

## Revision of specimens of *Melastiza* deposited in the PRM herbarium

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Over 100 specimens deposited under *Melastiza* in the PRM herbarium (Prague, Czech Republic) were revised. They were identified as *M. carbonicola*, *M. cornubiensis*, *M. flavorubens* and *M. contorta* (84 specimens), remained unidentified (1 specimen) or were included in *Scutellinia* (23 specimens). Most of the previously published differences in hair and ascospore characters between *M. carbonicola* and *M. cornubiensis* were confirmed based on the studied material. Lists of revised specimens with collection data are given. The lists show that some differences in distribution between *M. carbonicola* and *M. cornubiensis* probably exist, but it is also taken into account that these are finds by various collectors who may prefer visiting different habitats. A final decision on the identity of *M. carbonicola* and *M. cornubiensis* is not made due to a lack of molecular data.

**Key words:** Ascomycota, *Pyronemataceae*, *Melastiza carbonicola*, *Melastiza cornubiensis*, *Melastiza flavorubens*, *Melastiza contorta*, taxonomy, occurrence data.

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Šandová M. (2019): Revize položek rodu *Melastiza* uložených v herbáři Národního muzea v Praze. – Czech Mycol. 71(2): 205–217.

V rámci studie bylo revidováno více než 100 položek rodu *Melastiza* uložených v herbáři PRM. Osmdesát čtyři položek bylo určeno jako *Melastiza carbonicola*, *M. cornubiensis*, *M. flavorubens* a *M. contorta*, jedna položka zůstala neurčená a 23 položek bylo přeурčeno jako *Scutellinia*. Většina dříve publikovaných rozdílů mezi druhy *M. carbonicola* a *M. cornubiensis* ve vlastnostech chlupů a askospor se na základě studovaného materiálu potvrdila. Jsou publikovány seznamy revidovaných položek s údaji o sběru. Ze seznamů je vidět, že pravděpodobně existují určité rozdíly v rozšíření mezi druhy *M. carbonicola* a *M. cornubiensis*, je ale bráno v úvahu i že jde o sběry různých sběratelů, kteří mohli přednostně navštěvovat rozdílná stanoviště. Konečné rozhodnutí o identitě nebo rozdílnosti druhů *M. carbonicola* a *M. cornubiensis* není učiněno z důvodu nedostatku molekulárních dat.

### INTRODUCTION

*Melastiza* Boud. is a genus of *Pyronemataceae* (Ascomycota, Pezizomycetes) close to *Aleuria* Fuckel and *Spooneromyces* T. Schumach. & J. Moravec according

to Hansen et al. (2013). It is characterised by blunt, brown to barely brownish excipular hairs (Lassueur 1980, Moravec 1995). Historical classification (e.g. Le Gal 1947, Dennis 1960) kept *Melastiza* and *Aleuria* in separate families or tribes, because of less differentiated hairs in the latter. Close relationship between *Melastiza* and *Aleuria* was discussed by Le Gal (1964), Eckblad (1968), Rifai (1968), Mäkinen & Pohjola (1969), Moravec (1972) and later authors. Moravec (1995) treated it as a subgenus of *Aleuria*. Carotenoids detected in the fruit-bodies of *M. cornubiensis* (Berk. & Broome) J. Moravec and *M. flavorubens* (Rehm) Pfister & Korf are  $\beta$ - and  $\gamma$ -carotene, aleuriaxanthin ester and 2'-dehydroplectanixanthin ester, as published by Arpin & Bouchez (1969). Based on carotenoid content, Le Gal (1969; later accepted by Lassueur 1980) placed *Melastiza* in tribe *Melastizeae* Le Gal together with *Aleuria*, *Leucoscypha* Boud. and *Octospora* Hedw. (including *Lamprospora* De Not. as its synonym). Hansen et al. (2013) discussed the value of the carotenoid content in the light of molecular data and supposes loss of carotenoids in several lineages.

Moravec (1995) recognised eight species of *Melastiza*. Besides these, Index Fungorum (Anonymus on-line) lists five more species, *M. kumouensis* K.B. Khare, which is close to *M. flavorubens* as mentioned by Khare (1985) and probably its synonym according to Moravec (1995), *M. laxmannii* (Weinm.) Boud. and *M. phaeoloma* (Wallr.) Boud., with insufficient descriptions (Saccardo 1889), *M. rozei* (Boud.) Spooner & Y.J. Yao, placed tentatively in *Melastiza* by Yao & Spooner (1995a), but having an atypical colour, and *M. tetraspora* Dissing & Sivertsen, well-defined within *Melastiza* by its having four ascospores per mature ascus, its ascospore width and its ascospore ornamentation (Dissing 1993).

Four species have been reported from the Czech Republic (Velenovský 1934, Šmarda 1944 sec. Svrček 1981, Svrček 1949, Šmarda 1960, Svrček & Kubička 1963, Svrček & Kubička 1968, Černý & Kříž 1972, Moravec 1972, Kubička 1975, Kubička in Kotlaba 1981, Černý & Antonín 1982, Svrček 1990, Louda 1991, Moravec 1995, Hagara 2014): *M. cornubiensis*, *M. carbonicola* J. Moravec, *M. flavorubens* and *M. contorta* (Masse & Crossl.) Spooner & Y.J. Yao. The correct names were established by Moravec (1992, 1972), Pfister & Korf (in Korf 1971), and Spooner & Yao (in Yao & Spooner 1995b), respectively. The type of *M. cornubiensis* was revised by Moravec (1995), who also revised the type of its synonym, *M. chateri* (W.G. Sm.) Boud., and a syntype of *Humaria miniata* Fuckel [= *M. miniata* (Fuckel) Boud.]. The identity of *M. chateri* and *H. miniata* was already stated by Seaver (1928), while Boudier (1885) considered them as two species (see also Svrček 1949 and Moravec 1995). The name *M. flavorubens*, rediscovered by Pfister & Korf, is an earlier name for *M. greletii* Le Gal. The name *M. greletii* was established by Le Gal (1958; as 'greleti') for *M. chateri* ss. Grelet (1942). *Melastiza contorta* is an earlier name for *M. scotica* Graddon (1961). The holotype of *M. scotica* was examined by Moravec (1995) with illustrations including

SEM of ascospores; he concluded that this species has an outstanding position within the genus due to its unusually shaped and long (up to 480 µm) apothecial hairs. The holotype of *M. contorta* was studied by Spooner & Yao (in Yao & Spooner 1995b). A study by Hansen & Pfister (2006) shows *M. contorta* situated outside of *Melastiza*, in a clade containing *Humaria hemisphaerica* (F.H. Wigg.) Fuckel, but a later study (Hansen et al. 2013) shows *M. contorta* within *Melastiza*. *Melastiza carbonicola* was described by Moravec (1972) from burnt places (charred coniferous wood at the edge of a pond). Blank & Dougoud (1991) and Moravec (1995) also reported finds of *M. carbonicola* from soil or mossy soil. No molecular study has specifically been conducted on this genus recently.

The aim of the present study is to use the relatively large number of specimens deposited in the PRM herbarium (mostly under the names *M. chateri* and *M. greletii*) to identify *M. cornubiensis* and *M. carbonicola* and to revise and publish data on the occurrence of the less common *M. flavorubens* and *M. contorta*.

#### MATERIAL AND METHODS

Herbarium specimens were studied under a stereomicroscope using a small drop of tap water and studied in a lactophenol cotton blue solution (Merck: methyl blue 1 g/l, lactic acid 247 g/l, glycerol 502 g/l, phenol 204 g/l). A prepared slide was heated above a flame and after a short while of cooling studied under an Olympus BX-51 light microscope. The character of the hairs was usually examined at a magnification of 400× and the character of the ascospores was examined at a magnification of 1000× using an oil immersion lens. The ascospore size was measured excluding the ornamentation. Examined specimens are deposited in the PRM herbarium (National Museum, Prague, Czech Republic). Specimen data is cited in the form used on the herbarium labels. Czech texts have been translated into English.

#### RESULTS AND DISCUSSION

***Melastiza carbonicola*** J. Moravec, Česká Mykol. 26(2): 78, 1972      Fig. 1 a–c

Measured characters. Hairs 1–3(4)-septate, 37–135 × (8.5)10–16 µm. Ascospores 14.5–17.5(19) × 8–10 µm (average 16.1 × 8.9 µm), ornament at the apices 1.3–3.1 µm high, up to 8 µm wide, ridges in central part of the ascospore 0.4–1.3(1.7) µm broad, mesh size 1.4–4.4(4.8) × 1.1–3 µm.

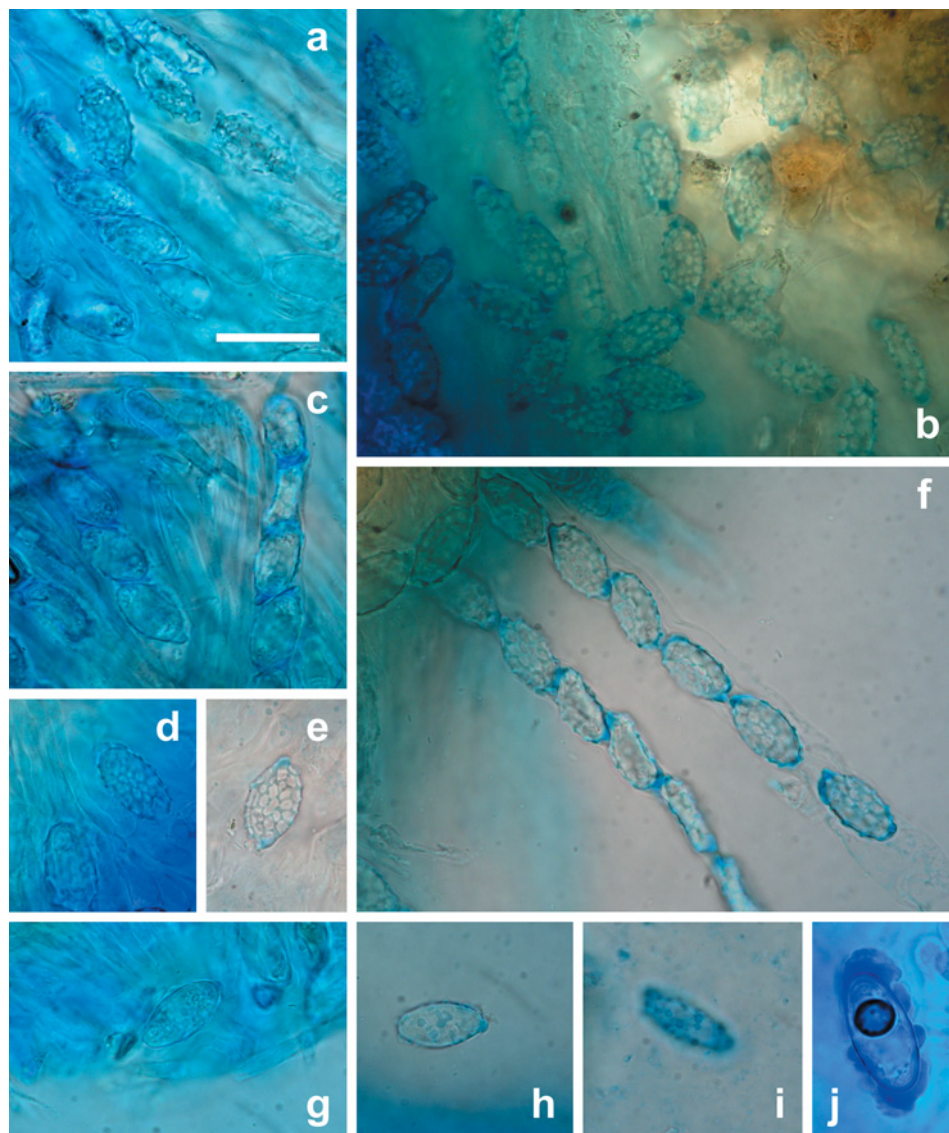
**Studied specimens**

Czech Republic. W Bohemia. Montes Šumava, in monte Špičák, ad terram, 8. VIII. 1965, leg. et det. J. Kubička (as *M. greletii*), PRM 824303. – C Bohemia. Kokořín, in convalle Boudecká rokle pr. Hlučov, ad terram nudam arenosam ad viam silvat., 5. VI. 1993, leg. et det. M. Svrček (as *M. chateri*), PRM 882513. – [Praha], Šárka, ad terram, 20. VI. 1946, leg. J. Landkamer [Landkammer] (as *M. chateri*), PRM 709270. – Praha, in horto publico Stromovka, ad terram muscosam, 22. X. 1949, leg. J. Hančl, det. M. Svrček (as *M. chateri*), PRM 939466. – Praha, Kinského sady, ad terram sub dumetis, 16. VIII. 1959, leg. E. Wichanský, det. M. Svrček (as *M. chateri*), PRM 617737. – [Černé] Voděradý pr. Kostelec nad Černými lesy, ad terram argillaceam, IX. 1950, leg. A. Příhoda, det. M. Svrček (as *M. chateri*), PRM 611032. – S Bohemia. Červená Řečice (distr. Pelhřimov), apud facturam ad ripam sinistram fluminis Trnávka (edge of paper mill sludge tank), 26. VII. 1986, leg. V. Skalický, det. M. Šandová, PRM 939524. – Křemže, 2 km E, Mladé Bory (forest district), Němá strouha (brook), mixed forest, on forest trail, 5. VII. 1984, leg. V. Dvořák, det. M. Svrček (as *M. chateri*), PRM 939526. – Český Krumlov, Městský kopec, 17. X. 1971, leg. et det. J. Kubička (as *M. chateri*), PRM 842486 (publ. Kubička 1975). – Rojov prope Kaplice, in declivitatibus montis Poluška (918 m s.m.), ad terram nudam viae silv., 19. IX. 1970, leg. et det. M. Svrček (as *M. chateri*), PRM 715468. – Měchnov pr. Trhové Sviny, ad terram nudam, 20. VIII. 1966, leg. J. Kubička, det. M. Svrček (as *M. chateri*), PRM 939444. – Smržov pr. Lomnice nad Lužnicí, ad marginem piscinae Dvořiště, ad terram deustam, 1. VII. 1962, leg. J. Kubička, det. M. Šandová, PRM 939494. – Smržov pr. Lomnice nad Lužnicí, ad ripam piscinae Dvořiště, ad terram arenosam, 1. VII. 1962, leg. et det. J. Kubička (as *M. chateri*), PRM 568027 (? publ. Svrček & Kubička 1963, as *M. greletii*, sample numbers are not mentioned in the publication). – Třeboň, loco Vimperka (near Svět pond), in sphagneto vetusto, 19. VI. 1965, leg. J. Kubička et S. Černý, det. J. Kubička (as *M. chateri*), PRM 777402. – Třeboň, ad terram nudam, VIII. 1959, leg. J. Kubička, det. M. Svrček (as *M. greletii*), PRM 613876. – Třeboň, ad terram argillaceam, 5. VII. 1960, leg. J. Kubička, det. M. Svrček (as *M. greletii*), PRM 620315 (the specimen contains *M. carbonicola* and *M. flavorubens*). – Třeboň, in horto publico, 23. VII. 1961, leg. et det. J. Kubička (as *M. greletii*), PRM 824302. – Třeboň, park, on bare soil, 28. VI. 1963, leg. L. Kubičková, det. J. Kubička (as *M. greletii*), PRM 939448 (the specimen contains *M. flavorubens* and *M. carbonicola*; deposited under *M. flavorubens*). – Moravia. Bystrc pr. Brno (now part of Brno), silva Rakovec, ad viam prope rivulum (*Alnus*, *Acer pseudoplatanus*), 26. VIII. 1962, leg. K. Koncerová, det. M. Šandová, PRM 568599. – In valle rivi Melatín prope Soběšice, distr. Brno (now part of Brno), ad terram nudam, 14. IX. 1974, leg. M. Svrček et A. Vágner, det. M. Šandová, PRM 939464. – Těsnohlídkovo údolí valley near Brno, by road, 19. VIII. 1972, leg. et det. A. Vágner (as *M. chateri*), PRM 939402. – Bílovice nad Svitavou, in valle silvatico Těsnohlídkovo údolí, ad terram viae silvaticae, 15. IX. 1974, leg. M. Svrček et A. Vágner, det. M. Svrček (as *M. chateri*), PRM 824305; *ibid.*, ad terram viae, 15. IX. 1974, leg. M. Svrček et A. Vágner (as *M. chateri*), PRM 804170. – Montes Rychlebské hory, in valle rivi Bučinský potok, ca. 650 m s.m., ad viam humidam ad marg. silvae, 12. VIII. 1962, leg. K. Kříž, det. M. Svrček (as *M. chateri*), PRM 611034. – Montes Jeseníky, Karlova Studánka, ad terram nudam, 22. VIII. 1963, leg. et det. J. Kubička (as *M. chateri*; rev. M. Svrček), PRM 650098 (publ. Svrček & Kubička 1968). – Montes Jeseníky, Karlov, in valle Moravice, ad terram argillaceam viae, 22. VIII. 1963, leg. J. et L. Kubičkovi, det. J. Kubička (as *M. greletii*), PRM 650099. – Pitárná (Osoblaha region), ad terram argillaceam inter fragmenta *Zeaе maydis*, 14. VI. 1965, leg. J. Kuthan, det. M. Svrček (as *M. chateri*), PRM 611033. – Uničov, in horto castelli, ad terram inter gramina ad marginem viae, 5. XI. 1969, leg. J. Kupka, det. M. Svrček (as *M. chateri*), PRM 685583.

Austria. Steiermark, Graz, wenig betretener Weg im botanischen Garten der Universität Graz (ca. 370 m), 11. IX. 1974, leg. J. Poelt (Plantae graecenses, Fungi 12; as *M. chateri*), PRM 778541.

Germany. Rheinprovinz, Boppard, auf sandigem Boden in einem Strassengraben, 20. IX. 1938, leg. J. Sponheimer (Sydow, Mycotheca germanica, no. 3340; as *Lachnea miniata*), PRM 178847.

Italy. Padova, in silvula horti botanici, ad terram muscosam, umbrosam, VII. 1902, leg. A. Pignal (D. Saccardo, Mycotheca italica, no. 1054; as *L. miniata*), PRM 178846.



**Fig. 1.** Ascospores of *Melastiza carbonicola* (a–c), *M. cornubiensis* (d–f), *M. flavorubens* (g–i) and *M. contorta* (j): **a** – PRM 611032; **b** – PRM 611033; **c** – PRM 568599; **d–e** – PRM 147291; **f** – PRM 148428; **g** – PRM 952668; **h** – PRM 824301; **i** – PRM 777406; **j** – PRM 922291. Scale bar (a–i) = 20  $\mu$ m. Photo M. Šandová.

Norway. Finnmark Fylke, Roeppen, ca. 10 km SE of Varangerbotu, on sandy roadside, 20. VIII. 1978, leg. S. Sivertsen, H. Dissing et R.P. Korf, det. R.P. Korf (Discomycetes Exsiccati, Department of Plant Pathology & Plant-Microbe Biology, Cornell University, Richard P. Korf & Robert Dirig, editors, no. 145), PRM 919602.

Poland. Area tuta Starożyn, apud viam (pr. Augustów), ad terram extra silvam, 12. IX. 1974, leg. Z. Pouzar, det. M. Šandová, PRM 847468.

Slovakia. [Montes] Strážovské vrchy, Domanižská Lehota, in declivitatibus septentr. montis Sádecký vrch (977 m s.m.), ad terram viae silv., 21. IX. 1975, leg. et det. M. Svrček (as *M. chateri*), PRM 939397. – Montes Nízke Tatry, in declivitate montis Chopok supra domum Srdiečko, ad terram argillaceam, 7. IX. 1960, leg. M. Svrček et J. Kubička, det. M. Šandová, PRM 939468. – Montes Nízke Tatry, in valle Trangoška, 1400 m s.m., ad terram nudam inter muscos (around a hunting lodge), 10. IX. 1960, leg. et det. M. Svrček (as *M. chateri*), PRM 614235; *ibid.*, ad terram nudam (around a hunting lodge), 10. IX. 1960, leg. M. Svrček et J. Kubička, det. M. Šandová (as *M. chateri*), PRM 614234 (publ. Svrček 1962). – [Montes] Slovenské Rudohorie, silva virginea Dobročský prales, ad terram nudam viae silv., 6. IX. 1962, leg. Z. Pouzar, det. M. Svrček (as *M. chateri*), PRM 568332. – Montes Vihorlat, in decliv. montis Sninský kámen, ad terram viae silvaticae, 2. VII. 1971, leg. et det. J. Kubička (as *M. greletii*), PRM 818125. – Poloniny [Mts.], Nová Sedlica, on mud of forest road, 8. VIII. 1966, leg. et det. K. Kult (as *Aleuria aurantia*; rev. M. Svrček, as *M. chateri*), PRM 629122. – Montes Nízke Poloniny, Nová Sedlica, in valle rivi Hlboký potok, 450–467 m s.m., in declivitate montis Kýčera (ca. 550 m s.m.), ad terram viae, 31. V. 1972, leg. et det. M. Svrček (as *M. chateri*), PRM 802347.

Sweden. Jämtland, Åre parish, Handöl, Oppgarden, moist road-cutting, 14. VIII. 1963, leg. J.A. Nannfeldt (no. 18281; Fungi exsiccati suecici, praesertim upsalienses, no. 3270; as *M. chateri*), PRM 838611. – Uppland, Läby parish, Vadbacka, on clay, 10. IX. 1963, leg. N. Lundquist (no. 4188; Fungi exsiccati suecici, praesertim upsalienses, no. 3269; as *M. chateri*), PRM 838556.

Switzerland. Arolla, Stirnmoräne des Glacier de Tsijioire nouve, 2200 m s.m., Gneis-schiefer, Exp. E. Lehmig, planierte Skipiste, 31. VII. 1982, leg. B. Irlet, det. M. Svrček (as *M. chateri*), PRM 879648. – Chur, in horto, 17. VI. 1968, leg. et det. J. Peter (as *M. chateri*), PRM 664926. – Fideris Gr., ca. 750 m s.m., ad terram muscosam, 7. XI. 1968, leg. et det. A. Pilát (as *M. chateri*), PRM 671901. – Davos, Davoser See, SSE bank, under railway line, on soil in woody debris and moss, 26. VI. 2009, leg. et det. J. Borovička (as *M. chateri*), PRM 915756.

United Kingdom. Scotland, Cadzow Park prope Hamilton, ad terram, 14. IX. 1959, leg. J.T. Palmer, det. M. Svrček (as *M. chateri*), PRM 939523.

***Melastiza cornubiensis*** (Berk. & Broome) J. Moravec, Mycotaxon 44(1): 68, 1992 Fig. 1 d–f

= *Melastiza chateri* (W.G. Sm.) Boud., Hist. Classific. Discomyc. Europe: 64, 1907

= *Lachnea miniata* (Fuckel) Gillet, Champ. France Discomyc. 8: 210, 1886

Measured characters. Hairs 1–3(5)-septate, 42–125(175) × 13.5–22(32) μm. Ascospores 14–18(19) × (7.5)8–10(10.5) μm (average 16.3 × 9.1 μm), ornament at the apices 1.3–3.2 μm high, ridges in central part of the ascospore 0.4–0.9 μm broad, mesh size 1.2–3.4 × 0.9–2.3 μm.

#### Studied specimens

Czech Republic. N Bohemia. České středohoří Protected Landscape Area, Korozluky, Jánský vrch National Nature Monument, western boundary of the reserve, on the ground in a disturbed place, 9. IX. 2011, leg. et det. M. Kříž (as *M. chateri*), PRM 923543; *ibid.*, 25. XII. 2012, leg. et det. M. Kříž (as *M. chateri*), PRM 923542. – C Bohemia. Křineč – Nová Ves – Branžež pr. Kněžmost, distr. Mladá Boleslav, ad terram nudam, 24. XII. 1966, leg. et det. J. Moravec (as *M. chateri*), PRM

939493 (a duplicate(?) of a specimen published by Moravec 1972, as *M. chateri*). – Tuhoměřice, ad terram nudam campi copiosissime (on the edge of a pit with beet cuts and on loam removed from it), 23. VIII. 1941, leg. J.A. Herink, det. M. Svrček (as *M. chateri*), PRM 939469. – Praha, in silva Čimický háj, ad terram nudam in fovea, 29. V. 1970, leg. R. Fellner, det. M. Svrček (as *M. chateri*), PRM 824306. – Praha, Hradčany, on pavement at Carmelite Monastery, 22. X. 1944, leg. K. Cejp, det. M. Svrček (as *M. chateri*), PRM 816715. – Praha, Kampa, XI. 1932, leg. J. Rohlena, det. M. Šandová, PRM 939430. – Praha, Kinského sady, ad terram nudam humidam, 12. VI. 1967, leg. et det. E. Wichanský (as *Lachnea scutellata*), rev. M. Svrček (as *M. chateri*), PRM 647292. – Praha, Nusle, between paving on pavement in front of Nusle Town Hall, 26. X. 1952, leg. et det. M. Svrček (as *M. chateri*), PRM 939465. – Praha, Bráník, in horto domi mei natalis supra fabricam cerevisiae, ad terram fossae, 3. X. 1984, leg. et det. J. Kubička (as *M. chateri*), PRM 842058. – [Praha], Chuchle, in fossa humida, 26. X. 1926, leg. J. Rohlena, det. J. Velenovský (as *L. miniata*), PRM 147291 (publ. Velenovský 1934, as *L. miniata*). – Chuchle pr. Pragam, in fossa, XI. 1926, leg. Rohlena, det. J. Velenovský (as *L. miniata*), PRM 148428 (publ. Svrček 1949, as *M. chateri*). – [Praha], Uhřetěves, on edge of a draining tank for sugar sludge, 19. XI. 1969, leg. M. Jungmannová, det. M. Svrček (as *M. chateri*), PRM 709269. – Moravia. Adamov pr. Brno, in declivitate montis Alexandrovka, ad terram nudam in fageto, 24. IX. 1972, leg. M. Svrček, det. M. Šandová, PRM 939445; *ibid.*, 24. IX. 1972, leg. M. Svrček et J. Moravec, det. M. Šandová, PRM 939473. – Kroměříž, in horto privato, ad terram argillaceam, 19. IX. 1963, leg. H. Zavřel, det. M. Svrček (as *M. chateri*), PRM 824304. – Kroměříž region, Hulín, in clay pit of brick factory, 200 m a.s.l., 25. X. 1958, leg. H. Zavřel, det. M. Svrček (as *M. chateri*), PRM 614319.

Austria. Austria inferior, ad terram et inter gramina ad Klosterneuburg, XI., leg. H. Zuderell et T. Cernohorsky, det. Keissler (Kryptogamae exsiccatae editae a Mus. Hist. Nat. Vindobon., no. 3114, as *L. miniata*), PRM 178844. – Nied.-Oesterreich, Vorgarten der Höheren Bundeslehranstalt für Wein-, Obst- und Gartenbau in Klosterneuburg, auf blosser Erde in Spalierobstbeeten, 29. XI. 1930, leg. H. Zuderell et T. Cernohorsky (V. Litschauer et A. Lohwag, Fungi selecti exsiccati europaei, no. 25; as *L. miniata*), PRM 178848.

Sweden. Uppland, Uppsala, Wahlenbergsvägen, outside Gamla Chemicum, on clay at road-side, 16. X. 1935, leg. J.A. Nannfeldt (Fungi exsiccati suecici, praesertim upsalienses, no. 273; as *M. chateri*), PRM 178742.

***Melastiza flavorubens*** (Rehm) Pfister & Korf, Phytologia 21(4): 204, 1971

Fig. 1 g–i

= *Melastiza greletii* Le Gal, Bull. Trimestriel Soc. Mycol. France 74(2): 151, 1958

Measured characters. Hairs 1–4-septate, 42–110(150) × 8.5–17 µm. Ascospores 13.5–19 × (7)7.5–9 µm (average 15.6 × 8.1 µm), ornament at the apices 1–1.8(2.1) µm high, pustules in face view of ascospores almost spherical, 1.2–2 × 1.1–1.8 µm in size.

Notes. During the revision of *M. flavorubens* specimens, specimen PRM 802123 (Josefovské údolí prope Adamov, ad terram calcaream viae silvaticae, in silva frondosa, 27. VIII. 1971, leg. M. Svrček et J. Moravec) showed larger, pale brown, more or less thin-walled hairs (107–227 × 15.8–23 µm, 2–5-septate), tapering towards apex or enlarged, but the ascospores were similar to *M. flavorubens* (measuring 13–17 × 7–8.5 µm; average 14.8 × 8.0 µm). The difference in hairs was confirmed in several slides and the identification of the find is still uncertain. Another specimen from the same date and locality (PRM 802124) was confirmed as *M. flavorubens*. Hairs of *M. flavorubens* measure 30–50–100 × 8–14–16 µm

according to Moravec (1972), 20–80–100 × 8–19 µm according to Moravec (1971), but during this study, hairs of a length of 130 or 150 µm were also found in the revised material. According to Dissing et al. (2000), the hairs of *M. flavorubens* are 2–5-septate and up to 150 µm long. This agrees with the revised *M. flavorubens* material except for the up to 5-septate hairs. Lassueur (1980) mentions hairs of *M. flavorubens* 60–250 × 10–20 µm large, with blunt apices and often clavate to pyriform. Although the hairs measured in unidentified find PRM 802123 might be almost in the range of it except for the hair width, I still feel some hesitation because of the shape, colour and wall thickness of the hairs observed in the specimen.

*Melastiza kumouensis* was described by Khare (1985) as differing from Moravec's (1972) description in having larger, blood-red apothecia, 1–4-septate, longer hairs and broader paraphyses. The hairs of *M. kumouensis* measure 50–135 × 8–18 µm according to the protologue and the paraphyses are up to 9 µm wide (according to the mentioned pigmentation, probably in living state). Paraphyses of the studied specimens of *M. flavorubens* were 3.6–6.6 µm wide. In my opinion, *M. kumouensis* might be a synonym of *M. flavorubens*, as previously stated by Moravec (1995).

#### Studied specimens

Czech Republic. N Bohemia. České středohoří Protected Landscape Area, Bílé stráně National Nature Monument near Litoměřice, by brook, on the ground under hazel, alder, poplar and ash, in humid place, 18. VII. 2011, leg. et det. M. Kříž, PRM 859963. – C Bohemia. Karlštejn, ad terram humidam, in silva frondosa, 12. X. 1947, leg. A. Doubová, det. V. Vacek (as *M. chateri*, syn. *Lachnea miniata*), PRM 515004. – S Bohemia. Bechyně, in horto publico, 4. VIII. 1961, leg. et det. J. Kubička (as *M. greletii*), PRM 824301. – Třeboň, ad terram argill., 5. VII. 1960, leg. J. Kubička, det. M. Svrček (as *M. greletii*), PRM 620315 (publ. Svrček & Kubička 1963, as *M. greletii*; the specimen contains *M. carbonicola* and *M. flavorubens*; deposited under *M. carbonicola*). – Prope oppidum Třeboň, ad terram argillaceam, 31. VIII. 1960, leg. J. Kubička (as *M. chateri*), PRM 620314. – Třeboň, ad scholam, ad terram arenosam, 27. VI. 1961, leg. J. Kubička, det. M. Šandová, PRM 616370. – Třeboň, park, on bare soil, 28. VI. 1963, leg. L. Kubičková, det. J. Kubička (as *M. greletii*), PRM 939448 (the specimen contains *M. flavorubens* and *M. carbonicola*). – Třeboň, in horto publico, 28. VI. 1965, leg. et det. J. Kubička (as *M. chateri*), PRM 777406. – Třeboň, park, 15. VIII. 1967, leg. J. Kubička, det. M. Šandová, PRM 646840. – Třeboň, park near school, sewerage trench, on bare soil, 4. IX. 1967, [leg. et det. M. Svrček] (as *Melastiza* cf. *greletii*), conf. M. Šandová, PRM 952668 and 952669. – Moravia. Moravský kras [Moravian Karst], in valle Josefské [Josefovské] údolí prope Adamov, ad terram calcaream viae, in silva frondosa, 27. VIII. 1971, leg. M. Svrček et J. Moravec (as *M. greletii*), PRM 802124 (the locality is mentioned by Moravec 1972; publ. Černý & Kříž 1972). – Brno, Těsnohlídkovo údolí valley [near Bílovice nad Svitavou], in margin of wet forest trail, 19. VIII. 1972, leg. A. Vágner, det. M. Svrček, PRM 939416. – Žarošice, ad terram humidam circa viam, in silva, 25. VIII. 1942, leg. et det. V. Vacek (as *L. miniata*), PRM 178845. – Žarošice, ad viam silvaticam in societate *Lachnea nuda*, 31. VII. 1947, leg. et det. V. Vacek (as *M. chateri* ss. Seaver, syn. *L. miniata*), PRM 709272. – Žarošice, ad terram humidam, in silva frondosa, 8. VIII. 1947, leg. et det. V. Vacek (as *M. chateri* ss. Seaver, syn. *L. miniata*), PRM 709271 (data from Žarošice was probably used, as *M. chateri*, by Šmarda 1960: 112, 118).

Hungary. Somogyfajsz, 18. VII. 1957, leg. L. Szemere, det. M. Svrček, PRM 824307.



*Melastiza contorta* (Masse & Crossl.) Spooner & Y.J. Yao, Mycotaxon 53: 469, 1995 Fig. 1j

= *Melastiza scotica* Graddon, Trans. Brit. Mycol. Soc. 44(4): 609, 1961

Measured characters. Hairs up to 10(?)-septate, 116–540 × 15.5–18.5 µm. Ascospores 19–25.5 × 10.5–13 µm (average 22.1 × 11.9 µm), ornament at the apices 3.9–6.8 µm high, on sides 1–3.5 µm high, pustules measured in face view of ascospores c. 2–6.5 µm in size.

Note. A previous find from České Švýcarsko (Bohemian Switzerland) National Park was published by Hagara (2014) from Hluboký důl near Mezní louka.

#### Studied specimen

Czech Republic. N Bohemia. České Švýcarsko National Park, c. 3.3 km N of Hotel Lípa in the village of Vysoká Lípa, 1.9 km NW to 1.9 km WNW of the top of Mlýny hill, locality: Střelecká rokle, broad sandstone gorge, grown by mossy to boggy *Picea* forest, rarely with *Fagus*, with mosses or *Sphagnum* at the bottom, alt. 330 m, in needles and moss under young *Picea* trees, close to layer of sand (deposited by heavy rains), 20. IX. 2010, leg. L. Edrová & J. Holec, det. J. Holec (as *Aleuria aurantia*; rev. M. Šandová, as *M. scotica*), PRM 922291.

#### Notes on non-studied and excluded specimens

Non-type material of *Melastiza* deposited in the PRM herbarium was revised. There is one type specimen in the herbarium, the type of *M. carbonicola*, which contains three quarters of an apothecium at present (not investigated microscopically during this study to avoid unnecessary loss of material). Isotypes are present in BRA, CUP and BRNM according to Moravec (1995) and Antonín & Vágner (2000). *Melastiza rubra* (L.R. Batra) Maas Geest. represented by two specimens (from China and Japan) in the PRM herbarium was neither investigated during this study.

During the revision, 84 specimens proved microscopically to contain material belonging to *Melastiza*, one specimen remained unidentified and 23 specimens were moved to *Scutellinia* (including 18 specimens of *Lachnea chateri* collected by J. Velenovský between 1920 and 1941 and 5 specimens by other collectors labelled as *M. chateri*, *L. chateri*, *M. greletii* and *Melastiza* indet.). According to Svrček (1949), *L. chateri* in the sense of Velenovský (1934) represents *L. umbrorum* (Fr.) Gillet [= *Scutellinia umbrorum* (Fr.) Lambotte]. In the present revision, this identification was confirmed microscopically for specimens PRM 147272, 147273 and 614754 (Libochovičky, VII. 1924, leg. F. Fechtner, Žehušice, VI. 1920, leg. J. Velenovský, and Menčice prope Mnichovice, 1. IX. 1923, leg. et det. J. Velenovský, all designated as *M. chateri*). The same identification was also confirmed for specimens PRM 129630 (Czech Republic, 'Rohožec', 3. VI. 1920, collector not mentioned [possibly J. Velenovský, Rohozec near Žehušice], as *L. chateri*), PRM 818179 (Slovakia, Poloniny, Runina apud Snina, 4. VII. 1971, leg.

et det. J. Kubička, as *M. greletii*) and PRM 884651 (Pičín, path to Kuchyňka Nature Reserve, 30. IX. 1980, leg. Anonymus, as *Melastiza*).

### Remarks to the identity of the studied species

During the revision, 1 to 6 slides per *Melastiza* specimen were examined because of the maturity of the apothecia (up to 3 or 4 slides) or the presence of two species in the specimen.

Two times, *M. flavorubens* was confirmed together with *M. carbonicola* in one specimen. In specimen PRM 939448, *M. flavorubens* was found to have thinner and smaller apothecia than *M. carbonicola*, but I do not consider this a rule. Specimens PRM 650099, 613876 and 568027, possibly identified only in the field by M. Svrček or J. Kubička as *M. greletii*, contain *M. carbonicola* according to the present revision, based on several apothecia from each specimen. The joint occurrence of the two species and the possibly similar colour (in my opinion possibly explaining the abovementioned identifications) led me to the question of differences in ascospore ornamentation. Moravec (1995) demonstrated (also in SEM) the ascospore ornamentation of *M. flavorubens*, which is similar only to that of *M. boudieri* (having larger ascospores) and is characterised by the presence of only thin ribs between the pustules. During examination of *M. carbonicola*, I often came across elevated peaks on the net at the nodes or missing ridges in part of the centre of the ascospore. But except for the ornamentation (protuberant ridges characterising *M. carbonicola* vs. *M. flavorubens*) also the ascospore size proved to be different (slightly smaller in *M. flavorubens*; see Tab. 1).

During the revision, *M. carbonicola* was distinguished from *M. cornubiensis* on the basis of larger (esp. broader) polar ornamentation, but out of three slides of specimen PRM 568599, one was closer to *M. cornubiensis* and two closer to *M. carbonicola*. The specimen was finally identified as *M. carbonicola*. From the above descriptions it also follows, in accordance with Moravec (1995), that the ridges in the central part of *M. carbonicola* ascospores are broader and the mesh size is larger when averaged. Hairs of *M. cornubiensis* were found to be broader than in *M. carbonicola*, which also agrees with and has been already published by Moravec (op. cit.). The lists of revised specimens show many finds of *M. carbonicola* from S Bohemia and many finds of *M. cornubiensis* from Prague (C Bohemia). The weight of these differences should not be overvalued since the finds come from different mycologists. However, some correlations with habitat might be assumed. The measurements of ascospores given in the descriptions (see also Tab. 1) were found to be almost identical in *M. carbonicola* and *M. cornubiensis*. A definitive conclusion on the identity of *M. carbonicola* and *M. cornubiensis* or their difference is not drawn due to absence of molecular data.

**Tab. 1.** Average values of ascospore length and width found during the present study for *Melastiza carbonicola* (50 measurements), *M. cornubiensis* (40 measurements) and *M. flavorubens* (38 measurements)

Species	average length of ascospores (µm)	average width of ascospores (µm)
<i>Melastiza carbonicola</i>	16.1	8.9
<i>Melastiza cornubiensis</i>	16.3	9.1
<i>Melastiza flavorubens</i>	15.6	8.1

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