The nomenclature of *Caeoma ornithogali*, *Uredo ornithogali*, *Uromyces ornithogali* and *Uromyces acutatus* revisited

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Abstract: Braun, U. & Kuyper, T. W. 2023: The nomenclature of *Caeoma ornithogali*, *Uredo ornithogali*, *Uromyces ornithogali* and *Uromyces acutatus* revisited. Schlechtendalia **40**: 348–352.

The typifications of *Caeoma ornithogali* and *Uredo ornithogali*, previously usually treated as synonyms of *Ustilago ornithogali*, are reconsidered. A previous lectotypification of the name *Uredo ornithogali* has been traced, and the previously designated 'lectotypification' of *Caeoma ornithogali* is discussed and corrected. The 'lectotype' can be regarded as holotype, according to Art. 9.1. Note 1. Furthermore, the confused history of the nomenclature of the *Gagea* rust, previously referred to as *Uromyces ornithogali*, is critically discussed. The correct name for this rust, *U. acutatus*, is lectotypified, based on a re-examination of type material.

Zusammenfassung: Braun, U. & Kuyper, T. W. 2023: Die Nomenklatur von *Caeoma ornithogali*, *Uredo ornithogali*, *Uromyces ornithogali* und *Uromyces acutatus* erneut aufgegriffen. Schlechtendalia **40**: 348–352.

Die Typisierungen von *Caeoma ornithogali* und *Uredo ornithogali*, früher gewöhnlich als Synonyme zu *Ustilago ornithogali* gestellt, wurden überprüft. Eine frühere Lectotypisierung des Namens *Uredo ornithogali* wurde gefunden und die früher vorgeschlagene ‚Lectotypisierung' von *Caeoma ornithogali* wird diskutiert und korrigiert. Der ‚Lectotypus' kann, nach Art. 9.1. Note 1, als Holotypus betrachtet werden. Weiterhin wird die verwirrende Geschichte der Nomenklatur des früher als *Uromyces ornithogali* bezeichneten *Gagea*-Rosts kritisch besprochen. Der korrekte Namen für diesen Rost, *U. acutatus*, wird auf Grundlage einer Neuuntersuchung von Typusmaterial lectotypisiert.

Key words: Smut fungi, *Vankya ornithogali*, typification.

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Vankya ornithogali (Ershad 2000) is the currently accepted name for a widespread smut species on *Gagea* (and possibly *Ornithogalum*) spp. Braun (1979) designated a specimen of *Caeoma ornithogali* deposited in D. F. L. v. Schlechtendal's herbarium at HAL as lectotype for this name. The details of the lectotype were repeated in Braun & Stordeur (2001: 4). Since the 19th century, this name was usually treated in connection with *Ustilago ornithogali* (see de Toni 1888). *C. ornithogali* was described as new species without any synonyms (Schlechtendal 1824). However, it soon surfaced that there was a potential older name for this species, viz., *Uredo ornithogali* J.C. Schmidt & Kunze. Link (1825: 7) listed *Caeoma ornithogali* and referred to both the exsiccate series of Schmidt & Kunze and to Schlechtendal's publication. One could likely both argue that *C. ornithogali*, as mentioned by Link, is a new combination (as it has a different type than Schlechtendal's species), which then becomes an illegitimate homonym; or that Link's treatment is just a further instance of continuation of Schlechtendal's (1824) name, but with an extended circumscription, including the type of an older name. As under both interpretations the status of that name used by Link has no further nomenclatural consequences, we refrain from a final conclusion. Later, Schlechtendal (1826: 239) also realised (or accepted, on Link's authority?) the identity of *C. ornithogali* with the older *U. ornithogali*. Schlechtendal's (1826) treatment of these names has frequently been (mis-)interpreted as new combination, '*Caeoma ornithogali* (J.C. Schmidt & Kunze) Schltdl.' This is incorrect because of the older treatment by Link. Schlechtendal's (1826) taxonomic conclusions are traceable in his herbarium, which is separately stored at HAL, the herbarium of the University in Halle (Saale), Germany, preserved in the original fascicles left by Schlechtendal. Four specimens are maintained in Schlechtendal's herbarium under the names *Caeoma ornithogali* and *Uredo ornithogali*. A single sample, collected in Berlin, only bears the name *Caeoma ornithogali*, suggesting that this specimen represents the original collection used by Schlechtendal (1824) for the description in Flora berolinensis. Schlechtendal did not add any datings to his mycological specimens. In addition, Schlechtendal's herbarium contains a single duplicate of Schmidt and Kunze, Deutschl. Schwämme 217, which is syntype material of *Uredo ornithogali*, and two samples with labels that bear both names, *Caeoma ornithogali* and *Uredo ornithogali*, and the handwritten indication that Kunze made them available. These samples are probably parts of the original material distributed by Schmidt and Kunze in 'Deutschlands Schwämme,' which is, however, only an assumption and cannot said for certain. In any case, the original collections of *U. ornithogali* provided by Kunze allowed Schlechtendal a comparison with his *C. ornithogali*, and

undoubtedly led to the conclusion in his publication from 1826. As to the 'lectotypification' of *C. ornithogali*, it must be taken into consideration that only a single original specimen, collected in Berlin, is included in Schlechtendal's herbarium, which was undoubtedly the only element used by him as basis for the description of *C. ornithogali* in 1824. This matter of fact allows in this case the application of Art. 9.1, Note 1, i.e., Schlechtendal's preserved specimen from Berlin can be considered the holotype of *C. ornithogali*, which renders the 'lectotypification' proposed by Braun (1979) obsolete and superfluous.

The holotype of *Caeoma ornithogali* has been re-examined (fig. 1). This material perfectly agrees with type material of *Uredo ornithogali* (the duplicate at HAL has also been re-examined) and previous descriptions of *Vankya ornithogali*, such as descriptions in Vanky (1985, 2012). The sori are characteristically pustulate or formed as fusiform swellings. The shape and size of the olivaceous brown smut spores are rather variable, ranging from almost subglobose, irregularly polygonal to oblong, 12–24 × 9–14 µm, wall 0.8–1.5(–2) µm thick, appearing to be smooth under light microscopy, but apparently delicately punctate.

As already mentioned, *Uredo ornithogali* was described by Schmidt & Kunze (1819). The original material (syntypes) was distributed as 'Deutschlands Schwämme 217' (details, including a scan of the label of the duplicate maintained at HAL, see Braun, 2016: 31). Therefore, a duplicate of 'Deutschlands Schwämme 217' must be designated as lectotype. Vánky (1985: 225) cited under *U. ornithogali*: "Type: Schmidt et Kunze, Deutschlands Schwämme 217 (UPS!)." This citation is acceptable and valid as lectotypification of *U. ornithogali*, according to Art. 7.11.



Fig. 1. *Caeoma ornithogali*, holotype, HAL 1610 F (close-up shot in the top right corner).

The nomenclature and synonymy of *Vankya ornithogali*, including typifications of the names involved, can be summarised as follows:

Vankya ornithogali (J.C. Schmidt & Kunze) Ershad, Rostaniha **1**(1-4): 66, 2000.

≡ *Uredo ornithogali* J.C. Schmidt & Kunze, Deutschl. Schwämme, Neunte Lieferung: 5, 1819.

Lectotype (designated by Vánky, 1985: 225; MycoBank, MBT10015079): Deutschl. Schwämme 217 [‘in Ornithogali primo vere’] (UPS). Isolectotypes: Deutschl. Schwämme 217 (e.g., FH, HAL 3067 F, W).

≡ *Erysibe rostellata* var. *ornithogali* (J.C. Schmidt & Kunze) Wallr., Fl. crypt. Germ. **2**: 209, 1833.

≡ *Uromyces ornithogali* (J.C. Schmidt & Kunze) Lév., Ann. Sci. Nat., Bot., Sér. 3, **8**: 371, 1847, nom. inval (Art. 35.2).

≡ *Uromyces ornithogali* (J.C. Schmidt & Kunze) Fuckel, Jahrb. Nassauischen Vereins Naturk. **15**: 20, 1860).

≡ *Ustilago ornithogali* (J.C. Schmidt & Kunze) Magnus, Hedwigia **14**: 19, 1875.

≡ *Ustilago ornithogali* (J.C. Schmidt & Kunze) J.G. Kühn, Fungi Europaei Exsiccati, Cent. 20, no. 1996, 1875, isonym (Art. 6, note 2).

≡ *Coeomurus ornithogali* (J.C. Schmidt & Kunze) Kuntze [as ‘*Caeomurus*’], Revis. gen. pl. **3**(3): 450, 1898.

= *Caeoma ornithogali* Schltdl., Fl. berol. **2**: 125, 1824.

Holotype (Braun 1979, as ‘lectotype’): [Germany,] Berlin, undated, on *Gagea pratensis* (≡ *Ornithogalum pratense*), herb. D. F. L. v. Schlechtendal (HAL 1610 F).

Critical notes to the misapplication of the name *Uromyces ornithogali* to an *Uromyces* species on *Gagea* spp.

Uredo ornithogali (Schmidt & Kunze 1819) is a smut fungus and the basionym of *Vankya ornithogali* (see discussion above). However, this name has a long history of misinterpretation and confusion with a rust fungus on *Gagea* spp., which was initiated by Léveillé (1847) who cited *U. ornithogali* under *Uromyces*. This treatment was usually recognised as valid combination or as a name solely ascribed to Léveillé (Sydow & Sydow 1910). However, Léveillé (l.c.) did not definitely associate the final epithet with the name of the genus *Uromyces*, which renders this ‘combination’ invalid (Art. 35.2). The combination *Uromyces ornithogali* was later validly introduced by Fuckel (1860). Winter (1885: 141) used this name, but cited it erroneously as ‘*U. ornithogali* (Wallr.)’ with reference to *Erysibe rostellata* ζ *ornithogali* Wallr. (Wallroth 1833: 209), who, however, cited *Uredo ornithogali* as synonym, which can be interpreted as an indirect reference to Léveillé (l.c.), rather than a ‘new combination’ based on Wallroth’s (l.c.) ζ *ornithogali*, which would be a homonym of *U. ornithogali* validly published by Fuckel (l.c.). In addition, Winter (l.c.) cited *Uromyces gageae* G. Beck (Beck 1880) as synonym and described smooth to verruculose spores, i.e., his species concept covered two different *Gagea* rusts, one with smooth and one with verruculose teliospores, as later correctly emphasized by Bubák (1903). Sydow & Sydow (1910) followed Bubák (l.c.) and recognized two species, viz., *Uromyces gageae* with smooth teliospores and a second species with verruculose spores that they called *U. ornithogali* Lév., 1847, without any reference to *Uredo ornithogali* J.C. Schmidt & Kunze, probably since the source of the latter name was unknow to them, as evident from Gäumann’s discussion (1959: 290). Gäumann (l.c.) also used *U. ornithogali* Lév. and emphasised that the source of the name *Uredo ornithogali* was unknown to him. He supposed that this name had only been published ‘in schedae’ or in a cryptic publication. Gäumann (l.c.) cited *Uromyces acutatus* Fuckel, validly published in Fungi Rhen. Exs., Suppl. Fasc. **2**: no. 1666, 1866 (see Braun & Bensch 2020: 98) as synonym, including a brief discussion on this name and the putative confusion of the host name. The host was originally identified as *Allium oleraceum*. Hariot (1891) evidently studied Fuckel’s material and concluded that the host was only *G. arvensis* (or he relied on Fuckel, 1870, who brought the involvement of *G. arvensis* as host into play). As to *U. acutatus*, Sydow & Sydow (l.c.) also suggested a misidentification and confusion with a host species of *Gagea*. These treatments of the *Gagea* rusts, above all that of Sydow & Sydow (l.c.), led to a widespread recognition of *Uromyces ornithogali* as name for the *Gagea* rust with verruculose teliospores until recently, and found entrance into influential European standard rust monographs, such as Gäumann (1959: 290). Many authors followed Sydow & Sydow (l.c.) and Gäumann (l.c.) and used the name ‘*Uromyces ornithogali* Lév.,’ such as Kuprevič & Ul’janiščev (1975) and Poelt (1985), just to name a few examples. Other authors preferred the name *U. acutatus* for this rust, e.g., Minkevičius & Ignatavičiūtė (1991), Müller (2000), and Klenke & Scholler (2015).

In any case, *Uredo ornithogali* belongs in the synonymy of the smut *Vankya ornithogali* and is not available for the *Gagea Uromyces*, which raises the question as to the correct name for the rust fungus concerned. *U. acutatus* is available and the oldest valid name for this species. However, the confusion around this rust name and the host identity (Fuckel 1870, Sydow & Sydow, l.c.), requires the clarification of this name and its lectotypification. Type material preserved at HAL has been examined. The type host was originally given as *Allium oleraceum*, which was undoubtedly wrong. The leaf fragments are very delicate, to 1 mm wide, and do not pertain to *A. oleraceum*, but rather to *Gagea* sp. (*G. arvensis*, according to Fuckel 1870 and Heriot 1891). The leaves are co-infected by a rust with pustulate, pulverulent, brown sori and large, papillate, verruculose teliospores, identical with the *Gagea* rust commonly referred to as *Uromyces ornithogali*, and a smut with fusiform blackish or blackish brown sori producing much smaller spores, 10–18 × 8–13 µm, brown, subglobose, ellipsoid, irregularly angular to oblong, wall 1.5–1.3 µm thick, irregularly delicately verruculose. This smut is identical with *Vankya ornithogali*. However, Fuckel's original description only refers to the rust: "Acervulis primo tectis, dein per epidermidem longitudinaliter fissam erumpentibus, atro-fuscis, sporidiis ovatis seu obovatis, breviter **stipitatis**, **apice hyalino apiculatis**, fuscis." (see Braun & Bensch 2020: 98). Therefore, the name *U. acutatus* is available for the *Gagea Uromyces* with verruculose spores. In order to fix the application of this name, we designate the examined specimen deposited at HAL as lectotype and confine the lectotype to the included and described rust element, excluding the smut sori and spores (*Vankya ornithogali*):

Uromyces acutatus Fuckel, Fungi Rhen. Exs., Suppl. Fasc. **2**: no. 1666, 1866 [repeated in Hedwigia **5**(4): 51, 1866].

≡ *Coeomurus acutatus* (Fuckel) Kuntze [as "*Caeomurus*"], Revis. gen. pl. **3**(3): 449, 1898.

Lectotype (designated here, MycoBank, MBT10015060): "Ad Allii oleracea folia, raro. Vere. Ca. Hostricham.," [host: *Gagea* sp., probably *G. arvensis*; locality today Germany, Hessen, Landkreis Rheingau-Taunus, Oestrich-Winkel, OT Oestrich], Fuckel, Fungi Rhen. Exs., Suppl. Fasc. 2: no. 1666 (HAL, s.n.). Isolectotypes: Fuckel, Fungi Rhen. Exs., Suppl. Fasc. 2: no. 1666, e.g., B, FH, G, S.

Misapplied names: *Uromyces ornithogali* (J.C. Schmidt & Kunze) Lév., auct.; *U. ornithogali* Lév., auct.

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