The nomenclature of *Erysiphe penicillata* revisited – a story of confusion and misinterpretation

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Abstract: Braun, U., Mitchell, J. K. & Bensch, K. 2023: The nomenclature of *Erysiphe penicillata* revisited – a story of confusion and misinterpretation. Schlechtendalia **40**: 353–355.

The confused nomenclatural and taxonomic history of the alder powdery mildew nowadays assigned to *Erysiphe penicillata* is discussed in detail, including nomenclatural status of the names concerned, and all matters relating to the typification. '*Erysiphe penicillata* Schltdl. nom. sanct.' is the correct denomination for this powdery mildew.

Zusammenfassung: Braun, U., Mitchell, J. K. & Bensch, K. 2023: Die Nomenklatur von *Erysiphe penicillata* erneut aufgegriffen – eine Geschichte von Verwechslung und falscher Interpretation. Schlechtendalia **40**: 353–355.

Die verworrene Geschichte der Nomenklatur und Taxonomie des Erlen-Mehltaus, der heute zu *Erysiphe penicillata* gestellt wird, wird eingehend diskutiert, einschließlich des nomenklatorischen Status der betreffenden Namen und aller Angelegenheiten, die sich auf die Typisierung beziehen. '*Erysiphe penicillata* Schtdl. nom. sanct.' ist die korrekte Bezeichnung dieses Mehltaus.

Key words: Powdery mildew, alder *Erysiphe*, denomination, typification.

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The whole history of the nomenclature of the alder powdery mildew, nowadays known as *Erysiphe penicillata*, is characterised by uncertainties in the applications and interpretations of the names involved, in the citation of authors, and around the typification. This high degree of confusion has also been intensified by changing rules of the nomenclature of fungi over decades.

Wallroth (1819b) considered the alder powdery mildew with apically dichotomously branched chasmothecial appendages a species of its own and introduced the combination *Alphitomorpha alni*, based on *Erysiphe alni* DC., for this species. Wallroth (1819a) preferred an alternative taxonomy, introduced the new name *Alphitomorpha penicillata*, which he divided into the unranked infraspecific taxa α *alni* (*Erysiphe alni* Lam. & DC.), β *grossulariae*, γ *berberidis* (*Erysiphe berberidis* DC.), sometimes regarded as varieties (Salmon 1900). The latter concept was maintained and accepted by Wallroth (1833). It is evident that Wallroth (1819a,b) misinterpreted the name *Erysiphe alni* and mistook it for the *Erysiphe* species with apically branched chasmothecial appendages. As has already been emphasized by Salmon (1900), *E. alni* represents a species of *Phyllactinia* (he cited *E. alni* as synonym of *Ph. corylea*). Salmon's (1900) treatment of this name has later been confirmed by Braun (1987), based on a re-examination of type material of *E. alni*, which is now the replaced synonym of the name *Phyllactinia alnicola* U. Braun (Braun & Cook 2012). Cooke (1865) published the valid combination *Microsphaera penicillata*. Winter (1884) followed Wallroth's (1819a,b) interpretation of *E. alni* and introduced the combination *Microsphaera alni* (DC.) G. Winter. Salmon (1900) accepted the name *M. alni*, which he applied with a very wide circumscription, but cited '(Wallr.)' as author of the basionym, with reference to *Alphitomorpha penicillata* α *alni* (as 'var.') and *A. alni*, 'excl. syn.' since he had realised that *E. alni* pertains to *Phyllactinia*. The wide circumscription of *Microsphaera alni* and *M. penicillata*, respectively, prevailed until Blumer (1933) confined the name '*M. alni* (Wallr.) G. Winter' to the alder powdery mildew. Based on the Botanical Code of Nomenclature of that time, Cooke (1952) reintroduced the name *Microsphaera penicillata* for *M. alni* (sensu Salmon 1900), which had subsequently been accepted, regardless of a wide circumscription of this name or a narrow concept, confining this name to the alder powdery mildew (Junell 1967, Braun 1987). Junell (1967: 60) confined the name *Alphitomorpha penicillata* to the powdery mildew on alder species by citing 'Type on *Alnus glutinosa* or *A. incana*.'

However, there is a basic nomenclatural problem connected with the name *Alphitomorpha penicillata*. In Wallroth's (1819a) original description, the name *A. penicillata* comprised two earlier described valid species names, viz., *E. alni* and *E. berberidis*. Hence, *A. penicillata* is an illegitimate (superfluous) name (Art. 52.1). Schlechtendal (1824), followed by Link (1824), introduced the name *Erysiphe* (as '*Erysibe*') *penicillata* (*Erysibe* is an orthographic variant of *Erysiphe*, see Braun & Cook, 2012: 632), based on the illegitimate name *A. penicillata*. Hence, *E. penicillata* must be regarded as a

replacement name ascribed to Schlechtendal, but not as a combination. Fries (1829: 243) adopted the name *E. penicillata*, so that this name is sanctioned according to the current Code (ICNafp). The status as sanctioned name only refers to *E. penicillata*, but not to the replaced synonym, *A. penicillata* (May et al. 2019). The next problem refers to the typification of *A.* (*E.*) *penicillata*. Names illegitimate according to Art. 52.1 are treated as replacement names (Art. 7.5), which are usually automatically typified by the type of the replaced synonym (Art. 7.4, 7.5), which would have serious consequences for the current application of the name *E. penicillata*. However, all older valid names cited in the original circumscription of *A. penicillata* were included in subordinate taxa (α, γ). Under these circumstances, automatic typification does not apply (Art. 7.6). Within the whole context of Wallroth's (1819a,b) introduction of *Alphitomorpha alni* and *A. penicillata* α *alni*, it is evident that he had in mind the common alder powdery mildew with apically dichotomously branched chasmothecial appendages, nowadays referred to as *E. penicillata*. Furthermore, Junell (1967) confined *A. penicillata* to the common alder powdery mildew with apically dichotomously branched chasmothecial appendages by citing 'Type on *Alnus glutinosa* or *A. incana*.' Therefore, Braun & Cook (2012) considered a corresponding collection in Wallroth's herbarium as potential type and proposed a neotype since an appropriate collection is not preserved. In doing so, the generally recognised application of the name *Erysiphe penicillata* (*Microsphaera penicillata*) has been maintained and stabilised.

The following 'nomenclator' summarises the results of the present discussion and explanations:

Erysiphe penicillata Schltdl. [as '*Erysibe penicillata* (Wallr.) Schltdl.'], Fl. Berol. 2: 170, 1824, nom. sanct. (Fr., Syst. mycol. **3**: 243, 1829).

≡ *Alphitomorpha penicillata* Wallr., Verh. Ges. Naturf. Freunde Berlin **1**(1): 40, 1819, nom. illeg. (Art. 52.1).

Neotype (designated by Braun & Cook 2012): Germany, on *Alnus* [*glutinosa*/*incana*], Fuckel, Fungi Rhen. Exs. 690 (HAL, s.n.). Epitype (designated by Bradshaw et al. 2023): Germany, Baden-Württemberg, Kreis Breisgau-Oberschwarzwald, Oberried, on *Alnus glutinosa*, 2008, K. Pastirčáková (KR-M36341). Ex-epitype sequence: MN759661 (ITS).

≡ *Erysiphe penicillata* Link [as '*Erysibe penicillata* (Wallr.) Link'] in Willdenow, Sp. pl. 4, **6**(1): 113, 1824, isonym (Art. 6.3, Note 2).

≡ *Microsphaera penicillata* (Schltdl.) Lév., Ann. Sci. Nat., Bot., Sér. 3, **15**: 381, 1851, nom. inval. (Art. 35.2).

≡ *Microsphaera penicillata* (Schltdl.) Cooke, Microscopic Fungi, Rust, Smut, Mildew & Mold, Ed. 1: 219, 1865.

≡ *Podosphaera penicillata* (Schltdl.) Quél., Champ. Jur. Vosg. **3**: 106, 1875.

= *Microsphaera penicillata* f. *alni* Jacz., Karm. Opred. Grib., Vip. 2. Muchn.-rosj. griby: 348, 1927.

Pseudonym: *Erysiphe alni* DC., in Lam. & DC., Syn. pl. Fl. gall.: 57, 1806 (synonym of *Phyllactinia alnicola*).

≡ *Alphitomorpha penicillata* α *alni* (DC.) Wallr., Verh. Ges. Naturf. Freunde Berlin **1**(1): 40, 1819.

≡ *Erysiphe penicillata* var. *alni* (DC.) Link [as '*Erysibe penicillata*'] in Willdenow, Sp. pl. 4, **6**(1): 113, 1824.

≡ *Microsphaera alni* (DC.) G. Winter, in Rabenhorst's Krypt.-Fl. **1**(2): 38, 1884.

Notes: "*Microsphaera penicillata* var. *alni* Cooke & Peck, J. Bot. **10** (N.S., **1)**: 171, 1872," often cited as synonym of *E. penicillata* (e.g., Salmon 1900: 130, excl. syn. *E. alni* DC., Braun 1987, Braun & Cook 2012) is a synonym of *Erysiphe alni* (≡ *Phyllactinia alnicola*). This variety was based on '*Erysiphe alni* Tul.' which refers to *E. alni* DC.

The priority of the introduction of *Erysiphe penicillata* in Schlechtendal (1824) or Link (1824) is not quite clear. Schlechtendal's (1824) "Flora berolinensis" was published in June to August 1824. The exact date of the publication of Link's (1824) book is unknown. However, Fries (1829: 234) cited Schlechtendal's publication at first, followed by a reference to Link's work, which is not in alphabetical order, suggesting that Fries (1829) possibly had knowledge of the earlier publication of Schlechtendal's book.

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