



Short note

Typification of the snow-bank *Peziza nivalis*

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ARTICLE INFO

Received 27/04/2025; accepted 03/11/2025

<https://doi.org/10.6092/issn.2531-7342/21851>

Abstract

Typification plays a crucial role in mycological taxonomy as it ensures nomenclatural stability and anchors species names to clearly defined reference material. This is particularly critical when original material is incomplete, poorly preserved, or lacks molecular data, since reliable reference points are essential for accurate species delimitation and consistent phylogenetic interpretation. Here, typifications are proposed for two nivicolous *Peziza* species. For *Galactinia nivalis* R. Heim & L. Rémy, a lectotype is designated from the original illustrations, and the holotype of *Peziza fortouliei* Donadini, a later synonym, serves as a supporting epitype. For *Peziza heimii* Pfister, the holotype in the MNHN herbarium (PC) is unsuitable for genetic characterization, and thus a supporting epitype is designated. In both cases, sequences from the epitypes are already available. These typifications strengthen nomenclatural stability and provide a robust foundation for future taxonomic, morphological, and molecular studies on nivicolous taxa within *Peziza*.

Keywords

Nivicolous fungi, type designation, *Galactinia nivalis*, *Auleria nivalis*, *Peziza flos-nivium*, *Peziza fortouliei*, *Peziza ninguis*

Introduction

Peziza nivalis was originally described by Heim and Rémy (1932) as *Galactinia nivalis*. Heim (1947) later proposed the new combination *Aleuria nivalis*, and based on his description this later collection had larger spores than originally described. The transfer of *Galactinia nivalis* to *Peziza* was first proposed by Moser (1963), but invalidly; it was finally validly published by Avizohar-Hershenzon and Nemlich (1974), who attributed it nonetheless to Moser. Donadini later published a superfluous replacement name for this species, *Peziza flos-nivium*, though he described a different fungus (Donadini, 1978). Rémy (1965) then introduced an invalid species and variety, *Aleuria nivalis* and *Aleuria nivalis* var. *alpina*. Several other nivicolous members of the genus *Peziza* were described by



Donadini and co-authors: *P. fortoulia* Donadini & Neville (Donadini, 1978; 1979b), *P. ninguis* Donadini & Trimbach (Donadini 1978, 1979b) and *Peziza nivis* (Donadini 1979a). The work of Van Vooren and Mauruc (2020) provides sequences from Donadini's types and specimens representing his concepts, allowing accurate placement of these taxa. *Peziza fortoulia* and *P. ninguis* fall within the *Peziza nivalis* complex (Pfister et al., 2024). Included in the complex is also the North American *P. phaeotheca* McKnight and Dublin (1979).

Typification

Galactinia nivalis R. Heim & L. Rémy, Bull. Trimestriel Soc. Mycol. France 48: 63 (1932), MycoBank # 272372

Lectotype (designated here, MycoBank Typification # MBT 10029381): Heim and Rémy (1932): Figure 5; **Epitype (designated here, MycoBank Typification # MBT 10029329):** FRANCE, Hautes-Alpes, Valloise-Pelvoux. Ailefroide, alt. 1600 m, dans un pré à proximité de mélèzes (*Larix decidua*), mai 1978, leg. G. Fortoul & J.-C. Donadini JCD 77-78 (MPU)

≡ *Aleuria nivalis* (R. Heim & L. Rémy) R. Heim, Rev. Mycol. (Paris) 12(2): 71 (1947), MycoBank # 284005

≡ *Peziza nivalis* (R. Heim & L. Rémy) M.M. Moser, Kleine Krypt.-Fl. IIa: 102 (1963), nom. inval. (Art. 41.5)

≡ *Peziza nivalis* (R. Heim & L. Rémy) M.M. Moser ex Aviz.-Hersh. & Nemlich, Israel J. Bot. 23(3): 162 (1974), MycoBank # 319482

≡ *Peziza nivalis* (R. Heim & L. Rémy) Donadini, Bull. Soc. Linn. Provence 31: 11 (1979) [1978], later isonym (Art. 6.3, Note 2)

≡ *Peziza flos-nivium* Donadini, Bull. Soc. Linn. Provence 30: 80 (1978) [1977], nom. illegit. (Art. 52.1), MycoBank # 110244

?= *Aleuria nivalis* R. Heim & L. Rémy, Bull. Trimestriel Soc. Mycol. France 48: 63 (1932), nom. inval. (Art. 38.1[a])

≡ *Aleuria nivalis* R. Heim & L. Rémy, in Rémy, Bull. Trimestriel Soc. Mycol. France 80(4): 562 & 584 (1965) [1964], nom. inval. (Art. 40.1)

= *Peziza ninguis* Donadini & Trimbach, in Donadini, Bull. Soc. Linn. Provence 30: 77 (1978) [1977] MycoBank # 110239

Holotype: FRANCE, Alpes-Maritimes, Lantosque, vers Peïra Cava, forêt de Turini, alt. ~1600 m, 25 mai 1974, leg. J. Trimbach & J.-C. Donadini JCD 398-74 (MPU)

= *Peziza fortoulia* Donadini & Neville, in Donadini, Bull. Soc. Linn. Provence 30: 83 (1978) [1977]. MycoBank # 110237

Holotype: FRANCE, Hautes-Alpes, Valloise-Pelvoux. Ailefroide, alt. 1600 m, dans un pré à proximité de mélèzes (*Larix decidua*), mai 1978, leg. G. Fortoul & J.-C. Donadini JCD 77-78 (MPU)

≡ *Peziza ninguis* var. *fortoulia* (Donadini & Neville) Donadini, Bull. Soc. Linn. Provence 31: 12 (1979) [1978] MycoBank # 117793, nom. inval. (Art. 41.5)

≡ *Peziza ninguis* f. *fortoulia* (Donadini & Neville) Donadini, Bull. Trimestriel Féd. Mycol. Dauphiné-Savoie 76: 30 (1980), nom. inval. (Art. 41.5)

≡ *Peziza ninguis* f. *fortoulia* (Donadini & Neville) Donadini, Doc. Mycol. 12(46): 5 (1982), MycoBank # 118037

= *Peziza phaeotheca* McKnight & Dublin, Beih. Sydowia 8: 224 (1979), MycoBank # 319485

Holotype: USA, Utah, Summit County, Wasatch National Forest, Mill Creek, 14 June 1971, leg. K. H. McKnight (BPI 569815)



Fig. 1 - Holotype of *Peziza fortoulia* (Donadini & Neville) Donadini [*Peziza ninguis* var. *fortoulia*] and epitype of *Peziza nivalis* (Heim & Rémy) M.M. Moser

Notes: No specimen has been found in herbarium of the MNHN in Paris (PC) matching the specimens listed in the protologue of *Galactinia nivalis*. Original material does exist in the form of two illustrations published in the protologue: Figure 5 on page 64 (an illustration of microscopic features)

and Plate X, Figure 2 (a color illustration of the macromorphology). Of the two, we prefer to select Figure 5, the image depicting a portion of the hymenium and spores, as lectotype. In support of this lectotype, we here propose as epitype the holotype of *Peziza fortoulia* to stabilize the concept of *Peziza nivalis*. Van Vooren and Mauruc (2020) generated the following sequences (indicated with their GenBank accession numbers) from this specimen: MT278882 (ITS), MT273599 (LSU), and MT274701 (*RPB2*). When analyzed with other collections, Pfister et al. (2024) showed that these agree with those generated from the holotype of *Peziza ninguis* (JCD 398-74, in MPU: MT278886 [ITS], MT273603 [LSU], and MT274704 [*RPB2*]) which should therefore be considered a further synonym of *P. nivalis*.

Medardi (2021), having searched the Herbarium of the University of Montpellier (MPU) for the holotype of *P. fortoulia* in vain, reported it as lost and designated as lectotype the figures of this species included in the protologue. This designation was not effected, however, as multiple illustrations were designated lectotype (Art. 9.3). The supporting epitype he designated, not supporting an effectively designated lectotype, has no standing. Happily, the holotype of *P. fortoulia* is still preserved at MPU, only filed under the name *Peziza ninguis* var. *fortoulia* (Fig. 1); this likely accounts for the previous failure to find it.

Peziza heimii Pfister, Mycotaxon 43: 174. 1992. MycoBank # 355491

Holotype: FRANCE, Haute-Savoie, pente terminale menant au Col de la Pointe Pelouse, vers 2260 m, versant Nord, 14 Juin 1943, leg. R. Heim (PC071485); **Epitype (designated here,** MycoBank Typification # MBT 10029330): FRANCE, Savoie, Termignon, Plan du Lac, près du refuge du Plan du Lac, alt. 2500 m, sur humus, herbes, mousses et autres brindilles pourries détrempées par les eaux de fonte des névés, été 1977, leg. J.-C. Donadini & A. Soleilhac JCD 174-78 (MPU)

= *Aleuria nivalis* sensu Heim (1947)

?= *Aleuria nivalis* var. *alpina* R. Heim & L. Rémy, in Rémy, Bull. Trimestriel Soc. Mycol. France 80(4): 564 & 585 (1965) [1964], nom. inval. (Art. 35.1, 40.1), MycoBank # 349006

= *Peziza flos-nivium* sensu Donadini (1978)

= *Peziza nivalis* sensu Donadini (1979a)

Notes: The holotype of *Peziza heimii* is a dried sample that had previously been preserved in an unidentified liquid. Due to the size of the sample and its preservation history, it is unsuitable for genetic analysis (B. Buyck, personal communication). In support of the holotype, in order to stabilize the application of this name, we designate as epitype a specimen from Donadini's herbarium representative of his concept of *Peziza flos-nivium* and later, *Peziza nivalis*. The following sequences were generated from this specimen by Van Vooren and Mauruc (2020): MT635329 (ITS), MT635332 (LSU), MT635814 (*RPB2*), and MT635811 (*TEF1*).

The name *Peziza flos-nivis* has in recent years been interpreted as the name of a new species and listed in synonymy with *Peziza heimii* (Van Vooren and Mauruc, 2020; Pfister et al., 2020), with JCD 478-77 indicated as holotype. Donadini (1978) when proposing the name unambiguously indicated it as a replacement name for *Galactinia nivalis* with a full and direct citation of the protologue, however. Treating it as the publication of a new species is thus not tenable; it must be treated as a superfluous renaming of *G. nivalis* and an obligate synonym of *Peziza nivalis*. The fact remains that Donadini's (1978) concept of *P. flos-nivis* and later, *P. nivalis* (Donadini, 1979a) was

apparently based on Heim's (1947) concept rather than the original concept of Heim and Rémy (1932). We thus list these interpretations here as synonyms and the actual names as synonyms of *P. nivalis*.

Acknowledgements

We would like to express our gratitude to Bart Buyck, Curator of Mycology at MNHN-PC Paris, and Caroline Loup, Curator of MPU Herbarium, for their kind information on the specimens in the herbarium MPU and the image of the holotype of *Peziza fortouliei*. Special thanks also to Ursula Peintner, Innsbruck, for the loan of the specimens of *Peziza nivalis* of M.M. Moser and the authorization to sequence them.

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