

## Typification of names of selected taxa described by Acharius and now placed in *Caloplaca*

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Typification of names of lichen-forming fungi referring to taxa currently placed in the genus *Caloplaca* was undertaken by examination of material from the Acharius herbaria (BM-ACH, H-ACH, UPS-ACH). Lectotypes are selected for *Lecanora inalpina*, *Lecanora teicholyta*, *Lecidea aurantiaca* var. *rubescens*, *Lecidea caesiorufa*, *Lecidea turneriana*, *Lichen erythrellus* and *Parmelia microthelia* and the holotype identified for *Lecidea viridirufa*. *Lecidea caesiorufa* var. *festiva* and *Lichen craspedius* are illegitimate names and both are automatically typified by the type of *Lichen arenarius*.

**KEYWORDS:** Acharius, *Caloplaca*, illegitimate names, lectotype selection, lichen-forming fungi, nomenclature, typification

### INTRODUCTION

The genus *Caloplaca* Th. Fr. (*Teloschistaceae*), one of the most species-rich genera of lichen-forming fungi, may comprise as many as 1,000 species (Arup, 2006). Among the innumerable names for particular *Caloplaca* species (cf. Zahlbruckner, 1931; Lamb, 1960), many old names still lack typification. In the Acharius herbaria (BM-ACH, H-ACH, UPS-ACH), we have found unidentified specimens that represent original material of some names now placed in *Caloplaca*.

Only a few Acharius names now included in *Caloplaca* have been typified: *Lecanora alpestris* Ach. (1810) (= *C. variabilis* (Pers.) Müll. Arg.) by Wunder (1974), *L. calloplisma* Ach. (1810) (= *C. aurantia* (Pers.) Hellb.) by Wetmore & Kärnefelt (1998), *L. cinnabarina* Ach. (1810) (≡ *C. cinnabarina* (Ach.) Zahlbr.) by Wetmore & Kärnefelt (1999), *L. cirrochroa* Ach. (1814) (≡ *C. cirrochroa* (Ach.) Th. Fr.) by Nordin (1972: 123), *Parmelia murorum* var. *steropea* Ach. (‘γ’) (1803) (= *C. saxicola* (Hoffm.) Nordin) by Nordin (1972: 88–89), *Lecanora rubelliana* Ach. (1810) (≡ *C. rubelliana* (Ach.) Lojka) by Wetmore & Kärnefelt (1999), and *Lepraria bassiae* Willd. ex Ach. (1803) (≡ *C. bassiae* (Ach.) Zahlbr.) by Wetmore (2004). Typification of *Parmelia cerina* var. *pyracea* Ach. (‘ζ’) (1803) (≡ *C. pyracea* (Ach.) Th. Fr. (1867)) is currently in preparation (U. Arup, pers. comm.). We have been seeking specialists to typify the remaining names.

### MATERIALS

Most of the specimens from Acharius’s original herbarium are currently deposited in the herbaria of BM

(BM-ACH), H (H-ACH) and UPS (UPS-ACH). Apart from these, some specimens are scattered among other European herbaria (C, L, LAU, LD, M, MB, PC, S) (Tibell, 1987). We have examined the samples referring to *Caloplaca* from the main three collections. Information on the Acharius herbaria is taken mainly from Galloway (1988) and Tibell (1987).

BM-ACH, containing 893 numbers, represents material donated by Acharius to the Linnean Society of London in 1807 but probably not arriving there earlier than 1809. This collection contains material of taxa described in *Methodus* (Acharius, 1803) and *Lichenographia Universalis* (Acharius, 1810). The advantage of this collection is that its samples are well-preserved, since it was largely neglected until 1961. The drawback of the collection is that no information about locality or collector is attached to the specimens.

H-ACH, the main Acharius collection, contains 2,017 numbered sheets, frequently with more than one specimen on a sheet sometimes representing more than one taxon. The material on the sheets is often heterogeneous, but the origin and collector of the separate pieces are usually provided. When received in 1834, this collection had been arranged according to *Synopsis methodica lichenum* (Acharius, 1814) by its vendor G.J. Billberg. It is probable that Acharius renamed and rearranged specimens during his lifetime according to his latest concepts (see e.g., Weber & Mohr, 1804: 76). This may be one explanation why the types of some names described in earlier publications by Acharius have not been found.

UPS-ACH, containing 1,270 sheets, previously included in the general herbarium, was separated as a unit by Dr R. Santesson and Dr R. Moberg. The main part of this collection consists of the herbarium of A.J. Agrelius

(1788–1833), son-in-law of Acharius. Other material in UPS-ACH originates from the herbaria of G. Wahlenberg, E. Fries and others. The status of the UPS-ACH material is often problematic since few labels were written by Acharius himself and numerous collections lack information on the locality and collector.

Images of the Acharius specimens studied in this paper are for the most part presented at the web site: <http://botanika.bf.jcu.cz/lichenology/index.php?pg=5>. The currently accepted name for the taxon to which each type refers is given in bold, parenthetically where the accepted name is not homotypic.

## RESULTS AND DISCUSSION

1) *Lecanora inalpina* Ach., Lichenogr. Universalis: 388. 1810 ≡ *Caloplaca aurantiaca* var. *inalpina* (Ach.) Servit in Zprávy Kommiss. Přír. Prozk. Moravy 6: 71. 1910 ≡ *Caloplaca flavovirescens* var. *inalpina* (Ach.) Zahlbr., Catal. Lich. Univ. 7: 136. 1931. (= *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth., Fl. Tirol: 180. 1902: *Lichen flavovirescens* Wulfen in Schriften Ges. Naturf. Freunde Berlin 8: 122. 1787) – Lectotype (designated here): Helvetia [Switzerland], Schleicher 425 (H-ACH 1046).

Three samples of *Lecanora inalpina* have been investigated (BM-ACH 494, H-ACH 1046, UPS-ACH 666). The sample in H-ACH labelled “Helvetiae, Schleicher” corresponds with the locality and collector in the protologue; it consists of a small piece of lichen with a yellowish, white-pruinose thallus and few dark red, convex apothecia, which are mostly parasitized by *Muellerella lichenicola* (Sommerf. : Fr.) D. Hawksw. Although the sample is small and in bad condition, its macroscopic characters fit well with those of *Caloplaca flavovirescens* Fries (1871: 178); more recently, some, e.g., Nimis & Martellos (2003), have included *Lecanora inalpina* as a synonym of *C. flavovirescens*. The samples BM-ACH 494 and UPS-ACH 666 may represent duplicates of H-ACH 1046. These lichens grow on the same kind of substrate, look morphologically identical and are also frequently parasitized by *Muellerella lichenicola*.

2) *Lecanora teicholyta* Ach., Lichenogr. Universalis: 425. 1810 ≡ *Caloplaca teicholyta* (Ach.) J. Steiner in Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 104: 388. 1895 – Lectotype (designated here): Gallia [France], Dufour (H-ACH 1229).

The sample of *Lecanora teicholyta* in H-ACH consists of well-preserved, fertile pieces of a lichen which clearly correspond with the recent concept of *Caloplaca teicholyta*. Its locality description in the protologue has only “Gallia”. The sample in UPS-ACH (no. 681) also

represents *C. teicholyta*; its locality description is also restricted to “Gallia” and this specimen may represent a duplicate of H-ACH 1229).

3) *Lecidea aurantiaca* var. *rubescens* Ach., Methodus: 69. 1803 (‘β’) ≡ *Lecanora erythrella* var. *rubescens* (Ach.) Ach., Lichenogr. Universalis: 402. 1810 ≡ *Caloplaca erythrella* var. *rubescens* (Ach.) H. Olivier, Exposé Syst. Lich. 1: 239. 1897 (= *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth., Fl. Tirol: 180. 1902: *Lichen flavovirescens* Wulfen in Schriften Ges. Naturf. Freunde Berlin 8: 122. 1787) – Lectotype (designated here): Suecia [Sweden] (H-ACH 1241C).

The H-ACH 1241A–C collection of *Lecanora erythrella* var. *rubescens* is composed of three lichen pieces, all of which are identified as *Caloplaca flavovirescens* (see also Fries 1871: 178). Samples 1241A and B come from “Helvetia” and 1241C from “Suecia”. Cl. Roux (in 1982) determined samples A and C as *C. flavovirescens*, but he did not select the lectotype. We have selected sample 1241C as the lectotype, since Acharius (1810) mentioned this taxon only from “saxis Sueciae”.

4) *Lecidea caesiorufa* Ach., Methodus: 71. 1803 ≡ *Caloplaca caesiorufa* (Ach.) Flagey in Revue Mycol. 17: 104. 1895. (= *Caloplaca crenularia* (With.) J.R. Laundon in Lichenologist 16: 231. 1984: *Lichen crenularius* With., Arr. Brit. Pl. 4: 22, 405. 1796) – Lectotype (designated here): Suecia [Sweden] (H-ACH 337B).

Material present in Acharius’s herbaria under this name is unusually rich (BM-ACH 150A–C, H-ACH 337A–J, 338A–G, UPS-ACH 221A–G) but heterogeneous. For example, the collection in BM-ACH consists of *Caloplaca crenularia* (150A), *C. atroflava* (Turner) Mong. (150B) and *C. cf. scotoplaca* (Nyl.) H. Magn. (150C).

In H-ACH, samples 337A and B, from “Suecia” represent *Caloplaca crenularia*; 337C, “Anglia, Harriman, *L. crenularius* With.” represents *C. ceracea* J.R. Laundon, and 337D from “Suecia” is *C. scotoplaca*; Magnusson made the note “orig.?” under this specimen, but he did not publish the typification (Magnusson, 1944: 55–56). Specimens 337E from “Suecia” and G from “Helvetia” are missing. 337F from “Suecia” is probably conspecific with *C. scotoplaca*, 337H is an indeterminable small piece of lichen from “Helvetia”, and samples 337I and J from “Helvetia” represent *C. crenularia*.

Samples H-ACH 338A and B representing *Caloplaca arenaria* (Pers.) Müll. Arg. are labelled “β. *discoidalis* Suecia”, a herbarium name. Sample 338C is labelled “δ. *festiva* Gallia, d’Angers Persoon misit *Patellaria lamprocheila* Decandolle” and probably represents a part of the original material of *Patellaria lamprocheila* DC. (Lamarck & Candolle, 1805: 557–558), as suggested by

Magnusson (1944: 47), and also corresponds with the recent concept of *Caloplaca arenaria*. Sample 338D is labelled “Σ. *arenaria* Germania, *L. arenarius* Pers.”; it was probably sent by Persoon to Acharius and thus may represent Persoon’s concept of *Lichen arenarius* Pers. (Persoon, 1794: 27); however, the sample clearly belongs to *C. albolutescens* (Nyl.) H. Olivier. Sample 338E, from “Helvetia”, represents *C. arenaria*. Samples 338F and G are labelled “γ. *marginalis* [herbarium name] Suecia” and belong to *C. scotoplaca* (Nyl.) H. Magn. and *C. viridirufa* (Ach.) Zahlbr., respectively.

The collection in UPS-ACH contains *Caloplaca ceracea* (221F), *C. crenularia* (221A–C, E, G), and *C. aff. concilians* (Nyl.) H. Olivier (201D). The material is labelled “Suecia in Omberg”; however, it is not clear, which of the samples actually come from this locality.

We have selected the well-preserved specimen H-ACH 337B (*C. crenularia*) as the lectotype with respect to nomenclatural stability and to the original description, which runs as follows: [thallus effuse, crustose-rimose, ash-grey, apothecia deep red, finally convex, margin concolours with disc, flexuose] (Acharius 1803: 71). No locality is mentioned in the protologue. Deep red apothecia and a flexuose margin correspond with the concept of *Caloplaca crenularia* (bas.: *Lichen crenularius* With. 1796), which is an older name and has priority; it was also listed as a synonym of *Lecidea caesiorufa* in Acharius (1810: 203; 1814: 44).

Magnusson (1944: 55) pointed out that the name *C. caesiorufa* (Ach.) Flagey, which Zahlbruckner (1931: 80) accepted, had been applied to so many different species that it was a nomen confusum, and discussed the uncertainties surrounding the names *Lichen caesiorufus* Schrader and *L. caesiorufus* Ach. Since then, *C. caesiorufa* has been more or less abandoned.

It is true that *Lichen caesiorufus* Ach. (1799) is an illegitimate name (Art. 53.1 of ICBN) because it is a later homonym of *L. caesiorufus* Schrader (1794: 80). However, *Lecidea caesiorufa* Ach. (1803) is an independent and legitimate name because Acharius then definitely excluded *Lichen caesiorufus* Schrader and synonymised it with *Parmelia craspedia*, which is an illegitimate name (see under *Lichen craspedius*).

- 5) *Lecidea caesio-rufa* var. *festiva* Ach., Syn. Meth. Lich.: 44. 1814 (β), nom. illeg. ≡ *Caloplaca festiva* Zwackh in Flora 47: 85. 1864 ≡ *Lichen arenarius* Pers. in Ann. Bot. (Usteri) 7: 27. 1794 ≡ *Caloplaca arenaria* (Pers.) Müll. Arg. in Mém. Soc. Phys. Hist. Nat. Genève 16: 387. 1862.

*Caloplaca festiva* “auct.” or “(Ach.) Zwackh” has commonly been used for the species *C. crenularia* (With.) J.R. Laundon (cf. Laundon, 1984, 1992a; Nimis & Martellos, 2003; Santesson & al., 2004). However, Acharius

(1814: 44) cited older synonyms in the protologue (*Lecanora craspedia* β. *arenaria* Ach. 1810, *Lichen arenarius* Pers. 1794, *Patellaria lamprocheila* DC. 1805, *Verrucaria arenaria* Hoffm. 1796) and citing the first of these made *Lecidea caesio-rufa* var. *festiva* an illegitimate homotypic synonym of *Lecanora craspedia* var. *arenaria* (Pers.) Ach. (≡ *Lichen arenarius* Pers.) Also the diagnosis (... apotheciis minutis planis... margine integerrimo dilutori persistente) suggests that Acharius intended *Caloplaca arenaria*, not *C. crenularia*. This conflict with the established concept was also noted by Magnusson (1944: 59), who advocated *Biatora ferruginea* var. *festiva* Fr. as the basionym of *C. festiva*.

- 6) *Lecidea turneriana* Ach., Lichenogr. Universalis: 206. 1810 ≡ *Caloplaca turneriana* (Ach.) Zahlbr., Catal. Lich. Univ. 7: 190. 1931 (= *Caloplaca atroflava* (Turner) Mong. in Bull. Acad. Int. Géogr. Bot. 23: 192. 1914: *Lecidea atroflava* Turner in Trans. Linn. Soc. London 9: 142. 1808) – Lectotype (designated here): Anglia [England], Turner (H-ACH 371).

Samples H-ACH 371 and UPS-ACH 239 are extremely similar in their morphology, grow on the same substrate and both are labelled “Anglia, Turner”. We assume that they were collected by Turner from the same locality on the same date. Both specimens can be considered as duplicates and the material in H-ACH can be alternatively regarded as the holotype, and the specimen in UPS-ACH as an isotype.

As suggested by Magnusson (1944: 52) and Laundon (1992b: 5), *Lecidea turneriana* is conspecific with *L. atroflava* Turn. (≡ *Caloplaca atroflava* (Turn.) Mong.). The first author had the opportunity to study the holotype of *Lecidea atroflava* (England, flints on the Sussex Downs, Turner, BM 000730327!), and regards both specimens as conspecific.

- 7) *Lecidea viridirufa* Ach., Lichenogr. Universalis: 204. 1810 ≡ *Caloplaca viridirufa* (Ach.) Zahlbr., Catal. Lich. Univ. 7: 198. 1931 – Holotype: Helvetia [Switzerland], Schleicher 544 (H-ACH 336).

The locality, Helvetia, is in keeping with the protologue; the corresponding collection, H-ACH 336, is a small, partially damaged fragment having only two apothecia. Its thallus is pale grey, crustose-rimose, rather glossy, the apothecia have an outer thalline margin of the same colour as the thallus, and the true exciple is blackish-grey. We consider this specimen conspecific with the holotype of *C. aractina* (bas.: *Parmelia aractina* Fr.; type: Sweden, Halland, 1825; UPS 63456!).

Since 1972, the name *Caloplaca aractina* (Fr.) Häyren has commonly been used for this species. Nordin (1972: 159) presented *C. viridirufa* as a similar but different species without further discussion of the characters

distinguishing these species. Since then, the name “*C. viridirufa* (Ach.) Zahlbr.” has largely been forgotten and “*C. viridirufa* auct.” has been used as a synonym of *C. aractina*. (e.g., Nimis, 1993; Hafellner & Türk, 2001; Santesson & al., 2004).

*Caloplaca aractina* was described from coastal rocks, while the type of *C. viridirufa* was collected inland. Therefore, we checked additional samples from inland and coastal rocks, but did not find any considerable differences between these populations. Similar conclusions are already seen in the treatments of *C. aractina* by Laundon (1992a) and Nimis (1993), and the name *C. viridirufa* (Ach.) Zahlbr. was accepted in the German checklist by Scholz (2000), with *C. aractina* as a synonym. However, it can be argued that additional study and molecular comparisons of continental and coastal populations are needed to support this synonymizing.

- 8) *Lichen craspedius* Ach., Lichenogr. Suec. Prodr.: 45. 1799, nom. illeg. ≡ *Lichen arenarius* Pers. in Ann. Bot. (Usteri) 7: 27. 1794 ≡ *Caloplaca arenaria* (Pers.) Müll. Arg. in Mém. Soc. Phys. Hist. Nat. Genève 16: 387. 1862.

When coining *Lichen craspedius*, Acharius cited older names *L. arenarius* Pers. (1794) and *Verrucaria caesiorufa* Hoffm. (1796) in synonymy, thus making his new name illegitimate. However, his material, as well as the diagnosis of *Lichen craspedius* (“crustaceus rimosus albido-caesius; scutellis rufescenti ferrugineis demum convexis, margine flexuoso albescente”), does not correspond with the recent concept of *C. arenaria*, and his (unlocalized) specimen BM-ACH 493, for example, represents *C. soralifera* Vondrák & Hrouzek.

- 9) *Lichen erythrellus* Ach., Lichenogr. Suec. Prodr.: 43. 1799 ≡ *Caloplaca erythrella* (Ach.) Kieff. in Bull. Soc. Hist. Nat. Metz 19: 67. 1895 (= *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth., Fl. Tirol: 180. 1902: *Lichen flavovirescens* Wulfen in Schriften Ges. Naturf. Freunde Berlin 8: 122. 1787) – Lectotype (designated here): Suecia [Sweden] (H-ACH 1240D; isoelectotype H-ACH 1240E)

The material of *Lichen erythrellus* consists of the samples BM-ACH 481 and H-ACH 1240A–G. The material in BM-ACH contains five pieces of rock (slate) covered by well-preserved thalli of typical *Caloplaca flavovirescens*. The lichens have a pale yellow thin thallus, which contrasts with the deep orange convex apothecia. Anatomical notes made by A. Fletcher (in 1973) which accompany the specimens, are consistent with *C. flavovirescens*. Apothecia are moderately parasitized by *Muel-lerella lichenicola*.

Sample H-ACH 1240A from “Helvetia” belongs to the group of *Caloplaca velana* (A. Massal.) Du Rietz. Samples

1240B and C from “Helvetia” represent *C. flavovirescens*. Samples 1240D and E, labelled “Suecia” and obviously collected in the same locality, are *C. flavovirescens*. Samples 1240F and G are also from “Suecia”, but belong to *Candelariella vitellina* (Hoffm.) Müll. Arg. The collection was checked by Cl. Roux (in 1982), who determined samples B and C as *C. flavovirescens*; however, he did not select a lectotype. Although no locality was mentioned in the protologue (Acharius, 1799: 43), we have chosen sample 1240D labelled “Sweden” as the lectotype, because *L. erythrellus* was described in the “Prodromus” of Swedish lichens. Acharius probably received the material from Switzerland at a later date.

- 10) *Parmelia microthelia* Ach., Methodus: 174. 1803 ≡ *Lecanora salicina* var. *microthelia* (Ach.) Ach., Lichenogr. Universalis: 401. 1810 ≡ *Lecanora aurantiaca* var. *microthelia* (Ach.) Nyl., Lich. Scand.: 142. 1861 (*Caloplaca flavovirescens* (Huds.) J.R. Laundon in Lichenologist 8: 147. 1976: *Lichen flavovirescens* Huds., Fl. Angl.: 443. 1762) – Lectotype (designated here): [Sweden, “in truncis Populi Tremulae, Salicis”] specimen without collecting data (BM-ACH 485).

Original material of *Parmelia microthelia* consists of samples BM-ACH 485, H-ACH 1239G and UPS-ACH 659. The specimens in BM-ACH and UPS-ACH are without locality details. The sample in BM-ACH consists of three pieces of a corticolous lichen, which is *Caloplaca flavovirescens*, as is the sample, a single piece, in UPS-ACH. Specimen H-ACH 1239 from “Suecia” is only a small piece of sterile *C. flavovirescens*. Since specimen BM-ACH 485 is well-preserved, it is selected here as the lectotype; no locality was mentioned in the protologue (Acharius, 1803: 174) but in later publication (Acharius, 1810: 410), Sweden was the sole area indicated.

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