

NOMENCLATURE COMMUNICATIONS

(2952) Proposal to conserve the name *Coccidioides posadasii* against *Posadasia esferiformis*, *Coccidium posadasi*, *Pseudococcidioides mazzae*, *Geotrichum louisianoideum*, *Glenospora meteuropea*, *Glenospora metamericana* and *Trichosporon proteolyticum* (Ascomycota)Sybren de Hoog,¹ Kathrin Tintelnot,² Matthew C. Fisher,³ John W. Taylor⁴ & Scott A. Redhead⁵¹ Radboudumc-CWZ Centre of Expertise for Mycology, Geert Grooteplein 10 Zuid, 6525GA Nijmegen, The Netherlands² Deidesheimer Strasse 10, 14197 Berlin, Germany³ MRC Centre for Global Infectious Disease Analysis, Imperial College, London, United Kingdom⁴ Plant and Microbial Biology, 111 Koshland Hall, University of California, Berkeley, California 94720-3102, U.S.A.⁵ National Mycological Herbarium, Ottawa Research & Development Centre, Science & Technology Branch, Agriculture & Agri-Food Canada, Ottawa, Ontario, Canada K1A 0C6Addresses for correspondence: Sybren de Hoog, Sybren.deHoog@radboudumc.nl; Scott A. Redhead, scott.redhead@agr.gc.caDOI <https://doi.org/10.1002/tax.12961>

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- (2952) *Coccidioides posadasii* M.C. Fisher & al. in Mycologia 94: 78. 2002, nom. cons. prop.
Lectotypus (hic designatus): [cryopreserved culture] “Pappagianis isolate ‘Silveira’” from “severe primary coccidioidal infection [human] with erythema nodosum”, U.S.A., California, San Joaquin Valley, 1951 (ATCC No. 28868). MBT 10011881
- (=) *Posadasia esferiformis* Cantón ex Posadas, Ensayo Nueva Neoplasia Hombre: Psorospermiosis Infect. Generaliz. 2: [3, footnote]–94. 1898 (*‘esferiforme’*), nom. rej. prop.
Lectotypus (hic designatus): preserved infected human male, left foot, Pieza No. 779 (Mus. Patol., Dept. Patol., Fac. Med. Univ. Buenos Aires). MBT 10011896
- (=) *Coccidium posadasi* Cantón, Tratado Zooparásitos Cuerpo Humano: 108. 1898 (*‘posadas’*), nom. rej. prop.
Lectotypus (hic designatus): [icon in] Cantón, Tratado Zooparásitos Cuerpo Humano: 119, fig. 6. 1898. MBT 10011898
- (=) *Pseudococcidioides mazzae* Fonseca in Bol. Inst. Clín. Quir. Fac. Ci. Méd. Univ. Nac. 4: 495. Apr–Mai 1928, nom. rej. prop.
Lectotypus (hic designatus): [icon in] Bol. Inst. Clín. Quir. Fac. Ci. Méd. Univ. Nac. 4: 499, fig. 19. Apr–Mai 1928. MBT 10011882
- (=) *Geotrichum louisianoideum* Castell. in Med. Press Circ. 136: 439. 31 Mai 1933, nom. rej. prop.
Neotypus (hic designatus): [cryopreserved culture] *Castellani*, No. C. 8 (CBS No. 145.34). MBT 10011899
- (=) *Glenospora meteuropea* Castell. in Med. Press Circ. 136: 440. 31 Mai 1933, nom. rej. prop.
Lectotypus (hic designatus): [icon in] Med. Press Circ. 136: 440, fig. 4. 31 Mai 1933. MBT 10011900. **Epitypus (hic designatus):** [cryopreserved culture] isolated by A. Castellani, deposited by R. Ciferri (CBS No. 146.34). MBT 10011885
- (=) *Glenospora metamericana* Castell. in Med. Press Circ. 136: 440. 31 Mai 1933, nom. rej. prop.
Lectotypus (hic designatus): [icon in] Med. Press Circ. 136: 440, fig. 5. 31 Mai 1933. MBT 10011901. **Epitypus (hic designatus):** [cryopreserved culture] isolated by A. Castellani, deposited by R. Ciferri (CBS No. 196.34). MBT 10011886
- (=) *Trichosporon proteolyticum* Negroni & Villafañe in Mycopathologia 2: 57. 1939, nom. rej. prop.
Lectotypus (hic designatus): [icon in] Mycopathologia 2(1): t. VIII, fig. 2. 1939. MBT 10011902
- Coccidioides immitis* Rixford & Gilchrist (in Johns Hopkins Hosp. Rep. 1: 243. 1896) was designated by Clements & Shear (Gen. Fung., ed. 2: 410. 1931) as type of the fungal generic name *Coccidioides* Stiles in Rixford & Gilchrist (l.c.) (*Ascomycota*, *Onygenales*). This species name is occasionally incorrectly cited as “*C. immitis* C.W. Stiles in Rixford & Gilchrist”, due to a misreading of a statement by Rixford & Gilchrist in the original description “[...] we propose for it, in accordance with the suggestion of Dr. Stiles, the generic name *Coccidioides*, and we designate the species as *Coccidioides immitis*”. A quoted letter from Stiles republished by Rixford & Gilchrist (l.c.: 244) supplies the generic diagnosis differentiating *Coccidioides* from other protozoan genera, *Eimeria* Schneider and *Klossia* Schneider, so that the generic name should be attributed to Stiles (Art. 46.2 of the *ICN*; Turland & al. in *Regnum Veg.* 159. 2018). Stiles agreed with the suggested specific epithet “*immitis*” that was made by Rixford & Gilchrist during a face-to-face meeting (see quoted letter) for the one species but disagreed with a second species epithet, “*superficialis*” for a second species that Rixford & Gilchrist subsequently formally named *C. pyogenes* Rixford & Gilchrist (l.c.: 261).
- A sister species was molecularly recognized by M.C. Fisher, G.I. Koenig, T.J. White & J.W. Taylor (in *Mycologia* 94: 73–84.

2002), who described, identified, and separated it using an operational species concept, Genealogical Concordance Phylogenetic Species Recognition (GCPSR; Avise & Ball in *Oxford Surv. Evol. Biol.* 7: 45–67. 1990; Taylor & al. in *Fungal Genet. Biol.* 31: 21–32. 2000). The species was named *Coccidioides posadasii* M.C. Fisher & al. (l.c. 2002: 78). Sequences of the rDNA internal transcribed spacer (ITS) region provide diagnostic polymorphisms for the identification and differentiation of this species from *C. immitis* (Tintelnot & al. in *Med. Mycol.* 45: 385–393. 2007). Both species are etiologic agents of one of the classical systemic diseases, coccidioidomycosis, an infection known since the late 19th century (Posadas [as Posada] in *Anales Circulo Méd. Argent.* 15: 585–597, t. I–III. 1892; Wernicke in *Centralbl. Bakteriol. Parasitenk.* 12: 859–861. 1892). While both species exhibit a preference for arid desert regions of North, Central and South America, *C. posadasii* is found throughout these climatic zones, whereas *C. immitis* is primarily restricted in its distribution to the San Joaquin Valley area in California (Fisher & al., l.c. 2002: 73–98; Hamm & al. in *J. Fungi* 5(74): 1–11. 2019; Kollath & al. in *Virulence* 10: 222–233. 2019; Crum in *Infect. Dis. Therapy* 11: 713–742. 2022; Kirkland & al. in *J. Fungi* 8(859): 1–36. 2022).

The purported “holotype” of *Coccidioides posadasii* is the frozen Californian strain RMSCC “Pappagianis isolate ‘Silveira’” (Fisher & al., l.c. 2002: 79), which, in the appendix to the publication (p. 82), is also listed as “Silveira4” from “D. Pappagianis”. Demosthenes Pappagianis is a well-known *Coccidioides* researcher who among other things was an author of a publication (Zimmermann & al. in *J. Clin. Microbiol.* 32: 3040–3042. 1994) that indicated that “Silveira” was isolated in 1951 from a human with severe primary coccidioidal infection with erythema nodosum and from the San Joaquin Valley, California. There were three other Silveira clones of the same isolate routed via the laboratory of Rebecca Cox, referred to as Silveira1, 2 and 3 by R. Cox used as controls (Fisher & al., l.c. 2002: 73–98). The history of these clonal isolates is further elucidated in a genome study of *C. posadasii* using the “Silveira” isolate in yet another lab (Teixeira & al. in *G3* 12(4): jkac031. 2022). RMSCC is an acronym for Roche Molecular Systems Culture Collection in Alameda, California. Article 40.7 of the *ICN* stipulates that beginning in 1990, “the single herbarium, collection, or institution in which the type is conserved must be specified” otherwise the name is not validly published. The type of *C. posadasii* is consequently interpreted as the RMSCC isolate stored in RMSCC because this was the only location and designation specified in the first sentence following “HOLOTYPE:”. The authors went on to say that it was a widely used isolate maintained in the American Type Culture Collection (ATCC) #28868. Additionally, they indicated that a “killed sample of RMSCC Silveira has been lodged in the Jepson Herbarium, University of California at Berkeley, Berkeley, California 94720, USA” and that frozen samples were also in the “Centers for Disease Control and Prevention, Atlanta, Georgia”, thus listing three other locations ATCC (Manassas), JEPS (Berkeley) and CDC (Atlanta) later in the paragraph. Consequently, we interpret the holotype designation to be complete at the end of the first sentence, and the next three mentioned institutes to be indications of isotypes. Given the great importance of the organism involved, it is convenient to make this reasonable assumption of a single holotype with three isotypes. If it were not so interpreted, the name would not be validly published.

Notably, the name *Coccidioides posadasii* was published in the first issue of *Mycologia* for 2002 and the paper had been in press when the 9/11 attacks occurred on September 11, 2001 in New York City, NY and the Pentagon, Arlington, VA. The species in the genus

Coccidioides had become select agents in the U.S.A. (Dixon in *J. Appl. Microbiol.* 91: 602–605. 2001) and tightened rules followed (Federal Register 70: 13294–13325. 2005) for security reasons. Consequently the isolates, including the holotype, at Roche were destroyed (Matthew Fisher, pers. comm., 2 May 2012). The “killed” specimen was probably intended for UC (J. Taylor, pers. comm., 1 May 2012) rather than JEPS (both herbaria are in Berkeley but only UC held fungi), but the specimen never made it to either and was destroyed before deposit (J. Taylor, pers. comm., 1 May 2012). The number “94720” published by Fisher & al. (l.c. 2002: 79), is a U.S.A. postal code number for the herbaria rather than a specimen number. Given that the holotype was destroyed at RMSCC, and there are no illustrations, we hereby designated the frozen isotype at ATCC as lectotype in accordance with Art. 9.11–9.12; specifically ATCC No. 28868 (ex-RMSCC Silveira from San Joaquin, California, U.S.A.). We note that this isolate is also deposited elsewhere as CBS No. 113859. Ironically and confusingly, the name *Coccidioides posadasii* was proposed (Fisher & al., l.c. 2002) for the predominantly so called “non-California population” (Zimmermann & al., l.c.; Koufopanou & al. in *Proc. Natl. Acad. Sci. U.S.A.* 94: 5478–5482. 1997) but typified by an aberrant outlier, a Californian isolate.

Should the Committee for Fungi and/or the General Committee decide that the name *Coccidioides posadasii* was not validly published in 2002 with regard to Art. 40.7 by not following our interpretation as explained above, then we request that the registered, validly published homonym (or isonym) *Coccidioides posadasii* M.C. Fisher & al. in de Hoog & al. (Index Fungorum No. 532. 2023) holotypified by the same lectotype (ATCC No. 28868) chosen here for the 2002 name, be substituted for conservation.

Several older names long forgotten as supposed synonyms of *Coccidioides immitis* (see, e.g., Dodge, *Med. Mycol.*: 149. 1935) were not considered by Fisher & al. (l.c. 2002) and some of those names threaten the name *C. posadasii*: *C. pyogenes* Rixford & Gilchrist (l.c.: 261) was described simultaneously with *C. immitis* but, because we conclude that it is referable to that species, not *C. posadasii*, it is discussed in the Appendix to this proposal (below). Other names older than *C. posadasii* that threaten or potentially threaten the name include *Posadasia esferiformis* (‘*esferiforme*’) Cantón ex Posadas (*Ensayo Nueva Neoplasia Hombre: Psorospermiosis Infect. Generaliz.* 2: [3]. 1898), type of the generic name *Posadasia* Cantón ex Posadas, which was named after the same person, Dr. Alejandro Posadas. Posadas’s famous patient was 33-year-old Mr. Domingo Escurra from Argentina. Posadas studied Mr. Escurra’s disease for 7 years, publishing photographs of him depicting his face, full head, torso, all limbs, front and back throughout the years and conducted an autopsy on him following his death. Posadas believed the causal agent was a protozoan and published numerous illustrations and photographs. Although the organism was unnamed in his thesis and some of his publications, Dr. Elios Cantón, a famous Argentinian medical doctor, proposed a generico-specific name to honour Posadas, “*Posadasia esferiforme*”, in a footnote in volume 2 of Posadas’s *Ensayo ...* for the organism infecting Mr. Escurra. In 1948 the infected head of Mr. Escurra was discovered preserved in a jar in formalin by Dr. Flavio Niño (in *Bol. Inst. Clin. Quir.* 26: 3–14. 1950), recognizable because the patient had been photographed while living. This was preceded by the discovery of other autopsy specimens (feet, hand) by Dr. R. Sammartino, as documented by Deresinski & Mirels (in *Med. Mycol.* 57: S3–S15. 2019). Escurra’s infected left foot (specimen No. 779) was re-examined by Canteros & al. (in *Medicina* (Buenos Aires) 69: 215–220. 2009)

using microscopy and molecular techniques to identify the fungus specifically as *Coccidioides posadasii*. Given a choice of original materials including numerous illustrations or Mr. Escurra's head (Exhibit No. 1, Museo del Instituto de Parasitología de la Facultad de Ciencias Médicas de Buenos Aires), versus the molecularly analysed left foot fungus (No. 779, Museo de Patología, Departamento de Patología, Facultad de Medicina de la Universidad de Buenos Aires., Pieza) we opt to select No. 779 as lectotype specimen of *Posadasia esferiformis*. Photographs of the lectotype were published by Niño (l.c.), Canteros & al. (l.c.) and Deresinski & Mirels (l.c.). This confirms that this earlier species name applies to *C. posadasii*.

Authentic materials of some species names introduced by Aldo Castellani and co-workers (in Med. Press Circ. 136: 439–440. 31 Mai 1933; all often incorrectly attributed to Castellani & Jacono in J. Trop. Med. Hyg. 36: 297–321. 16 Oct 1933) are still available as living isolates in the CBS culture collection. *Geotrichum louisianoideum* Castell. (CBS No. 145.34, from a well-travelled patient living in Louisiana, U.S.A.), *Glenospora meteuropa* Castell. (CBS No. 146.34, from an English patient reported to be infected in the Balkans) and *Glenospora metamericana* Castell. (CBS No. 196.34, origin unknown) all proved to be identical to *Coccidioides posadasii* on the basis of morphological characteristics and sequences of the rDNA ITS region (Tintelnot & al., l.c.). As these names fulfil the requirements for novel species descriptions under the *Code*, they are older synonyms of *C. posadasii*, having priority by more than 60 years (Tintelnot & al., l.c.). In his May 1933 publication, Castellani (l.c.) published two hanging drop illustrations of mostly nondistinctive mycelium, one each of *Glenospora metamericana* and *G. meteuropa* that are here selected as their respective lectotypes. No illustration was supplied for *Geotrichum louisianoideum* in May 1933 (Med. Press Circ. 136), but a nondescript illustration was published in October 1933 (Castellani & Jacono, l.c.) where the earlier publication in May is attributed to *G. louisianoideum*. The cryopreserved epitypes selected here for the *Glenospora* names are based upon authentic identified isolates deposited by R. Ciferri many years ago in CBS and their metadata has been lost. It is logical and reasonable to assume that Ciferri, a contemporary of the older Castellani who was a fellow Italian medical mycology investigator researching the same diseases (see obituary by Baldacci in Mycologia 57: 198–201. 1965), would have acquired Castellani's isolates directly. Castellani & Jacono (l.c.: 320) stated: "Cultures of the fungi described in this paper will be gladly supplied to workers interested in the subject."

Additional names for which there are neither types nor authentic cultures have been listed (Baker & al. in Farlowia 1: 220. 1943; Dodge, l.c.) as synonyms of *Coccidioides immitis* but because they are from outside of California they were probably the more widespread *C. posadasii*. These are:

"*Coccidium neoplasticum*" Cantón (Tratado Zooparasítica Cuerpo Humano: 123. 1898) that Cantón replaced by *Coccidium posadas* before publication (see below); *Pseudococcidioides mazzae* Fonseca (in Bol. Inst. Clín. Quir. Fac. Ci. Méd. Univ. Nac. 4: 495. Apr/Mai 1928; in Prensa Méd. Argent. 12: 532. post Aug 1928) from laryngeal abscess of male patient, Chaco, Argentina, 1927; *Oidium protozoides* Ophüls (in J. Exp. Med. 6: 459. 1905) isolated from disseminated infection of 19-year-old male cattle farmer, originating from the Azores, presenting in San Francisco, 1900 but now considered to be synonymous with *C. immitis* (see Appendix); and *Trichosporon proteolyticum* Negroni & Villafañe (l.c.) isolated from a pulmonary and disseminated fatal infection of 41-year-old male

originating from Córdoba, Argentina, 1938. This last species name was based upon a culture forming arthrospores rather than on the characteristic spherules in tissues normally linked to *Coccidioides*. Negroni later synonymized *Trichosporon proteolyticum* with *Pseudococcidioides mazzae* following experiments with cultures of *T. proteolyticum* injected into guinea pigs that induced production of endospores characteristic of *Pseudococcidioides* (Negroni & Radice in Rev. Arg. Dermatofilografía 30(3/4): 219–223. 1946), but this was followed by Artagaveytia-Allende, who studied the isolate and concluded *P. mazzae* was conspecific with *Coccidioides immitis* (in Mycopathologia 4: 375–378. 1949). As these originated in South America, they are here considered to be *C. posadasii*. The name *Pseudococcidioides mazzae* was published at least twice in 1928, with internal evidence suggesting that the article in Bol. Inst. Clín. Quir. Fac. Ci. Méd. Univ. Nac. volume 4 was published in the spring (April or May) because of articles dated April 1928 bracketing Fonseca's publication on pages 265 and 522. Whereas the publication in Prensa Méd. Argent. volume 12 begins on page 513 with a footnote saying the article was presented at a meeting in May, 1928 and it ends on page 536 where reference is made to a meeting on August 8, 1928. In both 1928 articles there is the same figure 19, here selected as lectotype.

The introduction of *Coccidioides posadasii* as a species distinct from *C. immitis* has stimulated much debate (Millar & al. in J. Clin. Microbiol. 41: 5778–5780. 2003), as this was the first time that a novel species had been described through the use of purely molecular methods. The name is now widely accepted by mycologists and physicians (Umeyama & al. in J. Clin. Microbiol. 44: 1859–1862. 2006; Ramani & al. in Mycopathologia 163: 315–319. 2007; Maxwell & al. in Evolution 73: 42–58. 2018; Crum, l.c.; Teixeira & al., l.c.). Furthermore, the species is the etiologic agent of one of the major fungal diseases in endemic areas in the Americas, with thousands of infections each year (Laniado-Laborin in Ann. New York Acad. Sci. 1111: 19–34. 2007). Under the names *Coccidioides immitis* and *C. posadasii*, the two species have been the focus of genome studies (Sharpton & al. in Genome Res. 19: 1722–1731. 2009; Neafsey & al. in Genome Res. 20: 938–946. 2010; Maxwell & al., l.c.; Teixeira & al., l.c.) and many medical studies (>215 listed in PubMed as of Jan 2022; e.g., Tortorano & al. in Mycopathologia 180: 229–235. 2015; Loudin & al. in Case Rep. Infect. Dis. 2016: No. 8715405. 2016) including whole-genome studies (Maxwell & al., l.c.; Teixeira & al., l.c.). Therefore, to resurrect an earlier name would be counter-productive as it would contribute to nomenclatural instability and confusion.

In contrast, the names *Coccidium posadasii*, *Geotrichum louisianoideum*, *Glenospora meteuropa*, *G. metamericana*, *Posadasia esferiformis*, *Pseudococcidioides mazzae*, and *Trichosporon proteolyticum* have been lost and forgotten except in lists of synonyms as has *Coccidioides pyogenes*, and *Oidium protozoides*, recognized as applicable to *Coccidioides immitis*. Given the wide usage of the name *C. posadasii* and the significance of this species as the infectious agent of a major clinical entity, it is judged inappropriate to replace the rapidly entrenched name for the species. We therefore propose to conserve the name *Coccidioides posadasii* against its earlier synonyms.

Finally, we note that many of the early reports on pathogenic fungi of humans in medical literature over a century ago often confused fungi for protozoans, and were often reported by investigators in several languages nearly simultaneously, which makes tracing of literature nearly impossible. For example, C.W. Dodge (l.c.) lists

“*Megalocitosporides*” Wernicke 1892 as a synonym of *Coccidioides* which would make it an earlier generic name, possibly with earlier specific epithets. But, the one citation given by Dodge and often subsequently referenced by many, the landmark publication by Wernicke (l.c.), does not mention “*Megalocitosporides*”. We saw that Posadas (Ensayo Nueva Neoplasia Hombre: Psorospermiosis Infect. Generaliz. 1: 97. 1897) noted that Dr. Wernicke thought that Posadas’s term, “megalosporideo” was not sufficient and that he recommended the term “megalocitosporideo” be used for the morphological structure. Dodge’s copied synonymy was repeated many times in the *Dictionary of the Fungi* up to edition 10 (Kirk & al., Dict. Fung., ed. 10: 412. 2008) and in other literature (e.g., Seifert & al., Gen. Hyphomycetes: 150 & 284. 2011). Another long-cited synonymous “name”, “*Coccidium neoplasicum*” attributed to Cantón was traced to his now exceedingly rare book (Cantón, l.c. 1898), where on page 123 he noted that following Posadas’s thesis presentation, they tentatively were going to name Posadas’s parasitic protozoan “*Coccidium neoplasicum*” [not validly published], but he settled on the name “*Coccidium posadasii*” instead. *Coccidium posadasii* (as *posadasii*) Cantón was based upon descriptions supplied by Posadas and quoted text and illustrations by Posadas. Cantón (l.c. 1898) redrew Posadas’s illustrations, as is evident from Cantón’s fig. 6, no. 5 (p. 119) which is identical to Posadas’s second drawing on page 79 of his published thesis (Posadas, Contribución Studio de la Etología de los Tumores Psorospermiosis Infectante Generalizada [thesis]. 1894). Cantón’s fig. 6, no. 5 (p. 119) is here selected as lectotype. Therefore, *Coccidium posadasii* is synonymous with *Coccidioides posadasii*.

Coccidium Leuckart, typified by *C. oviforme* Leuckart (Parasiten Menschen Krankheiten, ed. 2, 1: 254–255. 1879) remains a protozoan genus. We therefore, do not “correct” the epithet further than adding “i”. The generic name *Coccidium* Leuckart should not be confused with Agardh’s earlier use of “*Coccidium*” or “*Coccidia*”, with or without a capitalized first letter, for a suprageneric grouping among Floridean algae.

Failure to conserve the exact binomial, *Coccidioides posadasii*, would require publication of a new combination destabilizing medical mycology and governments’ listings causing considerable harm to the reputation of mycological taxonomy among user communities.

Appendix: Application and typification of the names of the related species, *Coccidioides immitis* and *C. pyogenes*.

Differentiation of *Coccidioides posadasii* from *C. immitis* not only involves differentiating two taxa using molecular analyses of sequence data, but is also dependent upon fixing the concept and application of the name, *C. immitis*, via its type (Principle II). When *C. posadasii* was described in 2002 the authors assumed the name *C. immitis* was applied to a different commonly recognized fungus. A second species, *C. pyogenes*, was simultaneously described with *C. immitis* in 1896 and could have been either *C. immitis* itself or *C. posadasii*. Neither the name *C. immitis* nor *C. pyogenes* have extant types and therefore both require typification and discussion to fix their application and to decide if *C. pyogenes* should be rejected against *C. posadasii* or listed as a synonym of *C. immitis* or if indeed *C. posadasii* should be named *C. immitis*! Effective typifications are required (Art. 7.10, 29.1) as explained below.

Rixford & Gilchrist (l.c.: 209–268) introduced the name *Coccidioides immitis*, the type of *Coccidioides*, based upon observations of a specimen from a fatal case of disseminated coccidioidomycosis in a 40-year-old agricultural labourer who had been admitted to the municipal hospital of San Francisco in 1893. Authentic material of *C. immitis* is not known to be preserved at the Johns Hopkins Medical

Center, Baltimore, Maryland (E. Hornsby and W.G. Merz, pers. comm., 2008) and the type specimen(s) reportedly deposited by Rixford & Gilchrist (l.c.: 243) at the “U.S. National Museum” (Smithsonian Institution, Washington, D.C.), consisting presumably of microscope slides prepared via alcohol, celloidin, haematoxylin and eosin, oil of cloves, and Canada balsam from tissue of diseased *Homo sapiens* [Mr. Joas Fertado Silveira, U.S.A., California], has been lost (Rusty Russell, pers. comm. 2008). Additional specimens purportedly held by Rixford, Gilchrist, Welch, Stiles, and Councilman have apparently been lost too. Tintelnot & al. (l.c.) therefore designated a dried culture of strain RMSCC No. 2394 preserved in the Centraalbureau voor Schimmelcultures (CBS No. H-19784), matching the original approximate geographical location, as the neotype of *C. immitis*. CBS is now the Westerdijk Fungal Biodiversity Institute. The ex-“neotype” culture is preserved as CBS No. 120936. Designation of the neotype was not in accordance with Art. 9.8 because other original materials, as photographs, were published in the protologue. Therefore, **we hereby designate a photograph, plate XXV, fig. 1 (Rixford & Gilchrist, l.c.) as lectotype of *Coccidioides immitis* (MBT 10011883). Additionally, we hereby designate CBS No. H-19784 as epitype to the lectotype (MBT 10011884), thus maintaining Tintelnot & al.’s (l.c.) application of the name, *C. immitis*, as a species distinct from *C. posadasii*. We further note that the lectotype was from “Case 1” as reported by Rixford & Gilchrist (l.c.), a labourer in California who had worked in the interior, but which they suspected may or may not have been infected prior to emigrating from the Azores.**

Coccidioides pyogenes Rixford & Gilchrist (l.c.: 261) described simultaneously with *C. immitis* was isolated from a cutaneous infection of a 33-year-old male originating from the Azores, having worked in San Joaquin Valley, California, presenting in San Francisco, 1938. As with *C. immitis*, the name’s authors purportedly deposited what are presumed to be microscope slides in the U.S. National Museum that are presumed lost as were the other materials with other researchers. For both protologues, *C. immitis* and *C. pyogenes*, Rixford and Gilchrist (l.c.: 243, 261) cited “(Rixford and Gilchrist, 1895)” following the binomials which suggests earlier publication of the names. A footnote on page 209 indicates that references were listed following another article on varicella. No reference to Rixford and Gilchrist 1895 is included there, but there are references by L.A. Duhring (Cutan. Med. 1: 156–157. 1895) to Gilchrist and Rixford 1894, 1895 and again to 1895 in another publication. The two former citations to “Rixford and Gilchrist, 1895” were public readings by the authors on the disease before scientific societies, whilst in the book by Duhring, both authors’ study of the disease is discussed, but no generic name or binomials are included. Rixford & Gilchrist (l.c.) differentiated the two species that they recognized based upon disease symptoms and morphological development but could not exclude the possibility that the same taxon was involved in both cases. We note that because the two species have a sympatric distribution and pathologically cannot be differentiated we still cannot exclude the possibility that the original material of *C. pyogenes* could have been *C. immitis* itself as both were described from California from labourers who had been in the San Joaquin Valley. However, to avoid continued ambiguity in name application in current literature, **we hereby designate the illustration of *Coccidioides pyogenes* from “Case 2”, Plate XL Fig. 1 by Rixford & Gilchrist (l.c.) as lectotype of *C. pyogenes* (MBT 10011903). Additionally, we hereby designate as epitype the same specimen selected as epitype for *C. immitis*, viz. CBS No. H-19784 (MBT 10011887). This establishes that *C. pyogenes* is a synonym of *C. immitis* and not**

of *C. posadasii*. The epitype selected for both was molecularly characterized and differentiated from that for *C. posadasii* by Tintelnot & al. (l.c.) and maintains current usage. There was always a greater likelihood that *C. pyogenes* was *C. immitis* than *C. posadasii* because of the prevalence of *C. immitis* in California.

Two other listed synonyms coined for *Coccidioides pyogenes* are superfluous and illegitimate. Ophüls (l.c.) considered that *C. immitis* Rixford & Gilchrist and *C. pyogenes* Rixford & Gilchrist represented a single species that should be included in *Oidium* and stated “[...] Its name then would be *Oidium coccidioides*, or, if there should be objections to the adoption of coccidioides, *Oidium protozoides*.” Being published prior to 1953 these are validly published alternative names (Art. 36.2), both are illegitimate as the epithets *immitis* or *pyogenes* were available for use in *Oidium*. It is also unclear which name is being replaced. Earlier *C. pyogenes* had been synonymized with *C. immitis* (Blanchard in Caus. Sci. Soc. Zool. France 1: 171. 1900), hence the alternative *Oidium* names should be considered as applying to *C. immitis*.

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(2953) Proposal to conserve the name *Absconditella* against *Geisleria* (*Ascomycota: Lecanoromycetes*)

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(2953) *Absconditella* Vězda in Preslia 37: 238. 1965, nom. cons. prop.

Typus: *A. sphagnum* Vězda & Poelt

(=) *Geisleria* Nitschke in Rabenhorst, Lich. Eur. Exs. No. 574. Oct 1861, nom. rej. prop.

Typus: *G. sychnogonioides* Nitschke

Vězda (in Preslia 37: 238. 1965) introduced a new genus of lichenized fungi, *Absconditella* (*Stictidaceae*, *Ostropales*, *Lecanoromycetes*, *Ascomycota*) with *A. sphagnum* Vězda & Poelt as the type to accommodate species having minute, urceolate (apothecioid) ascomata with a non-amyloid hymenium and without a dark pigment, simple and indistinctly septate paraphyses, asci with a distinct non-amyloid tholus and chlorococcoid algae as a photobiont. At least 12 additional species have been described (Vězda, l.c. 1965; Vězda & Vivant in Folia Geobot. Phytotax. 10: 205. 1975; Döbbeler & Poelt in Herzogia 4: 364. 1977; Vězda & Pišút in Nova Hedwigia 40: 342, 344. 1985 [“1984”]; Søchting & al. in Biblioth. Lichenol. 88: 613. 2004; Spribille & al. in Bryologist 112: 111. 2009; Kondratyuk & al. in Acta Bot. Hung. 55: 277. 2013; Van den Boom & al. in Phytotaxa 238: 272. 2015; Cáceres & Aptroot in Bryologist 119:

254. 2016; Kalb & Aptroot in Bryologist 121: 57, 60. 2018) and four have been transferred from other genera (Vězda, l.c. 1965: 241, 244; Rossman in Mycotaxon 8: 505. 1979; Hawksworth & al. in Lichenologist 12: 106. 1980). The genus is cosmopolitan, and most species are sporadically collected due to their small size and probably ephemeral nature.

The name *Geisleria* was introduced by Nitschke (in Rabenhorst, Lich. Eur. Exs. No. 574. 1861) for a single species, *G. sychnogonioides* Nitschke. Three more species were described later, one of which, *G. alpina* Servit (in Blumea 7: 594. 1954), appeared to be a parasymbiont on *Polyblastia albida* Arnold (Swinscow in Lichenologist 3: 418. 1967); another, *G. jamesii* Swinscow (l.c.: 420), was reassigned to *Swinscowa* S.H. Jiang, Lüicking & Sérus. (Hongsanan & al. in Fungal Diversity 10: 139. 2020); and the third, *G. xylophila* Vězda (in Folia Geobot. Phytotax. 5: 312. 1970), is still known only by the type specimen. For a long time, the type of ascomata has been one of the main characteristics to delimit higher taxa in *Ascomycetes*. The ascomata of *Geisleria* are enclosed, perithecium-like with a narrow pore, and therefore *G. sychnogonioides* has been referred to pyrenocarpous families such as *Verrucariaceae* in *Eurotiomyces* (Stizenberger in Ber. Thätigk. St. Gallischen Naturwiss. Ges.