

Validation of the generic names *Meira* and *Acaromyces* and nineteen species names of basidiomycetous yeasts

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Abstract. Two generic names, *Meira* and *Acaromyces*, and nineteen species names of basidiomycetous yeasts, earlier proposed and invalidly published, are validated.

Key words: *Acaromyces*, basidiomycetous yeasts, *Cystobasidium*, *Farysia*, *Farysizyma*, *Glaciozyma*, *Meira*, *Microsporomyces*, *Moniliella*, new combination, new genera, new species, nomenclature, *Occultifur*, *Rhodotorula*

Taxonomic novelties. New genera: *Acaromyces* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, *Meira* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev. New species: *Acaromyces ingoldii* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, *Cystobasidium iriomotense* Tanimura, Sugita & M. Takash. ex Denchev & T. Denchev, *Farysia itapuensis* Landell & P. Valente ex Denchev & T. Denchev, *Farysia setubalensis* Á. Fonseca & J. Inácio ex Denchev & T. Denchev, *Farysia taiwaniana* P.H. Wang, Yen T. Wang & S.H. Yang ex Denchev & T. Denchev, *Glaciozyma litoralis* Kachalkin ex Denchev & T. Denchev, *Meira geulakonigae* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, *Meira argovae* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, *Meira miltonrushii* T.A. Rush & Aime ex Denchev & T. Denchev, *Meira nashicola* F. Yasuda & H. Otani ex Denchev & T. Denchev, *Meira nicotianae* H.K. Wang & F.C. Lin ex Denchev & T. Denchev, *Meira siamensis* Limtong, Polburee, Chamnanpa, Khunnamw. & P. Limtong ex Denchev & T. Denchev, *Microsporomyces hainanensis* F.R. Bai & Yang Liu ex Denchev & T. Denchev, *Moniliella byzovii* Thanh, Hien & T.T. Thom ex Denchev & T. Denchev, *Moniliella sojajae* Thanh, Hien, Yaguchi, J.P. Samp. & Lachance ex Denchev & T. Denchev, *Occultifur kilbournensis* Kurtzman

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& Robnett ex Denchev & T. Denchev, *Occultifur tropicalis* Khunnamw., Suruss., Jindam., J.R.A. Ribeiro, Hagler & Limtong ex Denchev & T. Denchev, *Rhodotorula taiwanensis* F.L. Lee & C.H. Huang ex Denchev & T. Denchev. New combination: *Rhodotorula dairenensis* (T. Haseg. & I. Banno) Denchev & T. Denchev.

Introduction

In the cases of description of new yeast species, when the type is a culture preserved in a metabolically inactive state, it is a common practice the type culture to be conserved in two or more collections. Unfortunately, an explicit designation of a holotype often is omitted which has led to description of numerous invalidly published yeast names. In the present article, some invalidly published names of basidiomycetous yeasts are validated.

Validation of the generic names *Meira* and *Acaromyces*

Meira geulakonigii (Boekhout et al. 2003) is not a validly published name, as it was typified with two specimens: CBS 110052 and NRRL Y-27483.

[*Meira geulakonigii* Boekhout, Scorzetti, Gerson & Szejnb., in Boekhout, Theelen, Houbraken, Robert, Scorzetti, Gafni, Gerson & Szejnberg, International Journal of Systematic and Evolutionary Microbiology 53: 1661, 2003 (nom. inval., Shenzhen Code, Art. 40.7)]

Meira geulakonigii (Boekhout et al. 2003) is the type species of *Meira*, making this generic name invalidly published under Art. 40.1, see Arts 6.3, 12.1 (Shenzhen Code). *Meira argovae* Boekhout et al., *M. miltonrushii* T.A. Rush & Aime, *M. nashicola* F. Yasuda & H. Otani, *M. nicotianae* H.K. Wang & F.C. Lin, and *M. siamensis* Limtong et al. are not validly published names (Art. 35.1), as they were assigned to an invalidly published generic name.

Meira Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, **gen. nov.**
Index Fungorum number: IF 558271

For diagnosis see Boekhout et al., International Journal of Systematic and Evolutionary Microbiology 53: 1660, 2003.

Type species: *Meira geulakonigae* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev

Meira geulakonigae Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558272

For description see Boekhout et al., International Journal of Systematic and Evolutionary Microbiology 53: 1661, 2003.

Type: Israel, Upper Galilee, at Dan, isolated from the citrus rust mite infesting grapefruit (*Citrus ×paradisi* Macfad.), October 1996, sin. coll. (CBS 110052, holotype, preserved in a metabolically inactive state; isotype NRRL Y-27483).

Meira argovae Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558273

For diagnosis see Boekhout et al., International Journal of Systematic and Evolutionary Microbiology 53: 1661, 2003.

Type: Israel, Ness Ziona, isolated from a carmine spider mite on leaves of castor bean (*Ricinus communis* L.), autumn 1996, sin. coll. (CBS 110053, holotype, preserved in a metabolically inactive state; isotype NRRL Y-27482).

[*Meira argovae* Boekhout, Scorzetti, Gerson & Szejnb., in Boekhout, Theelen, Houbraken, Robert, Scorzetti, Gafni, Gerson & Szejnberg, International Journal of Systematic and Evolutionary Microbiology 53: 1661, 2003 (nom. inval., Shenzhen Code, Art. 35.1, 40.7)]

Meira miltonrushii T.A. Rush & Aime ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558274

For description see Rush & Aime, Antonie van Leeuwenhoek 103: 1101, 2013.

Type: U.S.A., Louisiana, East Baton Rouge Parish, Baton Rouge, Louisiana State University campus, isolated from a leaf surface of *Magnolia grandiflora* L., November 2009, M.C. Aime, no. 3882 (NRRL Y-48820, holotype, preserved in a metabolically inactive state; isotypes ATCC-MYA 4883, CBS 12591).

[*Meira miltonrushii* T.A. Rush & Aime, Antonie van Leeuwenhoek 103: 1101, 2013 (nom. inval., Shenzhen Code, Art. 35.1)]

Meira nashicola F. Yasuda & H. Otani ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558275

For description see Yasuda et al., Mycoscience 47: 39, 2006.

Type: Japan, Honshu, Tottori Prefecture, Tohaku-cho, orchards, isolated from Japanese pear (*Pyrus pyrifolia* var. *culta* (Makino) Nakai) fruits with reddish stain, September 2001, sin. coll. (MAFF 230028, holotype, preserved in a metabolically inactive state; isotype CBS 117161).

[*Meira nashicola* F. Yasuda & H. Otani, in Yasuda, Yamagishi, Akamatsu, Izawa, Kodama & Otani, Mycoscience 47: 39, 2006 (nom. inval., Shenzhen Code, Art. 35.1)]

Meira nicotianae H.K. Wang & F.C. Lin ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558276

For description see Cao et al., *Phytotaxa* 365: 176, 2018.

Type: China, Guizhou Province, planting farm of tobacco at Guiyang City, 26°62'83" N, 106°85'88" E, isolated from the rhizosphere of tobacco, sin. dat., sin. coll. (Mycological Collection of Zhejiang University, MCZU 1502, holotype, preserved in a metabolically inactive state; isotype CCTCC M2015704).

[*Meira nicotianae* H.K. Wang & F.C. Lin, in Cao, Li, Zhao, Wang, Jeewon, Bhoyroo, Aruna, Lin & Wang, *Phytotaxa* 365: 176, 2018 (nom. inval., Shenzhen Code, Art. 35.1)]

Meira siamensis Limtong, Polburee, Chamnanpa, Khunnamw. & P. Limtong ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558277

For description see Limtong et al., *International Journal of Systematic and Evolutionary Microbiology* 67: 2420, 2017.

Type: Thailand, Ratchaburi Province, Mueang District, isolated from the phylloplane of vetiver grass (*Chrysopogon zizanioides* (L.) Roberty, syn. *Vetiveria zizanioides* (L.) Nash), 2012, sin. coll. (CBS 12860, holotype, preserved in a metabolically inactive state).

[*Meira siamensis* Limtong, Polburee, Chamnanpa, Khunnamw. & P. Limtong, *International Journal of Systematic and Evolutionary Microbiology* 67: 2420, 2017 (nom. inval., Shenzhen Code, Art. 35.1)]

Acaromyces ingoldii (Boekhout et al. 2003) is not a validly published name, as two culture collections, in which the type is conserved, are specified: CBS 110050 and NRRL Y-27484.

[*Acaromyces ingoldii* Boekhout, Scorzetti, Gerson & Szejnb., in Boekhout, Theelen, Houbraken, Robert, Scorzetti, Gafni, Gerson & Szejnberg, *International Journal of Systematic and Evolutionary Microbiology* 53: 1662, 2003 (nom. inval., Shenzhen Code, Art. 40.7)]

Acaromyces ingoldii (Boekhout et al. 2003) is the type species of *Acaromyces* making this generic name invalidly published under Art. 40.1, see Arts 6.3, 12.1 (Shenzhen Code).

Acaromyces Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, **gen. nov.**

Index Fungorum number: IF 558278

[non *Acaromyces* Lavie, *L'Apiculteur* 3: 44, 1950 (nom. inval., Shenzhen Code, Art. 39.1)]

For diagnosis see Boekhout et al., *International Journal of Systematic and Evolutionary Microbiology* 53: 1662, 2003.

Type species: *Acaromyces ingoldii* Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev

Acaromyces ingoldii Boekhout, Scorzetti, Gerson & Szejnb. ex Denchev & T. Denchev, sp. nov.

Index Fungorum number: IF 558279

For diagnosis see Boekhout et al., International Journal of Systematic and Evolutionary Microbiology 53: 1662, 2003.

Type: Israel, south of the Sea of Galilee, isolated from the citrus rust mite on leaves of grapefruit (*Citrus ×paradisi* Macfad.), 1995, sin. coll. (CBS 110050, holotype, preserved in a metabolically inactive state; isotype NRRL Y-27484).

Validation of species names, invalidly published under Art. 40.7 of the ICN (Shenzhen Code), as more than one culture collection, in which the type is conserved, are specified

Cystobasidium iriomotense Tanimura, Sugita & M. Takash. ex Denchev & T. Denchev, sp. nov.

Index Fungorum number: IF 558280

For description see Tanimura et al., PLoS ONE 13(9): e0202164, 9, 2018.

Type: Japan, Okinawa, Iriomote Island, Iriomote Ishigaki National Park, isolated from soil, November 2008, T. Sugita, s.n. (JCM 24594, holotype, preserved in a metabolically inactive state; isotype CBS 15015).

[*Cystobasidium iriomotense* Tanimura, Sugita & M. Takash., in Tanimura, Sugita, Endoh, Ohkuma, Kishino, Ogawa, Shima & Takashima, PLoS ONE 13(9): e0202164, 9, 2018 (nom. inval., Art. 40.7)]

Farysizyma Á. Fonseca was described as an anamorphic genus in the *Ustilaginales* to accommodate three ustilaginomycetous yeast species: *F. itapuensis*, *F. setubalensis*, and *F. taiwaniana* (Inácio et al. 2008), with a type species *F. itapuensis* Landell & P. Valente. *Farysizyma itapuensis* (Inácio et al. 2008), however, is an invalidly published species name, as it was typified with two specimens (CBS 10428 and NRRL Y-48116), making the generic name *Farysizyma* invalidly published under Art. 40.1, see Arts 6.3, 12.1 (Shenzhen Code).

[*Farysizyma itapuensis* Landell & P. Valente, in Inácio, Landell, Valente, Wang, Wang, Yang, Manson, Lachance, Rosa & Fonseca, FEMS Yeast Research 8: 506, 2008 (nom. inval., Shenzhen Code, Art. 40.7)]

Thus, *Farysizyma setubalensis* and *F. taiwaniana* are not validly published names (Art. 35.1), as they were assigned to an invalidly published generic name. In the description of the genus *Farysizyma* (Inácio et al. 2008), it was noted: “Genus of epiphytic and anamorphic fungi that belongs to the *Ustilaginales* and is closely related to species of the genus *Farysia*”.

The phylogenetic position of the *Farysizyma* species in *Farysia* was demonstrated by Wang et al. (2015), who transferred *Farysizyma itapuensis*, *F. setubalensis*, and *F. taiwaniana* in *Farysia*, but their combinations are not validly published, as the ‘basionyms’ are not validly published names.

Farysia itapuensis Landell & P. Valente ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558281

For description see Inácio et al., FEMS Yeast Research 8: 506, 2008 (as ‘*Farysizyma itapuensis*’).

Type: Brazil, Rio Grande do Sul, Itapuá Park, Pedreira Beach, isolated from leaves of *Vriesea friburgensis* Mez (*Bromeliaceae*), sin. dat., sin. coll. (CBS 10428, holotype, preserved in a metabolically inactive state; isotype NRRL Y-48116).

Farysia setubalensis Á. Fonseca & J. Inácio ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558282

For description see Inácio et al., FEMS Yeast Research 8: 507, 2008 (as ‘*Farysizyma setubalensis*’).

Type: Portugal, Setúbal District, the Arrábida Natural Park, Fonte do Veado, isolated from the phylloplane of *Cistus albidus* L., sin. dat., sin. coll. (CBS 10241, holotype, preserved in a metabolically inactive state).

Farysia taiwaniana P.H. Wang, Yen T. Wang & S.H. Yang ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558283

For description see Inácio et al., FEMS Yeast Research 8: 506, 2008 (as ‘*Farysizyma taiwaniana*’).

Type: Taiwan, NanJen-Shan Natural Reserve, approx. 22°40'N, 120°29'E, isolated from the phylloplane of *Daphniphyllum glaucescens* subsp. *oldhamii* T.C. Huang (*Daphniphyllaceae*), sin. dat., sin. coll. (CBS 9927, holotype, preserved in a metabolically inactive state; isotype BCRC 23028).

Microsporomyces hainanensis F.R. Bai & Yang Liu ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558284

For description see Bai et al., Current Microbiology 73: 572, 2016.

Type: China, Hainan Province, the scientific research base of China National Hybrid Rice R&D Center in Sanya City, 18°18'01"N, 109°31'36"E, isolated from seeds of hybrid rice (*Oryza sativa* L.), sin. dat., sin. coll. (CICC 33066, holotype, preserved in a metabolically inactive state; isotype CBS 14092).

[*Microsporomyces hainanensis* F.R. Bai & Yang Liu, in Bai, Liu, Li, Yao, Li, Wang & Cheng, *Current Microbiology* 73: 572, 2016 (nom. inval., Art. 40.7)]

Moniliella byzovii Thanh, Hien & T.T. Thom ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558285

For description see Thanh et al., *International Journal of Systematic and Evolutionary Microbiology* 63: 1195, 2013.

Type: Vietnam, Phan Thiet, Cape of Ke Ga, isolated from a flower of *Ipomoea pes-caprae* (L.) R. Br., 2012, sin. coll. (CBS 12757, holotype, preserved in a metabolically inactive state).

[*Moniliella byzovii* Thanh, Hien & T.T. Thom, *International Journal of Systematic and Evolutionary Microbiology* 63: 1195, 2013 (nom. inval., Art. 40.7)]

Moniliella sojajae Thanh, Hien, Yaguchi, J.P. Samp. & Lachance ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558286

For description see Thanh et al., *International Journal of Systematic and Evolutionary Microbiology* 68: 1811, 2018.

Type: Vietnam, Hung Yen, My Hao, at Ban Yen Nhan, isolated from fermented soybean during traditional production of *tuong* (Vietnamese soy paste), sin. dat., sin. coll. (CBS 126448, holotype, preserved in a metabolically inactive state; isotype NRRL Y-48680).

[*Moniliella sojajae* Thanh, Hien, Yaguchi, J.P. Samp. & Lachance, *International Journal of Systematic and Evolutionary Microbiology* 68: 1811, 2018 (nom. inval., Art. 40.7)]

Occultifur kilbournensis Kurtzman & Robnett ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558287

For description see Kurtzman & Robnett, *Antonie van Leeuwenhoek* 107: 1325, 2015.

Type: U.S.A., Illinois, Kilbourne, an maize field, isolated from maize plants and from surrounding soil, April 2012, sin. coll. (NRRL Y-63695, holotype, preserved in a metabolically inactive state; isotype CBS 13982).

[*Occultifur kilbournensis* Kurtzman & Robnett, *Antonie van Leeuwenhoek* 107: 1325, 2015 (nom. inval., Art. 40.7)]

Occultifur tropicalis Khunnamw., Suruss., Jindam., J.R.A. Ribeiro, Hagler & Limtong ex Denchev & T. Denchev, **sp. nov.**

Index Fungorum number: IF 558288

For description see Khunnamwong et al., *International Journal of Systematic and Evolutionary Microbiology* 65: 1580, 2015.

Type: Thailand, Lopburi Province, Chai Badan District, 15°11'22" N, 101°7'37" E, isolated from the tissue of a sugar cane (*Saccharum officinarum* L.) leaf, 2 Mar 2012, sin. coll. (BCC 61184, holotype, preserved in a metabolically inactive state; isotypes CBS 13389, NBRC 109696).

[*Occultifur tropicalis* Khunnamw., Suruss., Jindam., J.R.A. Ribeiro, Hagler & Limtong, International Journal of Systematic and Evolutionary Microbiology 65: 1580, 2015 (nom. inval., Art. 40.7)]

Rhodotorula taiwanensis F.L. Lee & C.H. Huang ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558289

For diagnosis see Huang et al., Antonie van Leeuwenhoek 99: 300, 2011.

Type: Taiwan, near Kaohsiung, isolated from *Artemisia argyi* H. Lév. & Vaniot, 18 Mar 2007, sine coll. (BCRC 23118, holotype, preserved in a metabolically inactive state; isotype CBS 11729).

[*Rhodotorula taiwanensis* F.L. Lee & C.H. Huang, in Huang, Lee, Tien & Hsieh, Antonie van Leeuwenhoek 99: 300, 2011 (nom. inval., Art. 40.7)]

Validation of the names *Glaciozyma littorale* and *Rhodotorula dairenensis*

Glaciozyma littorale, proposed by Kachalkin (2014), is not a validly published name (Shenzhen Code, Art. 35.1), as it was assigned to an invalidly published generic name, *Glaciozyma*, based on *G. antarctica* (Fell, Statzell, I.L. Hunter & Phaff) Turchetti et al. (Turchetti et al. 2011: 579). The combination *Glaciozyma antarctica* was published without fulfilment of the relevant requirements of the Code (Art. 41.5, see Note 1). The names *Glaciozyma* and *G. antarctica* were recently validated in Li et al. (2020: 133–134).

Glaciozyma littoralis Kachalkin ex Denchev & T. Denchev, **sp. nov.**
Index Fungorum number: IF 558290

For description see Kachalkin, Antonie van Leeuwenhoek 105: 1082, 2014.

Type: Russia, isolated from silty-sandy substrate of intertidal zone of the White Sea, near the White Sea Biological Station 'Kartesh', June 2011, A.V. Kachalkin (CBS 12957, holotype, preserved in a metabolically inactive state; isotypes KBP 4246, VKPM Y-3850, PYCC 6252, DSM 28204).

[*Glaciozyma littorale* Kachalkin, Antonie van Leeuwenhoek 105: 1082, 2014 (nom. inval., Shenzhen Code, Art. 35.1)]

Rhodotorula dairenensis (T. Haseg. & I. Banno) Denchev & T. Denchev, **comb. et st. nov.**
Index Fungorum number: IF 558291

Basionym: *Rhodotorula glutinis* var. *dairenensis* T. Haseg. & I. Banno, Journal of Fermentation Technology 36(10): 405, 1958.

[*Rhodotorula dairenensis* (T. Haseg. & I. Banno) Fell, J.P. Samp. & Gadanho, in Gadanho & Sampaio, FEMS Yeast Research 2: 56, 2002 (the basionym is not indicated with a full and direct reference – nom. inval., Shenzhen Code, Art. 41.5)]

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