

New combinations and names in *Gyalecta* for former *Belonia* and *Pachyphiale* (Ascomycota, Ostropales) species

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Abstract: *Belonia* and *Pachyphiale* were recently shown to be nested within *Gyalecta*. Here, new combinations and names are introduced for species earlier classified in *Belonia*: *Gyalecta calcicola* (Walt. Watson) Baloch & Lücking comb. nov., *G. herculina* (Rehm) Baloch, Lumbsch & Wedin comb. nov., *G. incarnata* (Th. Fr. & Graewe) Baloch & Lücking comb. nov., *G. lumbrispora* (Etayo) Baloch & Lücking comb. nov., *G. lyngei* Baloch & Lücking nom. nov. (for *Belonia arctica* Lynge), *G. mediterranea* (Nav.-Ros. & Llimona) Baloch & Lücking comb. nov., *G. midarosiensis* (Kindt) Baloch & Lücking comb. nov., *G. pellucida* (Coppins & Malcolm) Baloch & Lücking comb. nov., *G. russula* (Körb. ex Nyl.) Baloch, Lumbsch & Wedin comb. nov., *G. uncinata* (P. M. McCarthy & Kantvilas) Baloch & Lücking comb. nov., and *G. vezdana* (Malcolm & Coppins) Baloch & Lücking comb. nov.; and for species earlier placed in *Pachyphiale*: *Gyalecta arbuti* (Bagl.) Baloch & Lücking comb. nov., *G. gyalizella* (Nyl.) Baloch & Lücking comb. nov., *G. himalayensis* (Vězda & Poelt) Baloch & Lücking comb. nov., and *G. ophiospora* (Bagl.) Baloch & Lücking comb. nov.

Key words: lichens, nomenclature, *Segestrella*, taxonomy, typification

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Introduction

The recent phylogenetic study by Baloch and co-workers (Baloch *et al.* 2010) showed that the type species of *Belonia* and *Pachyphiale* are nested within *Gyalecta*. Based on these results, Baloch *et al.* (2010) suggested that *Belonia* and *Pachyphiale* should be synonymized with *Gyalecta*, but the authors did not provide formal new combinations. Here we provide the necessary new combinations for currently accepted species of *Belonia* and *Pachyphiale* that lack valid names in *Gyalecta*.

Former *Belonia* species

Belonia Körb. is a group of *Trentepohlia*-containing crustose lichens with perithecioid apothecia and needle-shaped, multi-septate spores. In the phylogeny presented by Baloch *et al.* (2010), the two *Belonia* species included [the type species of *Belonia*, *B. russula*, and *B. herculina* (as *B. herculana*)], do not form a monophyletic group, but both were nested within *Gyalecta*. Based on these findings, we here suggest new combinations for the species currently placed in *Belonia*.

Gyalecta calcicola (Walt. Watson) Baloch & Lücking comb. nov.

Mycobank No.: MB 803305

Belonia calcicola Walt. Watson, *J. Bot.* 73: 160 (1935); type: England, North Somerset, Goblin Coombe, June 1934, *Watson* s. n. (BM—holotypus; BM—isotypus).

Gyalecta herculina (Rehm) Baloch, Lumbsch & Wedin comb. nov.

Mycobank No.: MB 803316

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Segestrella herculina Rehm in Lojka, *Mathem. és Természet. Közlem.* 11: 62 (1876).—*Verrucaria herculina* (Rehm) Lojka, *Mathem. és Természet. Közlem.* 21: 370 (1885).—*Belonia herculina* (Rehm) Keissler, *Rabenh. Krypog. Fl.* 9(1–2): 287 (1938); type: Romania (“Hungary”), “ad corticem fagorum infra sum. montem Domugled prope Thermis Herculis in Banatu,” 20 September 1872, *Lojka* 1048 (S L2801—lectotypus, designated here).

Belonia herculana Hazsl., *Grevillea* 6: 109 (1878); type: Romania (“Hungary”), “ad corticem fagorum infra sum. montem Domugled prope Thermis Herculis in Banatu,” 20 September 1872, *Lojka* 1048 (S L2801—neotypus, designated here).

The nomenclature of this lichen has been rather confused. The earliest name was published as *Segestrella herculina* Rehm., in Lojka (1876). The type locality (“on bark of a beech at lower elevation of Mt Domugled”, translated from Hungarian) corresponds to Mt Domogled in present-day Romania, and “herculina” implicitly refers to the Hercules Thermes spa on the lower southern slope of this mountain. Lojka expected a more detailed description by Rehm that never appeared, but it is clear that the original description was by Rehm (Lojka 1885). *Verrucaria hungarica* Nyl. *in litt.* was mentioned in the original diagnosis, but never published. Later, Lojka (1885) gives more detail on the original material, all of which is consistent with the original brief diagnosis. The material was collected by Lojka in 1872 and, according to Lojka (1885), given the collection number 1048. It was also distributed in the Lojka, *Lich. Regn. Hung. Exs.* as number 115. There are two samples annotated as types in hb. Rehm (which is housed in S), one annotated *Lojka* 1048 and one *Lojka* 1049. We designate the sample *Lojka* 1048 from hb. Rehm in S as lectotype of *Segestrella herculina* Rehm.

Belonia herculana Hazsl. (Hazslinsky 1878) was described separately, but it is based on part of the same original material as *Segestrella herculina* Rehm. Lojka (1885) comments on the fact that Hazslinsky attributes the type of *Belonia herculana* to two collectors: “Vicenze Borbás was mentioned as collector, too – it is just because during the excursion in autumn 1872 he was asking for a specimen and I cut a piece of bark for him. . .” (translated from

Hungarian). The sample studied by Hazslinsky should be housed in Budapest (hb. BP), as BP bought Hazslinsky’s herbarium after his death, but no material could be located there. A number of *Belonia* specimens were, however, out on loan and destroyed during World War II, according to a shipping list from 1944 preserved at BP (E. Farkas & L. Lökös, *in litt.*). We assume that the type of *Belonia herculana* was among the samples destroyed. As it is clear that Hazslinsky based his description on one of the many pieces collected by Lojka during his excursion to Mt Domogled (all probably to be considered syntypes of *Segestrella herculina*), we neotypify *Belonia herculana* Hazsl. on the same sample in S from hb. Rehm as the lectotype of *Segestrella herculina* Rehm., to automatically make the names synonyms and *Belonia herculana* Hazsl. superfluous.

***Gyalecta incarnata* (Th. Fr. & Graewe)
Baloch & Lücking comb. nov.**

Mycobank No.: MB 803306

Belonia incarnata Th. Fr. & Graewe, in Th. Fr., *Öfvers. K. Svensk. Vetensk.-Akad. Förhandl.* 21: 274 (1865).—*Gongylia incarnata* (Th. Fr. & Graewe) Zahlbr., in Engler & Prantl, *Nat. Pflanzenfam.* 1: 57 (1903); type: Sweden, Västergötland, Baljefors, near Främmestad, 1863, *Graewe* s. n. (UPS—holotypus).

Belonia terrigena Eitner, *Jahresber. Schlesisch. Ges. Vaterl. Kultur* 99: 34 (1910, ‘1911’); type: Poland, Schlesien, Riesengebirge, “um die Veilchensteine auf alten Rasenausstichen neben dem Kammweg”, June 1906, *Eitner* s. n. (W—holotypus).

This species is commonly cited as “ex” rather than “in”, but it is clear from the text in Fries’ paper (Fries 1865) that the intention of Fries and Græwe was to describe this species together, based on material collected by Græwe.

***Gyalecta lumbrispora* (Etayo) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803307

Belonia lumbrispora Etayo, *Öst. Z. Pilzk.* 5: 151 (1996); type: Spain, Canary Islands, Gomera, La Meseta, barranco de la Cueva Encantada, on *Ocotea foetens*, 720 m alt., 3 August 1994, *Etayo* 58(3) (MA-Lich.—holotypus; BM, W and hb. Etayo—isotypi).

***Gyalecta lyngei* Baloch & Lücking nom. nov.**

Mycobank No.: MB 803517

Belonia arctica Lynge, *Lich. Nov. Zemlya*: 39 (1928); type: Novaya Zemlya, Matochkin Shar Distr., Chalhounik Valley, 13 July 1921, *Lynge* s. n. (O—holotypus); non *Gyalecta arctica* Malme, *Ark. Bot.* 25A(2): 7 (1932).

This species is known only from the type collection. The taxonomic status and its distinction from *G. russula*, which has somewhat larger ascospores, require additional studies.

***Gyalecta mediterranea* (Nav.-Ros. & Llimona) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803308

Belonia mediterranea Nav.-Ros. & Llimona, *Lichenologist* 29: 16 (1997); type: Spain, Catalonia, prov. Girona, Medes Islands, 29 August 1981, *Llimona* s. n. (BCC Lich. 9309—holotypus).

***Gyalecta nidarosiensis* (Kindt) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803309

Microglæna nidarosiensis Kindt, *Kgl. norske vidensk. Selsk. Skr.* 1884: 4 (1885).—*Belonia nidarosiensis* (Kindt) P. M. Jørg. & Vězda in Jørgensen, Vězda & Botnen, *Lichenologist* 15: 54 (1983); type: Norway, 14 August 1884, *Kindt* s. n. (BG—holotypus; TRH, UPS— isotypi).

Clathroporina calcarea Walt. Watson, *J. Bot., Lond.* 63: 131 (1925); type: England, V.C.33, Gloucestershire, Winchcombe, 17 May 1924, *Knight* s. n. (BM—lectotypus).

Clathroporina caudata Vězda & Vivant, *Bull. Soc. Bot. Fr., Let. bot.* 118: 288 (1972) [‘1971’]; type: France, Gallia, Montes Pyrenæi Occident., St.-Just-Ibarre, 17 VII 1970, *Vivant* s. n. (Vězda: *Lich. sel. exs.* no. 1051; BCC Lich. 368, G— isotypi).

***Gyalecta pellucida* (Coppins & Malcolm) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803310

Belonia pellucida Coppins & Malcolm, *Lichenologist* 30: 563 (1998); type: New Zealand, North Island, Wellington, Scorching Bay, 10 October 1995, *Malcolm* 2490 (CHR—holotypus; E— isotypus).

***Gyalecta russula* (Körb. ex Nyl.) Baloch, Lumbsch & Wedin comb. nov.**

Mycobank No.: MB 803311

Belonia russula Körb. ex Nyl., *Act. Soc. Linn. Bordeaux* 21: 346 (1857); type: Poland, “ad rupes basalticas faucis

‘Klein Schneeegrube’ Sudetorum”, *Körber* s. n. (L. Körber Typenherbar—lectotypus, designated by Navarro-Rosinés & Llimona 1997: 25, as “holotype”; and L. Körber Stammherbar—isolectotypus; Körber, *Lich. Sel. Germ.* no. 79—isolectotypi).

Belonia femica Vain., *Meddeland. Soc. Fauna Fl. Fenn.* 10: 196 (1883); type: Russia (formerly part of Finland), Kuusamo, 30 July 1877, *Vainio* s. n. (TUR-31141, 31142—syntypi).

Beloniella cinerea Norman, *Kongl. Vetensk.-Akad. Förhandl.* 8: 35 (1884); type: Norway, Holmestrand, Nyveien, *Norman* s. n. (H and S L2798—isolectotypi).

The citation of this species has been confusing in the literature. The name was first published in Körber’s exsiccate *Lichenes Selecti Germaniae* no. 79 (Körber 1856), but without a valid description and diagnosis. Nylander (1857) then provided a description and has to be considered the validating author. Yet, both Körber (1863) and Garovaglio (1873) subsequently intended to publish the species validly, Garovaglio (1873) apparently having overlooked Körber’s (1863) treatment in his *Parerga*. In the latter, Körber (1863: 322) dismissed Nylander’s (1857: 322) view and description of the species, stating that “Nylander konnte keinen schlagenderen Beweis für die bodenlose Oberflächlichkeit seiner Untersuchungen geben, als diesen Nonsens!” [Nylander could not give a clearer proof of the bottomless superficiality of his research than this nonsense, translated from German]. Nylander (1857) had stated that the species lacks paraphyses and that because of its widened epitecium was related to *Gyalecta*. So while both Körber (1863) and Nylander (1857) were right and wrong with regard to particular details of the species, Nylander’s (1857) first published description, even if rudimentary, must be considered a validation of the name *Belonia russula*, thus taking the credit from Körber (1856, 1863) who had collected and thoroughly studied the taxon. Adding to the confusion is that Rabenhorst (1867) published an edited version of a work by Garovaglio, who had offered validation of both the genus and the species name, with Körber as sole author, but Garovaglio’s original work was not published until six years later (Garovaglio 1873).

***Gyalecta uncinata* (P. M. McCarthy & Kantvilas) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803312

Belonia uncinata P. M. McCarthy & Kantvilas, *Lichenologist* **29**: 489 (1997); type: Australia, Tasmania, Gordon Road, 8 April 1997, *Kantvilas* 96/97 (HO 320762—holotypus).

***Gyalecta vezdana* (Malcolm & Coppins) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803313

Belonia vezdana Malcolm & Coppins, *Australas. Lichenol.* **41**: 30 (1997); type: New Zealand, South Island, Sharland Creek, Hira Forest, 60 m alt., 6 February 1997, *W. Malcolm* 2074 (CHR 489027—holotypus; E—isotypus).

Former *Pachyphiale* species

Pachyphiale Lönnr. has traditionally been used for *Gyalecta*-like lichens with multi-spored asci (Vězda 1958, 1969). Baloch *et al.* (2010) included the type species, *Pachyphiale fagicola*, in their phylogeny, which was nested in *Gyalecta*, suggesting that ascospore number cannot be used as a genus-level character. For two *Pachyphiale* species to be treated in *Gyalecta*, valid names in *Gyalecta* are already available: *Gyalecta carneola* (Ach.) Hellb. [syn: *P. carneola* (Ach.) Arnold; *P. cornea* (With.) Poetsch] and *Gyalecta fagicola* (Hepp ex Arnold) Kremp. [syn.: *P. fagicola* (Hepp ex Arnold) Zwackh.; *P. corticola* Lönnr.]. Ten further species have been treated in *Pachyphiale*. Of these, *P. cornea* (Tuck.) Poetsch and *P. corticola* Lönnr. are synonyms of *Gyalecta carneola* and *G. fagicola*, respectively, whereas *P. carneolutea* (Turner) Samp. and *P. geocoides* (Vain.) Vězda [syn.: *G. geocoides* Vain.] have been transferred to *Cryptolechia* (Kalb 2007). *Pachyphiale arbuti* (Bagl.) Arnold, *P. gyalizella* (Nyl.) S. Ekman, *P. himalayensis* Vězda & Poelt, and *P. ophiospora* Lettau, appear to be good species (Vězda 1958; Poelt 1969; Vězda & Poelt 1975; Clauzade & Roux 1985; Ekman 1996) and are recombined in *Gyalecta* below. The status of *P. lojkana* (Nyl.) Keissl. is unclear; Vězda (1958) included it in *Pachyphiale* following Keissler (1933), although the black ascomata and cyanobacterial photobiont do not agree

with typical species of *Pachyphiale* or *Gyalecta*; Vězda (1968), Poelt (1969) and Clauzade & Roux (1985) retained the species in *Thelopsis*. We believe that this taxon requires a separate phylogenetic study to clarify its relationships. *Pachyphiale lecanorina* J. Steiner, described from Portugal (Steiner 1918), has never again been mentioned in the literature (Vězda 1958; Poelt 1969; Clauzade & Roux 1985) and the name does not appear in any checklist; its taxonomic status is unknown.

***Gyalecta arbuti* (Bagl.) Baloch & Lücking comb. nov.**

Mycobank No.: MB 804287

Bacidiopsis arbuti Bagl., *Comm. Soc. Crittog. Ital.* **1**: 22 (1861).—*Pachyphiale arbuti* (Bagl.) Arnold, *Flora* **54**: 50 (1871); type: Italy, *Baglietto* s. n. (TO—holotypus).

***Gyalecta gyalizella* (Nyl.) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803314

Lecidea gyalizella Nyl., *Sert. Lich. Trop. Labuan Singapore*: 38 (1891).—*Pachyphiale gyalizella* (Nyl.) S. Ekman, *Op. Bot.* **127**: 130 (1996); type: USA, Massachusetts, New Bedford, *Willey* s. n. (H-NYL 21313—lectotypus, selected by Ekman 1996).

***Gyalecta himalayensis* (Vězda & Poelt) Baloch & Lücking comb. nov.**

Mycobank No.: MB 803315

Pachyphiale himalayensis Vězda & Poelt, *Khumbu Himal* **6**: 130 (1974); type: Nepal, Himalaya, Khumbu, “*Abies-Rhododendron* Wald südlich Kunde”, 3900–4000 m, October 1962, *Poelt* 1554 (M—holotypus).

***Gyalecta ophiospora* (Lettau) Baloch & Lücking comb. nov.**

Mycobank No.: MB 804288

Pachyphiale ophiospora Lettau, *Feddes Repert., Beih.* **69**: 222 (1937); type: Switzerland, *Lettau* s. n. (M—holotypus).

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