple K−. Constituents: atranorin, gyrophoric and lecanoric acids (major compounds), parietin (traces).

Ecology: Known from the coastal regions, where it grows abundantly on large siliceous boulders (rocks) both on subvertical and horizontal faces exposed to the sun along with Caloplaca kobeana (Nyl.) Zahlbr., Buellia spp., Lecanora spp., Heterodermia diadema (Tayl) D. D. Awasthi, Physcia spp., Endocarpon petrolepideum Ach., Phlylliscum spp., Aspicilia spp., Xanthoparmelia saxeti (Stizenb.) Amo de Paz, A. Crespo, Elix et Lumbsch, Xanthoparmelia spp., Ramalina spp., Verrucaria spp.

Species diversity: Jasonhuria is presently a monophyletic genus; however, it is likely that additional species, occurring in Eastern Asia, will be described in the genus.

Distribution: The type species was originally found in Bogil Island, southern South Korea, but is now, in addition, known from numerous coastal, inland and island localities.

Etymology: The genus honours the South Korean lichenologist Prof. Jae-Seoun Hur (Sunchon, Korean Lichen Research Institute [KoLRI], South Korea), the founder of the KoLRI of Sunchon National University, to acknowledge his great contributions to the Korean lichen flora, his investigations of complete genomes of lichen-forming fungi including their practical application, Prof. Hur furthermore described the type species of the genus.

Taxonomic notes: The genus Jasonhuria is characterized by a crustose, cracked areolate to areolate, greyish thallus, reacting K+ yellow, a rust-red apothecial disc, a black proper margin, a grey thalline margin and maritime distribution, as well as atranorin, gyrophoric and lecanoric acids as major compounds.

Molecular data of Caloplaca agrata (Vain.) Zahlbr., C. leptozona (Nyl.) Zahlbr., C. subleptozona Y. Joshi et Upreti, C. poliota (Nyl.) J. Steiner, and C. subpoliota Y. Joshi et Upreti, supposed to be related with the type species are missing. Possibly some of them will become members of the new genus after future analyses.

Jasonhuria is similar to Usnorchroma Sochting, Arup et Frödén in having gyrophoric acid, but differs in having a white or whitish grey colour of thallus (vs. pale yellow), in having anthraquinones in the thallus (vs. thallus without anthraquinones), and in the lack of usnic acid in the thallus.

Jasonhuria forms a weakly supported clade together with the genus Loekoesia, why we prefer to describe two monotypic genera (Fig. 1). Furthermore, preliminary analyses reveal several undescribed species in both genera, forming two strongly supported clades.

Loekoesia S. Y. Kondr., S.-O. Oh et J.-S. Hur, gen. nov.

MycoBank No. MB 812930.

Thallus crustose, entire to areolate; grey; soralia rounded, stipitate, aggregated in irregular groups, bright white; soredious mass bluish to whitish; soredia powdery. Hypothallus bluish black. Apothecia black, bioterrine; true exciple paraplectenchymatous with well-developed matrix. Thallus K+ yellow, then greenish yellow, Pd+ slowly becoming pale yellow; probably contains atranorin and other compounds.

Type species: Loekoesia austrocoreana (S. Y. Kondr., L. Lőkös et J.-S. Hur) S. Y. Kondr., J. Kim, A. S. Kondratiu, S.-O. Oh et J.-S. Hur.

Thallus crustose, entire to areolate; plumbeus or lead grey to greyish white with brighter white soralia, sometimes coalescing in places; soralia rounded, stipitate, often aggregated in irregular groups; soredious mass bluish or becoming whitish. Soredia powdery, bluish. Hypothallus bluish black. Apothecia black, bioterrine; true exciple paraplectenchymatous with well-developed matrix; ascospores bipolar hyaline, elongated ellipsoid with rounded ends, ascospore septum
Fig. 1. Phylogenetic tree of the caloplacoid lichens based on combined data set.
of medium width.

**Chemistry:** Thallus K+ yellow, then greenish yellow; Pd+ slowly becoming pale yellow; ephymenium K+ purple and becoming lighter to/or hyaline or dull crimson; probably contains atranorin and other compounds.

**Ecology:** In coastal zone on rock surface growing together with *Pyxine endochrysea* Nyl., *Physcia adscendens* (Fr.) H. Olivier, *Caloplaca squamosa* (B. de Lesd.) Zahlbr. and species of the genera *Aspicilia*, *Myelochroa*, *Buellia*, *Dimelaena*, *Verrucaria*, and *Lecanora*.

**Etymology:** This new genus is named after the Hungarian lichenologist Dr László Lőkös (1959–) (Budapest, BP, Hungary), who contributed much to the knowledge of North and South Korean lichens.

**Distribution:** The new genus occurs in South Korea.

**Taxonomic notes:** *Loekoesia austrocoreana* is similar to *Caloplaca albovariegata* (B. de Lesd.) Metwore, a western North American species growing on calcareous and non-calcareous rocks, having a blue-grey thallus, stipitate areoles, a thick irregular cortex with an epinecral layer, and clumps of algae forming a variegated surface. Thus, *Loekoesia austrocoreana* differs from *C. albovariegata* by a regular cortex, presence of a lower hymenium, shorter and narrower ascospores and wider ascospore septa, a distinctly bluish epihymenium and a bluish lateral true exciple and a K− reaction in the thalline cortex and the lateral outermost part of the true exciple, as well as in the lack of an epinecral layer and clumps of algae [4, 26–28].

A number of other members, as well as the genus *Pyrenodesmia* A. Massal., i.e., *P. variabilis* (Pers.) A. Massal., *Caloplaca conversa* (Kremp.) Jatta, *Caloplaca atroalba* (Tuck.) Zahlbr., *Caloplaca peliophylla* (Tuck.) Zahlbr., differ from *Loekoesia austrocoreana* in having much wider ascospores and in the lack of soredia.

*Caloplaca oblongula* (H. Magn.) Metwore differs from *Loekoesia austrocoreana* in having light purplish brown epihymenium, in having non-septate or one-septate, larger and wider ascospores (15.5–21 × 5.5–8.5 µm vs. 13–14 × 5–6 µm), with narrower septa (0–1.5 µm vs. 4–6 µm wide), as well as in having a K+ purple apothecial margin [28].

The genus *Loekoesia* is similar to some representatives of the Australian genus *Marchantiana* S. Y. Kondr., Kärnefelt, Elix, A. Thell et J. -S. Hur of the Teloschistoideae, i.e., *M. kalbiorum* (S. Y. Kondr. et Kärnefelt) S. Y. Kondr., Kärnefelt, A. Thell, Elix, J. Kim, A. S. Kondratuki et J. -S. Hur, but differs in its distribution and in its position in the subfamily Caloplaeidae after phylogenetic analysis based on combined set of ITS and LSU rDNA and 12S small subunit (SSU) mtDNA sequences.

As mentioned earlier, *Loekoesia* forms a weakly supported clade together with the genus *Jasonhuria*. However, preliminary analyses show that hitherto undescribed species are to be described in both genera proposed here, forming two strongly supported clades, explaining why two new genera are described already.

**Olegblumia** S. Y. Kondr., L. Lőkös et J. -S. Hur. gen. nov.

MycoBank No. MB 812931.

Thallus lobate, distinctly rosette-like, upper surface brown to brownish grey; lobes flat to subconvex, very narrow; soralia laminal with convex, highly uplifted brownish soredious mass; soredia irregularly rounded, brown to brownish green; constituents: vicamin and calopoliozin.

**Type species:** *Olegblumia demissa* (Flot.) S. Y. Kondr., L. Lőkös, J. Kim, A. S. Kondratuki, S. -O. Oh et J. -S. Hur. Thallus lobate, distinctly rosette-like, 5–8 mm diam., often in large aggregations; upper surface brown, dark brown to brownish green in peripheral portions and greyish brown or whitish greyish in the centre, thallus whitish pruinose, whitish grey to whitish brown or brownish grey, grey in shaded conditions. Lobes to 1–1.5 (~2) mm long, flat to subconvex, very narrow to 0.1–0.2 (~0.3) mm wide, towards the tips branched or divided into 2–3 (~4) secondary lobules almost the same width; total width of terminal portion of single lobe with all secondary lobules to (0.3–) 0.4–1 mm wide. Soralia mainly in the centre of thallus, laminal (in the middle of lobe), at first puctiform or regularly rounded to (0.1–) 0.2–0.3 mm diam., soon becoming elongated along the lobe, fissure-like, to 0.3–0.4 mm long/ across, eroded portions with somewhat uplifted margins of cortical layer with convex, highly uplifted brownish soredious or soredious/viscid mass to confluent often whitish eroded-soredious mass in the centre. Soredia irregularly rounded, ca. (20–) 30–50 µm across, becoming isidious, brown to dark brown or brownish green well contrasting to light (white) medulla. Apothecia, conidiomata and conidia unknown.

**Chemistry:** Vicamin and calopoliozin.

**Ecology:** The single species of this genus grows on hard siliceous rocks, usually on vertical and inclined surfaces. It is often associated with *Aspicilia contorta* (Hoffm.) Körb., sometimes significantly damaged by parasites of the genus *Lichenostigma* Hafellner, *Lichenothelia scopularia* (Nyl.) D. Hawksw. [29], *Caloplaca aractina* (Fr.) Háyren, *Lecanora aff. frustulosa* Stizenb., *Lecanora lithophila* Oxner, *Aspicilia sp.*, *Physcia sp.*, and *Candelariella vitellina* (Hoffm.) Müll. Arg.

**Species diversity and distribution:** The genus is monotypic, known from Europe and North America.

**Etymology:** The genus is named after the Ukrainian lichenologist Oleg Blum (1937–) (Kyiv, Ukraine), who made important contributions to lichen ecology of Eurasian lichens, as well as in the usage of lichens as bioindicators for anthropogenic pollution of the environment.

**Taxonomic notes:** This genus *Olegblumia* is easily distinguished from the other caloplacoid lichens by the brownish, soredious, lobate thallus, and the negative reaction with K.

According to morphological and chemical characters it is similar to the genera *Elekkiniana* S. Y. Kondr., Kärnefelt, Elix, A. Thell et J. -S. Hur, and *Leprophace* (Nyl.) Hue of the subfamily Caloplaeidae, however, comparing with molecular
characters it is closely related only to Usnochroma or Pyrenodesmia.

The brownish lobate thallus, containing the depsidones vicaincin and caloploicin, shows similarity with some species of the genus Elenkiniana.

The lobate soredious thallus reminds of some species of the genus Leproplaca, particularly L. cirrochroa (Ach.) Th., Fr., but differs by its brownish thallus, compared with bright yellow to bright orange or reddish orange in Leproplaca. Further differences are the brownish soredious mass, not bright yellow, and the depsidones instead of anthraquinones of the parietin chemosyndrome in Leproplaca.

This new monotypic genus is known only as sterile and was earlier positioned in the Lecanoraceae, in the genera Lecanora and Placolecanora Räsänen, because of its general appearance. Molecular analyses finally confirmed its position in the Teloschistaceae [21] where Olegblumia appears as a sister group to the genus Usnochroma.

New combinations.
Jasonhuria bogilana (Y. Joshi et Hur) S. Y. Kondr., L. Lőkös, J. Kim, A. S. Kondratiuik and S. -O. Oh, comb. nov. MycoBank No. MB 812932.
Basionym: Calopla ca bogilana Y. Joshi et Hur, The Lichenologist 42: 716 (2010).
Type: South Korea, Jeonnam Prov., Wando Co., Bogil Island, 34°09’14.7” N, 126°37’33.2” E, alt. 5 m, on rock, 31 Dec 2004, JS Hur, 041679 (KoLRI 002475, holotype).

Loekoesia austrocoreana (S. Y. Kondr., L. Lőkös et J. -S. Hur) S. Y. Kondr., J. Kim, A. S. Kondratiuik, S. -O. Oh et J. -S. Hur, comb. nov. MycoBank No. 812934.
Basionym: Calopla ca austrocoreana S. Y. Kondr., L. Lőkös et J.-S. Hur, in Kondratyuk et al., Acta Bot. Hung. 55: 42 (2013).
Type: South Korea, Jeollanam-do, Yeosu-si, Nam-myeon, Yusong-ri, Geumohdo, on rock, 34°31’55.05” N, 127°45’55.05” E, alt. 11 m a.s.l. Coll., U Jayalal, JS Park, and JA Ryu (120513), 27 Apr 2012, KoLRI 015504-holotype.

Olegblumia demissa (Flot.) S. Y. Kondr., L. Lőkös, J. Kim, A. S. Kondratiuik, S. -O. Oh et J. -S. Hur, comb. nov. MycoBank No. MB 812935.
Basionym: Imbricaria demissa Flot., Iber. Schles. Ges. Vaterl. Kultur 28: 133 (1850).
Synonym: Calopla ca demissa (Flot.) Arup et Grube, Lichenologist 31: 428 (1999).

Conclusions. Future analyses of molecular characters reveal additional species to be described in all the three monotypic genera proposed here, which very likely will confirm their necessity analyses in which additional genera of the Caloplacoideae, firstly Mikhtomia s. lat., Variospora s. lat. and Seirophora s. lat., will be included and discussed.

ACKNOWLEDGEMENTS
This work was supported by The State Agency on Science, Innovations and Information of Ukraine (M317-2011-409, M111-2012-409 and M40-2013-409) for SK, and by the Korean Forest Service Program Korean National Arboretum (KNA 2014) through Korea Forest Research Institute and Korean National Arboretum for JSH.

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