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Significant type collections of Lichinaceae and allied lichenized ascomycetes in the herbaria of the Natural History Museum, Vienna (W) and the Institute of Botany, Vienna University (WU)

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Abstract

The type material of the cyanobacterial lichen family Lichinaceae and allies (Lichinomycetes, lichenized ascomycetes) in the collections of the Natural History Museum, Vienna (W) and in the herbarium of the Botanical Institute of the University Vienna (WU) was searched and documented. Altogether 221 type specimens were located representing 156 taxa. Both collections are most valuable for the study of Lichinaceae and cyanobacterial lichens in general.

Key words: lichenized ascomycetes, Lichinaceae, *Heppia*, type material.

Zusammenfassung

Das Typusmaterial von Flechten der Familie Lichinaceae und naher Verwandter (Lichinomycetes, flechtenbildende Ascomyceten) in den Sammlungen des Naturhistorischen Museums in Wien (W) sowie im Herbarium des Botanischen Instituts der Universität Wien (WU) wurde gesichtet und dokumentiert. Insgesamt wurden 221 Typusbelege von 156 Taxa nachgewiesen. Beide Sammlungen sind von höchstem Wert für das Studium der Lichinaceae und Cyanoflechten im Allgemeinen.

Introduction

The Lichinaceae (Lichinomycetes, lichenized ascomycetes) is a notoriously neglected family of inconspicuous, small and blackish coloured lichens which obligatory associate with various symbiotic cyanobacteria. Lichinaceae are generally rarely collected and often poorly represented in botanical collections. The family is not particularly rich in species but has a worldwide distribution, and species occur in nearly all kinds of habitats that are typically colonized by lichens. Although only some 250 species are currently accepted, the number of taxonomic and nomenclatural synonyms is enormous and adds to the on-going confusion around this family. Taxonomic and nomenclatural problems are predominantly due to a history of multiple descriptions of species (especially in Europe) as well as an instable and inconsistent application of generic names. Most of the lichens currently treated in Lichinaceae have been described during the second half of the 19th and early 20th Century – a period characterized by a disproportion between the sheer number of new species erected and the persisting uncertainty about the generic placement and family classification of the taxa resulting in

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repeated recombination of species names and a proliferating synonymy. This period came to a preliminary end with the publication of the 2nd edition of the lichen part of Engler & Prantl's "Natürliche Pflanzenfamilien" (Zahlbruckner 1926) and the monumental "Catalogus Lichenum Universalis" (Zahlbruckner 1921–1940), but – at the same time – resulted in a schematic and artificial classification of the Lichinaceae and lichen-forming fungi in general. Most types of Lichinaceae are deposited in major herbaria such as in Uppsala (UPS), Helsinki (H), Paris (PC), London (BM), Geneve (G), Munich (M), Leiden (L), Stockholm (S), Cambridge (FH), Turku (TUR) – and Vienna (W, WU). More recently, many species have been described by the monographer of the family, Aino Henssen (1925–2011) who published several monographic generic treatments (Henssen 1963a, 1977, 1986). A selection of other papers dealing with Lichinaceae include Henssen (1963b, 1970, 1974, 1980, 1989), Henssen & Büdel (1984), Henssen et al. (1985), Moreno & Egea (1992a, 1992b, 1992c), Schultz (2005, 2006), Schultz & Büdel (2002), Schultz & van den Boom (2007), Schultz et al. (1998, 2000, 2001). Most of the holotypes of species described by Henssen were designated to the herbarium of the University of Marburg (MB) or to her private herbarium (now in H, and made available only very recently). The author of the present paper described a number of Lichinaceae during the past couple of years, and types have been deposited in ASU, B, BM, GZU, HBG, M, MIN, RB, UPS, VEN, the herbarium of B. Büdel (Kaiserslautern) and the herbarium of the author. Some iso- and paratypes have been presented to W in 2012.

In the efforts towards a monographic treatment of the family the author received an EU-SYNTHESYS grant for registering the Lichinaceae type holdings in W and WU with most of the emphasis placed on the former collection. The aim of the visit was twofold: 1) the actual study of type material of critical taxa as part of the ongoing taxonomic and systematic studies of the author, and 2) the production of a Lichinaceae type registry for W and WU. Whereas the latter goal is achieved with the present paper, the former will require much more work. Nonetheless, the results obtained from studies of the Vienna type material so far proved to be very useful in this process and will be incorporated into forthcoming papers.

Material and method

During a two weeks stay at the Natural History Museum Vienna in January 2009 type material was traced in both the lichen type herbarium and in the general herbarium as it was anticipated that the general herbarium was likely to contain a number of unmarked types. Additionally, the separately kept lichen exsiccate "Flechten Europas" issued by Hepp (1853–1867) was checked for types which were otherwise not found in the type and general herbarium. The basis for type material detection were, if present, corresponding annotations by describing authors or later specialists. However, it was important to refer to the original literature in order to confirm the status of yet unmarked, putative type specimens. For this purpose the author used his own, nearly complete compilation of printed protologue information of taxa described in the Lichinaceae (more than 1000 binomials). In some critical cases the original literature had to be checked either in the library or using electronic resources such as the Biodiversity Heritage Library (BHL).

W has unique specimen numbers (since 1881), whereas WU has one number for a complete accession. The latter is given here anyway since it may be helpful for identification of specimens. The W as well as WU specimens still lacking a number will get unique numbers during the databasing process. The reader is further referred to the Virtual Herbaria webpage (http://herbarium.univie.ac.at/database/search.php) which is now also presenting metadata and digital images of cryptogamic specimens.

Results

The lichen herbaria of the Natural History Museum, Vienna (W) and the Institute of Botany of the University Vienna (WU) contain type specimens of Lichinaceae described from pre-Acharian to current times. Both herbaria hold material collected or studied by various distinguished botanists and lichenologists, naturalists and travellers. The most important of these persons is perhaps the famous Austrian lichenologist Alexander Zahlbruckner (1860–1938), author of the monumental "Catalogus Lichenum Universialis" (10 vols., 1921–1940) and the systematic part of the volume "Lichenes" of "Die Natürlichen Pflanzenfamilien" (eds. Engler & Prantl, 1st & 2nd. ed., 1906–1907, 1926) and director of the Natural History Museum, Vienna. Undoubtlessly, Zahlbruckner is one of the most influential lichenologists in history. For the purpose of the present paper it is perhaps sufficient to note that he described more than 20 species of Lichinaceae and allied groups based on material send to him from many parts of the world including Europe, China and Japan, south-western North America, the Caribbean, Kenya, South Africa and Java. The other famous Austrian lichenologist and contemporary of Zahlbruckner was Julius Steiner (1844–1918), teacher at the Staatsgymnasium in Vienna. He made important contributions to the knowledge of cyanolichens in the Middle East, northern Africa, Canary Islands, south-eastern Europe. Other important collections preserved in Vienna are those of Ferdinand Arnold (many types from Franconia and Tyrol; many duplicates from the herbarium of August v. Krempelhuber) and Abramo Bartolomeo Massalongo (Lichenes Italici and Anzi, Lichenes rariores Veneti ex herbario Massalongo; mostly upper Italy). Among the many other names worth being mentioned are William Nylander (including material collected by Le Jolie, Pelvet, Norrlin), Jean Müller (Argoviensis), Martino Anzi, Jacob Friedrich Ehrhart, Gustav Wilhelm Körber, Thore Magnus Fries, Johan Petter Norrlin, Edvard August Vainio, Hugo Lojka, Henry Wiley, Adolf Hugo Magnusson, Antonin Vězda and Aino Henssen. Regionally important collections with occasional Lichinaceae types are those of Heinrich Freiherr v. Handel-Mazzetti (China, Mesopotamia), Karl-Heinz Rechinger (Mesopotamia), Josef Brunnthaler (Dalmatia), Camile Flagey (Algeria), Yasuhiko Asahina (Japan), William Alfred Weber (North America), Arsene Brouard (New Mexico, Mexico), Johann Schuler (Croatia). A complete list of collectors treated in this inventory is given following the taxonomic enumeration. For biographic details the reader is referred to GRUMMANN (1974).

The following list enumerates all types of Lichinaceae and of the closely related genus *Heppia* which is traditionally placed in its own family Heppiaceae. Numerous species of *Heppia* have been described in the past, but most of them are placed in the genus *Peltula* (Peltulaceae) today, likewise a family closely related to the Lichinaceae. However, several species of *Heppia* are certainly not referable to *Peltula* and have to

be placed in the Lichinaceae instead. *Heppia* in its current circumscription (Henssen 1994) is restricted to few squamulose cyanolichens growing on soil, having thin-walled and 8-spored asci and *Scytonema*-like photobionts. Thus, the present results will hopefully be found useful in the course of taxonomic revision of poorly known taxa in *Heppia*.

Validly published basionyms are listed alphabetically followed by the author and reference to the printed description. Information regarding collector, locality and date are reproduced – if available – as they appear on the labels with minimal adjustments where necessary. Finally, the type status is given and the currently accepted name. Acceptance of a given name is based solely on reliable sources in printed publications. These are cited if necessary. In the absence of such information statements on acceptance are based on the authors' observations and, if needed, nomenclatural comments are given. It is hoped that these information will help to further improve electronic resources such as Index Fungorum (IF) or MycoBank. The list of basionyms is concluded by an index to collectors' names.

The determination of the actual type status of a given original collection is often not straight forward. Many names used in the Lichinaceae have not yet been typified, many types have not yet been traced, and many species and genera still await thorough taxonomic revision. In cases when typifications have been published a reference to the corresponding paper is made. For names that appear to have not yet been typified the type status is given in the broadest concept as either "type" or "syntype". For names validly published before 1st of January 1958 (mandatory designation of a type) it was attempted to incorporate useful notes by the describing author (especially Zahlbruckner) on the type packets such as "Typus!", "spec. orig.". In the presence of such information, or in the case that no other original material exists the corresponding type specimens are treated here as holotypes. An example is *Phylliscum japonicum* Zahlbr., published by Zahlbruckner (1927). The diagnosis is followed by the citation of two collections made by Y. Asahina in Japan. Zahlbruckner gives no type indication in the paper and in the absence of any further information the two collections would have to be considered syntypes. However, there is one packet preserved in W that corresponds to one of the two collections cited by Zahlbruckner carrying the name of the species and a note "specim. orig." in the handwriting of Zahlbruckner. Conseqently, this specimen has been marked earlier as "Holotypus" and was kept in the type herbarium. A second packet of *Phylliscum japonicum* was found in the general herbarium and the label data correspond to the information given by Zahbruckner for the second locality. The material is therefore considered here as a paratype. However, lectotypifications will become necessary in more complicated cases. An example is *Leprocollema finkii* Zahlbr.: the original material comprises several specimens and these represent three or four unrelated taxa of cyanolichens. In the present paper, no lectotypes have been selected. This will be done in forthcoming publications, however, corresponding notes are provided wherever appearing appropriate. Many types have been annotated by A. Henssen as lecto- or isolectotypes. It should be noted however, that most of these "lectotypifications" are yet unpublished. Other institutions, especially the Nylander herbarium in Helsinki (H-NYL) should be consulted for such predesignated "lectotypes". Already published lectotypes are cited. Plates 1 & 2, figs 1–9 illustrate examples of handwritings that have been repeatedly observed.

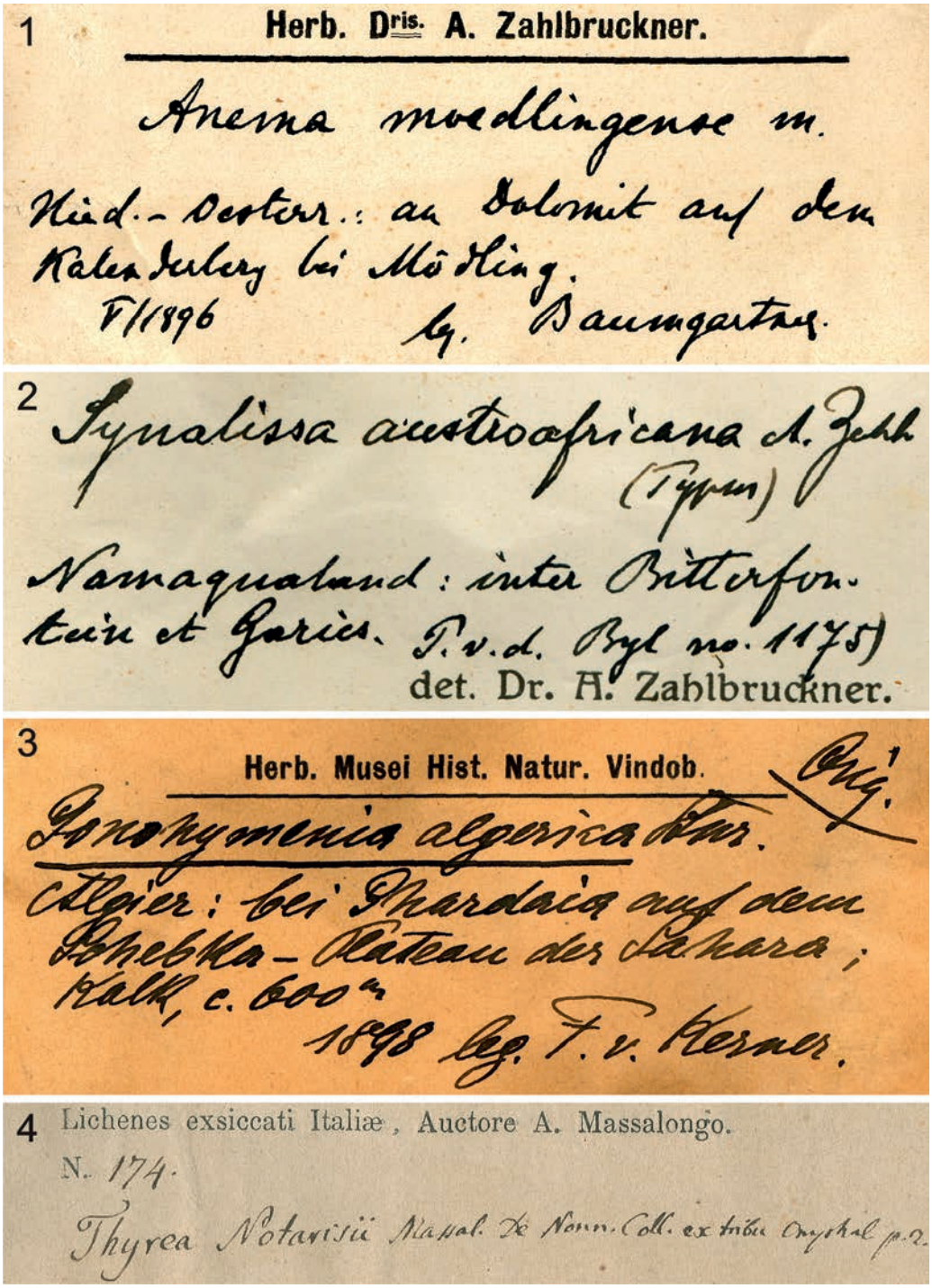

Plate 1: Examples of handwritings. Fig. 1 & 2: A. Zahlbruckner; Fig. 3: J. Steiner; Fig. 4: A.B. Massalongo.

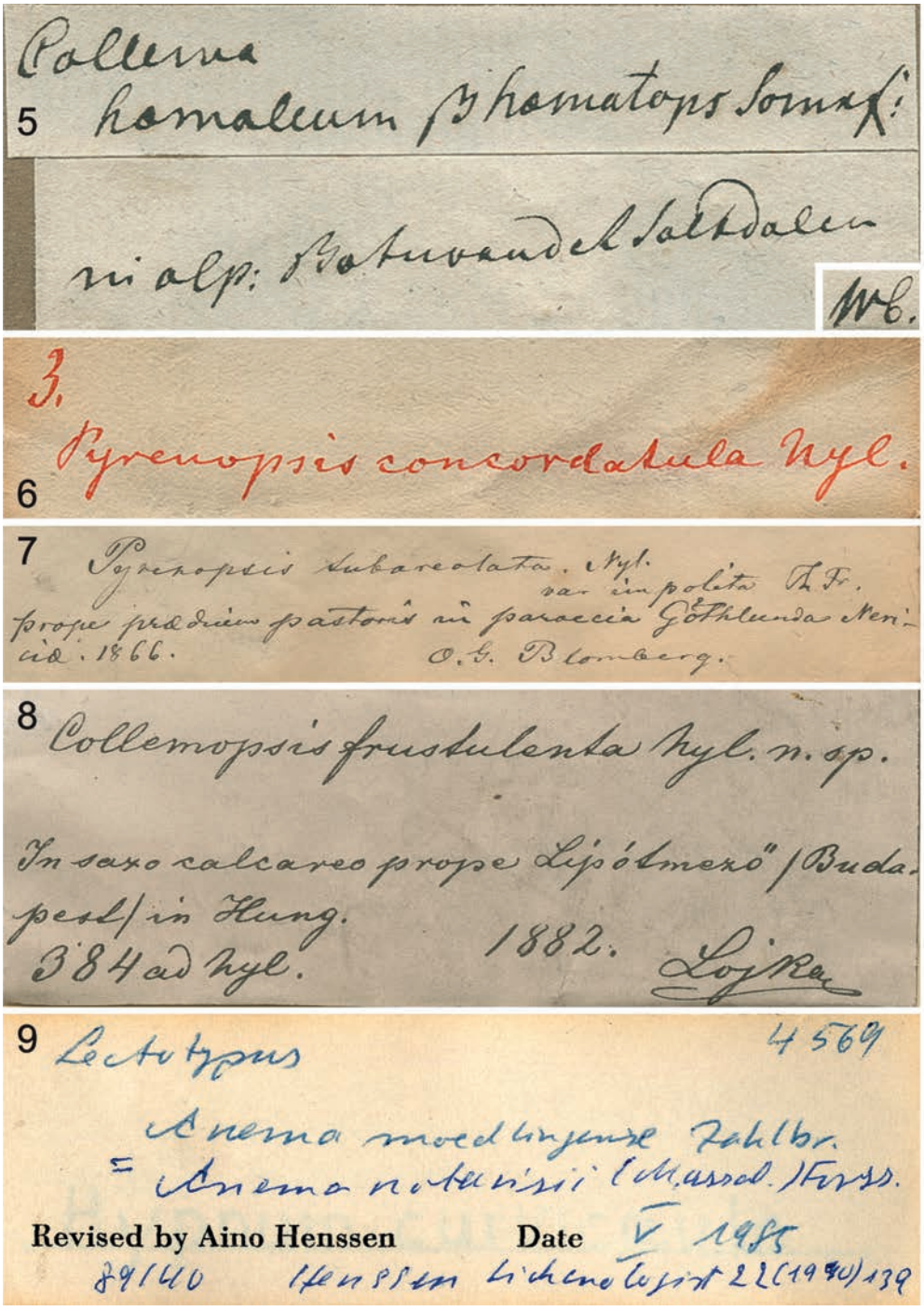

Plate 2: Examples of handwritings. Fig. 5: S.C. Sommerfelt. Inset at lower left corner showing a specific locality abbreviation; Fig. 6: W. Nylander; Fig. 7: Th.M. Fries; Fig. 8: H. Lojka; Fig. 9: A. Henssen.

Types

Anema moedlingense ZAHLBR., Verh. K. K. Zool.-Bot. Ges. Wien 48: 360 (1908); Plate 3, Fig. 10.
(Austria) Nieder-Oesterr., an Dolomit auf dem Kalenderberg bei Mödling, V/1896, Baumgartner [W 1899-04569] – lectotype (design. HENSSEN & JØRGENSEN 1990: 139).

Anema tumidulum HENSSEN ex P.M.JØRG., M.SCHULTZ & A.GUTTOVÁ, Herzogia 26(1): 2 (2013).
(Germany) Hessen, Kr. Oberlahn, Arfurt, 30 km östlich von Runkel, Grünsteinwände, 30.10.1964, Henssen 17744b (Lich. cyan. fung. exs. no. 47a; as *Anema cernohorskyi* HENSSEN) [W 1991-03903] – isotype.
(same locality) 26.09.1966, Henssen (18920d) & Jahns (HENSSEN, Lich. cyan. fung. exs. no. 47b; as *Anema cernohorskyi* HENSSEN) [W 1991-03885] – topotype.
Note: This widespread species was described only very recently (JØRGENSEN et al. 2013) although the name has been in use in the German lichenological literature since 1994.

Arnoldia botryosa A.MASSAL., Misc. lichenol.: 20 (1856).
(Germany, Bavaria) an Kalkfelsen zwischen Streitberg und dem Langenthale, und gegenüber Geilenreuth im Wiesenthale, Septbr. 1857, Arnold (Lich. exs. no. 31) [W 2009-00143] – topotype.
Current name: *Lempholemma botryosum* (A.MASSAL.) ZAHLBR.

Arnoldia cyathodes A.MASSAL., Flora 39: 214 (1856).
(Germany, Bavaria) ad rupes calcareas prope Streitberg in Franconia, Arnold (ANZI, Lich. rar. Veneti, ex Herb. Massal., no. 4) [W 2009-00149] – syntype.
Current name: *Lempholemma elveloideum* (ACH.) ZAHLBR.

Biatora terricola REHM in ARNOLD, Flora 51: 521 (1868) *nom. inval.* non *Biatora terricola* (ANZI) TH.FR. 1867.
Note: see *Physma terricolum* ARNOLD.

Collema coccodes FLOT., Linnaea 23: 152 (1850).
(Poland) ad saxa granitica fluvii "Bober" in valle "Sattler" prope Hirschbergam Silesiae, Körber (Lich. sel. Germ. no. 30) [WU 887] – topotype.
Current name: *Porocyphus coccodes* (FLOT.) KÖRB.

Collema demangeonii MOUG. & MONT. in MONTAGNE, Ann. Sci. Nat., Ser. 3, 12: 291 (1849).
(France) ad saxa granitosa aprica simul et rorida prope Romarimontem [Resmansberg, ann. K. v. Keissler] ad am. Demangeon lectum (MOUGEOT & NESTLER, Stirp. crypt. Vosge no. 1240) [W] – isolectotype (lectotype design. JØRGENSEN 2007: 144).
(France) ad saxa granitica Vogesarum, Mougeot (Hb. Nylander) [WU 887] – topotype?
Current name: *Phylliscum demangeonii* (MOUG. & MONT.) NYL.

Collema haemaleum var. ***haematops*** SOMMERF., Suppl. Fl. lapp.: 117 (1826).
(Sweden) ni alp: Batuvandel Saltdalen WC, Sommerfelt [W 1920-01280] – isolectotype (lectotype design. HENSSEN & JØRGENSEN 1990: 145).
Current name: *Pyrenopsis haematina* P.M.JØRG. & HENSSEN.

Collema vamberyi VAIN., Természetr. Füzetek. 22: 311 (1899); Plate 4, Fig. 18.
(Ukraine, Crimea) Caucasus, Nikita, an Kalktuff, Lojka (It. Caucas. no. 101) [W 2009-00132] – isotype.
Current name: *Lempholemma vamberyi* (VAIN.) ZAHLBR.

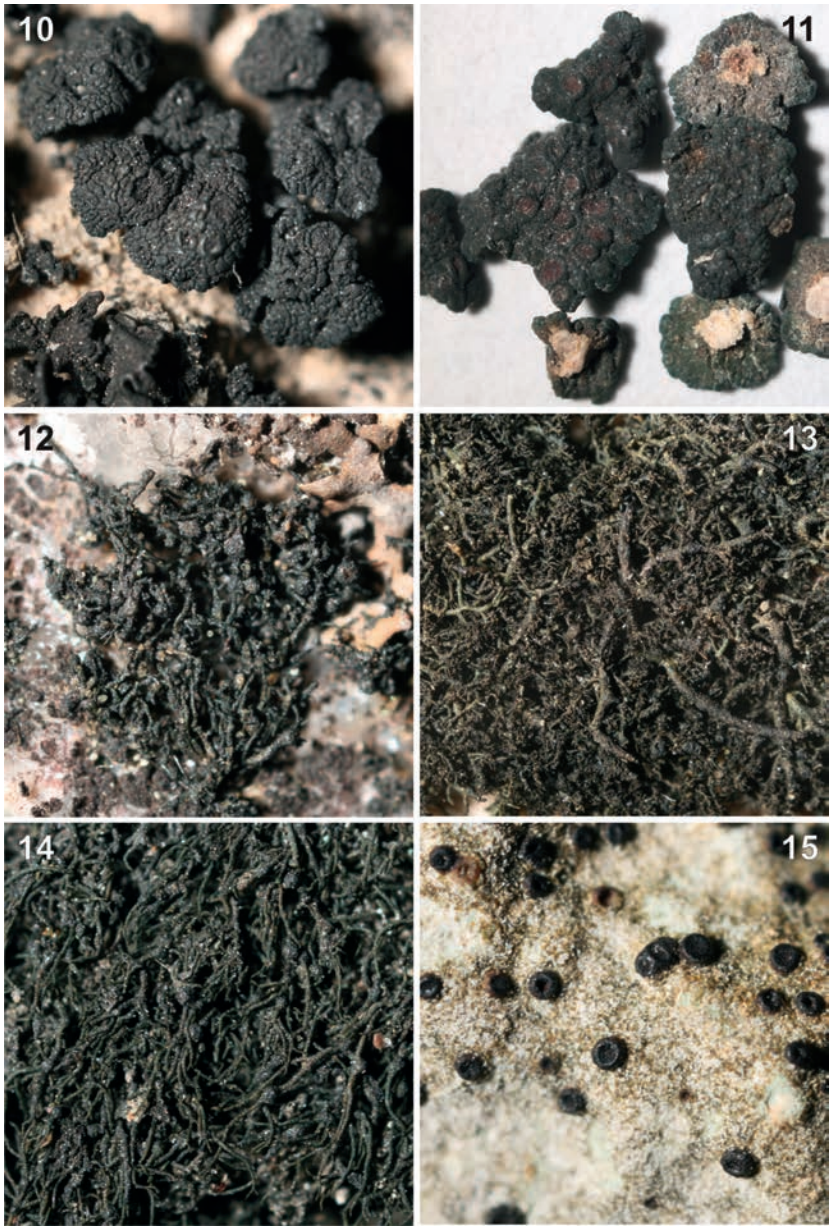

Plate 3: Fig. 10: *Anema moedlingense* ZAHLBR. Lectotype. Thallus squamulose-peltate, surface reticulately scupltured, apothecia lecanorine. Section 5.8 mm. Fig. 11: *Anema notarisii* A.MASSAL. Isoneotype. Thallus umbilicate-rosette shaped, apothecia with dark red discs. Section 6.0 mm. Fig. 12: *Ephebe americana* HENSSEN. Thallus thread-like with marginal apothecia. Section 3.7 mm. Fig. 13: *Ephebe spinulosa* Th.Fr. (= *E. hispidula* (ACH.) HENSSEN) Isolectotype. Thallus threads robust with numerous spiny side branches. Section 6.3 mm. Fig. 14: *Ephebe japonica* HENSSEN. Isotype. Thallus threads delicate with lateral fruit bodies. Section 4.4 mm. Fig. 15: *Psorotichia calcigena* ZAHLBR. (= *Gyrocollema scyphuliferum* VAIN.). Type. Thallus inconspicuous, mostly immersed, apothecia biatorine with blackish rim. Section 3.7 mm.

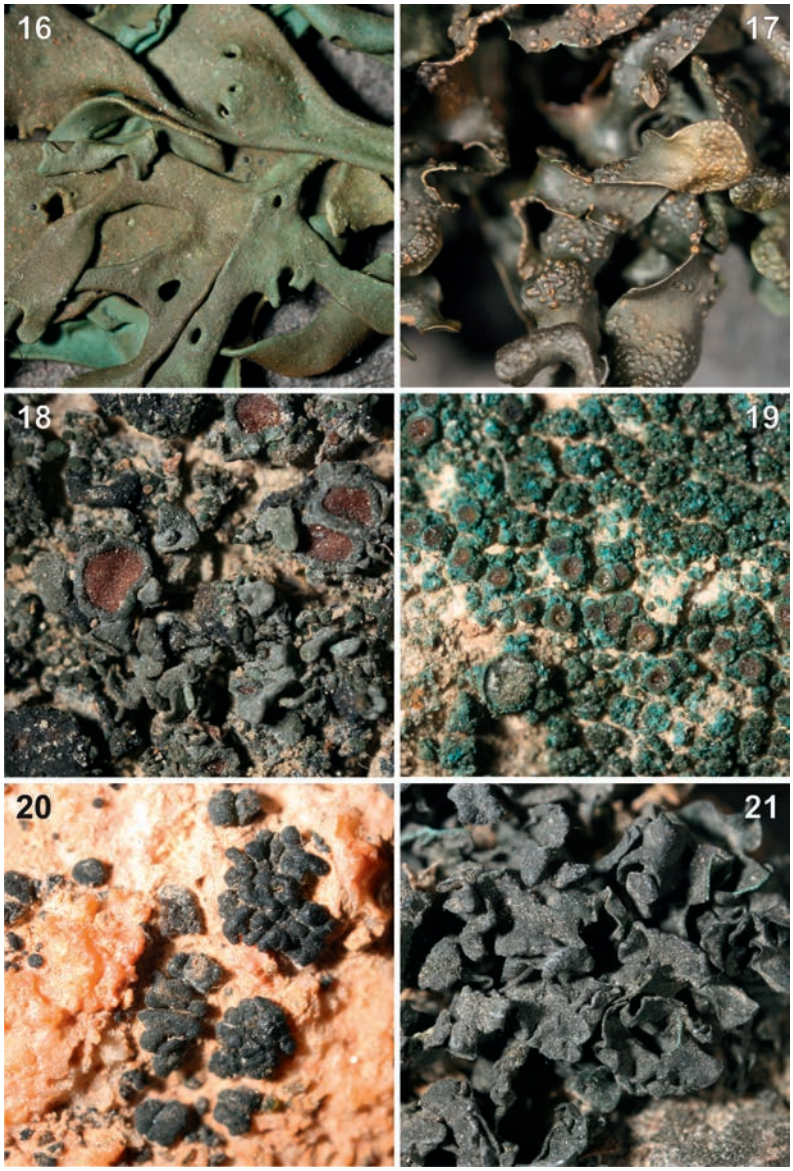

Plate 4: Fig. 16: *Jenmania goebelii* W.WÄCHT. Isotype. Thallus with strap-like, fenestrate lobes and numerous immersed apothecia (small pale dots). Section 8.1 mm. Fig. 17: *Jenmania osorioi* HENSSEN. Isotype. Thallus with erect, contorted, strap-like lobes and numerous apothecia (pycnoascocarps) in small thallus warts. Section 8.1 mm. Fig. 18: *Lempholemma vamberyi* VAIN. Isotype. Thallus squamulose, gray pruinose with large, dark red apothecia. Section 5.8 mm. Fig. 19: *Leprocollema finkii* ZAHLBR. (= *L. americanum* VAIN.). Syntype. Thallus crustose-granulose, apothecia with umbonate discs. Section 5.2 mm. Fig. 20: *Gonohymenia algerica* J.STEINER (= *Lichinella a.* (J.STEINER) P.MORENO & EGEA). Lectotype. Thallus small squamulose, thallinocarpous fruit bodies hidden in convex lobules. Section 4.5 mm. Fig. 21: *Thyrea hondoana* ASAHINA (= *Lichinella h.* (ASAHINA) P.MORENO & EGEA). Holotype. Thallus foliose-fruticose with deeply divided, ascending, flattened lobes. Section 8.1 mm.

Collemopsidium adriaticum ZAHLBR., Oesterr. Bot. Z. 68: 156 (1919).
(Croatia) Dalmatien, Insel Pago, an von Süsswasser überrieselten Strandfelsen (Kalk) gegenüber der Stadt Pago, 17.4.1914, Baumgartner [W 1915-00057] – holotype.
Note: Formerly, *Collemopsidium* was placed in the Pyrenopsidaceae, a family now included in the Lichinaceae. It is, however, a genus of fungi (HENSSEN 1980) growing in loose contact with or parasitic on cyanobacteria. Nowadays, the genus contains parasitic as well as lichenized fungi (GRUBE & RYAN 2002). The lichen-forming species used to be placed in *Pyrenocollema*, another genus of cyanobacterial, pyrenocarpous lichens. *Pyrenocollema* differs substantially from *Collemopsidium* (GRUBE & RYAN 2002) and currently contains a single species, *P. tremelloides* REINKE.

Collemopsis frustulenta NYL., Flora 67: 387 (1884); Plate 6, Fig. 30.
(Hungary) in saxo calcareo prope Lípótnerö (Budapest) in Hung., 384 ad Nyl., 1882, Lojka [W 2009-00098] – isotype.
Note: This is probably identical with *Psorotichia schaereri* (A.MASSAL.) ARNOLD.

Collemopsis lygoplaca NYL., Flora 68: 39 (1885)**.**
(France) Amélie les Bains, Pyren. orient., 1884, Nylander (as *Psorotichia lygoplaca* (NYL.) FORSSELL) [W 2009-00784] – isotype.
(France) Amélie-les-Bains (Pyrenées-Orientales), Marc (CLAUDEL & HARMAND, Lich. Gall. exs. no. 103) [W 1912-2908] – topotype.
Note: This name refers to an unlichenized cyanobacterial crust covering moist rocky surface (annot. A. Henssen V/1989 "Algenüberzug, i.e. cyanobacetial cover"). The type collected by Nylander additionally contains thalli of a small species of *Collema* as well as a crustose Lichinaceae, perhaps *Psorotichia montinii* (A.MASSAL.) FORSSELL. Nylander's brief description, however, clearly refers to the algal cover element of the original material.

Collemopsis numidella NYL., Flora 61: 338 (1878).
Algeria, Biskra, 1878, Norrlin (No. 10) [W 2010-00093] – orig. coll.
Current name: *Psorotichia numidella* (NYL.) FORSSELL.
Note: The material consists of thalli of a sterile Lichinaceae (*Psorotichia*?) as well as another lichen of that family, *Lichinella algerica* (J.STEINER) P.MORENO & EGEA (syn. *Gonohymenia algerica* J.STEINER).

Collemopsis obpallescens NYL., Flora 66: 97 (1883).
(Romania) Ungarn, Herkulesbad, Lojka [W 2010-00092] – isotype.
Current name: *Psorotichia obpallescens* (NYL.) FORSSELL.
Note: The original label was written by Nylander. This is not a *Lecidea* as suggested by v. Keissler. Its current placement in *Psorotichia*, however, is dubious as well. Apothecial characteristics indicate affinities with *Lemmopsis*, another genus of crustose Lichinaceae.

Collemopsis segregata NYL. ex HASSE, Lich. South. Calif., edit. 2: 6 (1898).
(USA, California) Erde, Santa Monica Gebirge Cal., 1897, Hasse (no. 892) [W 1899-05555] – isolectotype.
(USA, California) foothills, Santa Monica Range, 1898, Hasse (Lich. South. Calif. no. 892) [W 1913-09268] – isolectotype.
Current name: *Lempholemma chalazanum* (ACH.) DE LESD. (see SCHULTZ 2007).

Collemopsis taurica NYL., Flora 64: 97 (1886).
(Ukraine, Crimae) super saxa aprica arenacea prope balneum Jalta in peninsula Taurica Rossiae d. 6. Jul. 1885, Lojka (Lichenoth. Univ., fasc. II (1885), no. 52) [W 1888-01204, W 2009-00086] – isotype.
Current name: *Psorotichia taurica* (NYL.) VAIN.

Collemopsis vermiculata NYL., Flora 64: 529 (1881).
(Hungary) supra saxa dolomitica; Lipótmezö prope Budapest in Hungaria d. 7. Nov. 1880, Lojka (Lich. Regni Hung. exs., fasc. I (1882), no. 4) [W 1899-04580, WU (2×)] – isotypes.
Current name: *Psorotichia vermiculata* (NYL.) FORSSELL.
Note: Based on characteristics of thallus and ascoma anatomy this species should be referred to *Metamelanea* HENSSEN.

Corinophorus coralloides A.MASSAL., Flora 39: 213 (1856); Plate 5, Fig. 25.
(Germany, Bavaria) ad rupes calcareas terrosas prope Streitberg in Franconia, Arnold (ANZI, Lich. rar. Veneti ex Herb. Massal. no. 1) [W 2009-00104, WU] – isolectotypes (lectotype designated by HENSSEN & BÜDEL 1984: 262).
(Germany, Bavaria) an verwitterten Kalkfelsen und Wänden ober dem Galgen bei Streitberg, Mai 1859, Arnold (Lich. exs. no. 63) [W 1900-09614, W 2009-00103, WU] – topotypes.
(Germany, Bavaria) Kalkfelsen ober dem Galgen bei Streitberg, Arnold (388. Z., 169. M. K. H.) [WU] – type?
Current name: *Peccania coralloides* (A.MASSAL.) A.MASSAL.

Enchylium affine A.MASSAL., Mem. lichenogr.: 94 (1853).
(Italy) … Massalongo (Lich. Ital. no. 312A) [W 2009-00107] – isolectotype (lectotype designated by HENSSEN 1979"1980": 486).
Current name: *Pterygiopsis affinis* (A.MASSAL.) HENSSEN.

Endocarpon phylliscum WAHLENB. in ACH., Method. Lich.: 25 (1803).
(Norway) in rupibus Nordlandiae, Sommerfelt (Plant. Crypt. Norv. no. 58) [W 1915-08951] – type.
Current name: *Phylliscum demangeonii* (MOUG. & MONT.) NYL.

Ephebe americana HENSSEN, Symb. Bot. Upsal. 18: 47 (1963); Plate 3, Fig. 12.
(USA) New Bedford, Massachusetts, Willey (Lich. bor.-amer.; orig. sub *E. solida* BORN.) [W 2009-00106] – isotype.

Ephebe japonica ASAHINA & HENSSEN, Symb. Bot. Upsal. 18: 51 (1963); Plate 3, Fig. 14.
(Japan) Fluss Kiso, Prov. Shinano, Mittel Jap., 31.7.1926, Asahina (Lich. Jap. no. 535) [W 1927-466] – isotype.

Ephebe kerneri ZUKAL in KERNER, Sched. Fl. Exs. Austro-Hung. 2: 172 (1882) and Oesterr. Bot. Z. 33: 209 (1883) (descr. ampl.).
(Austria) an Gneissfelsen bei Trins im Gschnitzthale, Tirol, 1883, Kerner (comm. Lojka, Krypt. exs. Vindob. no. 1085; Kerner Herb. norm. exs. no. 880) [W 1900-09599] – holotype.
Current name: *Spilonema revertens* Nyl. (Coccocarpiaceae; see HENSSEN 1963a).

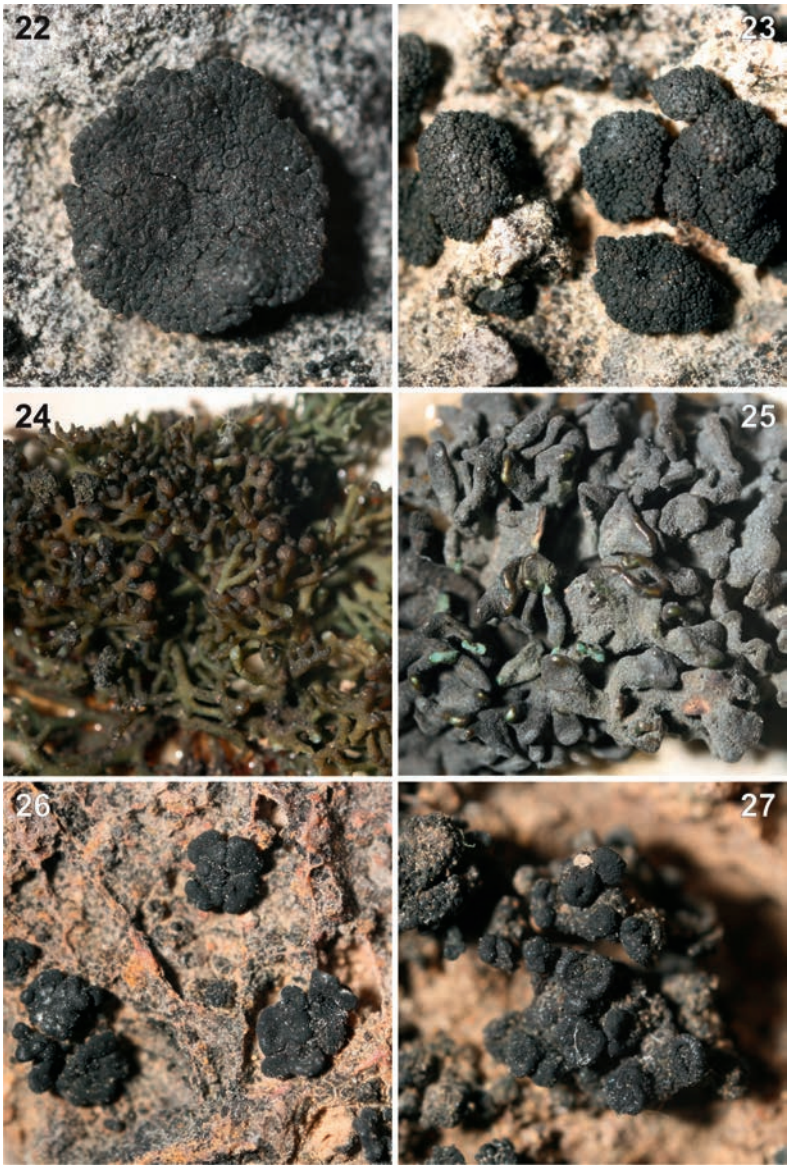

Plate 5: Fig. 22: *Thyrea myriocarpa* ZAHLBR. (= *Paulia m.* (ZAHLBR.) HENSSEN). Lectotype. Thallus squamulose-peltate with regularly tessellate surface, plane. Section 3.9 mm. Fig. 23: *Thyrea schroederi* ZAHLBR. (= *Paulia s.* (ZAHLBR.) HENSSEN). Holotype. Thallus squamulose-peltate, roughly tessellate, convex. Section 6.0 mm. Fig. 24: *Omphalaria wrightii* TUCK. (= *Paulia w.* (TUCK.) TRETIACH & HENSSEN). Isolectotype. Thallus fruticose, branchings repeatedly furcate, apothecia terminal. Section 7.8 mm. Fig. 25: *Corynophorus coralloides* A.MASSAL. (= *Peccania c.* (A.MASSAL.) A.MASSAL.). Isolectotype. Thallus foliose-fruticose, lobes gray pruinose, deeply branched, ascending. Section 8.0 mm. Fig. 26 & 27: *Omphalaria pulvinata* var. *teretiuscula* FLAG. (= *Peccania t.* (FLAG.) HENSSEN). Isolectotype. Fig. 26: Thallus small squamulose-peltate, sparingly lobulate. Section 5.9 mm. Fig. 27: Terminal apothecia of mature thallus with ± erect, subcylindrical lobes. Section 7.2 mm.

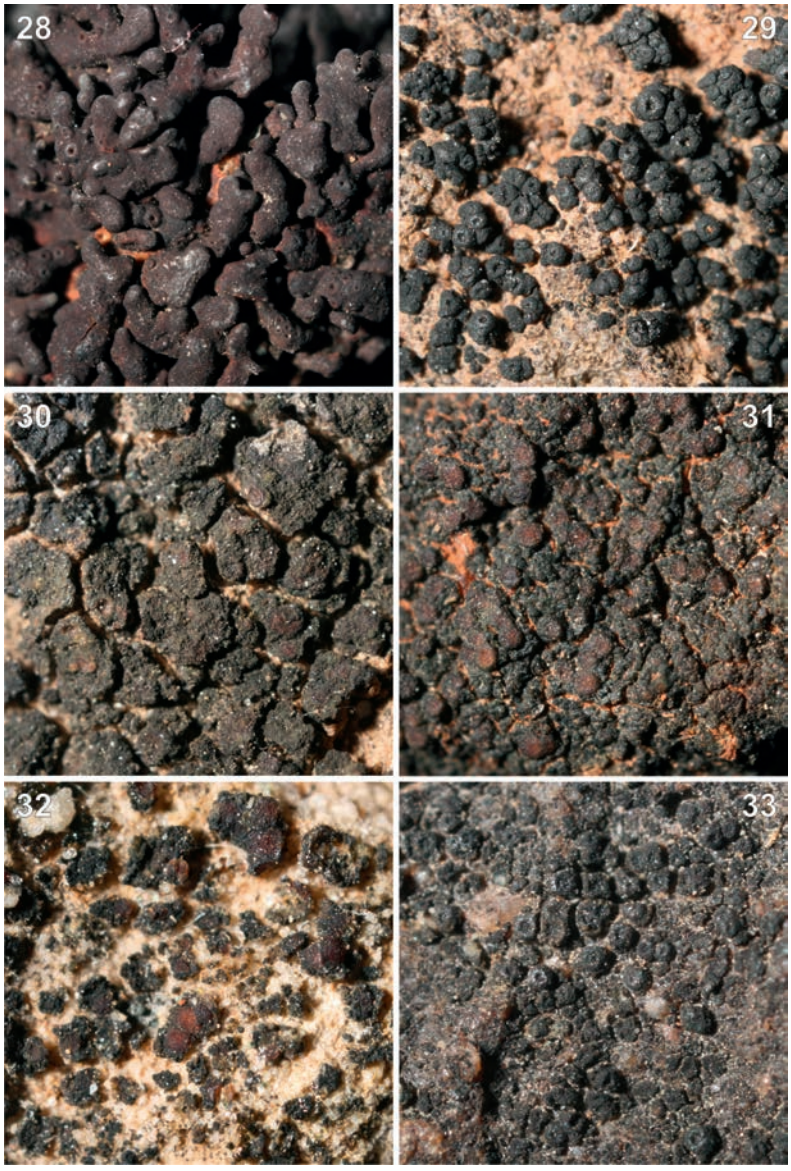

Plate 6: Fig. 28: *Phylliscum japonicum* ZAHLBR. Holotype. Thallus foliose-rosette shaped. Lobes convex, canaliculate below, apothecia laminal with pore-like discs. Section 8.1 mm. Fig. 29: *Psorotichia cataractae* ZAHLBR. (= *Phloeopeccania* sp.). Lectotype. Thallus small squamulose, apothecia sessile with thick thalloid rim. Section 5.0 mm. Fig. 30: *Collemopsis frustulenta* Nyl. (= *Ps. schaereri* (A.MASSAL.) ARNOLD s.l.). Type. Thallus areolate-crustose, apothecia adnate with expanded discs. Section 5.1 mm. Fig. 31: *Psorotichia moravica* ZAHLBR. (= *Ps. schaereri* (A.MASSAL.) ARNOLD s.l.). Type. Thallus irregularly crustose-areolate, apothecia adnate with dark red open discs. Section 4.7 mm. Fig. 32: *Pannaria schaereri* A.MASSAL. (= *Psorotichia s.* (A.MASSAL.) ARNOLD). Isolectotype. Thallus irregularly granulose to crustose, sparingly developed around around mature apothecia. Section 4.3 mm. Fig. 33: *Psorotichia arnoldii* ZAHLBR. (= *Ps. taurica* VAIN.). Holotype. Thallus small areolate, apothecia with blackish discs. Section 3.1 mm.

Ephebe pubescens f. ***complicata*** VAIN., Meddel. Soc. Fauna Flora Fenn. 7 (= Adjum. Fl. Lapp. 1): 83 (1881).
(Finland) Fennia, Hollolo Enonsoari, 1871, Vainio [W 2009-00134] – type?
Current name: *Ephebe lanata* (L.) VAIN. (see JØRGENSEN 2007).

Ephebe spinulosa TH.FR., Bot. Not.: 59 (1866); Plate 3, Fig. 13.
(Finland) Ryska Lappmark, Th.M. Fries [W 1920-01466] – isolectotype (lectotype cited by HENSSEN 1963a: 49 as "Holotypus").
Current name: *Ephebe hispidula* (ACH.) HENSSEN

Forssellia umbilicata VĚZDA, Folia Geobot. Phytotax. 13: 408 (1978); Plate 7, Figs. 35 & 36.
(Czechia) Czechoslovakia, Moravia, Distr. Námest ad Oslavou, 29.8.1969, Vězda & Wirth (Lich. sel. exs. no. 1480) [W 1978-06425] – isotype.
Current name: *Pterygiopsis umbilicata* (VĚZDA) HENSSEN.

Ginzbergerella rupestrina ZAHLBR., Hedwigia 71: 208 (1931).
(Italy) Abruzzen, Gran Sasso, zwischen Monte Portella und Corno Grande, 2400–2900 m, Kalk, 10.8.1912, Ginzberger [WU 2940] – holotype.
Current name: *Gyrocollema rupestrinum* (ZAHLBR.) HENSSEN.

Gonohymenia algerica J.STEINER, Verh. K. K. Zool.-Bot. Ges. Wien 52: 485 (1902); Plate 4, Fig. 20.
(Algeria) Algier, bei Phardaja auf dem Schebka-Plateau der Sahara, Kalk, c. 600 m, 1898, Kerner [W 1931-00189] – lectotype, [WU] – isolectotype (designated by MORENO & EGEA 1992b: 241).
Current name: *Lichinella algerica* (J.STEINER) P.MORENO & EGEA (not accepted by other authors).

Gonohymenia algerica var. ***granulosa*** J.STEINER, Verh. K. K. Zool.-Bot. Ges. Wien 52: 485 (1902).
(Algeria) Algerische Sahara, Schebka-Plateau, bei Ghardaia, 600 m, 32°25'N, auf mergeligem Kalk der Cenomanstufe, Kerner – WU?
Note: The type has not yet been traced but is most likely preserved in WU. According to STEINER (1902) this variety resembles *Psorotichia* but shares the characteristic apothecia (thallinocarps) with the main form, and therefore is perhaps referrable to *Lichinella myriospora* (ZAHLBR.) P.MORENO & EGEA ex M.SCHULTZ.

Gonohymenia lusitanica HENSSEN, Lich. cyan. fungi sax. exs., fasc. 2, no. 39: 7 (1990).
Portugal, Baixo-Alentejo, Garique der Serra da Arrabida; auf Sickerwasserstreifen und in Mulden auf S exponierten Kalkfelsen in Meeresnähe, 1971, Henssen 21775g & Schäfer (Lich. cyan. fungi sax. exs. no. 39) [W 1991-03892] – isotype.
Note: According to a draft manuscript on the Lichinaceae of the Iberian Peninsula written by J.M. Egea which is available to the author, this species is synonymous to *Lichinella myriospora* (ZAHLBR.) P.MORENO & EGEA ex M.SCHULTZ. This view is confirmed here.

Gonohymenia mesopotamica J.STEINER, Ann. Naturhist. Mus. Wien 34: 21 (1912).
(Iraq) Mesopotamia, Dschesiret-ibn-Omar, ad rupes, substrato basaltico, 400 m, 21.8.1910, Handel-Mazzetti (Mesopotamien-Exp. 3086) [WU] – lectotype, [W 1929-15360] – isolectotype.

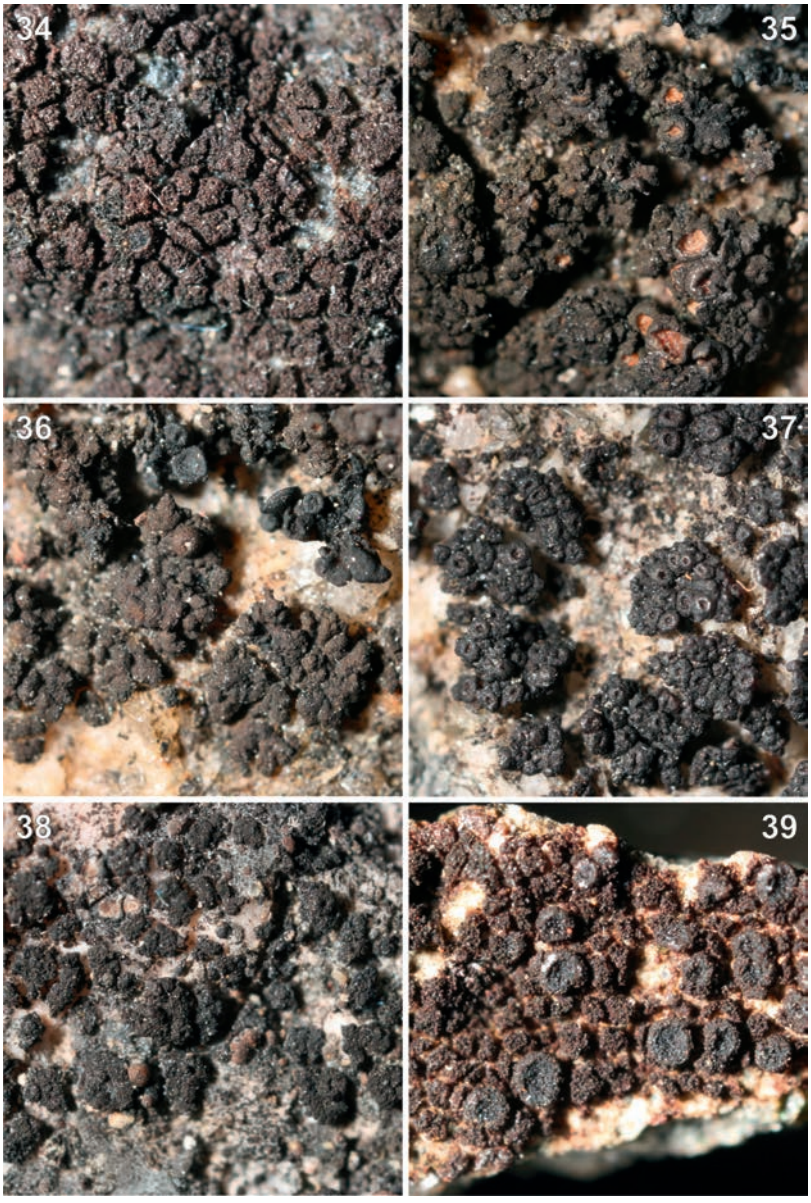

Plate 7: Fig. 34: *Pyrenopsis concordatula* NYL. (= *Pterygiopsis c.* (NYL.) P.M.JØRG.). Isotype. Thallus crustose-areolate, surface furfuraceous, apothecia immersed with back disc. Section 4.2 mm. Fig. 35 & 36: *Forssellia umbilicata* VĚZDA (= *Pterygiopsis u.* (VĚZDA) HENSSEN). Isotype. Fig. 35: Mature, squamulose-crustose thallus with apothecia. Section 5.6 mm. Fig. 36: Juvenile small squamulose thalli with slightly lobate, or effigurate margin. Section 5.0 mm. Fig. 37: *Pyrenopsis anemoides* SAMP. Isotype. Thallus small squamulose with numerous sessile apothecia. Section 4.1 mm. Fig. 38: *Pyrenopsis subareolata* NYL. var. *impolita* TH.FR. (= *P. i.* (TH.FR.) FORSSELL). Isotype. Thallus irregularly crustose with somewhat dispersed areoles and adnate apothecia with narrow discs. Section 4.2 mm. Fig. 39: *Pyrenopsis portoricensis* ZAHLBR. Lectotype. Thallus granulose-crustose to areolate, apothecia large with conspicuous black discs. Section 3.2 mm.

Current name: *Lichinella cribellifera* (Nyl.) P.Moreno & Egea (not accepted by other authors and referred to *Gonohymenia* or *Thallinocarpon*).

Gonohymenia undulata Henssen, Lich. cyan. fungi sax. exs., fasc. 2, no. 35: 5 (1990).
(Spain) Kanarische Inseln, Fuerteventura, Sukkulentenhalbwüste auf basisch-kristallinem Gestein, Paßstraße zwischen Betancuria und Pájara nahe Vega del Rio de las Palmas; auf sonnenexponierten Sickerwasserflächen bei 550–580 m, 1986, Henssen 30736b (Lich. cyan. fungi sax. exs. no. 35a) [W 1991-03878] – isotype.
(Spain) Kanarische Inseln, Fuerteventura, bei Degolla de las Granadillas; auf Vertikalflächen und in Mulden mit Erdanflug, 1988, Henssen 32048a (Lich. cyan. fungi sax. exs. no. 35b) [W 1991-03877] – paratype.
Current name: *Lichinella undulata* (Henssen) M.Schultz & v.d.Boom (see Schultz & v.d. Boom 2007; not accepted by other authors).

Heppia adriatica Zahlbr., Oesterr. Bot. Z. 59: 498 (1909).
(Croatia) Ragusa, Torrente nördlich Dubacpass, c. 200 m, 18.1.1908, Latzel (Fl. Dalmatien) [W 1908-08289] – holotype.
Note: The type material was annotated by K. Marton & M. Galun as belonging to *Pterygiopsis*, and J.M. Egea referred it to Lichinaceae. These preliminary results are confirmed here, and *Heppia adriatica* is found to be conspecific with *Pterygiopsis affinis* (A.Massal.) Henssen.

Heppia arenacea M.Schultz, Lichenologist 37: 227 (2005).
Yemen, Governorate Abyan, Jabal Arays, Wadi Asariah, below *Anisotes trisulcus* shrub, on exposed soil over basaltic rock, c. 600 m, 13°28'N, 45°55'E, 16 March 2002, Schultz 14238a [W 2012-03455] – isotype.

Heppia conchiloba Zahlbr., Beih. Bot. Centralbl. 13: 157 (1902).
(USA, California) Palm Springs, in lateribus orientalibus montium San Jacinto, ad terram, 1901, Hasse (Lich. Calif. no. 823 pr.p.) [W 1903-7049] – holotype.
Note: This species was treated as a synonym of *Heppia lutosa* by Wetmore (1970), but it was accepted as a distinct species by Henssen (1994), a view widely adopted by current authors (Büdel et al. 2002, Schultz & van den Boom 2007).

Heppia hassei Zahlbr., Beih. Bot. Centralbl. 13: 157 (1902).
(USA, California) Palm Springs, ad saxa granitica, Hasse (Lich. Calif. no. 817) [W 1903-07055] – lectotype (designated by Wetmore 1970: 191).
Current name: *Peltula obscurans* (Nyl.) Gyeln. var. *hassei* (Zahlbr.) Wetmore (Peltulaceae; see Wetmore 1970).

Heppia hungarica Sántha, Botan. Közlem. 21: 53 (1924).
(Hungary) Com. Tolna, ad cippum arenarium in sepulcretis prope Tevel, 25.8.1922, Sántha; (Lich. Hung. exs. no. 2495) [W 1923-04174] – type.
Note: As already observed by Egea, this is a dark coloured, crustose pyrenocarpous lichen of the genus *Verrucaria* s.l. (Verrucariaceae).

Heppia monguillonii Harm. in Hue, Mém. Soc. Sci. Nat. Cherbourg 36: 10 (1907).
(France) ad terram calcaream, Bray (Sarthe), Monguillon (Harmand, Lich. rar. exs. no. 38) [W 1908-02722] – isolectotype (lectotype designated by Henssen 1994: 61).
Current name: *Heppia adglutinata* (Kremp.) A.Massal. (see Henssen 1994).

Heppia placodizans ZAHLBR., Bull. Torrey Bot. Club 35: 299 (1908).
(USA) Arizona, Tuscon, Tumamoc Hill, station II, southward facing cliff of boulders, 2600 ft., 1908, Blumer [W 1908-02984] – holotype.
Current name: *Peltula placodizans* (ZAHLBR.) WETMORE (Peltulaceae; see WETMORE 1970).
Note: locality data missing on sheet and reproduced from printed diagnosis.

Heppia pulvinata HUE, J. Bot. (Morot) 22 (ser. 2, 2): 84 (1909).
(Korea) Fusan, maio 1906, Faurie (Lich. Corée no. 49) [W 1911-00009] – isotype.
Note: According to the diagnosis the species undoubtlessly belongs to *Peltula*. Judging from the general thallus shape and the presence of characteristic soralia it seems to be conspecific with *P. euploca* (ACH.) POELT (Peltulaceae).

Heppia spectabilis ZAHLBR., Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 104: 271 (1940).
(New Zealand) Hen Island, off North Auckland coast, N of island, n. 3. on cliff face, 15.2.1933, Cranwell Z A 24 [W 1935-02489] – holotype.
Current name: *Peltula euploca* (ACH.) POELT (Peltulaceae; see GALLOWAY 1985).

Heppia subrosulata J.STEINER, Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Cl. 104, Abt. 1: 387 (1895).
(Algeria) Algier, bei Phardaia auf dem Schebka-Plateau der Sahara, Kalk, c. 600 m, 1898, Kerner [W 1913-00196] – type.
Current name: *Peltula obscuratula* (NYL.) EGEA (see EGEA 1989).

Heppia tenayucae DE LESD., Ann. Cryptog. Exot. 6(2): 112 (1933).
(Mexico) Mexique, Etat de Mexico, Tenayuca, 27.1.1925, Frère Amable (Herb. B. de Lesdain) [W 1934-00571] – isotype.
Note: This species matches *Peltula impressa* (VAIN.) SWINSCOW & KROG (Peltulaceae).

Heppia tenebrata NYL., Flora 57: 310 (1874) and Flora 64: 537 (1881), descr. emend. et ampl.
(Romania) ad saxa calcarea prope Plavisevistye ad Orsova in Banatu d. 21. Sept. 1872, Lojka (no. 1024) [W 1994-02915] – isotype.
(Romania) supra saxa calcarea, Cetati Boli prope Petroseny, comit. Hunyad in Transsylvania, Lojka, (Lich. Regni Hung. exs., Fasc. I (1882), no. 23) [W 1994-02913] – paratype?
Note: According to EGEA (1989) *Heppia tenebrata* NYL. is very close to *H. purpurascens* NYL. The latter species is treated as a synonym of *Pterygiopsis affinis* (A.MASSAL.) HENSSEN by NIMIS (1993). This view is confirmed here.

Heppia terrena NYL. ex HASSE, Bull. Torrey Bot. Club 24: 445 (1897).
(USA, California) Lehmerde, San Gabriel Geb., Los Angeles Co., Cal., 1897, Hasse (no. 680) [W 1900-13732] – type?
Note/current name: According to WETMORE (1970) *Heppia terrena* belongs to *Peltula patellata* (BAGL.) SWINSCOW & KROG (Peltulaceae, sub *P. polyspora*). The type status of the present material remains uncertain. Two collections by Hasse are cited in the protologue: "San Gabriel Mountains" and "near Santa Monica" but only one date is given "August, 1896" (HASSE 1897). This raises the question whether Hasse visited both locations within one month – not impossible given the relative proximity of the two

mountain ranges. The present material is dated "1897" which would mean that it is not part the original collection.

Heppia trinitatis VAIN., Proc. Amer. Acad. Arts 58: 132 (1923).
Trinidad, St. Anna Valley, on rocks in swift brook in forest, Thaxter 1912–1913; W 1928-13899] – isotype.
Current name: *Hydrothyrea trinitatis* (VAIN.) HENSSEN (Peltigeraceae; see HENSSEN 1968).

Heppia zahlbruckneri HASSE, Bryologist 14: 100 (1911).
(USA) California, Rubio Canon, San Gabriel Gebirge bei Paratera, Kingman (comm. Hasse) [W 1911-03751] – holotype.
(USA) America borealis (California), Rubi Canon in montibus San Gabriel, Los Angeles Co., ad saxa quartzosa (Specimina originalia), Hasse [?] (Krypt. exs. Vindob. no. 1965) [W 1912-23268] – topotype or isotype?
Current name: *Peltula zahlbruckneri* (HASSE) WETMORE (Peltulaceae; see WETMORE 1970).
Note: According to WETMORE (1970), Krypt. exs. Vindob. no. 1965 is not part of the type collection despite the fact that the labels are marked "Specimina originalia". The new species had been discovered by Kingman and was described by Hasse who also forwarded material to Zahlbruckner for distribution in the Vienna cryptogamic exsiccate ("comm. Hasse"). This allows the alternative explanation that the material distributed as Krypt. exs. Vindob. no. 1965 was in fact part of the original collection, but that the labels erroneously give Hasse as collector. If correct, the exsiccate specimens are isotypes; if not, it has to be assumed that Hasse recollected material of his new lichen at the type locality which would make the exsiccate material topotypes.

Jenmania goebelii W.WÄCHT., Flora 84: 349 (1897); Plate 4, Fig. 16.
(Brit. Guyana, Mazaruni River, Marshall Falls, Goebel) [W 1899-04581] – isotype.
Note: locality data missing on sheet and reproduced from printed diagnosis.

Jenmania osorioi HENSSEN, Lichenologist 5: 447 (1973); Plate 4, Fig. 17.
Uruguay, Salto-Uruguay River, Salto Grande Island, 1972, Osorio 6675 (HENSSEN, Lich. cyan. fungi sax. exs. no. 29) [W 1991-03883] – isotype.

Lemmopsis polychidioides ZAHLBR. in SKOTTSBERG, Nat. Hist. Juan Fernadez and Easter Isl. 2: 333 (1924).
(Chile) Juan Fernandez, Masatierra, Cordón Chifladores, Skottsberg [W 1923-04180] – isotype.
Current name: *Santessoniella polychidioides* (ZAHLBR.) HENSSEN (Pannariaceae; see HENSSEN 1963a, 1997).

Lempholemma compactum KÖRB., Syst. Lich. Germ.: 401 (1855).
(Poland) Kitzelberg b. Kauffungen in Schlesien, 1841, Flotow (Herb. Körber) [W 2009-00140] – syntype.
Current name: *Lempholemma polyanthes* (BERNH.) MALME.

Lempholemma dispansum H.MAGN., Bot. Not.: 302 (1939).
Sweden, Dalsland, Bäcke, Kårud, 24 Jun 1938, Bergström & Magnusson (Lich. sel. scand. exs. no. 298) [W 1939-5646, W 1954-00955] – isotypes.

Note: Some elements of the original collection represent *Collema parvum* DEGEL. (Collemataceae; see SANTESSON et al. 2004) whereas others belong to a still incompletely understood species of *Lempholemma* close to *L. botryosum* (A.MASSAL.) ZAHLBR. (see JØRGENSEN 2007).

Lempholemma polycarpum M.SCHULTZ, Lichenologist 37: 231 (2005).
Yemen, Governorate Al-Mahra, Damkaut, Shah-ot, open forest vegetation, on small inclined limestone boulders, 680 m, 16°33.9'N, 52°46.4'E, 17 October 2001, Schultz 14138a [W 2012-03453] – isotype.

Lempholemma silicicola H.MAGN., Bot. Not.: 304 (1939).
Sweden, Bohuslän, Norum, St. Askerön, 11 Aug 1930, Magnusson (Lich. sel. scand. exs. no. 300) [W 1939-05675, W 1954-00959] – isotypes.
Current name: *Lempholemma isidiodes* (NYL. ex ARNOLD) H.MAGN.

Lempholemma socotranum M.SCHULTZ, Biblioth. Lichenol. 86: 156 (2003).
Yemen, Socotra, c. 4.5 km S of Hadibu, ascent to Muqadrihon Pass, on large, karstic, shady limestone boulder, c. 250 m, 12°36.8'N, 54°0.75'E, 19.03.1997, Schultz 14045a [W 2012-03454] – isotype.

Leprocollema finkii ZAHLBR., Mycologia 22: 74 (1930); Plate 4, Fig. 19.
(USA) Puerto Rico, Yauco, open hill, rocks, 28.12.1925, Fink 1385 [W 1925-01692] – syntype.
Note: Of the original material cited by ZAHLBRUCKNER (1930) in the protologue, only Fink no. 1385 is present in W. So far, other syntype specimens (Fink no. 616 & 1396) have been traced in MICH and BM. The Vienna type material consists of two superficially similar, but distinctly different lichens. The diagnosis seems to best fit to a *Leprocollema*-like lichen that is very close to *L. americanum* VAIN. The other element is a *Psorotichia* species close to *Ps. hassei* ZAHLBR.

Leptopterygium gracilescens ZAHLBR. in HANDEL-MAZZETTI, Symb. sinic. 3: 74 (1930).
(China) Prov. Setschwan austro-occid., in jugi Tschescha ad septentr. pagi Yünnanensis Yungning in districtu monasterii Muli regione frigide temperata, submersa in rivulo loco Gusji dicto, substr. calceo, 3950 m, 24.7.1915, Handel-Mazzetti (Iter Sinense 1914–1918 no. 7206) [W 1926-02305] – holotype, [WU 2780] – isotype.
Current name: *Zahlbrucknerella calcarea* (HERRE) ZAHLBR.

Lichen intricatus EHRH. ex SCHRAD., J. Bot. (Schrader) 1: 73, 82 (1799).
(Sweden) Upsaliae, Ehrhart (Plant. Crypt. no. 80) [W 2010-00225] – type.
Current name: *Ephebe lanata* (L.) VAIN.

Lichen polyanthes BERNH. in SCHRAD., System. Samml. krypt. Gew., 2. Lief.: 11 (1797) *nom. inval.* and BERNH., J. Bot. (Schrader) 1: 12, tab. I, fig. 4 (1799).
(Germany, Göttingen?) ... Schrader (?) (Syst. Samml. Kryptogam. Gew. no. 138) [W 1885-00387, W 2009-00137] – types.
Current name: *Lempholemma polyanthes* (BERNH.) MALME.
Note: Following JØRGENSEN (2007) plate 1, figure 4 in BERNHARDI (1799) is to be considered the holotype of *Lempholemma polyanthes* (BERNH.) MALME. Bernhardi's illustration is inconclusive and consequently JØRGENSEN selected an epitype: Malme, Lich. exs. Suec. no. 883. This was evidently a good choice since MALME (1924) correctly recognized the identity of the species and transferred it to *Lempholemma*. It should be noted,

however, that in all probability Bernhardi's illustration was based on material distributed as *Lichen polyanthes* Bernh. in Schrader's exsiccate "Sammlung kryptogamischer Gewächse" (Schrader 1797: 11), an invalid name because of the lacking designation of a type. Only two years later, Bernhardi (1799: 11) reproduced his earlier diagnosis in an unchanged way, but this time added a reference to the geographic origin of the original material ("inter saxorum muscos in Carinthia et Goettingae")] – and thereby provided the first valid description of the species. So far, the author did not thoroughly search for additional specimens of no. 138 of Schrader's "Sammlung kryptogamischer Gewächse". At the moment, W holds two of a yet unknown number of surviving specimens of *Lichen polyanthes* that most likely constitute part of the original material.

Lichina confinis var. ***willeyi*** Tuck., Syn. N. Amer. Lich. 1: 133 (1882).
(USA) Am. bor., on granite ledge, New Bedford, Mass., Willey [W 2010-00222] – isotype.
Current name: *Lichina willeyi* (Tuck.) Henssen.

Lichina elisabethae A.Massal., Misc. lichenol.: 32 [62] (1856).
(Italy) Sugli scogli alle spiagge di Terracina, 1850, Fiorini-Mazzanti (Erbar. Crittogam. Ital. no. 279, Massal. Miscell. lich. 52) [WU] – type.
Current name: *Lichina confinis* (O.F.Müll.) C.A.Ag.

Lichina macrospora Henssen, Büdel & Wessels, Mycotaxon 22: 171, 173 (1985).
Republic of South Africa, Eastern Transvaal, Graskop 2430DD, Panorama Falls, Lookout Point, on sandstone plates along the edges of rivulets and streams, c. 1400 m, 1982, Henssen & Wessels 28405a (Lich. cyan. fungi sax. exs. no. 32) [W 1991-03911] – isotype.

Lichinella americana Henssen, Nova Hedw. 15: 544 (1968) 1969.
USA, Arizona, Pima Co., Tuscon, Gates Pass, in Sickerwasserstreifen einer N-exponierten Felswand aus vulkanischem Gestein in 1200 m Höhe, 1961, Henssen 13772a (Lich. cyan. exs. no. 9) [W 1969-14424] – isotype.

Lichinella granulosa M.Schultz, Bryologist 108: 572 (2005).
U.S.A. Arizona: Yavapai Co., Bell Trail in Beaver Creek valley (E of exit 298, hwy. 17), pine-juniper woodland, steep water run-off in SE exposed rocky slope, exposed, ca. 1200 m, 34°40'N, 111°41'W, 23 Feb 1999, Schultz 16079e [W 2012-03459] – isotype.

Lichinella stipatula f. ***calcarea*** Gyeln., Rabenh. Krypt.-Fl. IX, Abt. II, Teil 2, Lief. 1: 11 (1940).
(Algeria) Algerien, Sidi Mcid, Flagey (Lich. Alg. no. 196) [W 2010-00221] – holotype.
Current name: *Lichinella stipatula* Nyl.

Lichinella stipatula f. ***silicea*** Gyeln., Rabenh. Krypt.-Fl. IX, Abt. II, Teil 2, Lief. 1: 12 (1940).
(Croatia) Scoglio Mellisello (Brusnik) westl. v. Lissa, 4. u. 5. Juni, Ginzberger (Reise nach den dalmatinischen Inseln 15. Mai bis 15. Juni 1911) [W 1912-04596] – type.
Current name: *Lichinella stipatula* Nyl.

Lichinodium sirosiphoideum Nyl., Flora 58: 297 (1875).
(Finland) Fennia, Hollolo Enonsoari, 1871, Vainio [W 2009-00109] – isotype.

Omphalaria camaromoprha A.Massal., Symm. lich. nov.: 59 (1855).
(Italy) Super strata calcarea Genuae (valletta di Granarolo), Baglietto (Anzi, Lich. rar. Veneti no. 3 ex Herb. Massal.) [W 2009-00102] – type.

Current name: *Thyrea plectopsora* A.MASSAL.
Note: Initially, MASSALONGO (1855a: 14) published the species as "*Omphalaria comaromorpha* spec. nov.?". Apparently, he was uncertain about the status of this lichen as he did not provide a diagnosis, and thereby created a *nomen nudum.* However, he cited the studied material collected by Baglietto near Genova in Italy. Only shortly later, MASSLONGO (1855b: 59) provided a detailed diagnosis for *Omphalaria* [!] *camaromorpha*, but this time he cited no type material. However, he linked his new name and diagnosis to his earlier published *nomen nudum* and thereby validated the description. Potentially, problems arise from the fact that *Omphalaria camaromorpha* is most likely identical with *Thyrea plectopsora* A.MASSAL., a species erected one year later by MASSALONGO (1856: 75). Therefore, *Omphalaria camaromorpha* A.MASSAL. seems to take priority over *Thyrea plectopsora*. However, placing the latter into synonymy would clearly be disadvantegous since it is a well-established species and has been used many times in the literature – and therefore certainly deserves conservation if this should become necessary.

Omphalaria decipiens A.MASSAL., Symm. lich. nov.: 61 (1855).
(Germany, Bavaria) ad muros, et rupes calcareas inter Streitberg, et Langethal in Franconia, Arnold (ANZI, Lich. rar. Veneti no. 2 ex Herb. Massal.) [W 2009-00108] – isoneotype (rej.).
Current name: *Anema decipiens* (A.MASSAL.) FORSSELL.
Note: MORENO & EGEA (1992a) located original material in the herbarium of Massalongo in Verona (VER) which nullifies the selection of a neotype by HENSSEN (1979 [1980]). Nonetheless the Franconian material collected by Arnold is cited here because it is very characteristic and – in contrast to the original material collected by Massalongo – is represented in several large herbaria.

Omphalaria deusta TUCK., Gen. lich.: 73 (1872).
(Cuba) (Guajuybon, ins. Cuba, 1868) Wright (Lich. Cuban., ser. II, no. 45) [W 2010-00254] – isotype.
Current name: *Thyrea deusta* (TUCK.) ZAHLBR.

Omphalaria granitica SAMP., Brotéria, Sér. Bot. 14: 66 (1916).
Portugal, Melgaco, 28.8.1917, Sampaio 470 [W 1921-00783] – isolectotype (lectotype designated by MORENO & EGEA 1992b: 243).
Current name: *Lichinella cribellifera* (NYL.) P.MORENO & EGEA (see MORENO & EGEA 1992b; but not accepted by other authors and referred to *Gonohymenia* or *Thallinocarpon*).

Omphalaria leptophylla TUCK., Proc. Amer. Acad. Arts 5: 383 (1862).
(On rocks in rivulets, overflowed after rains, in the island of Cuba, Wright, Lich. Cuban. no. 1) [W 1908-07724] – isotype.
Current name: *Thyrea leptophylla* (TUCK.) ZAHLBR.
Note: According to her annotation Henssen considered this species to belong to *Jenmania*. However, it seems that she never published the name. The genus *Jenmania* currently contains two species, *J. goebelii* WÄCHT. and *J. osorioi* HENSSEN. Despite a general resemblance in external thallus shape and thallus anatomy, and the similar occurrence in tropical fresh water habitats the two species differ profusely in ascomatal characteristics. The main difference is that the ascomata are common apothecia formed in a tangle of generative hyphae in *Jenmania goebelii* whereas they are pycnoascocarps in *J. osorioi*.

Therefore, the latter seems to be close to *Thyrea*. Future studies will have to reveal if "*Jenmania leptophylla*" is to be placed in *Jenmania* or should be retained in *Thyrea*.

Omphalaria minnesotensis Fink, Contr. U. S. Natl. Herb. 14: 145 (1910).
(USA) on calcareous rocks, Minneapolis, Minnesota, July 1896, Fink (orig. sub "Omph. macmillana sp. nov.", an unpublished herbarium name) [W 1920-00604] – isotype.
Current name: *Lichinella minnesotensis* (Fink) Essl. (not accepted by other authors and referred to *Gonohymenia* by Henssen & Jørgensen 1990).

Omphalaria nodulosa var. ***sphaerospora*** Harm., Bull. Soc. Bot. France, Sér. 4, 6: 236 (1906).
(France) Suprà mortarium, route de Vias à Agde (Hérault), sur le mortier du pont du canal, Crozals (Harmand, Lich. rar. exs. no. 3) [W 1908-2689] – isotype.
Note: This is most probably *Anema nodulosum* (Nyl.) Forssell.

Omphalaria notarisii A.Massal., Framm. lichenogr.: 13 (1855) & Symm. lich. nov.: 58 (1855); Plate 3, Fig. 11.
(Italy) ... Baglietto (Massalongo, Lich. Ital. no. 174; sub *Thyrea notarisii* Massal.) [W 2009-00111] – isoneotype (neotype designated by Henssen & Jørgensen 1990: 138).
Current name: *Anema nummularium* (Duf. ex Dur. & Mont.) Nyl. ex Forssell (Moreno & Egea 1992a, Jørgensen 2007), but previously accepted as distinct species by Henssen & Jørgensen (1990). *Anema notarisii* has smaller, bulging rosettes, but is otherwise similar to *A. nummularium*.

Omphalaria pulvinata f. ***canaliculata*** Tonglet, Bull. Soc. Roy. Bot. Belgique 37: 18 (1898).
(Belgium) Belgique, Houx, Kalkfelsen, Mai 1897, Tonglet [W 1900-13485] – type.
Note: The material was tentatively annotated by the author as "*Thyrea confusa*", however, this needs verification.

Omphalaria pulvinata var. ***schleicheri*** Hepp, Flecht. Eur. 3, Fasc. 12: pl. 74, no. 659 (1860).
(Switzerland) an Kalkfelsen bei Baden, Kt. Aargau, Hepp (Flecht. Eur. no. 659) [W (Hepp exs.)] – isolectotype (lectotype designated by Henssen & Jørgensen 1990: 141).
Current name: *Gonohymenia schleicheri* (Hepp) Henssen (referred to *Lichinella iodopulchra*-complex by Moreno & Egea 1992b).

Omphalaria pulvinata var. ***teretiuscula*** Flagey, Rev. Mycol. (Toulouse) 17: 113 (1895); Plate 5, Figs. 26 & 27.
(Algeria) Disséminée sur les rochers calcaires de Constantine et d'Ain-Tinn, Flagey (Lich. Alg. no. 297) [W 1899-04561] – isolectotype (lectotype designated by Henssen & Jørgensen 1990: 143).
Current name: *Peccania teretiuscula* (Flagey) Henssen.

Omphalaria tiruncula Nyl., Flora 61: 338 (1878).
Algeria, Biskra, 1878, Norrlin [W 2010-00253] – orig. coll.
Current name: *Peccania tiruncula* (Nyl.) Henssen.
Note: According to the annotation by Henssen the specimen represents poor, inconclusive material belonging to the original collection.

Omphalaria veronensis A.Massal., Symm. lich. nov.: 60 (1855).
(Italy) ... Massalongo (Lich. Ital. no. 183) [W 2009-01000] – type?
Current name: *Peltula euploca* (Ach.) Poelt.

Note: According to MORENO & EGEA (1992a) this species belongs to *Peltula euploca* (ACH.) POELT (Peltulaceae). The present material represents a rather small form with undulating, sorediate squamules.

Omphalaria wrightii TUCK., Gen. lich.: 72 (1872); Plate 5, Fig. 24.
(Cuba) on rocks, Guajuybon, May 8, in ins. Cuba, 1868, Wright (Lich. Cub., ser. II, no. 46) [W 2009-00105] – isotype.
Current name: *Paulia wrightii* (TUCK.) TRETIACH & HENSSEN.

Pannaria schaereri A.MASSAL., Ric. auton. lich. crost.: 114 (1852) Plate 6, Fig. 32.
(Italy, ad saxa arenacea corrupta oppidi Tregnago (Ponzaigo), Massalongo) (Lich. Ital. no. 338) [W 2009-00093] – isolectotype (lectotype designated by JØRGENSEN 2007: 145).
(Italy) in prov. Veronensi (Ponzaigo), Massalongo, in prov. Novo-Comensi, et Sondriensi (Como, Bormio), Anzi (Lich. Langob. 430) [W 2009-00093] – isolectotype?
Current name: *Psorotichia schaereri* (A.MASSAL.) ARNOLD.

Pannaria schaereri var. ***arenaria*** ARNOLD, Flora 44: 243 (1861).
(Germany, Bavaria) an Sandsteinen des braunen Jura im lichten Föhrenwalde des Staffelberges bei Staffelstein in Oberfranken, Juli 1860, Arnold (Lich. exs. no. 162, as "f. *arenaria* m.") [W 1900-09620] – type.
Note: This is certainly very close to *Psorotichia schaereri* (A.MASSAL.) ARNOLD, but probably identical with *Ps. moravica* ZAHLBR. which would have priority over *Ps. schaereri* var. *arenaria* (ARNOLD) FORSSELL if accepted at species level.

Pannaria schaereri var. ***urceolata*** HEPP in ARNOLD, Flora 42: 147 (1859).
(Germany, Bavaria) Dolomitfelsen bei der Willibaldsburg, Eichstätt, 1858, Arnold [WU (2×)] – syntypes.
(Germany, Bavaria) feuchte Kalkwand zwischen Jachhausen d. Riedenburg im Altmühlthale, 1858, Arnold (Lich. exs. no. 827) [WU] – syntype.
Note: Strangely, v. Keissler annotated this material as belonging to *Psorotichia montinii*, and it seems that he badly misinterpreted the concept of that species. In fact, *Pannaria schaereri* var. *urceolata* is most certainly indentical with *Metamelanea caesiella* (TH. FR.) HENSSEN.

Parmelia stygia var. ***pulvinata*** SCHAER., Lich. helv. spic., sect. 11: 544 (1842).
(Switzerland) ad rupes calcarias supra lacum Biennensem, Schaerer (Lich. Helv. no. 435) [W 1908-08848, WU (2×)] – isolectotype (lectotype designated by HENSSEN & JØRGENSEN 1990: 141).
Current name: *Lichinella iodopulchra* (CROZ.) P.MORENO & EGEA (MORENO & EGEA 1992b, but not accepted by other authors and referred to *Gonohymenia* by HENSSEN & JØRGENSEN 1990).

Paulia caespitosa TRETIACH & HENSSEN, Mycotaxon 57: 360 (1996).
Mexico, southwestern Chihuahua, Mpio. Bocoyna, valley of Basiguare, 21 km S of Cusarare; on dripping ledges above stream in pine-oak forest, c. 2000 m sm., 1 August 1977, Weber & Bye (Lich. Exs. Univ. Colo. Mus. Boulder no. 576; sub *Peccania* sp. indet.) [W 1979-10992] – isotype.

Peccania crispa M.STEINER, Lichenoth. Afghan., Fasz. 3 (1988) *nom. nud.*
Afghanistan, Prov. Parwan, oberes Gorband-Tal, ca. 5 km unterhalb Dahane-Gordbandak, bei Sulbinak, 68°18'E, 34°53'N, 2560 m, Bänke von Kalkgestein an der Grenze

von bewässertem Talgrund und Steppenhang; mit *Peccania terricola*, 8.6.1970, Steiner 55/1 (Lichenoth. Afghan. 73a) [W 1988-04486] – type.
Note: The name has not yet been validated though the species seems to be widespread in arid regions of Arabia. It resembles *Peccania coralloides* but differs in the smaller, ± markedly crisped and broadly rounded lobes.

Phloeopeccania anemoides M.Schultz & Büdel, Bryologist 108: 520 (2005).
Mexico, Baja California Sur, Sierra la Giganta, dirt road to Agua Verde, Rancho Viejo ca 7 km SE of Rte. 1, Sonoran Desert scrub, N-facing rocky slope, on SE-exposed rock faces, volcanic conglomerate, 300 m, 25°33'43"N, 111°16'03"W, 18 March 2003, Schultz 16262a [W 2012-03458] – paratype.

Phloeopeccania pulvinulina J.Steiner, Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 71: 93 (1902 [1907]).
(Yemen) Vulkan El Harida el Hamra, Südarab. Exped. 1898/99, Dezember 1898, Simony [W 1931-00193] – holotype, [WU 2907] – isotype.

Phylliscum endocarpoides Nyl., Ann. Sci. Nat. Bot., ser. 3, 20: 320 (1853).
Note: same type and substitute name of *Endocarpon phylliscum* Wahlenb.; see there.

Phylliscum endocarpoides var. ***compositum*** Nyl. in Norrl., Not. Sällsk. Fauna Fl. Fenn. Förh. 13: 315 (1871-1874) *nom. nud.*
(Finland) in Lapponia Kemensi, Kätkesuanto, supra latus rupis praeruptum, irroratum, boream versus situm, 1867, Norrlin (Nylander, Herb. Lich. Fenn. Fasc. III (1875), no. 104) [W 1903-00742] – type.
Current name: *Phylliscum demangeonii* (Moug. & Mont.) Nyl.

Phylliscum japonicum Zahlbr., Bot. Mag. (Tokyo) 41: 320 (1927); Plate 6, Fig. 28.
(Japan) Prov. Tamba, 16.5.1926, Ogata (Lich. Jap. no. 519) [W 1927-373] – holotype.
(Japan) am Ufer des Flusses "Kisogawa" Prov. Shinano, Hondo, saxicola, 29.7.1926, Asahina (Lich. Jap. no. 519) [W 1927-483] – paratype.

Physma franconicum A.Massal., Misc. lich. nov.: 21 [51] (1856).
(Germany, Bavaria) ad muros vetustos terroros prope Eichstaedt [Eichstätt], Arnold (Anzi, Lich. rar. Veneti ex Herb. Massal. no. 8) [W 2009-00136] – type.
Current name: *Lempholemma chalazanum* (Ach.) de Lesd.

Physma intricatissimum J.Steiner, Ann. K. K. Naturhist. Hofmus. 23: 113 (1909).
(Turkey) Asia minor, districtus (Sandschak) Trapezunt, in ditione vici Eseli prope oppidum Goerele (Elehu), in decivitate tergi versus vallem Elewy Deressi ad viam Karaburk ducentem, ad rupes, substrato calcecretaceo, ca. 700 m, 21.7.1907, Handel-Mazzetti (Reise pont. Randgeb. 1907, no. 914) [W 1908-6271] – type.
Note: This species probably belongs to *Lempholemma botryosum* (A.Massal.) Zahlbr.

Physma muelleri Hepp in Müll.Arg., Mém. Soc. Phys. Genève 16 (= Princ. classif. lich.): 424 (1862).
(Switzerland) Helvetia, Genf, Müller [W 2009-00138] – type?
Current name: *Lempholemma polyanthes* (Bernh.) Malme.

Physma terricolum Arnold, Flora 68: 216 (1885).
(Germany, Bavaria) auf Erde eines schattigen Waldgrabens bei Sugenheim in Franken, Sommer 1867, Rehm (Arnold, Lich. exs. no. 387) [W 1900-09617] – isolectotype (lectotype designated in Diederich et al. 2010: 261).

Current name: *Llimoniella terricola* (REHM ex ARNOLD) M.SCHULTZ, DIEDERICH & ERTZ.
Note: This is a lichenicolous fungus growing on crustose, ephemeral cyanolichens such as *Gregorella humida* (DIEDERICH et al. 2010).

Porocyphus cataractarum KÖRB., Parerga lichenol.: 440 (1865).
(Poland) ad saxa irrigua cataractae "Lomnitzfall" in Sudetis, Körber (Lich. sel. Germ. no. 29; as "Psorotichia cataractarum Körb. ad int.") [WU 887] – orig. coll. excl.
Note: This is part of the original material of *Psorotichia cataractarum* KÖRB. described by KÖRBER *in schedae* as no. 29 of Lichenes selecti Germaniae (KÖRBER 1856). The schedae have a short diagnosis, locality and a collection date. It is, however, not a valid name since KÖRBER proposed it merely as a provisional name which is indicated by the phrase "*ad int.*". Later, KÖRBER (1865) validated the species as *Porocyphus cataractarum* KÖRB. Interestingly, Körber cited a name in synonymy introduced earlier by FLOTOW (1850): "*Ephebe pubescens* δ *gonimica* 1 *haematodes* FLOT., Fw. in Bot. Zeit. 1850. pag. 75". This name is based on material collected by Flotow at the same place as *Porocyphus cataractarum* and Körber obviously considered the two taxa to be identical. However, it seems that at least two discordant elements are involved. The WU specimen of Körber, Lich. sel. Germ. no. 29 has been annotated by A. Henssen as "Pyrenopsis haemaleella". However, HENSSEN (1963a) synonymized *Psorotichia cataractarum* under *Porocyphus coccodes* (FLOT.) KÖRB. Apparently, the material in the Körber herbarium represents a *Porocyphus*. The author of the present paper has studied several specimens of Körber, Lich. sel. Gern. no. 29 and also found them to correspond to *Porocyphus coccodes*. However, material at M collected by Rehm and cited by Körber proved to belong to *Pyrenopsis*. Therefore, the present element of the original collection preserved at WU should be excluded from the protologue and treated as *Pyrenopsis haemaleella* following the annotation by Henssen.

Porocyphus globulosus COUDERC in CROZ., Bull. Acad. Intern. Geogr. Botan. 18: 502 (1908).
(Germany, Bavaria) an niedrigen Dolomitfelsen des begrasten Berghanges unterhalb der Piesenharder Römerschanze bei Eichstadt [Eichstätt], August 1860, Arnold (Lich. exs. no. 157; sub "*Psorotichia murorum*") [W 2009-00089, W 2009-00090] – types.
Current name: *Porocyphus rehmicus* (A.MASSAL.) ZAHLBR.
Note: This name was first introduced by Massalongo in a letter to Arnold (12 May 1858), but has been validated by Couderc 50 years later.

Porocyphus kalbarrensis HENSSEN, Lich. cyan. fungi sax. exs., fasc. 2, no. 46: 9 (1990).
(Australia) Australien, Western Australia, Kalbarri National Park, Red Bluff, Sandstein in fast vollständig ausgetrocknetem Bachbett, auf leicht geneigten Felsflächen, 29.8.1987, Henssen 31358a (Lich. cyan. fungi sax. exs. no. 46) [W 1991-03902] – isotype.

Pseudoheppia schuleri ZAHLBR., Ann. Mycol. 1: 356 (1903).
(Croatia) an dolomitischen Kalkstein ... unter Pulac an dem Weg der nach Grahovo ob. a. S. Lubaju führt, 1902, Schuler (Lichenen der Umgebung Fiume's) [W 1903-7067] – holotype.
Note: This is most probably identical with *Psorotichia obpallescens* (NYL.) FORSSELL described from Romania, a species that falls far outside the common circumscription of *Psorotichia*.

Pseudopaulia tessellata M.Schultz, Mycotaxon 82: 446 (2002).
Yemen, Socotra Island, c. 3.5 km S of Hadibu, foot of Haghier Mts., limestone boulder, c. 100 m, 12°37.3'N, 54°1.0'E, 19.03.1997, Schultz 14042a [W 2012-03456] – isotype.

Psorotichia arenaticola Eggerth in Arnold, Verh. K. K. Zool.-Bot. Ges. Wien 39: 266 (1889).
(Italy) auf Mörtel alter Mauern bei Meran: a) sp. sin.: Gartenmauer des Klosters der englischen Fräulein; b) sp. dext.: Spitalmauer Schgörrensteig; Südtirol. März 1886, Eggerth (Krypt. exs. Vindob. no. 1193) [W 1900-09621, WU 887] – types.
(Italy) Tirolia meridionalis, ad oppidum Meran, ad caementum murorum (locus classicus), Eggerth jun. (Krypt. exs. Vindob. no. 3146) [W 1984-02785, WU] – topotypes.
Note: Unlike the type, no. 1193 of Krypt. exs. Vindob., no. 3146 of the same exsiccate lacks a collecting date but has the phrase "locus classicus". It is assumed here that C. Eggerth jun. recollected the species at the type locality, and that this material was issued later – long after Eggerth had died (March 30th 1888, Arnold 1889). However, it can not be excluded that all exsiccate material belonged to just one collection issued at different times under different numbers. *Psorotichia arenaticola* is most likely identical with *Ps. murorum*.

Psorotichia arnoldii Heufl. in Arnold, Verh. K. K. Zool.-Bot. Ges. Wien 14: 462 (1864); Plate 6, Fig. 33.
(Italy) südöstliches Tirol, … M. Canzacolli bei Gredazzo …, 1863, Molendo [W 1913-05405] – holotype.
Current name: *Psorotichia tirolensis* Zahlbr.
Note: Apparently, Zahlbruckner (1924) introduced *Psorotichia tirolensis* Zahlbr. as a substitute name for *Ps. arnoldii* because of the (potentially) homonymic *Ps. arnoldiana* (Hepp ex Arnold) Körb. 1865 (now called *Lemmopsis arnoldiana* (Hepp ex Arnold) Zahlbr.). Since *Ps. arnoldii* is found here to be identical with *Ps. taurica* (Nyl.) Vain., the latter name should be adopted for this distinctive species.

Psorotichia calcigena Zahlbr., Mycologia 22: 73 (1930); Plate 3, Fig. 15.
(USA, Puerto Rico) Yauco, partly shaded area, rocks, 28.12.1915, Fink 1413 [W 1924-04222] – type.
Note: This is identical with *Gyrocollema scyphuliferum* Vain., likewise described from Puerto Rico (Vainio 1929).

Psorotichia cataractae Zahlbr., Bot. Jahrb. Syst. 60: 485 (1926); Plate 6, Fig. 29.
(Zimbabwe) Rhodesien, Victoria Falls, Palm Kloof, Basalt, c. 900 m, 4.10.1909, Brunnthaler [W 1931-08326] – lectotype, [WU] – isolectotype.
Note: The W-specimen has a pencil annotation is the handwriting of Henssen: "Lectotypi W" whereas the WU-specimen has a similar annotation "Iso-Lectotypus WU". This suggestion will be followed in the lectotypification of the name *Psorotichia cataractae*, a species that clearly does not belong to *Psorotichia*.

Psorotichia cataractarum Körb. *ad int.*, Lich. sel. Germ. no. 29 (1856) *nom. inval.* (art. 34.1b, ex. 6, provisional name).
See *Porocyphus cataractarum* Körb.

Psorotichia frustulosa Anzi, Comment. Soc. Crittog. Ital. 2(1): 4 (1864).
(Italy) ad saxa calcarea aprica prope Bormium (sopra Molina, e sopra i Bagni nuovi; 1530 m. supra mare, plerumque sterilis), Anzi (Lich. Langob. no. 388); [W, WU (2×)] – types.

Psorotichia globulosa A.MASSAL. in ARNOLD, Flora 68: 219 (1885) *nom. nud.*
See *Porocyphus globulosus* COUDERC in CROZALS.

Psorotichia incrustans [ARNOLD in FLAGEY ex] ZAHLBR., Cat. Lich. Univ. 2: 791 (1924), non *Porocyphus incrustans* (WALLR.) [ARNOLD ex] ZAHLBR. (1924).
(Algeria) A. C. sur les calcaires humides à Azeba, Flagey (Lich. Alger. 302) [W 1899-04575] – type.
Note: The name *Psorotichia incrustans* was first introduced in FLAGEY (1895: 114) as a new combination of the earlier name *Thrombium incrustans* WALLR. This is evident from the direct reference to Wallroth's name which is cited as a synonym. The latter is an inconspicuous species described from loamy soil in Thuringia, Germany growing together with *Leptogium palmatum* (HUDS.) MONT. and *Icmadophila ericetorum* (L.) ZAHLBR. (see WALLROTH 1831: 294), and thus obviously comes from a humid, mountainous habitat. ARNOLD (1885: 216) compared *Thrombium incrustans* with *Physma terricolum* REHM ex ARNOLD, a name that has been shown recently to belong to a lichenicolous fungus growing on small terrestrial cyanolichens (DIEDERICH et al. 2010). Hence, there is reason to believe that Flagey misapplied Wallroth's name when using it for his Algerian limestone species – perhaps owing to the fact that ARNOLD (1885) had suggested to place *Thrombium incrustans* into *Porocyphus*. Obviously, Flagey was very uncertain about the generic placement of his Algerian lichen since only shortly later he called it *Collemopsis incrustans* (FLAGEY 1896: 109). Eventually, HARMAND (1905: 54) listed the species again as *Psorotichia incrustans* with reference to Flagey's exsiccate material. However, he also cited Wallroth's "basionym" and thereby maintained the misapplication. Finally, ZAHLBRUCKNER (1924: 765, 791) separated the species and referred the one which is based on Wallroth's *Thrombium incrustans* to *Porocyphus* (though still with doubt and with a "?") and the other one to *Psorotichia* with clear reference to the Algerian lichen and excluding Wallroth's name from the synonymy. Thereby, Zahlbruckner created a nomen novum for the Algerian plant. The citation of HARMAND (1905) and FLAGEY (1895) appears to be sufficient as reference to an earlier description since both authors clearly described the Algerian lichen. Type is Flagey, Lich. Alger. no. 302 cited above. Authorship of *Porocyphus incrustans* is usually given as "(WALLR.) ARNOLD". This is incorrect since ARNOLD (1885: 216) did not definitely link genus and species epithet. This was done later by ZAHLBRUCKNER (1924: 765). Likewise, authorship of *Psorotichia incrustans* is also attributed to Arnold. This, however, is incorrect as well since Arnold's name – when established in FLAGEY (1895: 114) – is just a recombination for *Thrombium incrustans* WALLR. Therefore, authorship for *Psorotichia incrustans* should be "[ARNOLD in FLAGEY ex] ZAHLBR.". *Psorotichia incrustans* belongs to an interesting group within this genus characterized by a vivid bluish-green epihymenium. Apparently, this has caused confusion with another, though unrelated lichen, *Thelignya lignyota* (WAHLENB.) P.M.JØRG. & HENSSEN. The latter is a chiefly Nordic lichen on wet rock. Possibly, *Psorotichia incrustans* – which grows on dry limestone – is identical with *Ps. numidella* var. *flageyana* J.STEINER described from Greece.

Psorotichia lugubris f. ***atrata*** ARNOLD, Flora 68: 218 (1885).
(Germany, Bavaria) an Kalkfelsen der lichtbewaldeten Schlucht gegenüber Kunstein bei Eichstätt, Juni 1858, Arnold (Lich. exs. no. 40) [W 1900-9622, W] – types.
Note: This form seems to falls into the variation of *Psorotichia lugubris* (A.MASSAL.) ARNOLD, a species better referred to *Metamelanea* HENSSEN.

Psorotichia lugubris var. ***buschirense*** J.Steiner, Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Cl. 105, Abt. 1: 436 (1896).
(Iran, Persien, Buschir, Nummulithenkalk, Stapf); WU?
Note: The type has not yet been traced but is most likely preserved in WU. The locality information is reproduced from the printed diagnosis.

Psorotichia lugubris var. ***pannosa*** Arnold, Flora 68: 218 (1885).
(Germany, Bavaria) an einer Kalkfelsenwand zwischen Dollnstein und Breitenfurt im Altmühlthale, October 1858, Arnold (Lich. exs. no. 39) [W 1900-9624, W 2009-00092] – syntypes.
(Germany, Bavaria) 1857, Arnold, Hb. Kremp. (Lich. exs. no. 39) [WU] – type.
(Germany, Bavaria) Kalk bei Dollnstein/Eichstädt [Eichstätt], Arnold (Lich. exs. no. 39) [WU] – type.
(Germany, Bavaria) Frankenjura, 1857, Arnold [WU] – type?
(Germany, Bavaria) Frankenjura, 1858, Arnold [WU (2×)] – type?
Note: This variety seems to be close to *Psorotichia vermiculata* (Nyl.) Forssell, a species better referred to *Metamelanea* Henssen.

Psorotichia moravica Zahlbr., Ann. Naturhist. Mus. Wien 42: 61 (1928); Plate 6, Fig. 31.
(Czechia) Moravia occidentalis, in valle fluminis Jihlavka prope pag. Mohelno, supra tegulas lateritias, Suza (Krypt. ex Vindob. no. 3052) [W 1928-6100] – holotype.
(same locality) (Lich. Bohem. no. 94, fasc. IV (1929)) [W 1929-11054] – isotype?
Note: This species is certainly very close to *Psorotichia schaereri* and its status as distinct species needs verification.

Psorotichia murorum A.Massal., Framm. lichenogr.: 15 (1855).
(Italy) … Massalongo (Lich. Ital. no. 300) [W 2009-00087] – isolectotype (lectotype designated by Henssen & Büdel 1984: 262).

Psorotichia myriospora Zahlbr., Ann. Mycol. 1: 355 (1903).
(Croatia) Hungaria, ad saxa calcarea prope Fiume, Schuler (Krypt. exs. Vindob. no. 1036) [W 1905-01302, WU 5164] – topotypes.
Current name: *Lichinella myriospora* (Zahlbr.) P.Moreno & Egea ex M.Schultz (referred to *Gonohymenia* by other authors).
Note: The material distributed as no. 1036 in Krypt. exs. Vindob. is often considered to be topotype material. However, no "holotype" was found at W and one wonders whether the exsiccate material extent in W might actually be the material that Zahlbruckner based his diagnosis on.

Psorotichia numidella var. ***flageyana*** J.Steiner, Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Cl. 107, Abt. 1: 109, 110 (1898).
(Greece) auf Kalk von Makriouni, Nider; WU?
Note: The type has not yet been traced but is most likely preserved in WU. Possibly identical with *Psorotichia incrustans* (see there).

Psorotichia pelodes Körb. ex B.Stein, Jahresber. Schles. Ges. Vaterl. Cult. 50: 173 (1873).
(Poland) Obernigk bei Breslau, auf Lehmboden des Eisenbahndammen gegen Sellendorf, Okt. 1872, Stein [W 2009-00091] – isolectotype (lectotype designated by Ellis 1981: 132; as "holotype").

(Poland) … (KÖRBER, Lich. sel. Germ. no. 415) [W 1915-11997, WU] – isolectotypes?
(Poland) Obernigk bei Breslau, Körber (ex Herb. Körber) [W 1915-12002] – isolectotype?
(Poland) Obernigk b. Vratislaviam, Körber [WU] – isolectotype?
Current name: *Lemmopsis pelodes* (KÖRB. ex B.STEIN) L.T.ELLIS.

Psorotichia recondita ARNOLD, Verh. K. K. Zool.-Bot. Ges. Wien 36: 71 (1886).
(Italy, South Tirol) … Arnold (Lich. exs. no. 903) [W 1900-09625, W 19??-19413 (unreadable)] – isotype.
Note: Authorship is often attributed to FORSSELL (1885: 75) who, however, did not provide a diagnosis and solely cited Arnold's exsiccate no. 903 wherein the name was introduced as a *nomen nudum*. The first valid description was given by ARNOLD (1886: 71). The species is most certainly identical with *Psorotichia montinii* (A.MASSAL.) FORSSELL.

Psorotichia rehmica A.MASSAL., Misc. lich. nov.: 23 [53] (1856).
(Germany, Bavaria) ad saxa arenacea prope Dietenhofen in Franconia, Rehm (ANZI, Lich. rar. Veneti ex Herb. Massal. no. 16) [W 2009-00139] – type.
Current name: *Porocyphus rehmicus* (A.MASSAL.) ZAHLBR.

Psorotichia riparia ARNOLD, Flora 42: 145 (1859).
(Germany, Bavaria) Kalkfelsen des Donauufers bei Kelheim, 1858, Arnold [W 1889-313730] – type.
(Germany, Bavaria) an Kalkfelsen und Blöcken längs des Donauufers zwischen Kelheim und Weltenburg, August 1858, Arnold (Lich. exs. no. 33) [W 1900-09626] – type.
(Germany) an Kalkfelsen des Donauufers zwischen Kelheim und Weltenburg, 1858, Arnold (Lich. exs. no. 832) [WU 887] – type.
(Germany) Kalkfelsen am Donauufer zwischen Kelheim und Weltenburg, 1858, Arnold (Lich. exs. no. 834c) [WU 887] – type.
Current name: *Porocyphus rehmicus* (A.MASSAL.) ZAHLBR.

Psorotichia sinensis ZAHLBR. in HANDEL-MAZZETTI, Symb. sin. 3: 73 (1930).
China, … Handel-Mazzetti (Iter Sin. 1914-1918 no. 1772) [W 1926-00200] – lectotype, [WU] – isolectotype.
Note: This is a species of *Lecidea* s.l. (Lecideaceae).

Psorotichia squamulosa ZAHLBR., Beih. Bot. Centralbl. 13: 158 (1902).
(USA, California) … Hasse [W 1903-07062] – holotype.
Current name: *Gloeoheppia squamulosa* (ZAHLBR.) M.SCHULTZ.

Psorotichia tirolensis ZAHLBR., Cat. Lich. Univ. 2: 798. 1924.
Note: same type and substitute name of *Psorotichia arnoldii* HEUFFL.; see there.

Psorotichia tongletii DE LESD., Bull. Soc. Bot. France 56: 174 (1909).
(Belgium) Belgien, ad rupes calcareas, Pond de Seffe (Dinant), 1908, Tonglet [W 1912-04589] – type.
Note: According to DIEDERICH & SÉRUSIAUX (2000: 151) this is a poorly known, uncertain species. The present materialis scarce and partly covered with glue. It perhaps belongs to *Psorotichia frustulosa*.

Pterygiopsis canariensis HENSSEN, Lich. cyan. fungi sax. exs., fasc. 2: 8 (1990).
(Spain, Canary Isl.) Kanarische Inseln, Fuerteventura, bei Degolla de las Granadillas; auf etwa 80° geneigter, S exponierter Felswand in ca. 1 m breitem und 2 m langem

Sickerwasserstreifen, 1988, Henssen 32050 (Lich. cyan. fungi sax. exs. no. 42b) [W 1991-03900] – paratype.

Pterygiopsis mutabilis M.Schultz, Bryologist 109: 74 (2006).
Mexico, Baja California Sur, Sierra la Giganta, dirt road to Agua Verde, Rancho Viejo ca. 7 km SE of rte. 1, Sonoran Desert scrub, N-facing rocky slope, on SE-exposed rock faces, volcanic conglomerate, 300 m, 25°33'43"N, 111°16'03"W, 18 Mar 2003, Schultz 16265a [W 2012-03450] – paratype.

Pterygiopsis pulchra M.Schultz, Biblioth. Lichenol. 88: 556 (2004).
Yemen, Governorate Al Mahra, western extensions of the Dhofar Mtns. near Hawf close to the Omani boarder, close to Jabal Quatam Jehzir, open forest vegetation with *Anogeissus dhofarica* and *Maitenus dhofarensis*, on W-exposed, vertical, shaded limestone boulder, c. 750 m, 16°38.9'N, 52°57.6'E, 14.10.2001, Schultz 14128b [W 2012-03457] – paratype.

Pyrenopsis anemoides Samp., Bol. Soc. Brot., ser. 2, 2: 165 (1924); Plate 7, Fig. 37.
(Portugal) Póvoa de Lanhoso, Terrao, 10-1920, Sampaio (Lich. Portug., fasc. I, Marco de 1923, no. 41) [W 1915-01713] – type.

Pyrenopsis caesiella Th.Fr., Bot. Not.: 58 (1866).
(Norway) Dovre, Th.M. Fries [W 1920-01277] – isotype.
Current name: *Metamelanea caesiella* (Th.Fr.) Henssen.

Pyrenopsis concordatula Nyl., Flora 58: 440 (1875); Plate 7, Fig. 34.
(Finland, Korpilahti, Lang [= Vainio]) ula Nyl. [W 2010-00408] – isotype.
Current name: *Pterygiopsis concordatula* (Nyl.) P.M.Jørg.
Note: The label misses locality information, but the species name was written by the describing author, W. Nylander, and the phrase "specim. origin.!" added later by A. Zahlbruckner.

Pyrenopsis corallina Willey in Tuck., Syn. North Amer. Lich. 1: 137 (1882).
(USA) New Bedford, Massachusetts, Willey [W 2009-00146] – syntype.
Note: This species probably belongs to *Porocyphus rehmicus* (A.Massal.) Zahlbr.

Pyrenopsis fuscatula Nyl., Syn. meth. lich. 1: 97 (1858).
(France) Cherbourg à Arville hague ..., Le Jolis 557 [WU 887] – type.

Pyrenopsis lemovicensis Nyl., Flora 63: 387 (1880).
(France) Limoges (Hte Vienne), rochers au bord d'un riuveau, Lamy [W 1921-00716] – type.
Note: This species most probably belongs to *Pyrenopsis subareolata* Nyl., an observation already noted by v. Keissler on the the packet and who referred it to *P. rhodosticta* (sensu auct. medieur. non (Taylor) Müll.Arg.).

Pyrenopsis leprosa Anzi, Atti Soc. Ital. Sci. Nat. 11 (= Analecta lich. rar.): 158 (1868).
(Italy) ad rupes calcareo-marmosa declives, et fere verticales, insolatas, at aqua pluviali irrigatas, prope Novum-Comum (S. Croce), Anzi (Lich. Langob. no. 526) [W] – type.
Current name: *Psorotichia leprosa* (Anzi) Forssell.

Pyrenopsis palmana J.Steiner, Oesterr. Bot. Z. 54: 333 (1904).
(Spain, Canary Isl.) La Palma, in montibus supra Santa Cruz, 26.4.1901, Bornmüller (Pl. exs. Canar. no. 3305) [WU] – syntype.

(same locality) Bornmüller (Pl. exs. Canar. 3451) [W 1931-00208] – syntype.
(same locality) Bornmüller (Pl. exs. Canar. 3289) [W 1906-12984] – paratype.
Note: STEINER (1904) already pointed in his diagnosis to the similarity of this species with *Pyrenopsis subareolata* NYL., and SCHULTZ & VAN DEN BOOM (2007) treated it as a synonym of the latter.

Pyrenopsis paraguayana MÜLL.ARG., Flora 70: 285 (1887).
(Paraguay) Cerro de Gayuaron, Mai 1879, Balansa (Pl. Paraguay, 1878–84) [WU 887] – orig. coll.
Note: Whereas the type material in the herbarium of Müller Argoviensis in G clearly belongs to *Pyrenopsis*, the present material in WU is neither a *Pyrenopsis* nor does it belong to Lichinaceae] – perhaps to Pannariacae?

Pyrenopsis pleiobola NYL., Flora 56: 17 (1873).
(Russia) Russland, Onega, Norrlin [W 2010-00406] – isotype.

Pyrenopsis portoricensis ZAHLBR., Mycologia 22: 72 (1930); Plate 7, Fig. 39.
(USA, Puerto Rico) Mayaguez, exposed hill, rocks, 24.12.1915, Fink 1278 [W 1923-04268] – syntype.
(USA, Puerto Rico) Aibonito, exposed plain at 2200 ft., rock, 5.1.1916, Fink 1950 [WU 2968] – syntype.
Note: Henssen predesignated a lectotype from W 1923-04268 since the material contains two different species of *Pyrenopsis*. This is confirmed here, but the lectotyfication is not formalized here since additional elements of the original collection in MICH still need to be studied in detail.

Pyrenopsis reducta TH.FR., Bot. Not.: 57 (1866); Plate 8, Fig. 40.
(Norway) Finmarkia, Th.M. Fries [W 1920-1282] – isotype.
Note: Strangely, v. Keissler annotated this material as *Pyrenopsis pulvinata* (= *Euopsis p.*), but *P. reducta* has certainly no affinities with *Euopsis*.

Pyrenopsis robustula MÜLL.ARG., Verh. K. K. Zool.-Bot. Ges. Wien 43: 295 (1893).
(Mozambique) Zambesigebiet, Berg Kandulirè bei Boruma, Menyharth [WU] – holotype [W 1931-00202] – isotype.
Note: MÜLLER (1893) cited "hb. Univ. Vind. 1893, Menyhardt" and therefore the WU specimen is considered to be the holotype. A. Henssen predesignated the WU specimens as lecto-, and the W specimens as isolectotype.

Pyrenopsis sanguinea ANZI, Atti Soc. Ital. Sci. Nat. 9 (= Neosymb. lich. rar.): 241 (1866); Plate 8, Fig. 41.
(Italy) ad rupes serpentinosas apricas supra Bormium (Campello), 1500 m. supra mare, raro fructifera, Anzi (Lich. langob. no. 474) [W 2009-00156, WU] – types.
Note: This is a distinct species not to be synonymized under *P. subareolata* NYL. nor under *P. rhodosticta* (TAYLOR) MÜLL.ARG. (syn. *Cryptothele r.* (TAYLOR) HENSSEN).

Pyrenopsis sojakii VĚZDA, Folia Geobot. Phytotax. 14: 205 (1979).
(Iran) Persia australis, Dandar Lengeh, in colle ad sept.-orientem versus ab urbe Bandar Lengeh, 25.IV.1977, Soják (VĚZDA, Lich. sel. exs. no. 1654); W?
Current name: *Phloeopeccania pulvinulina* J.STEINER (see HENSSEN & JØRGENSEN 1990: 143)
Note: Only an empty envelope of an isotype was found.

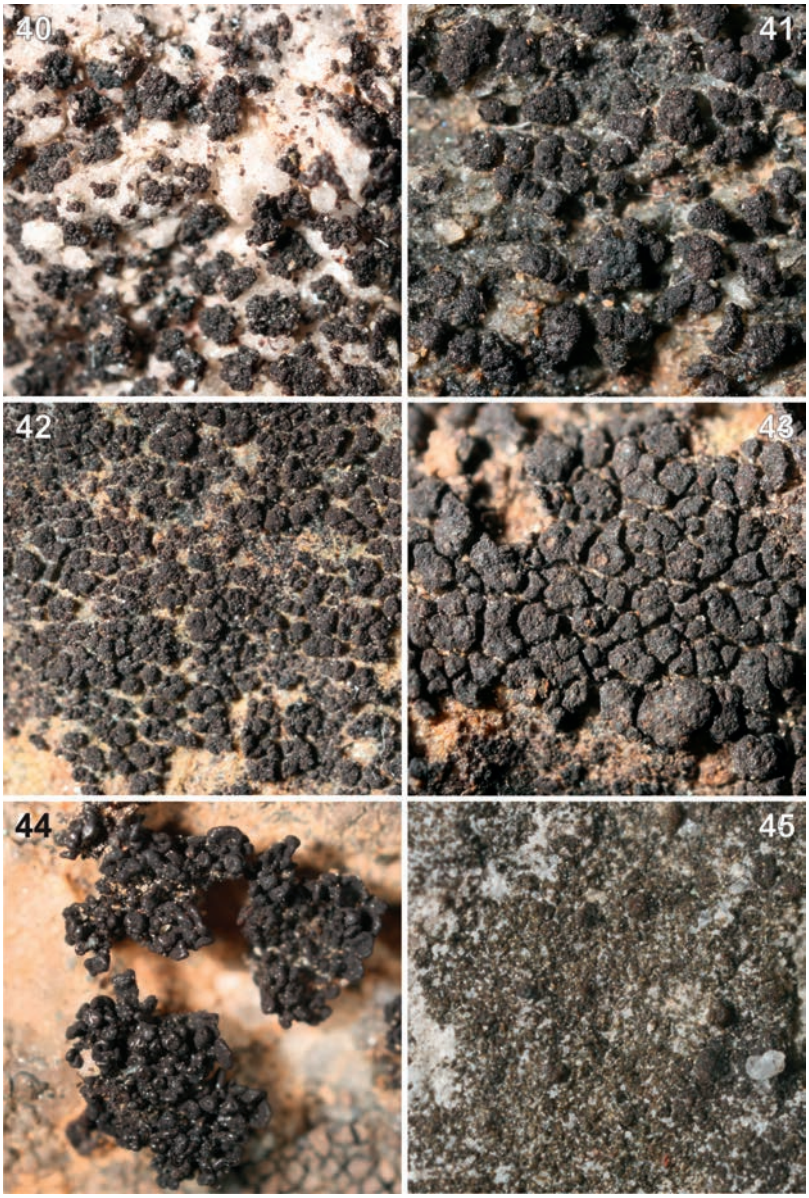

Plate 8: Fig. 40: *Pyrenopsis reducta* TH.FR. Isotype. Thallus composed of minute, irregularly shaped granules, apotheica very small. Section 4.3 mm. Fig. 41: *Pyrenopsis sanguinea* ANZI. Isotype. Thallus irregularly areolate with ± dispersed, convex areoles and apothecia with very narrow discs. Section 4.1 mm. Fig. 42: *Pyrenopsis sphaerospora* VAIN. Isotype. Thallus small areolate with inconspicuous fruit bodies. Section 3.9 mm. Fig. 43: *Pyrenopsis subareolata* NYL. Isolectotype. Thallus regularly areolate-crustose, apothecia remaining immersed with narrow discs. Section 4.7 mm. Fig. 44: *Synalissa austroafricana* ZAHLBR. Holotype. Thallus squamulose-lobate, peltate, marginal lobules widened towards the apex, apothecia small, on terminal branchlets. Section 4.3 mm. Fig. 45: *Thelochroa montinii* A.MASSAL. (= *Psorotichia m.* (A.MASSAL.) FORSSELL). Isolectotype. Thallus very thin, apothecia minute, inconspicuous. Section 2.3 mm.

Pyrenopsis sphaerospora VAIN., Termeszetr. Füzetek. 22: 312 (1899); Plate 8, Fig. 42.
(Ucraine) Krim, Jalta, auf Sandstein bei der Villa Glagoljeff, Lojka (Iter. Cauc. no. 70) [W 2009-00155] – type.

Pyrenopsis sphinctotricha VAIN. in H.MAGN., Bot. Not.: 386 (1924).
Sweden, Bohuslän, Marstrand, Koön, on irrigated sunny rocks, 28.8.1922, Magnusson (Lich. sel. scand. exs. no. 249) [W 1938-1549] – type.
Current name: *Pyrenopsis haemaleella* (NYL.) BLOMB. & FORSSELL.

Pyrenopsis subareolata NYL., Not. Sällsk. Fauna Fl. Fenn. Förhandl. 5 (n. ser. 2) (= Lich. scand.): 27 (1861); Plate 8, Fig. 43.
France, Vire, 1861, Pelvet [W 1982-04578, W 2009-00154, WU 887] – isotypes.

Pyrenopsis subareolata var. ***impolita*** TH.FR., Bot. Not.: 58 (1866) Plate 7, Fig. 38.
(Sweden) prope prechieno (?) pastoris in paraecia Gothlunda Nerice, 1866, Blomberg [W 2010-00405] – isotype.
Current name: *Pyrenopsis impolita* (TH.FR.) FORSSELL.

Pyrenopsis triptococca NYL., Flora 64: 2 (1881).
(Portugal) Lusitania, Capsella Boa Nova, Leca, Avut 1880, Newton 322 [W 2009-00152] – isotype.

Rechingeria cribellifera var. ***kastrensis*** SERVÍT, Ann. Naturhist. Mus. Wien 46: 80, figs. 1. 1932/32.
(Greece) Ins. Lemnos, Kastro, in rup. trachyt., 22.-28.V.1927, Rechinger fil. (Iter Graec. 1927, no. 1641) [W 1932-03387] – holotype.
Current name: *Lichinella cribellifera* (NYL.) P.MORENO & EGEA (MORENO & EGEA 1992b; not accepted by other authors and referred to *Gonohymenia* or *Thallinocarpon*).

Stenhammara lugubris A.MASSAL., Misc. lichenol.: 40 (1856).
(Germany, Bavaria) ad rupes calcareas prope Eichstaedt [Eichstätt] in Franconia superior, Arnold (ANZI, Lich. rar. Veneti ex Herb. Massal. no. 53; as *Aspicilia lugubris*) [W 2009-00094] – type.
(Germany, Bavaria) Franken-Jura, Arnold (Hb. Kremp. 16) [WU] – type?
(Germany, Bavaria) am Grunde hervorstehender Dolomitfelsen am sonnigen Abhange des tiefen Thales bei Eichstätt, April 1858, Arnold (Lich. exs. no. 6) [W 2009-00095, W 2009-00097] – topotype.
(Germany, Bavaria) auf Dolomit bei Eichstadt [Eichstätt] in Bayern, 1862, Arnold (mitg. von Dr. Poetsch) [W 2009-00088] – topotype.
(Germany, Bavaria) Franken-Jura, 1866, Arnold (Hb. Kremp. 13) [WU] – topotype.
Current name: *Psorotichia lugubris* (A.MASSAL.) ARNOLD, but better referred to *Metamelanea*.

Synalissa austroafricana ZAHLBR., Ann. Mycol. 34: 165 (1936); Plate 8, Fig. 44.
(South Africa) Namaqualand, inter Bitterfontein et Garies, v.d. Byl 1175 [W 1934-00497] – holotype.

Synalissa phaeococca TUCK., Gen. lich.: 80 (1872).
(USA) New Bedford, Massachusetts, Willey [W 2009-00158] – syntype.
(USA) New England, Willey [W 2009-00157] – syntype.
Current name: *Pyrenopsis phaeococca* (TUCK.) TUCK.

Synalissa phylliscina TUCK., Gen. lich.: 80 (1872).
(USA) Am. bor., New Bedford, Massachusetts, Willey [W 2010-00519] – isotype.
(USA) New Bedford, 1874, Willey [WU] – topotype.
Current name: *Cryptothele permiscens* (NYL.) TH.FR. (see HENSSEN & JØRGENSEN 1990).

Synalissa picina NYL., Actes Soc. Linn. Bordeaux 21 (= Prodr. Lichenogr. Galliae Algeriae): 265 ("1856" 1857).
(Switzerland?) ad terram nudam et saxa, Schaerer (exs. no. 431; as *Parmelia pulposa* δ *diffracto-areolata* SCHAER.) [WU 887] – orig. coll.
Current name: *Pyrenopsis picina* (NYL.) FORSSELL.
Note: NYLANDER (1857) already found Schaerer's exsiccate material to be inhomogenous ("impurum"). The present material in WU seems to contain a juvenile *Lempholemma*, free-living *Nostoc* cyanobacteria and a *Catatyperium* s.l. – but no *Pyrenopsis*.

Synalissa salevensis MÜLL.ARG., Mém. Soc. Phys. Genève 16 (= Princ. classif. lich.): 421 (1862).
(France) Salève bei Genf, Müller [W 2010-00518] – isolectotype (lectotype designated in SCHULTZ & BÜDEL 2002: 22).
(France) an nassen Felsen auf Kalk am Salève mit Synalissa acharii, Coll. multipart. u. Synechob. laureri, Müller [WU 887] – isolectotype.
Current name: *Paulia salevensis* (MÜLL.ARG.) M.SCHULTZ.

Synalissa violacea GEITL. ad. int., Arch. Protistenk. 80: 386 (1933) & Arch. Protistenk. 88: 162. 1936, nom. inval. (art. 34.1b, ex. 6, provisional name).
(Austria) Austria inferior, Lunz a. See, rupibus calcareis ad exitum lacus inferioris, 600 m, Herrmann (ZAHLBRUCKNER-REDINGER, Lich. rar. exs. 369) [WU 3045] – type?
Current name: *Synalissa ramulosa* (HOFFM. ex BERNH.) FR.

Thelochroa montinii A.MASSAL., Symm. lich. nov.: 86 (1855); Plate 8, Fig. 45.
(Italy) … Massalongo (Lich. Ital. no. 355) [W 2009-00110] – isolectotype (lectotype designated by HENSSEN & BÜDEL 1984: 268).
Current name: *Psorotichia montinii* (A.MASSAL.) FORSSELL.

Thyrea hondoana ZAHLBR., Ann. Mycol. 29: 79 (1931); Plate 4, Fig. 21.
(Japan) Sendai, Prov. Rikusen, Hondo, 30.7.1927, Asahina (Lich. Jap. 557) [W 1929-04175] – holotype.
Current name: *Lichinella hondoana* (ZAHLBR.) P.MORENO & EGEA (see MORENO & EGEA 1992b; not accepted by other authors and referred to *Gonohymenia* or *Thallinocarpon*).

Thyrea myriocarpa ZAHLBR., Mycologia 22: 73 (1930); Plate 5, Fig. 22.
(USA) Puerto Rico, Manoti, open field, rocks, 12.01.1926, Fink 2053 [W 1927-00355] – lectotype (designated by Henssen & Jørgensen 1990: 142).
Current name: *Paulia myriocarpa* (ZAHLBR.) HENSSEN.

Thyrea plectopsora A.MASSAL., Sched. crit. 4: 75 (1856).
(Italy) … Massalongo (Lich. Ital. 110) [W 2009-00101] – isolectotype (lectotype designated by MORENO & EGEA 1992a: 49).

Thyrea schroederi ZAHLBR., Ann. Mycol. 19: 233 (1921); Plate 5, Fig. 23.
(Kenya) Britisch-Ostafrika, Mombassa, an Strandklippen, Schröder 340 [W 1911-03733] – holotype.
Current name: *Paulia schroederi* (ZAHLBR.) HENSSEN

Verrucaria flotowiana Hepp, Flecht. Eur. 1: pl. 11, no. 92 (1853).
(Switzerland) häufig auf Alpenfindling u. Nagelfluhblöcken am Ufer der Sihl bei Zürich, Hepp (Fl. Eur. no. 92) [W (Hepp exs.)] – isolectotype (lectotype designated by Ellis 1981: 136; as "holotype").
Current name: *Pyrenocarpon thelostomum* (Ach. ex J.Harriman) Coppins & Aptroot.

Verrucaria lignyota Wahlenb. in Ach., Methodus: 301 (1803).
(Norway) Ressbottens, Finmarkia, 1802, Wahlenberg [WU] – isolectotype (lectotype designated by Henssen & Jørgensen 1990: 145).
Current name: *Thelignya lignyota* (Wahlenb.) Henssen.

Zahlbrucknerella patagonica Henssen, Lichenologist 9: 41 (1977).
Argentina, Lago Argentino, Calafate, 1973, Henssen & Vobis 24525a (Lich. cyan. fungi sax. exs. no. 30) [W 1991-03881] – isotype.

List of collectors

The following list enumerates the collectors of the type specimens listed above. Life data were compiled from "Collectors Index" (Lanjouw & Stafleu 1954, 1957; Chadhri et al. 1972; Vegter 1976, 1983, 1986, 1988) and Harvard University Herbaria botanist database (http://asaweb.huh.harvard.edu:8080/databases/botanist_index.html) with additions from other sources.

Amable, Bro. (coll. 1925): *Heppia tenayucae*
Anzi, M. (1812–1883): *Psorotichia frustulosa*, *Pyrenopsis leprosa*, *sanguinea*
Arnold, F.C.G. (1828–1901): *Arnoldia botryosa, cyathodes, Corinophorus coralloides, Omphalaria decipiens, Pannaria schaereri* var. *arenaria, schaereri* var. *urceolata, Physma franconicum, Porocyphus globulosus, Psorotichia lugubris* f. *atrata, lugubris* var. *pannosa, recondita, riparia, Stenhammara lugubris*
Asahina, Y. (1881–1975): *Ephebe japonica, Phylliscum japonicum, Thyrea hondoana*
Baglietto, F. (1826–1916): *Omphalaria camaromorpha, notarisii*
Balansa, B. (1825–1891): *Pyrenopsis paraguayana*
Baumgartner, J. (1870–1955): *Anema moedlingensis, Collemopsidium adriaticum*
Bergström, S. (coll. 1938): *Lempholemma dispansum*
Blomberg, O.G. (1838–1901): *Pyrenopsis subareolata* var. *impolita*
Blumer, J.C. (1872–1948): *Heppia placodizans*
Bornmüller, J.F.N. (1862–1948): *Pyrenopsis palmana*
Brunnthaler, J. (1871–1914): *Psorotichia cataractae*
Bye, R.A. (*1947): *Paulia caespitosa*
Byl, P.A. v.d. (1888–1939): *Synalissa austroafricana*
Cranwell, L.M. (1907–2000): *Heppia spectabilis*
Crozals, A. de (1861–1932): *Omphalaria nodulosa* var. *sphaerospora*
Demangeon, J.B. (1764–1844): *Collema demangeonii*
Eggerth, C. jun. (1861–1888): *Psorotichia arenaticola*
Ehrhart, J.F. (1742–1795): *Lichen intricatus*
Faurie, U.J. (1847–1915): *Heppia pulvinata*
Fink, B. (1861–1927): *Leprocollema finkii, Omphalaria minnesotensis, Psorotichia calcigena, Pyrenopsis portoricensis, Thyrea myriocarpa*
Fiorini–Mazzanti, E. (1799–1879): *Lichina elisabethae*

Flagey, C. (1837–1898): *Lichinella stipatula* f. *calcarea, Omphalaria pulvinata* var. *teretiuscula, Psorotichia incrustans*
Flotow, J.C.G.U.G.G.A.E.F. v. (1778–1856): *Lempholemma compactum*
Fries, Th.M. (1832–1913): *Ephebe spinulosa, Pyrenopsis caesiella, reducta*
Ginzberger, A. (1873–1940): *Ginzbergerella rupestrina, Lichinella stipatula* f. *silicea*
Goebel, K.I.E. v. (1855–1932): *Jenmania goebelii*
Handel-Mazzetti, H.R.E. v. (1882–1940): *Gonohymenia mesopotamica, Leptopterygium gracilescens, Physma intricatum, Psorotichia sinensis*
Hasse, H.E. (1836–1915): *Collemopsis segregata, Heppia conchiloba, hassei, terrena, zahlbruckneri, Psorotichia squamulosa*
Henssen, A. (1925–2011): *Anema tumidulum, Gonohymenia lusitanica, undulata, Lichina macrospora, Lichinella americana, Porocyphus kalbarrensis, Pterygiopsis canariensis, Zahlbrucknerella patagonica*
Hepp, J.A.P. (1797–1867): *Omphalaria pulvinata* var. *schleicheri, Verrucaria flotowiana*
Herrmann, K. (?, coll. c. 1930): *Synalissa violacea*
Jahns, H.M. (*1942): *Anema tumidulum*
Kerner v. Marilaun, A.J. (1831–1898): *Ephebe kerneri*
Kerner v. Marilaun, F. (1866–1944): *Gonohymenia algerica*, *Heppia subrosulata*
Kingman, C.C. (1817–1885): *Heppia zahlbruckneri*
Körber, G.W. (1817–1885): *Collema coccodes, Psorotichia pelodes*
Lamy de la Chapelle, P.M.É. (1804–1886): *Pyrenopsis lemovicensis*
Latzel, A. (1858–1946): *Heppia adriatica*
Le Jolis, A.F. (1823–1904): *Pyrenopsis fuscatula*
Lojka, H. (1844–1887): *Collema vamberyi, Collemopsis frustulenta, obpallescens, taurica, vermiculata, Heppia tenebrata, Pyrenopsis sphaerospora*
Magnusson, A.H. (1885–1964): *Lempholemma dispansum, silicicola, Pyrenopsis sphinctotricha*
Marc, F. (1862–1912): *Collemopsis lygoplaca*
Massalongo, A.B. (1824–1860): *Enchylium affine, Omphalaria veronensis, Pannaria schaereri, Psorotichia murorum, Thelochroa montinii, Thyrea plectopsora*
Menyhárth, L. (1849–1899): *Pyrenopsis robustula*
Molendo, L. (1833–1902): *Psorotichia arnoldii, tirolensis*
Monguillon, E.L.H. (1865–1940): *Heppia monguillonii*
Mougeot, J.B. (1776–1858): *Collema demangeonii*
Müller Argoviensis, J. (1828–1896): *Physma muelleri*, *Synalissa salevensis*
Newton, I. (1840–1906): *Pyrenopsis triptococca*
Nider, C. (coll. 1895–1896): *Psorotichia numidella* var. *flageyana*
Norrlin, J.P. (1842–1917): *Collemopsis numidella, Omphalaria tiruncula, Phylliscum endocarpoides* var. *compositum, Pyrenopsis pleiobola*
Nylander, W. (1822–1899): *Collemopsis lygoplaca*
Ogata, M. (1883–1944): *Phylliscum japonicum*
Osorio, H.S. (*1928): *Jenmania osorioi*
Pelvet, F.A. (1801–1882): *Pyrenopsis subareolata*
Rechinger fil., K.H. (1906–1998): *Rechingeria cribellifera* var. *kastrensis*
Rehm, H. (1828–1916): *Physma terricolum, Psorotichia rehmica*
Sampaio, G.A. da Silva Ferreira (1865–1937): *Omphalaria granitica*, *Pyrenopsis anemoides*

Sántha, L. (1886–1954): *Heppia hungarica*
Schaerer, L.E. (1785–1853): *Parmelia stygia* var. *pulvinata, Synalissa picina*
Schrader, H.A. (1767–1836): *Lichen polyanthes*
Schröder, B. (1867–1928): *Thyrea schroederi*
Schuler, J.A.E. (1853–1946): *Pseudoheppia schuleri, Psorotichia myriospora*
Schultz, M. (*1972): *Heppia arenacea, Lempholemma polycarpum, socotranum, Lichinella granulosa, Phloeopeccania anemoides, Pseudopaulia tessellata, Pterygiopsis mutabilis, pulchra*
Simony, O. (1852–1915): *Phloeopeccania pulvinulina*
Skottsberg, C.J.F. (1880–1963): *Lemmopsis polychidioides*
Sojak, J. (*1936): *Pyrenopsis sojakii*
Sommerfelt, S.C. (1794–1838): *Collema haemaleum* var. *haematops, Endocarpon phylliscum, Phylliscum endocarpoides*
Stapf, O. (1857–1933): *Psorotichia lugubris* var. *buschirensis*
Stein, B. (1847–1899): *Psorotichia pelodes*
Steiner, M. (1904–1988): *Peccania crispa*
Suza, J. (1890–1951): *Psorotichia moravica*
Thaxter, R. (1858–1932): *Heppia trinitatis*
Tonglet, A. (1864–1936): *Omphalaria pulvinata* f. *canaliculata, Psorotichia tongletii*
Vainio, E.A. (1853–1929): *Ephebe pubescens* var. *complicata, Lichinodium sirosiphoideum, Pyrenopsis concordatula*
Vězda, A. (1920–2008): *Forssellia umbilicata*
Vobis, G. (*1946): *Zahlbrucknerella patagonica*
Wahlenberg, G. (1780–1851): *Verrucaria lignyota*
Weber, W.A. (*1918): *Paulia caespitosa*
Wessels, D.C.J. (*1950): *Lichina macrospora*
Willey, H. (1824–1907): *Ephebe americana, Lichina confinis* var. *willeyi, Pyrenopsis corallina, Synalissa phaeococca, phylliscina*
Wirth, V. (*1943): *Forssellia umbilicata*
Wright, C. (1811–1885): *Omphalaria deusta, leptophylla, wrightii*

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