Microbotryum lagerheimii sp. nov. (*Microbotryaceae*)

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Abstract. The taxonomic status of *Microbotryum* species on *Silene vulgaris, Lychnis viscaria,* and *L. alpina* is discussed. A new species on *Lychnis viscaria, Microbotryum lagerheimii,* is described and illustrated.

Key words: *Caryophyllaceae, Lychnis alpina, Lychnis viscaria, Microbotryum, Silene vulgaris,* smut fungi

Introduction

Recently, it was proposed that the genus *Microbotryum* should be restricted to the group of the anthericolous species (incl. *M. majus*) on *Caryophyllaceae* (Almaraz *et al.* 2002; Denchev 2006; Denchev *et al.* 2006, 2007). In the present article, the taxonomic status of species of *Microbotryum* on *Silene vulgaris, Lychnis viscaria,* and *L. alpina* is discussed and a new species, *Microbotryum lagerheimii,* is described and illustrated.

Materials and Methods

Material from the herbaria of BERN, BP, BPI, COLO, DAOM, F, FH, GZU, H, ISC, KSC, M, MA, MICH, NY, S, and UC was examined under light microscope (LM) and scanning electron microscope (SEM). Herbaria abbreviations follow Holmgren & Holmgren (1998). For LM observations, the spores were mounted in lactophenol solution on glass slides, gently heated to boiling point and then cooled. The measurements of spores are given in the form: min-max (mean ± 1 standard deviation). In the description, the symbol '$n/_{x=}$' is used to indicate the total numbers of measured collections and spores, respectively. For SEM, the spores were attached to specimen holders by double-sided adhesive tape and coated with gold. The surface structure of spores was observed at 15 kV and photographed with a scanning electron microscope. The spore mass colour treatment is based on Rayner's colour chart (Rayner 1970).

Taxonomic status of *Microbotryum* species on *Silene vulgaris, Lychnis viscaria,* and *L. alpina*

An anthericolous smut fungus found on *Lychnis alpina* and *L. viscaria* was noted by Lagerheim as a separate taxon under the name *Utilago pallida* Lagerh. This taxon was distributed in Sydow's exsiccata, initially as *Ustilago violacea* Fuckel β *pallida* Lagerh. on *Viscaria alpina* (Sydow, Ustilagineen, no. 65), thereafter as *Ustilago pallida* Lagerh. on *Viscaria vulgaris* (Sydow, Ustilagineen, no. 111); in both cases the name was published as a *nomen nudum.* This name was validated by Bubák (1912, n.v.; cfr Bubák 1916: 22) as *Ustilago pallida,* on the basis of Lagerheim's specimen distributed in Sydow's exsiccata but remains an illegitimate name as it is homonymous with two previously published names (*U. pallida* Körn. and *U. pallida* J. Schröt.).

Subsequently, many authors have discussed the problem about species delimitation within the group of anthericolous smut fungi on different members of *Caryophyllaceae.* Liro (1924) proposed that the smut fungus, *Ustilago silenes-inflatae,* found in the anthers of *Silene vulgaris,* was a separate species and distinguished it from the anthericolous smut fungi on other *Silene* spp. and other genera of *Caryophyllaceae.* He successfully carried out artificial infection of *Silene vulgaris* with spores of *Utilago pallida* on *Lychnis viscaria* and concluded that *Lychnis viscaria* was an additional host of *Ustilago silenes-inflatae.* Based on this experiment, Liro reduced *Utilago pallida* to a synonym of *U. silenes-inflatae.* This taxonomic proposition has been accepted by many mycologists (incl.

Deml & Oberwinkler 1982, 1983; Scholz & Scholz 1988; Vánky 1994 – as *Microbotryum silenes-inflatae*). In the recent literature (Scholz & Scholz 1988; Vánky 1994; etc.), the colour of the spore mass of *U. silenes-inflatae* is described as greyish violet.

During an extended examination (1994-2007) of the spore mass colour and morphometric variability of the spores of anthericolous smut fungi on *Caryophyllaceae,* we found that there was a clear difference between the spore mass colour of the species on *Silene vulgaris,* compared with the species on *Lychnis alpina* and *L. viscaria.*

Nannfeldt (1959) noted the importance of the spore mass colour in the taxonomic separation of the anthericolous smuts on *Caryophyllaceae.* Lutz *et al.* (2005) tried to apply this approach but only selected three groups of spore mass colours, based on their intensity, i.e., dark, medium, and light. We took into consideration the three levels of colour intensity (low, medium, and high), as well as the basic colour and number of colours in the case of compound colours based on Rayner's colour chart (Rayner 1970; cfr also the explanations in Stearn 1998: 233-235).

For the spore mass of the anther smut on *Lychnis alpina* and *L. viscaria,* we found the colours: fawn (87 – *hinnuleus*), hazel (88 – *avellaneus*), livid vinaceous (83 – *vinoso-lividus*), salmon (41 – *salmoneus*), flesh (37 – *incarnatus*), pale vinaceous (85 – *subvinosus*), or rosy vinaceous (58 – *roseo-vinosus*). Fawn, hazel, and livid vinaceous were of medium intensity, while the rest were of low intensity.

For the spore mass of the anther smut on *Silene vulgaris,* we found the colours: dark brick (60 – *latericius*), sepia (63 – *sepiaceus*), dark livid (80 – *atrolividus*), dark vinaceous (82 – *atrovinosus*), rarely dark reddish brown, dark purple (36 – *atropurpureus*), or purple slate (102 – *purpureo-ardesiacus*); all of high intensity.

Based on these results we found that the smut fungus on *Lychnis alpina* and *L. viscaria* has spore mass of medium or low colour intensity, while the smut fungus on *Silene vulgaris* has spore mass of high colour intensity.

For the anther smut on *Silene vulgaris,* with spore mass of high colour intensity, we retain the name *Microbotryum silenes-inflatae,* while for the anther smut on *Lychnis alpina* and *L. viscaria,* with spore mass of medium or low colour intensity and definitely paler spores than these on *Silene vulgaris,* we propose a new species, *Microbotryum lagerheimii.*

The authentic specimen from the artificial infection of *Silene vulgaris,* made by Liro with spores of *Ustilago pallida* Lagerh. from *Lychnis viscaria* and described in his monograph (Liro 1924), has fawn coloured spore mass of the attacked anthers in open flowers and livid vinaceous spore mass of the attacked anthers in closed calyces. Both colours are typical for the smut on *Lychnis alpina* and *L. viscaria* (*Microbotryum lagerheimii*) but not for the smut on *Silene vulgaris* (*Microbotryum silenes-inflatae*). This means that in the case of this particular artificial infection, *Silene vulgaris* has to be treated as an additional host of *Microbotryum lagerheimii.* We also observed a few cases of natural infection of *Silene vulgaris,* considered to be *Microbotryum lagerheimii* (see the selected list of specimens). In addition, we observed a few cases of natural infection of *Lychnis alpina,* considered to be *Microbotryum silenes-inflatae* (specimens with a dark livid to dark vinaceous spore mass).

Microbotryum silenes-inflatae (DC. ex Liro) G. Deml & Oberw. emend. Denchev, Phytopath. Z. **104**: 354, 1982. — [*Uredo antherarum* DC. β *silenes-inflatae* DC., Flore française, 3rd edn, **6**: 79, 1815 (nom. nudum)]. — *Ustilago silenes-inflatae* DC. ex Liro (as "(DC.) Liro"), Ann. Acad. Sci. Fenn., Ser. A, **17**(1): 44, 1924. — Lectotype on *Silene vulgaris* (as *S. inflata*), Czech Republic (as Bohemia), Krupka (as Graupen), 1873, F. de Thümen (H.U.V. 7340; design. by Vánky 1985: 250); isolectotypes in Thümen, Fungi austr. exs., no. 1031 (as *Ustilago violacea* f. *silenes-inflatae*).

Sori in the anthers. **Spore mass** powdery, dark brick, sepia, dark livid or dark vinaceous, rarely dark reddish brown, dark purple or purple slate. **Spores** globose, subglobose, ovoid, broadly ellipsoidal, rarely irregularly elongated, 5-11 × 5-10 (7.4±0.7 × 6.9±0.6) µm ($n/_{34}$=1700), length/width ratio 1.04-1.11 (mean 1.07); spore wall reticulate, (5–) 6-9 (–10) meshes per spore diameter, meshes mainly irregularly polygonal, sometimes irregularly or regularly rounded, (0.4–) 0.7-1.2 (–2) µm long.

Distribution: Europe.

Specimens examined (a selected list):

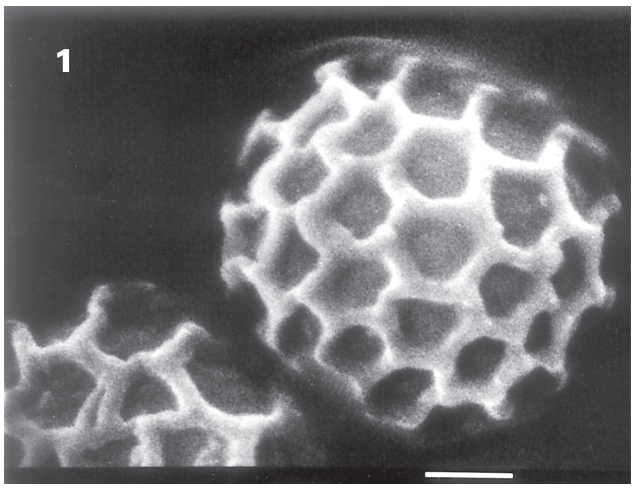
On ***Lychnis alpina*** L.: **FINLAND:** Tb., Viitasaari, Konginkangas, sine dat., W.F. Brotherus (as *U. silenes-inflatae* – H) [**dark livid <> dark vinaceous**]; NW-Le, SE-Ailakahvaarri, alt. *ca* 850 m, 1 Aug 1958, Laila & H. Roivainen (as *U. silenes-inflatae* – H) [**dark livid <> dark vinaceous**].

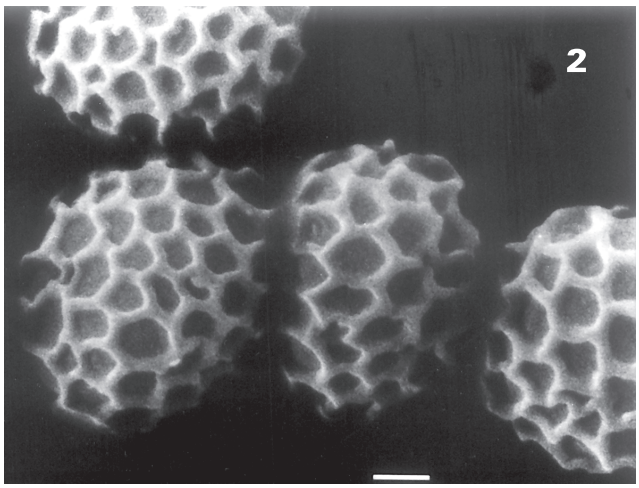
On ***Silene vulgaris*** (Moench) Garcke (*Silene cucubalus* Wibel, *S. inflata* Sm., *S. venosa* Asch.): **AUSTRIA:** Tirol, Sep 1913, K. Keimler (as *Ustilago* sp. – H) [**dark brick**]; Tirol, Kaiserjoch bei Pettneu, 27 Jul 1898, P. Sydow (Sydow, Ustilagineen, no. 171, as *U. violacea* – KSC, M, NY) (1) [**dark brick**]; Tirol, Ötztaler Alpen, Obergurgl, Weg zur Seenplatte, 25 Jul 1959, W. Brandenburger (as *U. violacea* – GZU) [***silenes-inflatae*-type**]; Tirol, Ötztaler Alpen, Gurgler Tal, beim Steinkofel am Weg zum Ramolhaus, *ca* 2120 m, 24 Jul 1959, M. Steiner & W. Brandenburger (Reliquiae Petrakianae, no. 2779, as *U. violacea* – GZU) (2) [***silenes-inflatae*-type**]; Tirol, Paznauntal bei Ischgl, Waldrand W vom Brandhof, 1490 m, 23 Jul 1970, W. Brandenburger (as *U. violacea* – GZU) (3) [***silenes-inflatae*-type**]; Tirol, Fimbertal oberhalb der Bodenalm, *ca* 2000 m, 31 Jul 1963, O. Klement (as *U. violacea* – M) (4) [***silenes-inflatae*-type**]; Tirol, Fimbertal Weg von Ischgl zum Boden, Stadel S der Pirstig Alp, 1720 m, 24 Jul 1970, W. Brandenburger (as *U. violacea* – GZU) (5) [***silenes-inflatae*-type**]; Austria super., pr. Kremsmünster, sine dat., Poetsch (Rabenhorst, Fungi europ., no. 397, as *U. violacea* – BP 3919, H) [**dark brick**]; **CZECH REPUBLIC:** Krupka (as Graupen), aest. 1873, F. de Thümen (Thümen, Fungi austr. exs., no. 1031, as *U. violacea* f. *silenes-inflatae* – GZU, H, NY, UC 1 270 794) (6) [**sepia <>dark brick**]; bei Prag, Jun 1883, Schiffner (as *U. antherarum* – M) (7) [***silenes-inflatae*-type**]; Hochgesenke Spiegl. Schneeberg, sine dat., J. Hruby (Petrak, Fl. Bohemiae et Moraviae exs., no. 2560, as *U. silenes-inflatae* – BP 3901) [**dark brick**]; Böhmen, Klein-skal, 10 Jun 1901, J.E. Kabat (as *U. silenes-inflatae* – H) [**dark brick**]; Moravia, Montes Jesenily, 'Vys. hole', Jul 1924, R. Picbauer (as *U. silenes-inflatae* – BPI 166 465) (8) [***silenes-inflatae*-type**]; Moravia, Brünn,

Jul 1927, J. Hruby (Petrak, Mycotheca generalis, no. 1079, as *U. silenes-inflatae* – BPI 166 503) (9) [***silenes-inflatae*-type**]; Moravia, Brünn, Jul 1930, J. Hruby (as *U. silenes-inflatae* – M) (10) [***silenes-inflatae*-type**]; Moravia, Brünn, Jul 1936, J. Hruby (Reliquiae Petrakianae, no. 1142, as *U. silenes-inflatae* – GZU) (11) [***silenes-inflatae*-type**]; Moravia, Mährisch-Weißkirchen (Hranice), Hrabuvka, Jul 1929, F. Petrak (Reliquiae Petrakianae, no. 1771, as *U. violacea* – GZU) (12) [***silenes-inflatae*-type**]; Moravia, M. Kroman, Aug 1927, J. Hruby (as *U. silenes-inflatae* – BP 3903) [**dark reddish brown** <> **dark brick**]; Moravia, Kotlina in mont. Jesenily, 18 Jul 1924, R. Picbauer (as *U. silenes-inflatae* – BP 3913) [**sepia**]; **DENMARK:** …, 16 Jul 1884, E. Rostrup (as *U. violacea* – H) [**dark brick**]; …, Oct 1887, E. Rostrup (as *U. violacea* – H) [**sepia**]; **FINLAND:** Lkem., Muonio, Torasieppi, 31 Jul 1903, K.H. Enwald (as *U. silenes-inflatae* – H) [**dark brick**]; Kuusamo, Kuusamo, Liikanen, 21 Jul 1949, L. Kari (Fungi exs. fennici, no. 158, as *U. silenes-inflatae* – H, MICH, NY, UC 1 143 973) [**dark brick** <> **dark vinaceous**]; PS, Joroinen, Lahnalahti, 13 Jul 1991, V. Haikonen (as *U. silenes-inflatae* – H) [**vinaceous grey**]; **GERMANY:** Zermath (Wallir), 24 Aug 1886, P. Magnus (as *U. antherarum* – M) (13) [***silenes-inflatae*-type**]; Bayern, Berneck, Jul 1875, Thümen (as *U. violacea* f. *silenes-inflatae* – FH, H, M, NY) (14) [**dark brick**]; Bayern, Reichenhall, Weißbachschlucht, Jun 1912, Schoenau (as *U. antherarum* – M) (15) [***silenes-inflatae*-type**]; Bayern, Reichenhall, 5 Aug 1916, Schoenau (as *U. violacea* – M) (16) [***silenes-inflatae*-type**]; Bayern, Berchtesgaden, zwischen Grunsee und Funkensee, 1500-1600 m, 9 Aug 1917, Schoenau (as *U. violacea* – M) (17) [***silenes-inflatae*-type**]; Bayern, Windsbach, Retzendorf, Sep & Oct 1920, A. Vill (Zillig, Ustilag. Europ., no. 120, as *U. violacea* – M) (18) [***silenes-inflatae*-type**]; Bayern, Pfronten, Jul 1920, sine coll. (as *U. violacea* – M) (19) [***silenes-inflatae*-type**]; Bayern, Bezirk Kempten, Masers, 9 Aug 1936, H. Poeverlein (as *U. silenes-inflatae* – M) (20) [***silenes-inflatae*-type**]; Bayern, Bezirk Regensburg, Matting, 24 Jun 1939, E. Eichhorn (as *U. silenes-inflatae* – M) (21) [***silenes-inflatae*-type**]; ditto, Wörth a.D., 27 Jun 1943, E. Eichhorn (as *U. silenes-inflatae* – M) (22) [***silenes-inflatae*-type**]; Bayern, Kr. Wolfstein, Neureichenau, 18 Jun 1939, E. Eichhorn (Sydow, Mycotheca german., no. 3260, as *U. silenes-inflatae* – M) (23) [***silenes-inflatae*-type**]; Hessen, Kr. Alsfeld, Gr. Felda, Goldberg, 4 Jul 1948, H. Hupke (as *U. silenes-inflatae* – BPI 193 166, UC 1 320 059) (24) [**dark livid**]; ditto, Goetberg, 30 Jun 1952, H. Hupke (as *U. silenes-inflatae* – H) [**dark reddish brown**]; Nordrhein-Westfalen, Siegtal, Windecker Berg, Jun 1930, A. Schumacher (as *U. silenes-inflatae* – DAOM 24 017, F) (25) [**dark brick**]; ditto, 30 May 1932, A. Schumacher (Sydow, Mycotheca german., no. 2658, as *U. silenes-inflatae* – COLO F-8658, ISC 370 589, M, MA 11 359, MICH, UC 567 477) (26) [**dark brick**]; Mecklenburg, Rügen, Gr. Zicker, 12 Jul 1899, P. Sydow (Sydow, Ustilagineen, no. 216, as *U. violacea* – FH, M, NY) [**dark brick** or **dark livid**]; Sachsen-Anhalt, Kr. Wanzleben, Seehausen, 5 Oct 1934, Fahrendorff (as *U. silenes-inflatae* – M) (27) [***silenes-inflatae*-type**]; Sachsen-Anhalt, Naumburg, Jenaner Landstr., 25 Jun 1932, L. Lange (as *U. violacea* – M) (28) [***silenes-inflatae*-type**]; Sachsen, Königstein, 14 Jun 1890, W. Krieger (Krieger, Fungi saxonici, no. 1701, as *U. violacea* – MICH) (29) [**dark brick**]; **HUNGARY:** in valle 'Kerteskő völgy' pr. pag. Bakonybél m. Bakony Hegység, 26 Jun 1963, S. Tóth (as *U. silenes-inflatae* – BP 40 437) [**sepia**]; **ITALY:** Sicilia, Palermo, Busumbra, *ca* 900 m, Jul 1895, H. Ross (as *U. violacea* – M) (30) [***silenes-inflatae*-type**]; **POLAND:** "Liegnitz", 1869, Gerhardt (Schneider, Herb. Schles., Pilze, no. 194, as *U. antherarum* – H) [**dark brick**]; "Alta Weistritz", sine dat., Schröter (Schröter, Pilze Schlesiens, no. 439, as *U. silenes-inflatae* – H) [**dark purple**]; **REPUBLIC OF MACEDONIA:** Treska, Üsküb, 10 May 1917, J. Bornmüller (as *U. silenes-inflatae* – H) [**sepia**]; **ROMANIA:** Transsilvania, oppid. Sighişoara, mons 'Kereszthegy', 18 Jul 1956, K. Vánky (as *U. violacea* – BP 33 727) [**dark brick**]; **SWEDEN:** Norrbotten, ad Wittangi, Aug 1894, R. Tolf (Eriksson, Fungi parasitici scandinavici, no. 452b, as *U. violacea* – NY) [**dark brick** or **sepia**]; Jämtland, Ås, 17 Jul 1920, K. Falck (as *U. violacea* – UC 1 272 848) [**dark livid**]; **SWITZERLAND:** Bellinzona, 6 Sep 1927, W. Ritz (as *U. violacea* – BERN) [**dark brick**]; Zürich, Aug 1879, G. Winter (Winter, Fungi Helvetici, no. 206, as *U. antherarum* – FH) (31) [**dark brick**]; Freiburger Alpen, zwischen Bounavaux und Bounavallelta, 23 Aug 1891, E. Fischer (as *U. violacea* – BERN) [**purple slate**]; zwischen Zallikop und M. (?)Bucrsee, 17 Jun 1892, Fischer (as *U. violacea* – BERN) [**dark brick**]; Graubünden, Bergen, 20 Aug 1904, P. Magnus (as *U. silenes-inflatae* – H) [**dark brick**]; Graubünden, Alps (Davos), Klosters, Monbiel, 21 Jul 1970, E. Müller (as *U. silenes-inflatae* – H) (32) [***silenes-inflatae*-type**]; Graubünden, Davos, Sertig, 1850 m, 8 Aug 1991, B. Senn-Irlet (as *U. violacea* – BERN) [**dark reddish brown**]; Graubünden, Rhätische Alpen, Val Tuors E Filisur, Talgrund und untere Hänge oberhalb Chans, 1800-2000 m, 29 Aug 1980, J. Poelt (as *U. violacea* – GZU) (33) [***silenes-inflatae*-type**]; les haies entre Rizi et Albuda, 1888, G. Lagerheim (C. Roumeguère, Fungi sel. exs., no. 5916b, as *U. violacea* – NY) [***silenes-inflatae*-type**].

Morphometric variability of the spores

On ***Silene vulgaris:*** (1) Austria, 27 Jul 1898, P. Sydow (Sydow, Ustilagineen, no. 171), spores 5-11 × 5-8 (7.3±1.0 × 6.6±0.7) µm; (2) Austria, 24 Jul 1959, M. Steiner & W. Brandenburger, spores 5.5-10.5 × 5.5-8 (7.2±0.8 × 6.6±0.6) µm; (3) Austria, 23 Jul 1970, W. Brandenburger, spores 6.5-10.5 × 5.5-8 (7.6±0.9 × 7.0±0.6) µm; (4) Austria, 31 Jul 1963, O. Klement, spores 6.5-8 × 5.5-7.5 (7.3±0.5 × 7.0±0.5) µm; (5) Austria, 24 Jul 1970, W. Brandenburger, spores 5.5-9 × 5.5-7.5 (6.8±0.5 × 6.4±0.5) µm; (6) Czech Rep.: aest. 1873, F. de Thümen (Thümen, Fungi austr. exs., no. 1031), attacked anthers in closed calyces, spores 6.5-10 × 6.5-10 (8.1±0.7 × 7.5±0.7) µm, (6a) attacked anthers in open flowers, spores 5.5-9 × 5-8 (7.2±0.7 × 6.6±0.7) µm; (7) Czech Rep.: bei Prag, Jun 1883, Schiffner, spores 5.5-8 × 5-8 (6.9±0.6 × 6.4±0.7) µm; (8) Czech Rep.: Jul 1924, R. Picbauer, spores 5.5-9 × 5-8 (7.3±0.7 × 6.7±0.6) µm; (9) Czech Rep.: Jul 1927, J. Hruby (Petrak, Mycotheca generalis, no. 1079), spores 5.5-9 × 5-7.5 (7.0±0.6 × 6.6±0.5) µm; (10) Czech Rep.: Jul 1930, J. Hruby, spores 6.5-10 × 5.5-10 (7.9±1.0 × 7.2±0.9) µm; (11) Czech Rep.: Jul 1936, J. Hruby (Reliquiae Petrakianae, no. 1142), spores 6.5-10.5 × 5.5-9 (7.6±0.7 × 6.9±0.5) µm; (12) Czech Rep.: Jul 1929, F. Petrak (Reliquiae Petrakianae, no. 1771), spores 6.5-10 × 5.5-7.5 (7.1±0.5 × 6.5±0.5) µm; (13) Germany: 24 Aug 1886, P. Magnus, spores 6.5-10 × 5.5-9 (7.7±0.8 × 7.1±0.7) µm; (14) Germany: Jul 1875, Thümen, spores 6.5-10 × 5.5-8 (7.9±0.9 × 7.3±0.6) µm; (15) Germany: Jun 1912, Schoenau, spores 5.5-10 × 5.5-8 (7.4±0.8 × 6.7±0.7) µm; (16) Germany: 5 Aug 1916, Schoenau, spores 6.5-9 × 5.5-9 (7.4±0.7 × 6.9±0.5) µm; (17) Germany: 9 Aug 1917, Schoenau, spores 6.5-10 × 5.5-9 (7.9±0.8 × 7.5±0.8) µm; (18) Germany: Sep & Oct 1920, A. Vill (Zillig, Ustilag. Europ., no. 120), spores 6.5-9 × 6.5-9 (7.7±0.6 × 7.2±0.5) µm; (19) Germany: Jul 1920, sine coll., spores 6.5-10 × 5.5-9 (8.3±0.7 × 7.8±0.7) µm; (20) Germany: 9 Aug 1936, H. Poeverlein, spores 5.5-8 × 5.5-8 (7.0±0.6 × 6.7±0.6) µm; (21) Germany: 24 Jun 1939, E. Eichhorn, spores 5.5-8 × 5-8 (6.9±0.7 × 6.4±0.7) µm; (22) Germany: 27 Jun 1943, E. Eichhorn, spores 6.5-10 × 6.5-10 (7.6±0.6 × 7.3±0.7) µm; (23) Germany: 18 Jun 1939, E. Eichhorn (Sydow, Mycotheca german., no. 3260), spores 6.5-10 × 6.5-9 (7.9±0.7 × 7.2±0.6) µm; (24) Germany: 4 Jul 1948, H. Hupke, spores 5.5-9 × 5.5-7.5 (7.2±0.6





Figs 1-2. Spores of *Microbotryum lagerheimii* Denchev on *Lychnis viscaria,* in SEM: **1** – Finland, N., Tuusula, Paijala, 19 Jun 1966, P. Alanko (H); **2** – Finland, Ta., Lammi, Evo, 29 Jun 1947, V. Kujala (H). Bars = 1 µm

× 6.7±0.4) µm; (25) Germany: Jun 1930, A. Schumacher, spores 5.5-10.5 × 5-10 (7.6±1.0 × 6.9±0.9) µm; (26) Germany: 30 May 1932, A. Schumacher (Sydow, Mycotheca german., no. 2658), spores 6.5-10.5 × 5.5-10 (8.7±0.9 × 8.0±0.9) µm; (27) Germany: 5 Oct 1934, Fahrendorff, spores 5.5-9 × 5-8 (6.9±0.8 × 6.3±0.8) µm; (28) Germany: 25 Jun 1932, L. Lange, spores 6.5-10 × 5.5-9 (7.7±0.9 × 7.3±0.8) µm; (29) Germany: 14 Jun 1890, W. Krieger (Krieger, Fungi saxonici, no. 1701), spores 6.5-11 × 5.5-9 (7.6±0.9 × 7.0±0.6) µm; (30) Italy: Jul 1895, H. Ross, spores 5-8 × 5-7.5 (6.8±0.6 × 6.5±0.6) µm; (31) Switzerland: Aug 1879, G. Winter (Winter, Fungi Helvetici, no. 206), spores 5.5-8 × 5.5-7.5 (7.2±0.6 × 6.7±0.5) µm; (32) Switzerland: 21 Jul 1970, E. Müller, spores 5.5-9.5 × 5.5-9 (7.3±0.7 × 6.7±0.6) µm; (33) Switzerland: 29 Aug 1980, J. Poelt, spores 5.5-8 × 5.5-7.5 (6.9±0.5 × 6.3±0.5) µm.

Microbotryum lagerheimii Denchev, **sp. nov.**

Sori *antheras Lychnidis viscariae et Lychnidis alpinae destruentes.* ***Massa sporarum*** *pulverea, hinnulea, avellanea, vinoso-livida, salmonea, incarnata, subvinosa vel roseo-vinosa.* ***Sporae*** *globosae, subglobosae, ovoideae vel late ellipsoideae, 5-10 × 5-8 (6,4±0,6 × 5,9±0,5) µm, subhyalinae; paries reticulatus, 5-8 (–9) maculis in diametro sporae, maculae irregulariter polyangulares, (0,4–) 0,5-1,2 (–1,6) µm longae.*

Holotypus *on Lychnis viscaria L. subsp. viscaria, Fennia, Ab., Kakskerta, Monnonen, 12.VI.1933, L.E. Kari (H – s.n.).* ***Isotypi*** *in Fungi exsic. fennici, no. 293 (ut U. silenes-inflatae); H.U.V. 5142.* ***Paratypi:*** *Fennia, Al., Lemland, Jersö, 13.VI.1919, leg. T. Putkonen, det. J.I. Liro (H) (isopara- in Liro, Mycotheca fennica, no. 405, ut U. silenes-inflatae); H.U.V. 7762; Fennia, Sat., Huittinen, Raskalanmäki, 30.VI.1919, W.M. Linnaniemi (ut U. silenes-inflatae – H); Fennia, Ta., Sääksmäki, Maatiala, Urpola, 30.VII.1918, J.I. Liro (ut U. silenes-inflatae – H); Germania: Sachsen, Königstein, 16.VI.1888, W. Krieger (GZU) (isopara- in Krieger, Fungi saxonici, no. 458, ut Ustilago violacea).*

Synonyms: [*Ustilago violacea* (Pers. : Pers.) Roussel (as 'Fuckel') β *pallida* Lagerh. in P. Syd., Sydow, Ustilagineen, no. 65 (nom. nudum)]. — 'Type' on *Lychnis alpina* (as *Viscaria alpina*), Norway, Alten, Kåfjord, Aug 1895, G. Lagerheim (FH! – on the label as *U. pallida* Lagerh.); 'isotypes' in Sydow, Ustilagineen, no. 65 (H!, H.U.V. 9751, 11 504, KSC!, M!, NY!) (syn. nov.). — [*Ustilago pallida* Lagerh. in P. Syd., Sydow, Ustilagineen, no. 111, 1897 (nom. nudum)]. — *Ustilago pallida* Lagerh. ex Bubák, Arch. Přír. Výzk. Čech. **15**(3): 22, 1912 (later homonym; non *U. pallida* Körn., Hedwigia **16**: 34, 1877, nec *U. pallida* J. Schröt. in A.A. Fisch. Waldh., Aperçu systématique des Ustilaginées, p. 30, 1877). — Type on *Lychnis viscaria* (as *Viscaria vulgaris*), Sweden, Öland, Borgholm, Jul 1896, G. Lagerheim; isotypes in Sydow, Ustilagineen, no. 111 (H.U.V. 5134, KSC!, M!, S!) (syn. nov.).

Sori in the anthers. **Spore mass** powdery, fawn, hazel, livid vinaceous, salmon, flesh, pale vinaceous or rosy vinaceous. **Spores** globose, subglobose, ovoid, or broadly ellipsoidal, 5-10 × 5-8 (6.4±0.6 × 5.9±0.5) µm (n/37=1850), length/width ratio 1.05-1.13 (mean 1.09), subhyaline to pale coloured; spore wall reticulate, 5-8 (–9) meshes per spore diameter, meshes mainly irregularly polygonal, sometimes more or less regularly polygonal, (0.4–) 0.5-1.2 (–1.6) µm long (Figs 1-2).

Distribution: Europe, (?) Asia.

Etymology: named in honour of the Swedish mycologist Nils Gustaf von Lagerheim (1860-1926).

Specimens examined (a selected list):

On ***Lychnis alpina*** L. (*Viscaria alpina* (L.) G. Don fil.): **FINLAND:** Lapponia kemensis, Kolari, Äkäsjoki, 5 Jul 1928, J.I. Liro (Liro, Mycoth. fennica, no. 406, as *U. silenes-inflatae* – NY) [**fawn**]; N., Pyhtää, Ristisaari, 20 Jun 1929, C. Cedercreutz (as *U. silenes-inflatae* – H) [**livid vinaceous** <> **fawn**]; U., Anjala, Wredebyhov, 24 May 1975, P. Alanko (as *U. violacea* – H) [**livid vinaceous** <> **fawn**]; N., Vantaa, Tikkurila, 29 Jun 1919, A. Rainia (as *U. violacea* – H) [**livid vinaceous** <> **fawn**]; Virdni, alt. 800 m, 1 Aug 1939, J.I. Liro & H. Roivainen (as *U. silenes-inflatae* – H) [**livid vinaceous** <> **fawn**]; W-Terbmisaarri, alt. 900 m, 31 Aug 1939, J.I. Liro & H. Roivainen (as *U. silenes-inflatae* – H) [**livid vinaceous**]; **NORWAY:** Alten, Kåfjord, Aug 1895, G. Lagerheim [as *U. pallida* – a specimen selected

by G. Lagerheim as a **type** of *U. pallida* Lagerh. is kept in FH (34); Sydow, Ustilagineen, no. 65, as *U. violacea* β *pallida* Lagerh. – H, KSC, M, NY (35)] [**fawn**]; ditto, Jul 1895, G. Lagerheim (Vestergren, Micromycetes rar. sel., no. 194, as *U. pallida* Lagerh. – FH, M, S) (36) [**livid vinaceous** <> **fawn**]; **SWEDEN:** Blekinge, Vedeby, 20 Jun 1898, Y. & F. Thörn (as *Ustilago* sp. – H) [***lagerheimii*-type**]; Helsingland, Ljusdal, 1884, N.J. Doecham (as *Ustilago* sp. – H) [***lagerheimii*-type**]; Lapponia Tornensis, Vaddetjocko prope lacum Tornejaure, 7 Jul 1903, T. Vestergren (Vestergren, Micromycetes rar. sel., no. 1415, as *U. pallida* Lagerh. – F 1 293 433, M) (37) [**livid vinaceous** or **livid vinaceous** <> **fawn**].

On ***Lychnis viscaria*** L. subsp. ***viscaria*** (*Viscaria vulgaris* Bernh., *V. viscosa* Asch.): **AUSTRIA:** Niederösterreich, Waldviertel, E Zwettl, 26 May 1978, J. Poelt (38) (as *U. violacea* – GZU) [***lagerheimii*-type**]; Steiermark, Fischbacher Alpen, Glanzgraben bei Bruch a.d. Mur, 10 May 1957, W. Möschl (as *U. violacea* – GZU) (39) [***lagerheimii*-type**]; Kärnten, Ossiacher Tauern, Wegrand gegen Tauern, *ca* 600 m, 3 Jun 1968, H. & H. Doppelbaur (40) (as *U. violacea* – M) [***lagerheimii*-type**]; **CZECH REPUBLIC:** Moravia, ad Hohenstadt, 17 May 1898, F. Bubák (Sydow, Ustilagineen, no. 161, as *U. pallida* Lagerh. – KSC, M, S) [**livid vinaceous**]; Moravia, ad Znojmo, May 1928, R. Picbauer (as *U. pallida* Lagerh. – BP 3605, MICH) (41) [**fawn**]; **DENMARK:** Bornholm, Gudhjem, 12 Jun 1977, L. Roivainen (as *U. violacea* – H) [**salmon** <> **flesh**]; Bornholm, Nexö, Halleklipper, 14 Jun 1977, L. Roivainen (as *U. violacea* – H) [***lagerheimii*-type**]; Jylland, Baelum, 13 Jun 1884, L. Hammer (as *U. violacea* – FH) (42) [**livid vinaceous**]; **FINLAND:** Ab., Piikkiö, 9 Jul 1916, E. Kitunen (as *U. pallida* Lagerh. – H) [**fawn**]; ditto, 25 Jun 1919, J.I. Liro (as *U. violacea* – F, H, NY) [**fawn**]; Ab., Piikkiö, Bussila, 21 Jun 1919, J.I. Liro (as *U. pallida* Lagerh. – H) [**fawn**]; Ab., Piikkiö, Kuusisto, 20 Jun 1920, J.I. Liro (as *U. pallida* Lagerh. – H) [**fawn**]; Ab., Piikkiö, Raadelma, 20 Jun 1920, J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; Ab., Piikkiö, Hirsund (60°24' N), 10 Jun 1955, N. Tarén (Fungi exsic. fennici, no. 711, as *U. violacea* – MICH, UC 1 269 116) (43) [**fawn** or **hazel**]; Ab., Kakskerta, Monnonen, 12 Jun 1933, L.E. Kari (Fungi exsic. fennici, no. 293, as *U. silenes-inflatae* – DAOM 92 773, H, MICH, NY, UC 1 144 365) (44) [**fawn**]; Ab., Turku, Ruissalo, 12 Jul 1916, E. Kitunen & J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; Ab., Turku, Ruissalo, Corraeusen lähde, 27 Jun 1919, J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; Ab., Turku, Katariinanlaakso, 13 Jul 1928, L.E. Kari (as *U. silenes-inflatae* – DAOM 92 770, H) (45) [**fawn**]; Ab., Paimio, Viksberg, 26 Jun 1919, J.I. Liro (as *U. silenes-inflatae* – FH, H) [**fawn**]; Ab., Turku, Paimio, Ilttula, Mäkilahti Kalliolla, 25 Jun 1956, I. Kukkonen (as *Ustilago* sp. – H) (46) [**fawn**]; Al., Lemland, Järsö, 13 Jun 1919, leg. T. Putkonen, det. J.I. Liro (Liro, Mycotheca fennica, no. 405, as *U. silenes-inflatae* – H, NY) [**fawn**]; Al., Lemland, Nåtö, 8 Jun 1937, A.V. Auer (as *U. silenes-inflatae* – H) [**fawn**]; ditto, 8 Jul 1938, J.I. Liro & H. Roivainen (as *U. violacea* – H) [**fawn**]; ditto, 20 Jun 1981, P. Alanko (as *U. violacea* – H) [**fawn**]; Al., Eckerö, Skagen, 11 Jun 1948, L. Kari (Kari, Fungi exs. fennici, no. 159, as *U. silenes-inflatae* – H, MICH, NY, UC 1 143 972) [**fawn** <> **hazel**]; EH, Somero, Hirsjärvi N-puol. metsäkalliolla, 15 Jun 1968, P. Alanko (as *U. violacea* – H) [**fawn**]; EH, Hämeenlinna, Aulanko, Kärmeskallio, 24 Jun 1968, P. Alanko (as *U. violacea* – H) [**fawn**]; EH, Hauho, Viittakivi, 23 Jun 1979, P. Alanko (as *U. violacea* – H) [**fawn**]; EH, Loppi, Läyliäinen, Metsä-Soukki, 8 Jul 1984, P. Alanko (as *U. violacea* – H) [**fawn**]; EH, Loppi kk, Vanha kirkko, 60°40' N, 24°25' E, alt. 125 m, 26 Jun 1989, P. Alanko (as *U. violacea* – H) [**rosy vinaceous**]; N., Sibbo, Östersundom, Korsnäs, 21 Jun 1919, A. Rainio (as *U. violacea* – H) [**fawn**]; N., Tikkurila, Ånäs, 30 Aug 1921, J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; N., Inkoo, Fagervik, 4 Jun 1931, J.I. Liro & V. Heikinheimo (as *U. silenes-inflatae* – H) [**fawn** <> **hazel**]; N., Tuusula, Paijala, kylän N-puolella Tuusulan järven rantakalliolla, 19 Jun 1966, P. Alanko (as *U. silenes-inflatae* – DAOM 119 211, H) (47) [**fawn**]; Sat., Huittinen, Raskalanmäki, 30 Jun 1919, W.M. Linnaniemi (as *U. silenes-inflatae* – H) [**fawn**]; Ta., Järvelä, Lepola, 4 Jul 1902, J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; Ta., Sääksmäki, Maatiala, Urpola, 30 Jul 1918, J.I. Liro (as *U. silenes-inflatae* – H) [**fawn**]; Ta., Lammi, Evo, 29 Jun 1947, V. Kujala (as *U. silenes-inflatae* – DAOM 134 792, H) (48) [**fawn** or **salmon**]; Ta., Valkeakoski, Sääksmäki, Voipaala, 61°10' N, 24°05' E, alt. 120 m, 17 Jun 1986, P. Alanko (as *Microbotryum silenes-inflatae* – H) [**fawn** <> **flesh**]; V., Vihti, Ojakkala, Kotkaniemi, Vähämäki, 28 May 1975, P. Alanko (as *U. violacea* – H) [**livid vinaceous** <> **fawn**]; ditto, 30 Jun 1982, P. Alanko (as *U. violacea* – H) [**livid vinaceous** <> **fawn**]; **GERMANY:** Bayern, Bayreuth, Jun 1874, Thümen (as *U. violacea* – NY) [**fawn**]; Bayern, Berneck, Jul 1875, Thümen (as *U. violacea* – H) [**fawn**]; Bayern, Kr. Viechtach, Schönau, 18 May 1939, E. Eichhorn (Sydow, Mycotheca german., no. 3262, as *U. silenes-inflatae* – M) (49) [***lagerheimii*-type**]; Bayern, Kr. Wolfstein, Riedelsbach, 18 Jun 1939, E. Eichhorn (as *U. pallida* Lagerh. – M) (50) [***lagerheimii*-type**]; Hessen, Kr. Alsfeld, Ermenrod, Höllenberg, 22 May 1952, H. Hupke (as *U. silenes-inflatae* – M) (51) [***lagerheimii*-type**]; Rheinland-Pfalz, Trier, "Augenscheiner", 21 May 1924, H. Zillig (Zillig, Ustilag. Europ., no. 38, as *U. violacea* – BP 3904) [**fawn**]; Rheinland-Pfalz, Kr. Ahrweiler, Mayschoß, 4 Jun 1939, H. Hupke (Sydow, Mycotheca german., no. 3261, as *U. silenes-inflatae* – M) (52) [***lagerheimii*-type**]; Sachsen, Königstein, 16 Jun 1888, W. Krieger (Krieger, Fungi saxonici, no. 458, as *U. violacea* – GZU, MICH, NY, UC 1 209 972) (53) [**fawn**]; Sachsen, Muscau, 3 Jun 1898, P. Sydow (Sydow, Ustilagineen, no. 160, as *U. pallida* Lagerh. – KSC, M) [**rosy vinaceous**]; **ITALY:** Südtirol, Pustertal, am Rienz-Ufer gegen Niederdorf, 3 Jun 1966, H. & H. Doppelbaur (as *U. violacea* – M) (54) [***lagerheimii*-type**]; **LATVIA:** Riga, 14 Jun 1915, F. Bucholtz (as *U. violacea* – FH) (55) [**livid vinaceous** <> **pale vinaceous**]; **POLAND:** "Liegnitz", 1869, Gerhardt (Schneider, Herb. Schles., Pilze, no. 196, as *U. antherarum* – H) [**fawn** or **hazel**]; "Oberlausitz, Muscau, Lugknitz", Jun 1891, P. Sydow (Sydow, Mycotheca Marchica, no. 3223, as *U. violacea* – BP 3606, NY) [***lagerheimii*-type**]; "Schweidnitz, Ober-Weistritz", sine dat., J. Schröter (Schröter, Pilze Schlesiens, no. 439, as *U. violacea* – S) (56) [***lagerheimii*-type**]; Natolin prope Warszawa, 12 Jun 1938, J. Kochman (J. Kochman, Ustilaginales Poloniae, no. 59, as *U. silenes-inflatae* – S) (57) [***lagerheimii*-type**]; **RUSSIA:** "Muolaa, Kyyrölä Kirkon luona", 27 Jul 1909, R. Cederhvarf (as *U. silenes-inflatae* – H) [**fawn**]; "Vuoksi, Ikola", 15 Jul 1919, I. Aro (as *U. silenes-inflatae* – H) [**fawn**]; **SWEDEN:** Bahusiae, pr. Kristineberg in insula Skaftőland, 7 Jun 1911, A.G. Eliasson (Sydow, Ustilagineen, no. 454, as *U. pallida* Lagerh. – FH, H, KSC, MA 4358, NY; Vestergren, Micromycetes rar. sel., no. 1523, as *U. pallida* Lagerh. – F 1 293 584, S) [**fawn** or **hazel**]; ditto, Jun 1913, A.G. Eliasson (Petrak, Mycotheca gener., no. 1094, as *U. silenes-inflatae* – BPI 166 487, M) (58) [***lagerheimii*-type**]; Gästrikland, Gävle, about 800 m W of Vall, 1 Jul 1938, J.A. Nannfeldt (Fungi exsic. suecici praes. upsal., no. 861b, as *U. silenes-inflatae* – S) [***lagerheimii*-type**]; Öland, Borgholm, Jul 1896, G. Lagerheim (Sydow, Ustilagineen, no. 111, as *U. pallida* Lagerh. – KSC, M, S) [**fawn**]; ditto, 30 Jun 1928, A.G. Eliasson (as *U. silenes-inflatae* – S) (59) [***lagerheimii*-type**]; Öland, Bejershamn, Jul 1902, G. Lagerheim (as *U. pallida* Lagerh. – H) [**fawn**]; Skåne, Lomma s:n, Alnarp, 22 May 1934, H. Christoffersson (as *U. pallida* Lagerh. – S) (60) [***lagerheimii*-type**]; Skåne, Baldringe, Lyckås, 23 May 1936, Th. Arwidsson (as *U. silenes-inflatae* – S) (61) [***lagerheimii*-type**]; Söderköping, Alboda, 24 Jun 1905, B. Lagerwall (as *U. pallida* Lagerh. – H) [**salmon** <> **fawn**]; Uppland, Bergsbrunna, 10 Jun 1884, L. Romell (as *U. violacea* – S) (62) [***lagerheimii*-**

type]; Uppland, Lovö s:n, Drottningholm, Kersö, Jun 1916, Vestergren (as *U. pallida* Lagerh. – S) (63) [***lagerheimii*-type**]; Uppland, Danderyds s:n, backen mellan Långängen och Djursholm, 7 Jun 1936, Th. Arwidsson (as *U. silenes-inflatae* – S) (64) [***lagerheimii*-type**]; Uppland, Börje parish, Hesselby (near Upsala), 19 Jun 1938, J.A. Nannfeldt (Fungi exsic. suecici praes. upsal., no. 861a, as *U. silenes-inflatae* – S) (65) [***lagerheimii*-type**]; Upsala, 16 Jun 1895, A.G. Eliasson (as *U. violacea* – S) (66) [***lagerheimii*-type**]; ditto, 13 Jun 1920, O. Juel (as *U. silenes-inflatae* – FH, MICH) (67) [**fawn**]; Västergötland, Hassle, 1 Jul 1909, leg. ? (as *U. silenes-inflatae* – S) (68) [***lagerheimii*-type**]; Västergötland, Goteborg, Margreteborg, May 1915, leg. E. Hjertman (as *U. violacea* – DAOM 48 965) (69) [***lagerheimii*-type**].

On ***Lychnis alpina* × *vulgaris:*** **SWEDEN:** Blekinge, par. Augerum, Afvelsgärde, 17 Jun 1855, J. Ankarcrona (as *U. violacea* – DAOM 48 979) (70) [***lagerheimii*-type**].

On ***Silene vulgaris*** (Moench) Garcke: **CZECH REPUBLIC:** Moravia, Brno, Jun 1924, R. Picbauer (as *U. silenes-inflatae* – BPI 166 467, MICH) (71) [**livid vinaceous <> fawn**]; **FINLAND:** Li., Inari, Törmänen, 26 Jul 1920, A.J. Rainio (as *U. silenes-inflatae* – H) [**livid vinaceous**]; Nylandia, Tikkurila, Jokiniemi, 13 Jul 1914, A.J. Rainio (as *U. silenes-inflatae* – H) [**fawn**]; Nylandia, Tikkurila, Maatalouskoelaitos, 6 Aug 1918, J.I. Liro (as *U. silenes-inflatae* – H) [**livid vinaceous <> fawn**]; ditto, 13 Jul 1919, A.J. Rainio (as *U. silenes-inflatae* – H) [**fawn**]; Nylandia, Tikkurila, 7 Jul 1925, J.I. Liro & A. Rainio (Liro's authentic specimen from an artificial infection described in Liro 1924; Liro, Mycotheca fennica, no. 407; as *U. silenes-inflatae* – H, NY) [**fawn** – in anthers in open flowers, or **livid vinaceous** – in anthers in closed calyces]; Lkem., Muonio, Torasieppi, 30 Jul 1915, J. Montell (as *U. silenes-inflatae* – H) [**livid vinaceous <> fawn**].

Morphometric variability of the spores

The spore sizes, given in the description, are based on measurements of spores from the holotype and specimens on *Lychnis alpina, L. viscaria* L. subsp. *viscaria,* and *Lychnis alpina* × *vulgaris.* The sizes of the measured spores on *Silene vulgaris,* given bellow under no. '(71)', are slightly larger and similar to these of *Microbotryum silenes-inflatae* on *Silene vulgaris.* In that case, we give the priority to the spore mass colour over the spore sizes.

On ***Lychnis alpina:*** (34) Norway: Aug 1895, G. Lagerheim (FH, type of *U. pallida* Lagerh.), spores 5.5-8 × 5-6.5 (6.7±0.6 × 6.2±0.5) µm; (35) Norway: Aug 1895, G. Lagerheim (Sydow, Ustilagineen, no. 65.), spores 5.5-10 × 5.5-8 (7.0±0.8 × 6.4±0.6) µm; (36) Norway: Jul 1895, G. Lagerheim (Vestergren, Micromycetes rar. sel., no. 194), spores 5.5-8 × 5-7.5 (6.7±0.5 × 6.1±0.5) µm; (37) Sweden: Jul 1903, T. Vestergren (Vestergren, Micromycetes rar. sel., no. 1415), spores 5-8 × 5-6.5 (6.7±0.7 × 6.0±0.6) µm.

On ***Lychnis viscaria*** L. subsp. ***viscaria:*** (38) Austria: 26 May 1978, J. Poelt, spores 5.5-9 × 5.5-7.5 (6.9±0.7 × 6.5±0.4) µm; (39) Austria: 10 May 1957, W. Möschl, spores 6.5-10 × 5.5-8 (7.4±0.6 × 6.8±0.5) µm; (40) Austria: 3 Jun 1968, H. & H. Doppelbaur, spores 5-7.5 × 5-6.5 (5.9±0.5 × 5.5±0.6) µm; (41) Czech Rep.: May 1928, R. Picbauer, spores 5.5-10 × 5.5-8 (7.1±0.7 × 6.6±0.7) µm; (42) Denmark: 13 Jun 1884, L. Hammer, spores 5.5-8 × 5-7.5 (6.6±0.7 × 6.1±0.5) µm; (43) Finland: 10 Jun 1955, N. Tarén (Fungi exsic. fennici, no. 711), spores 5.5-8 × 5.5-7.5 (6.8±0.6 × 6.3±0.5) µm; (44) Finland: 12 Jun 1933, L.E. Kari (Kari, Fungi exsic. fennici, no. 293), spores 5.5-8 × 5-6.5 (6.4±0.5 × 5.7±0.5) µm; (45) Finland: 13 Jul 1928, L.E. Kari, spores 5.5-7.5 × 5-6.5 (6.1±0.5 × 5.6±0.5) µm; (46) Finland: 25 Jun 1956, I. Kukkonen, spores 5.5-8 × 5-7.5 (6.4±0.6 × 6.0±0.6) µm; (47) Finland: 19 Jun 1966, P. Alanko, spores 5.5-8 × 5-6.5 (6.3±0.6 × 5.6±0.5) µm; (48) Finland: 29 Jun 1947, V. Kujala, spores 5.5-8 × 5-6.5 (6.3±0.6 × 5.6±0.5) µm; (49) Germany: 18 May 1939, E. Eichhorn (Sydow, Mycotheca german., no. 3262), spores 5-8 × 5-7.5 (6.3±0.7 × 5.9±0.7) µm; (50) Germany: 18 Jun 1939, E. Eichhorn, spores 5.5-7.5 × 5.5-7.5 (6.5±0.5 × 6.2±0.6) µm; (51) Germany: 22 May 1952, H. Hupke, spores 5-7.5 × 5-6.5 (6.1±0.6 × 5.7±0.5) µm; (52) Germany: 4 Jun 1939, H. Hupke (Sydow, Mycotheca german., no. 3261), spores 5.5-8 × 5-7.5 (6.9±0.6 × 6.3±0.7) µm; (53) Germany: 16 Jun 1888, W. Krieger (Krieger, Fungi saxonici, no. 458), spores 5.5-9 × 5-7.5 (6.8±0.5 × 6.2±0.5) µm; (54) Italy: 3 Jun 1966, H. & H. Doppelbaur, spores 5-9 × 5-6.5 (6.5±0.8 × 5.9±0.6) µm; (55) Latvia: 14 Jun 1915, F. Bucholtz, spores 5.5-7.5 × 5-6.5 (6.2±0.5 × 5.9±0.5) µm; (56) Poland: sine dat., J. Schröter (Schröter, Pilze Schlesiens, no. 439), spores 5.5-8 × 5-7.5 (6.6±0.5 × 6.0±0.6) µm; (57) Poland: 12 Jun 1938, J. Kochman (J. Kochman, Ustilaginales Poloniae, no. 59), spores 5.5-8 × 5-6.5 (6.2±0.5 × 5.7±0.6) µm; (58) Sweden: Jun 1913, A.G. Eliasson (Petrak, Mycotheca gener., no. 1094), spores 5-8 × 5-7.5 (6.6±0.6 × 6.0±0.6) µm; (59) Sweden: 30 Jun 1928, A.G. Eliasson, spores 5-8 × 5-6.5 (5.8±0.6 × 5.5±0.5) µm; (60) Sweden: 22 May 1934, H. Christoffersson, spores 5.5-8 × 5-7.5 (6.5±0.5 × 5.8±0.5) µm; (61) Sweden: 23 May 1936, Th. Arwidsson, spores 5.5-7.5 × 5-7.5 (6.4±0.7 × 5.8±0.6) µm; (62) Sweden: 10 Jun 1884, L. Romell, spores 5.5-7.5 × 5-6.5 (6.2±0.5 × 5.7±0.6) µm; (63) Sweden: Jun 1916, Vestergren, spores 5.5-7.5 × 5-6.5 (6.2±0.5 × 5.6±0.4) µm; (64) Sweden: 7 Jun 1936, Th. Arwidsson, spores 5.5-8 × 5-6.5 (6.6±0.4 × 5.9±0.4) µm; (65) Sweden: 19 Jun 1938, J.A. Nannfeldt (Fungi exsic. suecici praes. upsal., no. 861a), spores 5-8 × 5-6.5 (6.1±0.6 × 5.7±0.5) µm; (66) Sweden: 16 Jun 1895, A.G. Eliasson, spores 5-8 × 5-7.5 (5.9±0.7 × 5.6±0.5) µm; (67) Sweden: 13 Jun 1920, O. Juel, spores 5.5-7.5 × 5-6.5 (6.4±0.5 × 5.9±0.5) µm; (68) Sweden: 1 Jul 1909, leg. ?, spores 5.5-9 × 5-7.5 (6.7±0.6 × 6.0±0.6) µm; (69) Sweden: May 1915, leg. E. Hjertman, spores 5-8 × 5-6.5 (6.3±0.6 × 5.6±0.4) µm.

On ***Lychnis alpina* × *vulgaris:*** (70) Sweden: 17 Jun 1855, J. Ankarcrona, spores 5.5-9 × 5-8 (6.4±0.7 × 5.7±0.6) µm.

On ***Silene vulgaris:*** (71) Czech Rep.: Jun 1924, R. Picbauer, spores 5.5-10 × 5.5-8 (7.6±1.0 × 6.9±0.6) µm.

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