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Taxonomy and nomenclature of *Sphaeria aucupariae* (*Mycosphaerella aucupariae*, *Venturia aucupariae*) – a story of confusion and misinterpretation

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Abstract: Braun, U. 2018: Taxonomy and nomenclature of *Sphaeria aucupariae* (*Mycosphaerella aucupariae*, *Venturia aucupariae*) – a story of confusion and misinterpretation. Schlechtendalia **36**: 61–69.

The illegitimate, homonymous name *Sphaeria aucupariae* Lasch, non Pers., was introduced in 1844 for an ascomycete on *Sorbus aucuparia*. The original description is brief and of little significance, and type material is not preserved. Lasch's name was validated as *Sphaerella aucupariae*, a name which had later been interpreted and used for two different leaf-inhabiting ascomycetes on *Sorbus aucuparia*, viz., a common mycosphaerellaceous species and a species of the genus *Venturia.* The confused nomenclature and taxonomy of the two species involved in this assemblage of taxa is discussed and disentangled. In order to stabilize the nomenclature of the names concerned, a neotype for *Sphaeria aucupariae* Lasch (≡ *Sphaerella aucupariae*) is designated, and this name is reduced to synonymy with *Septoria sorbi* [Plowright's material distributed in "Sphaer. Brit. 2: no. 92" could be identified as sexual morph of *Ramularia endophylla* (= *Mycosphaerella punctiformis*)]. The combination *Venturia aucupariae* (Plowr.) Rostr. was introduced by E. Rostrup in 1902, and not by O. Rostrup, in Lind 1913, as previously supposed. *Venturia* on *Sorbus aucuparia* has previously been considered a *forma specialis* of *Venturia inaequalis*, but the latest phylogenetic examinations of the *V. inaequalis* complex have revealed that the *Venturia* on *Sorbus* represents a species of its own. The name *V. aucupariae* is, however, a synonym of *Septoria sorbi*, determined by the present neotypification, and is not any longer applicable to the *Venturia* on *Sorbus* spp., for which the new combination *Venturia orbiculata* (≡ *Cladosporium orbiculatum*) is introduced. *Septoria sorbi* Sacc. is the correct name for the mycosphaerellaceous species on hosts of *Sorbus s. str*. The nomenclature and taxonomy of this species is discussed. *Depazea sorbicola* is epitypified and the new combination *Asteromella sorbicola* is introduced. The latter name refers to a common genuine *Asteromella* on *Sorbus aucuparia* which was previously erroneously identified as *Asteromella trautmanniana*.

Zusammenfassung: Braun, U. 2018: Taxonomie und Nomenklatur von *Sphaeria aucupariae* (*Mycosphaerella aucupariae*, *Venturia aucupariae*) – eine Geschichte von Verwechslung und Fehlinterpretation. Schlechtendalia **36**: 61–69.

Der illegitime, homonyme Name *Sphaeria aucupariae* Lasch, non Pers., wurde im Jahr 1844 für einen Ascomyzeten auf *Sorbus aucuparia* eingeführt. Die Originalbeschreibung ist kurz und wenig aussagekräftig und das Typusmaterial ist nicht erhalten. Lasch's Name wurde später als *Sphaerella aucupariae* validiert. Das ist ein Name, der später im Sinne zweier unterschiedlicher blattbewohnender Askomyzeten auf *Sorbus aucuparia* interpretiert und genutzt wurde, nämlich für eine häufige Mycosphaerellaceen-Art und eine Art der Gattung *Venturia*. Die verworrene Nomenklatur und Taxonomie der zwei involvierten Arten dieser Gruppen von Taxa wird diskutiert und geklärt. Um die betroffenen Namen nomenklatorisch zu stabilisieren, wird ein Neotypus für *Sphaeria aucupariae* Lasch (≡ *Sphaerella aucupariae*) eingeführt und dieser Name wird in die Synonymie von *Septoria sorbi* gestellt [Plowrights Material verteilt als "Sphaer. Brit. 2: no. 92" konnte als sexuelle Morphe von *Ramularia endophylla* (= *Mycosphaerella punctiformis*) identifiziert werden]. Die Kombination *Venturia aucupariae* (Plowr.) Rostr. wurde 1902 von E. Rostrup vorgenommen und nicht von O. Rostrup, in Lind 1913, wie früher vermutet. Obwohl *Venturia* auf *Sorbus aucuparia* früher als *forma specialis* von *Venturia inaequalis* betrachtet wurde, haben neuste phylogenetische Untersuchen des *Venturia inaequalis*-Komplexes gezeigt, dass die *Venturia* auf *Sorbus aucuparia* eine eigene Art darstellt. Der Name *V. aucupariae* ist jedoch ein Synonym von *Septoria sorbi*, festgelegt durch die vorliegende Neotypisierung, und kann nicht mehr für die *Venturia* auf *Sorbus* spp. verwendet werden, für die die neue Kombination *Venturia orbiculata* (≡ *Cladosporium orbiculatum*) eingeführt wird. *Septoria sorbi* Sacc. ist der gültige Name für die Mycosphaerellaceen-Art auf Wirten der Gattung *Sorbus s. str*. Die Nomenklatur und Taxonomie dieses Namens wird diskutiert. *Depazea sorbicola* wird epitypisiert und die neue Kombination *Asteromella sorbicola* wird eingeführt. Dieser Name bezieht sich auf eine häufige, echte *Asteromella* auf *Sorbus aucuparia*, die früher fälschlicher Weise als *Asteromella trautmanniana* identifiziert worden war.

Key words: *Ascomycota*, *Mycosphaerellaceae*, *Venturiaceae*, *Asteromella sorbicola* comb. nov., *Septoria sorbi*, epitypification, neotypification.

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(1) Introduction

Several ascomycetes inhabiting the foliage of species belonging to the genus *Sorbus s. str*., now confined to species with pinnate leaves around *Sorbus aucuparia*, the type species of this genus (Sennikov *et al*. 2017), have been described with *Sphaeria aucupariae* Pers. (≡ *Tympanis*

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aucupariae (Pers. : Fr.) Wallr.) as one of the first species. Later the homonymous name *Sphaeria aucupariae* Lasch (non Pers.) was published with a brief, little meaningful description in Rabenhorst (1844), which was the beginning of a long-lasting confusion of several foliicolous ascomycetes on *Sorbus aucuparia*, including the names *Depazea sorbicola*, *Didymosphaeria aucupariae*, *Leptosphaeria sorbi*, *Mycosphaerella aucupariae*, *Phoma sorbi*, *Septoria sorbi*, and *Venturia aucupariae*. The names involved are nomenclaturally and taxonomically discussed and at least in part disentangled. The current usage of three of the names concerned is determined by lecto-, neo- and epitypification, respectively.

(2) Taxonomy and nomenclature of several ascomycetes on *Sorbus aucuparia*

(2.1) *Depazea sorbicola*

This name was recently discussed in Braun & Bensch (2019). This species was validly published with a description on the label of Rabenh., Fungi Eur. Exs. 548 (fig. 1). Laibach (1920) examined syntype material, but could not trace any conidia. Nevertheless, he considered *Depazea sorbicola* a probable synonym of *Septoria sorbi* Lasch [current valid name – *Septoria sorbi* Sacc. (see Braun 2018: 6, as "*S. sorbi* (Sacc.) Sacc."]. Syntypes preserved at B, HAL, and WRSL have been re-examined, but these samples are also sterile. Rabenhorst (l.c.) just mentioned the formation of acrogenous conidia, but, in contrast to many other descriptions published in his exsiccata, he did not give any further details, suggesting that the whole material or at least almost all duplicates were immature when collected and distributed. However, the conidiomata in Rabenhorst's material are rather small (50–75 µm diam.). Pycnidia of *Septoria sorbi* are much larger, about 90–200 µm diam. (see Laibach 1920, Teterevnikova-Babayan, 1987: 376), and ascomata of the putative sexual morph of *S. sorbi* (see Laibach 1920: 210) are 80–120 µm diam. The leaf spots of *Depazea sorbicola* and the size of the conidiomata agree well with a modern description of "*Asteromella trautmanniana* (Moesz) Moesz" in Ruszkiewicz-Michalska (2016: 96), based on collections from Poland on *Sorbus aucuparia*. However, the Polish collections on *S. aucuparia* (conidia cylindrical, (3–)4.5–7.5 × (0.6–)1–1.5 µm) do not agree with the original description of *A. trautmanniana* (conidia ellipsoid, 7–8 × 2–4 µm), a species described from Hungary on *Torminalis glaberrima* (= *Sorbus torminalis*). Furthermore, the generic affinity of the genuine *A. trautmanniana* is quite unclear. The ellipsoid conidia are not in favour of *Asteromella*. According to Van der Aa & Vanev (2002), the original description and illustration of the latter species rather suggest an affinity to the genus *Leptodothiorella*, but a species of *Phoma* can also not be ruled out (there are several common *Phoma* species known to infest species of *Sorbus s. lat*., see Van der Aa & Vanev 2002). The species on *Sorbus aucuparia*, belonging in *Asteromella*, seems to be rather common, at least in Poland. *Depazea sorbicola* seems to refer to this species, but due to the absence of conidia in the type material it is necessary to determine the application of this name by epitypification.

The first attempt to validate *Septoria sorbi* Lasch, nom. nud., was made by Cooke (1871: 448). He added a brief description ("Epiphyllous; perithecia minute, … Sporidia elliptic, slightly pointed at the extremities, so as to be almost almond-shaped"). The Latin description of *Phoma sorbi* Sacc. ("Peritheciis minutis, … sporulis ellipticis, utrinque leniter acutis et fere amygdaliformibus") agrees with Cooke's English description and was undoubtedly based on it, but not with *Depazea sorbicola* (≡ *Asteromella sorbicola*), epitypified below and characterised by having narrowly cylindrical conidia. However, *Septoria sorbi* Lasch ex Cooke was nomenclaturally superfluous when published since Cooke (l.c.) cited *Depazea sorbicola* as synonym. *D. sorbicola* is a valid name that ought to have been adopted by him. Hence, *Septoria sorbi* Lasch ex Cooke is typified by the type of *Depazea sorbicola* (Art. 7.5) and thus this name is now nomenclaturally a homotypic synonym of *Asteromella sorbicola*.

Asteromella sorbicola (Rabenh.) U. Braun & Ruszk.-Mich., **comb. nov.**

MycoBank, MB829717.

≡ (basionym) *Depazea sorbicola* Rabenh., Fungi Eur. Exs. (Klotzschii Herb. Viv. Mycol. Continuatio, Ed. Nova, Ser. Sec.), Cent. 6: no. 548, 1863.

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≡ *Septoria sorbi* Lasch ex Cooke (as "Lasch"), Handb. Brit. fungi: 448, 1871, nom. illeg. (Art. 52.1).

Misapplied name: *Asteromella trautmanniana* (Moesz) Moesz, sensu Ruszkiewicz-Michalska (2016: 96).

Lectotype (designated here, MycoBank, MBT385638): Germany, "Flora Megapolitana" [Mecklenburg-Vorpommern], Dömitz [Landkreis Ludwigslust-Parchim], undated, on *Sorbus* (= *S. aucuparia*), Dr. Fiedler, Rabenh., Fungi Eur. Exs. 548 (HAL, s.n.). Epitype (designated here, MBT385639): Poland, Łódź, Łagiewnicki Forest complex, *Calamagrostio-Quercetum*, on *Sorbus aucuparia*, 30 Sep. 2007, K. Brózio (LOD PF-3675).

Rabenhorst, Fungi europaei.
548. **Depazea Sorbicola** Rabenh. Mspt.
Perith. minutis aggregatis semiinnatis, nucleo celluloso albido, sporis acrogenis monoblastis, absque ascis et paraphysibus.
Doemitz (Flor. megapolit.) in fol. Sorbi leg. Dr. Fiedler.

Fig. 1: Label of *Depazea sorbicola* Rabenh., Fungi Eur. Exs. (Klotzschii Herb. Viv. Mycol. Continuatio, Ed. Nova, Ser. Sec.), Cent. 6: no. 548, 1863.

Description [based on Ruszkiewicz-Michalska (2016: 96; fig. 50, epitype, symptoms and micrographs), and type material of *Depazea sorbicola*]: Leaf spots small, 3–5 mm diam., circular to oblong, often vein-limited and lateral or terminal, at first yellowish, later brown to dark grey. Microconidial conidiomata (spermogonia) epiphyllous, mostly few per leaf spot, scattered, immersed, black, small, 50–75 µm diam., ostiolum small, to 17 µm diam., microconidiogenous cells (spermatiogenous cells) globose to cylindrical, 3–4 × 1.8–2 µm, or integrated in a two-celled conidiophore (spermatiophore), 5–6 × (2–)3–4 µm, terminal. Microconidia (spermatia) cylindrical to somewhat rod-shaped, (3–)4.5–7.5 × (0.6–)1–1.5 µm.

Whether the *Asteromella* described by Ruszkiewicz-Michalska (2016: 96) belongs in the life cycle of *Septoria sorbi* is unknown and requires detailed biological and phylogenetic examinations of this species. Laibach (1920) carried out comprehensive examinations of *S. sorbi* in vivo and in vitro, including inoculation experiments, but he did not observe any microconidial (spermogonial) stage. Since other mycosphaerellaceous species on *Sorbus aucuparia* with an *Asteromella* stage cannot be excluded with certainty, we prefer to maintain the present *Asteromella* as a separate species until its true affinity will be elucidated.

(2.2) *Septoria sorbi*

Septoria sorbi Sacc. (as "Lasch"), Bull. Soc. Mycol. Fr. **5**(4): 121, 1890.

≡ *Septoria sorbi* Lasch, in Rabenh., Klotzschii Herb. Viv. Mycol., Cent. 5: no. 459, 1843 [and Bot. Zeitung **2**: 172, 1844], nom. nud.

≡ *Cryptosporium sorbi* Ces., in Rabenh., Klotzschii Herb. Viv. Mycol., Ed. Nova, Ser. Secunda, Cent. 2: no. 160, 1860, nom. nud. [*Septoria sorbi* Lasch was cited as synonym].

≡ *Septoria sorbi* Fuckel [as (Ces.) Fuckel], Jahrb. Nassauischen Vereins Naturk. **23**–**24**: 390, 1870, nom. nud.

= *Sphaeria aucupariae* Lasch, in Rabenh., Deutschl. Krypt.-Fl.: 170, 1844, nom. illeg. (Art. 53.1), non Pers., 1801.

≡ *Sphaerella aucupariae* Plowr., Sphaeriacei Brit. **2**: no. 92, 1875 [neotype (designated here, MycoBank, MBT385641): the Netherlands, Bergendal near Nimwegen, on *Sorbus aucuparia*, 26 Aug. 1885, P. Magnus, Winter, Fungi Eur. Extraeur. Exs. 3498 (HAL, s.n.)], non *Septoria aucupariae* Bres., 1882.

≡ *Mycosphaerella aucupariae* (Plowr.) Oudem. (as "(Lasch) Johanson"), Rév. Champ. Pays-Bas (Amsterdam) **2**: 466, 1897.

≡ *Didymosphaeria aucupariae* (Plowr.) Oudem., Rév. Champ. Pays-Bas (Amsterdam) **2**: 466, 1897.

≡ *Venturia aucupariae* (Plowr.) Rostr. [as "(Lasch)"], Plantepatologi: 466, 1902.

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= *Septoria aucupariae* Bres., Hedwigia **31**: 40, 1892 [lectotype (designated here, MycoBank, MBT385641): Germany, Saxony, near Königstein, on *Sorbus aucuparia*, Aug. 1884/Jul. 1886/Aug. 1892, W. Krieger, Fungi Saxon. Exs. 795b (HAL, s.n.)].
= *Septoria aucupariicola* Oudem., Ned. Kruidk. Arch., Ser. 3, **2**(4): 893, 1903.

Exs.: Fuckel, Fungi Rhen. Exs. 509. Krieger, Fungi Saxon. Exs. 795. Migula, Crypt. Germ. Austr. Helv. Exs. 225. Petrak, Fl. Bohem. Morav. Exs., II. Ser., 1. Abt. , Pilze, 1786. Petrak, Fungi Polon. Exs. 259. Petrak, Mycoth. Carp. 62. Petrak, Mycoth. Gen. 1369. Winter, Fungi Eur. Extraeur. Exs. 3498. Syd., Mycoth. Germ. 1687, 2761. Weese, Eumyc. Sel. Exs. 507.

Lectotype [of *Septoria sorbi*] (designated here, MycoBank, MBT365642): Germany [sine loco et anno], on leaves of *Sorbus aucuparia*, W. G. Lasch, s.d., Rabenh., Klotzschii Herb. Viv. Mycol., Cent. 5, no. 459 (HAL, s.n.).

Asexual morph in vivo (description based on the examination of the lectotype, Laibach 1920, and Teterevnikova-Babayan 1987): On living and senescent leaves, leaf spots indistinct to subcircular or angular-irregular, reddish brown to brown leaf spots on the upper surface, less conspicuous on the lower surface, about 1–5 mm diam. Pycnidia scattered to subgregarious, immersed, often occupying the entire leaf cross-section, sometimes even bulging, large, 90–250 µm diam., black when viewed by a hand lens or stereomicroscope, microscopically rather brownish, peridium thin, pseudoparenchymatous, cells thin-walled, apical pore (ostiolum) about 25–50 µm diam., outline irregular, basal half of the cavity lined with a layer of colourless conidiogenous cells, subcylindrical to usually ampulliform, 8–15 × 3–5.5 µm, apex obtuse to mostly truncate, unilocal, probably monoblastic (proliferation and periclinal thickenings not observed), conidia solitary, straight, curved to somewhat sigmoid, oblong cylindrical or somewhat attenuated towards the tip (subacicular) or somewhat attenuated towards both ends and then slightly obclavate, (25–)35–75(–80) × (2–)2.5–5(–5.5) µm, (1–)2–3-septate, thin-walled, hyaline to somewhat greenish, smooth, apex obtuse to somewhat narrowed, base truncate to somewhat obconically truncate, hila (1.5–)2–3 µm wide.

Sexual morph (based on Laibach 1920): Lesions associated with ascomata greyish. Pseudothecia immersed, 80–120 µm diam., globose, apex papillate, protruding, 20–25 µm long, peridium 1–3-layered, pseudoparenchymatous, membranous, dark brown, outer cells somewhat oblong, pigmented, wall somewhat thickened, inward peridial wall converted into a layer of thin-walled, colourless cells, giving rise to a hymenial layer of asci, subcylindrical to slightly clavate when mature, 53–77 × 10–13 µm, straight to curved at the periphery, wall thin, only somewhat thickened at the apex, 8-spored, mostly 2–3-stichous, ascospores fusiform, only slightly narrowed towards the obtuse apex and base, straight to slightly curved, 26–34 × 4 µm, with a single median septum, hyaline.

Host range and distribution: on species of *Sorbus s. str.* [*S. aucuparia* subsp. *aucuparia*, *S. aucuparia* subsp. *glabrata*, *S. aucuparia* subsp. *sibirica* (≡ *S. sibirica*), *S. commixta*, *S. tianschanica*], *Rosaceae*, Asia (Russia, Siberia, Far East), Europe (Czech Republic, France, Germany, Hungary, Netherlands, Norway, Poland, Romania, Russia, Switzerland, UK, Ukraine), North America (Canada; USA, Iowa).

Notes: The name *Septoria sorbi* (nom. nud.), introduced by Lasch in Rabenh., Klotzschii Herb. Viv. Mycol., Cent. 5: no. 459, 1843 [and also in Bot. Zeitung **2**: 172, 1844], was published without any description. Two early attempts to validate this name had been made, viz., as *Cryptosporium sorbi* Ces., in Rabenh., Klotzschii Herb. Viv. Mycol., Ed. Nova, Ser. Secunda, Cent. 2: no. 160, 1860, nom. nud. [*Septoria sorbi* Lasch was cited as synonym] and as *Septoria sorbi* Fuckel [as (Ces.) Fuckel], Jahrb. Nassauischen Vereins Naturk. **23**–**24**: 390, 1870, but both names are nomina nuda since the authors failed to add descriptions or diagnoses. The first validation of *S. sorbi* goes back to Saccardo (1890: 121) who added a description [Saccardo (1884: 529) published the name *Phoma sorbi* Sacc. (as "(Lasch) Sacc.") with a brief description, which represents an introduction of a new species, i.e., it does not constitute a new name based on *Septoria sorbi* since *S. sorbi* is a nom. nud. and *Phoma sorbi* is no replacement name. Therefore, *Septoria sorbi* Sacc. has to be ascribed to Saccardo (1890) and does not represent a combination based on *Phoma sorbi* as erroneously cited in Braun (2018: 6). The latter name

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was not cited in Saccardo (1890) suggesting that Saccardo intended to introduce two quite different species – *Phoma sorbi* and *Septoria sorbi*. A first attempt to validate the name *Septoria sorbi* Lasch was made by Cooke (1871: 448). He added a brief description which agrees with Saccardo's (1884) description of *Phoma sorbi* Sacc. (see comments under 2.1. *Depazea sorbicola*). However, the name *Septoria sorbi* Lasch ex Cooke is an illegitimate superfluous name and now a homotypic synonym of *Asteromella sorbicola* since the valid name *Depazea sorbicola* had been cited by Cooke (l.c.) as synonym. Therefore, *Septoria sorbi* Lasch ex Cooke does not nomenclaturally influence the name *Septoria sorbi* Sacc.

The name *Sphaeria aucupariae* Lasch was introduced in Rabenhorst (1844: 170) with a brief, little informative description ["Perithecien dicht stehen, oft kegelförmig, schwarz, mit feiner Mündung, im Inneren weiß, gelatinös. Lasch Mspr non Pers." (Perithecia dense, often conical, black, with fine mouth {ostiole}, inside white, gelatinous. Lasch Mspr non Pers.)]. Plowright, Sphaer. Brit. **2**: no. 92, 1875, validated this name by introducing the name *Sphaerella aucupariae* (as "Lasch", see fig. 2). Plowright's (l.c) citation of "Lasch" referred to *Sphaeria aucupariae* Lasch in Rabenhorst (1844) [Oudemans (1897) cited "*Sphaeria aucupariae* Lasch, in Rabenh., Klotzschii Herb. Viv. Mycol. 459, 1843" but this reference is wrong and does not exist. No. 459 (1843) refers to *Septoria sorbi* Lasch, nom. nud.]. *Sphaerella aucupariae* Plowr. is a replacement name (nom. nov.) for *Sphaeria aucupariae* Lasch, non Pers., and hence typified by the type of its replaced synonym (Art. 7.4). However, the type of *Sphaeria aucupariae* Lasch, non Pers., is not preserved and the original description of this species is brief, little informative and does not allow a proper interpretation of this name. Therefore, it is not surprising that this name was later interpreted differently, either as species of *Venturia* (Rostrup 1902) or as *Mycosphaerella* (Oudemans 1897, Laibach 1929). The clarification of the application of the name *Sphaerella aucupariae* needs to be determined by means of neotypification. Rostrup's (1902) interpretation of *Sphaeria aucupariae* Lasch (≡ *Sphaerella aucupariae*) as *Venturia* is, however, not acceptable. Lasch, in Rabenhorst (1844) described a fungus found in summer, i.e., undoubted on living green leaves, and setae, characteristic for overwintering pseudothecia of species of the *Venturia inaequalis* complex, were not mentioned.

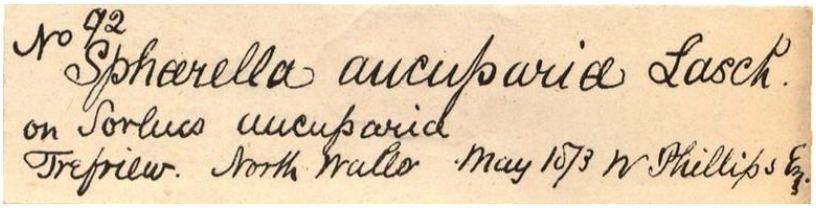

Fig. 2: Label of *Sphaerella aucupariae* Plowr., Sphaer. Brit. 2: no. 92, 1875 (duplicate deposited at B).

A duplicate of Plowright's material distributed under the name *Sphaerella aucupariae* has been examined [UK, North Wales, Trefriw, on *Sorbus aucuparia*, May 1873, W. E. Phillips, Plowr., Sphaer. Brit. 2: no. 92 (B700016125)]. The leaves are brown and necrotic. Several fungi have been found, including *Cladosporium* sp. Ascomata (pseudothecia) on the leaves are amphigenous, scattered to gregarious, immersed, 80–110 µm diam., ostiolate, with numerous subcylindrical asci, 30–45 × (4–)5–6 µm, 8-spored, ascospores 7–9 × 2–3 µm, ellipsoid-obovoid, with a single median septum, upper and lower cell more or less equal in shape and size or often somewhat wider above the septum (upper cells somewhat wider), hyaline. The characters agree well with the morphology of *Mycosphaerella punctiformis* (Pers.) Starbäck (now *Ramularia endophylla* Verkley & U. Braun, Verkley et al. 2004). Hence, Plowright's specimens distributed in "Sphaer. Brit. 2: no. 92" are not suitable as neotype.

Oudemans (1897: 215) interpreted the name *Sphaeria aucupariae* Lasch, non Pers. as *Mycosphaerella* and introduced the combination *Mycosphaerella aucupariae* (Plowr.) Oudem. (as "Lasch [*Sphaeria aucupariae* in Klotzsch Herb. mycol. I, n° 459]) Johanson; *Sphaerella aucupariae* Plowr., Sphaer. brit. II, n°. 91 …"). This combination has to be attributed to Oudemans and not to Johanson (this combination is not to be found in Johanson's (1884) basic treatment of *Mycosphaerella*). In an appended note, Oudemans (1897: 215) proposed the alternative combination *Didymosphaeria aucupariae* (Plowr.) Oudem.

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Laibach (1920: 216) disagreed with Rostrup's (1902) interpretation of *Sphaeria aucupariae* Lasch as *Venturia*, considered this species a member of *Mycosphaerella* with *Septoria sorbi* as asexual morph, and cited it as "*M. aucupariae* (Lasch)" (he was undoubtedly not aware of the combination *M. aucupariae* introduced in Oudemans, 1897). Laibach's (l.c) interpretation of Lasch's name is reasonable and followed in the present taxonomic-nomenclatural interpretation of *Sphaeria aucupariae* Lasch. However, Lasch's fungus, collected in summer, rather referred to the asexual morph (*Septoria*) and not to the sexual mycosphaerella-like morph. Therefore, an asexual collection (*Septoria*) is designated as neotype for *Sphaeria aucupariae* Lasch, non Pers. (≡ *Sphaerella aucupariae*). The exsiccatum concerned, Winter, Fungi Eur. Extraeur. Exs. 3498, has been examined. Most conidiomata are sterile, but in a few cases *Septoria* conidia have been found. On account of this neotypification, *Sphaeria aucupariae* Lasch, non Pers. (≡ *Sphaerella aucupariae*) has to be reduced to synonymy with *Septoria sorbi* (the older valid name *Sphaerella aucupariae* is nomenclaturally not relevant in this case since it is blocked in *Septoria* by *S. aucupariae* Bres., 1892.

On the basis of a new phylogenetic concept, the genus *Sorbus s. lat.* is now splitted into several genera, including *Aria*, *Cormus*, and *Torminalis* (Sennikov et al. 2017). *Sorbus s. str.* is confined to species with pinnate leaves allied to *Sorbus aucuparia*. *Septoria sorbi* occurs only on species of *Sorbus s. str*. Records on *S. commixta*, *S. aucuparia* subsp. *glabrata*, *S. aucuparia* subsp. *sibirica*, and *S. tianschanica* go back to Teterevnikova-Babayan (1987). Records on *Torminalis glaberrima* (= *Sorbus torminalis*) do not belong to the true *S. sorbi*, but they are rather allocable to *Septoria hyalospora* (Mont. & Ces.) Sacc., a similar but different species on *Torminalis glaberrima*. Records from Romania on *Hedlundia mougeotii* [≡ *Aria mougeotii*, *Sorbus mougeotii*, *S. aria* subsp. *mougeotii*] (Radulescu *et al*. 1973) and on *Borkhausenia intermedia* [≡ *Sorbus intermedia*] are unclear and have to be re-examined and verified. Species of *Hedlundia* and *Borkhausenia* are of hybridogenous origin with the involvement of species of *Sorbus s. str*. Therefore, it cannot be excluded that these species might be infected by *S. sorbi*.

(2.3) *Venturia orbiculata* (*V. aucupariae* auct.)

Venturia orbiculata (Desm.) U. Braun, **comb. nov.**

MycoBank, MB829718.

≡ (basionym) *Cladosporium orbiculatum* Desm., Ann. Sci. Nat., Bot., Sér. 3, **11**: 275, 1849.
≡ *Fusicladium orbiculatum* (Desm.) Thüm., Fungi Austr., Cent. VIII, no. 774, Teplitz 1873.
≡ *Passalora dendritica* var. *orbiculata* (Desm.) Berk., in Sacc., Mycoth. Ven., Cent. XII, no. 1246, Padua 1876 [Michelia 1: 265, 1878].
≡ *Fusicladium dendriticum* var. *orbiculatum* (Desm.) Sacc., Syll. fung. **4**: 345, 1886.
= *Actinonema crataegi* f. *sorbi-torminalis* Thüm., Herb. Mycol. Oecon., Fasc. XI, no. 527, Klosterneuburg 1877.
= *Actinonema crataegi* f. *sorbi-ariae* Thüm., Mycoth. Univ., Cent. XIV, no. 1372, Klosterneuburg 1879.
= *Fusicladium dendriticum* var. *sorbinum* Sacc., Ann. Mycol. **3**: 170, 1905 [lectotype (designated here, MycoBank, MB365643): on leaves of *Sorbus domestica*, Italy, Selva (Treviso), Aug. 1904, Sacc., Mycoth. Ital. 1582 (B, s.n.); isolectotypes – Sacc., Mycoth. Ital. 1582].
= *Fusicladium dendriticum* [var. *sorbinum*] f. *fruticola* Ferraris, Fl. Ital. Crypt., Pars I. Fungi, Fasc. 6: 879, 1910.

Misapplied name: *Venturia aucupariae* (Plowr.) Rostr. [as "(Lasch)"], Plantepatologi: 466, 1902.

Lectotype (designated in Bensch et al. 2012: 323): France, on living leaves of *Sorbus domestica*, herb. Desmazières (PC).

Notes: The *Venturia* on *Sorbus* spp. is morphologically very similar to *Venturia inaequalis* (Cooke) G. Winter. Therefore, collections on *Sorbus* spp. were previously usually assigned to the latter species (Sivanesan 1977). However, Menon (1956a,b) carried out inoculations tests and demonstrated that the race on *Sorbus aucuparia* represented a biologically specialized form

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(*forma specialis*) for which he introduced the name *V. inaequalis* f. sp. *aucupariae* R. Menon. "*Venturia inaequalis*" on *Sorbus* spp. recently turned out to be a separate species of *Venturia* confirmed by molecular sequence analyses (Le Cam et al. 2018). Therefore, a name for this species is needed. The name *Venturia aucupariae*, based on *Sphaerella aucupariae* (≡ *Sphaeria aucupariae* Lasch, non. Pers.), introduced by Rostrup (1902), is misapplied and refers to *Septoria sorbi* (see detailed discussion above under the latter name). Another teleomorph-typified name for the *Venturia* on *Sorbus* spp. is not available. *Cladosporium orbiculatum*, an anamorph-typified name, is the oldest valid name on species level applicable to the species concerned. This name was introduced by Desmazières (1849) for asexual morphs on two hosts: "Hab. In foliis Sorbi et Mespili Pyracanthae, aestate, autumn". Schubert et al. (2003: 76) lecotypified *C. orbiculatum* and confined this name to an included *Fusicladium* morph on *Sorbus domestica*. Asexual and sexual morphs of *Venturia inaequalis s. lat*. are known on several species of *Sorbus s. lat*. Sivanesan (1977) examined collections on *Sorbus aria*, *S. aucuparia*, *S. domestica*, and *S. torminalis*.

(2.5) *Leptosphaeria sorbi*

Leptosphaeria sorbi Jacz., Ann. Mycol. **1**(1): 30, 1903.

Jaczewski (1903) described this species as follows: Perithecia 100–150 µm diam., apex with small porus, with several asci, clavate, 55–60 × 12–14 µm, interspaced with fine paraphyses, asci 8-spored, fusiform, olivaceous, 4-celled, straight to somewhat curved, 25–30 × 4–5 µm. On *Sorbus aucuparia*, Russia, Gouvernement Smolensk, 1901, A. A. Jaczewski. *L. sorbi* is little known and modern re-examinations and revisions of this species are not yet available. However, the original description of the ascomata ("paraphysate" ascomata, 8-spored asci with fusiform, pigmented, 3-septate ascospores) might fit with the concept of the family *Leptosphaeriaceae* in its current circumscription on the basis of phylogenetic analyses and reassessments of morphological traits (Câmara *et al*. 2002, Ariyawansa *et al.* 2015). But the generic affinity of this species remains unclear, above all due to clavate asci and olivaceous ascospores. 3-septate ascospores are in agreement with *Leptosphaeria s. str.*, but the latter genus currently comprises species with cylindrical asci and reddish to yellowish brown ascospores (Ariyawansa *et al.* 2015). Clavate asci and paler ascospores are known in the genus *Paraleptosphaeria* Gruyter *et al*. (Ariyawansa *et al.* 2015). The clarification of the true generic affinity of *L. sorbi* requires the re-examination of type material and analyses of this species with modern methods.

Jaczewski's (1903) presumption that *Septoria sorbi* might be the pycnidial stage of *Leptosphaeria sorbi* can be excluded since *Leptosphaeria* and allied genera are rather characterised by having phoma-like asexual morphs. The genus *Septoria s. str.* and allied septorioid genera are now recognised holomorph genera with mycosphaerella-like sexual morphs pertaining into the family *Mycosphaerellaceae* (Quaedvlieg *et al.* 2013).

(2.5) *Phoma sorbi*

Phoma sorbi Sacc. [as "(Lasch) Sacc."], Syll. Fung. **3**: 529, 1884.

Misapplied name: *Septoria sorbi* Lasch ex Cooke (as "Lasch"), Handb. Brit. fungi: 448, 1871, nom. illeg. (nom. superfl., Art. 52.1).

The name *Phoma sorbi* was introduced by Saccardo (1884) ["Peritheciis minutis, … sporulis ellipticis, utrinque leniter acutis et fere amygdaliformibus"]. Saccardo's (l.c.) description agrees with the description of *Septoria sorbi* Lasch ex Cooke (Cooke 1871: 448), nom. illeg (nom. superfl, Art. 52.1) ["Epiphyllous; perithecia minute, … Sporidia elliptic, slightly pointed at the extremities, so as to be almost almond-shaped"], i.e., it was undoubtedly based on it (Saccardo, l.c., referred to Cooke's publication in Handb. Brit. fungi). However, the name *Phoma sorbi* has to be ascribed to Saccardo, who provided a description and regarded the fungus described by Cooke (l.c.) as a true species of *Phoma* (*Depazea sorbicola* was, in contrast to Cooke, l.c., not cited as synonym in Saccardo, l.c.). Saccardo's (l.c.) name is neither a combination based on Cooke's *Septoria sorbi* (nom. illeg., superfl.) nor a nom. nov. for the latter name.

The identity of *Phoma sorbi* is quite unclear. Type material is not preserved in Saccardo's herbarium at PAD (see Gola 1930). Several common *Phoma* species are known to infest *Sorbus*

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spp. (Van der Aa & Vanev 2002), but an association with *Leptosphaeria sorbi* can also not be excluded but needs further examinations.

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