



Short communication

A new species of the genus *Aleurodiscus* sensu lato (*Russulales*, *Basidiomycota*) from Hachijo Island, Japan

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ABSTRACT

Aleurodiscus sagittisporus sp. nov. is described and illustrated. This species is characterized by producing basidiomata with a monomitic hyphal system, clampless-septate hyphae, arrowhead-shaped, amyloid, finely verrucose basidiospores, gloeocystidia, dendrohyphidium-like branched paraphysoid hyphae, and variously shaped swelling cells in the hymenium. Phylogenetic analyses based on nuclear rDNA LSU and ITS sequences revealed that the species is distinct from the lineage of *Aleurodiscus* s. str. and related genera in the *Aleurodiscus* s. lat. clade. Basidiomata of *A. sagittisporus* have been collected only from dead petioles attached to living trees of *Livistona chinensis* var. *subglobosa* on Hachijo Island, Japan.

Keywords: corticioid fungi, *Livistona chinensis*, molecular phylogeny, *Stereaceae*

Article history: Received 23 February 2023, Revised 2 June 2023, Accepted 2 June 2023, Available online 31 July 2023.

Hachijo Island (known locally as Hachijo-jima), located 287 km south of Tokyo, Japan (33°06'N, 139°47'E), is a small volcanic oceanic island and part of the Izu Islands. The climate is humid subtropical. In Aug 2010 and Sep 2011, the authors collected several specimens of an undescribed corticioid fungus on dead petioles of *Livistona chinensis* R. Br. ex Mart. var. *subglobosa* (Hassk.) Becc. (*Areaceae*) planted in gardens and along roadsides at several sites on the island (Supplementary Fig. S1). This fungus is morphologically similar to taxa of *Aleurodiscus* Rabenh. ex J. Schröt. and related genera (*Basidiomycota*, *Russulales*, *Stereaceae*), except in its basidiospore morphology, which is clearly distinct. Here we describe the fungus as a new species of *Aleurodiscus* and discuss its phylogenetic position and ecological features.

The color and configuration of the hymenial surface and marginal zone were noted based on fresh and dried specimens. In the description, color names in quotation marks refer to Rayner (1970). For microscopic observations, a piece of a dried specimen was sectioned vertically using a razor blade. Sections were mounted in 3% (w/v) KOH, Melzer's reagent (Weresub, 1953), sulphobenzaldehyde reagent (SA) (Boidin, 1951), and distilled water. Microscopic elements of the basidiomata were drawn using a drawing tube (Y-IDT, Nikon Imaging, Tokyo, Japan) attached to the microscope (Eclipse Ni, Nikon Imaging). For each taxonomic element of each

specimen, 20 measurements were usually made in Melzer's reagent. Basidiospore surface structure was observed with a scanning electron microscope (SU1510, Hitachi, Tokyo, Japan) under 5 kV accelerating voltage, using dried specimens. Procedures for rehydrating, fixing, dehydrating, critical-point drying and sputter coating of the specimens followed Endo et al. (2019). The specimens and cultures examined in this study are deposited at the Tottori University Mycological Herbarium (TUMH) and the fungal culture collection (TUFC), respectively, in the Fungus/Mushroom Resource and Research Center (FMRC), Tottori University, Tottori, Japan.

All polypore isolates examined in this study were obtained from voucher specimens. These isolates were grown on malt extract agar [MA, 1.5% (w/v) malt extract, Difco, Detroit, MI; 2% (w/v) Bacto agar, Difco] at 25 °C in the dark. To determine the optimum growth temperature, the isolates were grown on MA plates at eight different temperatures (5–40 °C).

The procedures for DNA extraction, PCR amplification, and sequencing analysis followed Maekawa et al. (2020). For PCR amplification and sequencing analysis, we used the primer pairs ITS5/ITS4 (White et al., 1990) for the internal transcribed spacer (ITS) regions of nuclear rDNA and LR0R/LR5 (Hopple & Vilgalys, 1994) for the D1/D2 domain of the large subunit of the 28S nuclear rRNA (LSU). After assembling the bidirectional sequences, the ITS and LSU sequences of each of the 10 strains were deposited in the DNA Data Bank of Japan under the accession numbers LC754704–754713 and LC754714–754723, respectively.

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Phylogenetic analyses were performed using the combined LSU and ITS dataset. Taxon sampling of *Aleurodiscus* s. lat. and related taxa followed Wu et al. (2022) and included *Stereaceae* (*Aleurodiscus* s. lat.) and an outgroup (Table 1). We aligned sequences using MAFFT v. 7 (Katoh et al., 2019) under the “L-INS-i” algorithm. Because the resulting alignment included many ambiguous or gapped sites due to low homology among taxa, we trimmed the sequences. Manual trimming was mostly performed on the ITS2 region, where the newly described species showed a large amount of variation compared to related species. After manual trimming, the alignment was further trimmed using the software trimAl v. 1.2. (Capella-Gutiérrez et al., 2009) by using the “automated1” method. We included a total of 1212 sites of the alignment in our analyses, including 111 from ITS1, 55 from ITS2, 157 from 5.8S, and 885 from 28S. Each of ITS1, ITS2, 5.8S, and 28S was treated as a separate data block during model selection with ModelTest-NG v. 0.2.0 (Flouri et al., 2015; Darriba et al., 2020) and during phylogenetic analysis under the maximum likelihood (ML) and Bayesian inference (BI) methods. The best fitting substitution models were GTR+G+I for ITS1 and ITS2, HKY+G for 5.8S, and GTR+G+I for 28S. The ML phylogeny was inferred by using raxml-ng v. 1.1.0 (Kozlov et al., 2019) with 1,000 replicates for the bootstrap analysis for each branch. The BI analysis was run under the same partition schemes with MrBayes v. 3.2.7 (Ronquist et al., 2012). We ran two independent four-chain Markov chain Monte Carlo analysis for 3,000,000 generations. We checked for convergence by using Tracer v. 1.7.2 (Rambaut et al., 2018) and calculated the posterior probability for each branch under the 50% majority consensus tree after discarding the first 25% of trees as burn-in. The alignment and tree have been submitted to TreeBase (<http://www.treebase.org>; accession no. S30351).

Basidiomata of the present species are primarily characterized by having a monomitic hyphal system, clampless-septate hyphae, arrowhead-shaped, amyloid, finely verrucose basidiospores, gloeocystidia, dendrohyphidium-like branched paraphysoid hyphae, suburniform basidia, and variously shaped swelling cells in the hymenium. In addition, this species produces gloeoplerous hyphae with subhyaline oily contents, which have been observed in cultures of several taxa of *Aleurodiscus* and related genera. These morphological and cultural features indicate that the species belongs to *Aleurodiscus* s. lat.

Aleurodiscus s. lat. contains morphologically diverse species, and the following genera have been segregated based on morphological and/or phylogenetic analyses: *Acanthobasidium* Oberw. (Oberwinkler, 1966), *Acanthophysellum* Parmasto (Parmasto, 1967), *Acanthophysium* (Pilát) G. Cunn. (Cunningham, 1963), *Aleurobotrys* Boidin (Boidin et al., 1985), *Aleurocystidiellum* P.A. Lemke (Lemke, 1964a), *Gloeosoma* Bres. (Bresadola, 1920), and *Stereodiscus* Rajchenb. & Pildain (Rajchenberg et al., 2021). In addition, two allied genera, *Acanthofungus* Sheng H. Wu, Boidin & C.Y. Chien (Wu et al., 2000) and *Neoaleurodiscus* Sheng H. Wu (Wu et al., 2010), were established. However, recent phylogenetic analyses suggested that *Aleurodiscus* s. lat. is still polyphyletic (Wu et al., 2001; Dai & He, 2016; Wu et al., 2019; Rajchenberg et al., 2021; Wu et al., 2022) and that the clade of *Aleurodiscus* s. lat. included, in addition to the above genera, taxa of *Aleurodiscus* s. str., *Conferticium* Hallenb., *Gloeocystidiellum* Donk, *Stereum* Hill ex Pers., and *Xylobolus* P. Karst. (Wu et al., 2001; Dai & He, 2016; Rajchenberg et al., 2021; Wu et al., 2022). Our phylogenetic analyses based on nuclear rDNA LSU and ITS sequences also showed that *Aleurodiscus* s. lat. is polyphyletic and is intermixed with taxa of *Acanthobasidium*, *Acanthofungus*, *Acanthophysellum*, *Acanthophysium*, *Boidinia* Stalpers & Hjortstam, *Conferticium*, *Gloeocystidiellum*, *Gloeocystid-*

iopsis, *Gloeosoma*, *Megalocystidium* Jülich, *Neoaleurodiscus*, *Stereum*, and *Xylobolus* within the clade (Fig. 1). In these genera, no known species possess arrowhead-shaped (in frontal view) basidiospores like those produced by the present species (Figs. 2D, E, 3A). In our phylogenetic tree, the 10 accessions formed a strongly supported monophyletic clade (ML bootstrap/BI probability = 100/1) that is distinct from the lineage of *Aleurodiscus* s. str., to which the type species *A. amorphus* belongs. We could not identify any known genera suitable for this species within the *Aleurodiscus* s. lat. clade, although many subterminal nodes of the tree were not supported by high ML bootstrap values due to the high degree of divergence of rDNA LSU and ITS sequences between species (less than 90% sequence homology in most cases). Although this species can easily be delineated by ITS sequences, the interrelationships among the species within the clade remain unclear. Further phylogenetic studies are needed, including one to determine whether this species should be treated as an independent genus. Therefore, we describe the species as a new species of *Aleurodiscus* s. lat. as follows.

Aleurodiscus sagittisporus N. Maek., Y. Oba & R. Nakano, sp. nov. Figs. 2, 3.

MycoBank No.: MB 847629.

Diagnosis: This species is characterized by producing corticioid basidiomata, clampless-septate hyphae, numerous gloeocystidia, paraphysoid hyphae, usually urniform basidia and arrowhead-shaped, finely verrucose, amyloid basidiospores measuring 14–17 × 10–11.5 μm in frontal view, and by growing on dead petioles of *Livistona chinensis* var. *subglobosa*.

Holotype: JAPAN, Tokyo, Hachijo-machi, Sueyoshi, on dead petiole of *L. chinensis* var. *subglobosa*, 8 Sep 2011, collected by N. Maekawa and R. Nakano, TUMH 40363 (ex-holotype culture, TUF 14455). Gene sequences ex-holotype: LC754708 (ITS), LC754718 (LSU).

Etymology: “*sagittisporus*” [*sagitti* (= sagittate) + *sporus* (= spore)] refers to having arrowhead-shaped basidiospores.

Description: Basidiomata annual, resupinate, adnate, occurring as small patches, then confluent; hymenial surface ‘Rosy Buff’, ‘Rosy Vinaceous’ to ‘Pale Luteous’, partly ‘Orange’ when fresh, ‘Pale Luteous’, ‘Luteous’ to ‘Ochreous’ when dry; margin ‘Pale Luteous’ to ‘Luteous’, thinning out, indeterminate; in vertical section 100–350 μm thick, subhyaline to pale yellow-brown, membranous, sometimes containing masses of crystals in the subcilia. Hyphal system monomitic; hyphae 2–5 μm wide, smooth, thin- to slightly thick-walled (up to 0.5 μm), clampless septate, sometimes anastomosing. Paraphysoid hyphae 1.5–4 μm wide, sinuous, thin-walled, smooth, without a basal clamp, sometimes dendrohyphidium-like branched; branches sometimes anastomosing. Gloeocystidia 75–213 × 8.5–12.5 μm, cylindrical, narrowly obclavate to tubular, occasionally branching at the apex, sometimes sinuous, smooth, thin-walled, without a basal clamp, numerous, mostly embedded but occasionally projecting up to 25 μm beyond the hymenial surface, positive to sulphobenzaldehyde (SA+). Swelling cells 24–46 × 9.5–13 μm, various shaped, smooth, thin-walled, without a basal clamp, containing granular materials, present in the hymenium. Basidia 34.5–56 μm long, 7–9 μm wide at the upper part, 9.5–12.5 μm wide at the under part, suburniform to subclavate, occasionally with various shaped projections at under part, producing 4 sterigmata, without a basal clamp, containing granular materials. Basidiospores 14–17 × 10–11.5 μm, triangular to lanceolate in frontal view, 14–17 × 4.5–5.5 μm, banana-shaped to lunate in lateral view, finely verrucose, thin-walled, amyloid.

Table 1. Sequences in nrITS-LSU dataset

Species	Voucher/strain nos.	Accession nos.	
		ITS	nrLSU
<i>Acanthobasidium bambusicola</i>	He 2357	KU559343	KU574833
<i>Acanthobasidium norvegicum</i>	T623	–	AY039328
<i>Acanthobasidium penicillatum</i>	HHB13223	–	KU574816
	T322	–	AY039315
<i>Acanthobasidium phragmitis</i>	CBS 233.86	–	AY039305
<i>Acanthobasidium weirii</i>	HHB12678	–	AY039322
<i>Acanthofungus rimosus</i>	Wu 9601-1	MF043521	AY039333
<i>Acanthophysellum cerussatum</i>	He 20120920–3	KU559339	KU574830
<i>Acanthophysium bisporum</i>	T614	–	AY039327
	T627	–	AY039318
<i>Acanthophysium lividoceruleum</i>	FP-100292	–	AY039319
<i>Aleurobotrys botryosus</i>	He 2712	KX306877	KY450788
	Wu 9302-61	–	AY039331
<i>Aleurocystidiellum disciforme</i>	He 3159	KU559340	KU574831
<i>Aleurocystidiellum subcruentatum</i>	He 2886	KU559341	KU574847
<i>Aleurodiscus abietis</i>	T330	–	AY039324
<i>Aleurodiscus alpinus</i>	Wu 1407–59	MF043522	MF043527
	Wu 1407–61	MF043523	MF043528
<i>Aleurodiscus amorphus</i>	Ghobad-Nejhad-2464	KU559342	KU574832
<i>Aleurodiscus aurantius</i>	T621	–	AY039317
<i>Aleurodiscus bambusinus</i>	He 4261	KY706207	KY706219
<i>Aleurodiscus bicornis</i>	Wu 1308–101	LC433893	LC433900
	Wu 1308–125	LC433899	LC433906
<i>Aleurodiscus canadensis</i>	Wu 1207–90	KY706203	KY706225
<i>Aleurodiscus cerussatus</i>	He 2208	KX306874	KY450785
	HHB11235	–	AY039321
<i>Aleurodiscus dextrinoideocerussatus</i>	EL25-97	AF506401	AF506401
<i>Aleurodiscus dextrinoideophyses</i>	He 4078	–	KY450783
	He 4105	MH109050	KY450784
<i>Aleurodiscus effusus</i>	He 2261	KU559344	KU574834
<i>Aleurodiscus formosanus</i>	Chen 2736	LC433894	LC433901
	Chen 2748	LC433895	LC433902
<i>Aleurodiscus gigasporus</i>	Wu 0108–15	KY706205	KY706213
<i>Aleurodiscus grantii</i>	He 2895	KU559347	KU574837
	HHB14417	KU559363	KU574821
<i>Aleurodiscus isabellinus</i>	He 5283	MH109052	MH109046
<i>Aleurodiscus mesaverdensis</i>	FP-120155	KU559359	KU574817
<i>Aleurodiscus oakesii</i>	He 2243	KU559352	KU574840
	HHB11890-A-sp	KU559365	KU574823
<i>Aleurodiscus parvisporus</i>	Wu 1307–84	LC433897	LC433904
	Wu 1307–88	LC433898	LC433905
<i>Aleurodiscus pinicola</i>	Wu 1106–16	MF043524	MF043529
	Wu 1308-54	MF043525	MF043530
<i>Aleurodiscus sagittisporus</i>	TUFC 13927	LC754704	LC754714
	TUFC 14450	LC754705	LC754715
	TUFC 14454	LC754706	LC754716
	TUFC 14455	LC754707	LC754717
	TUFC 14456	LC754708	LC754718
	TUFC 14457	LC754709	LC754719
	TUFC 14458	LC754710	LC754720
	TUFC 14459	LC754711	LC754721
	TUFC 14461	LC754712	LC754722
	TUFC 14462	LC754713	LC754723
<i>Aleurodiscus senticosus</i>	Wu 1209–7	MH596849	MF043531
	Wu 1209–9	MH596850	MF043533
<i>Aleurodiscus sichuanensis</i>	He 4935	LC430904	LC430907
	Wu 0010–18	MH596852	MF043534
<i>Aleurodiscus subroseus</i>	He 4807	MH109054	MH109048
	He 4895	LC430903	LC430910
<i>Aleurodiscus tenuissimus</i>	He 3575	KX306880	KX842529
<i>Aleurodiscus thailandicus</i>	He 4099	KY450781	KY450782
<i>Aleurodiscus tropicus</i>	He 3830	KX553875	KX578720
<i>Aleurodiscus verrucosporus</i>	He 4491	KY450786	KY450790
<i>Aleurodiscus wakefieldiae</i>	He 2580	KU559353	KU574841
	FP-135654	KU559369	KU574829
<i>Boidinia macrospora</i>	Wu 9202-21	AF506377	AF506377
<i>Bondarzewia mesenterica</i>	DSM 108281	MK500942	MK500942
<i>Conferticium heimii</i>	CBS 321.66	AF506381	AF506381
<i>Conferticium ravum</i>	NH13291	AF506382	AF506382
<i>Gloeocystidiellum aspellum</i>	LIN 625	AF506432	AF506432
<i>Gloeocystidiellum compactum</i>	Wu880615-21	AF506434	AF506434
<i>Gloeocystidiellum formosanum</i>	Wu9404-19	AF506439	AF506439
<i>Gloeocystidiellum luridum</i>	HK9808	AF506421	AF506421
<i>Gloeocystidiellum porosum</i>	Wu 1608–176	LC430905	LC430908
<i>Gloeocystidiellum triste</i>	KHL10334	AF506442	AF506442
<i>Gloeocystidiellum wakullum</i>	Oslo-930107	AF506443	AF506443
<i>Gloeocystidiopsis flammea</i>	AH000219	AF506438	AF506438
	CBS 324.66	AF506437	AF506437
<i>Gloeosoma mirabile</i>	Dai 13281	KU559350	KU574839
	He 3733	KY450787	KY450791
	91605	KJ651503	KJ651561
<i>Heterobasidium parviporum</i>	LodgeSJ110.1	AF506441	AF506441
<i>Megalocystidium chelidonium</i>	V.Spirin4244	MT477147	MT477147
<i>Megalocystidium diffusum</i>	HK9808	AF506420	AF506420
<i>Megalocystidium leucoxanthum</i>	He 2921	KU559357	KU574845
<i>Neoleurodiscus fujii</i>	Wu 0807-41	–	FJ799924
	CBS 125846	–	MH875266
<i>Stereodiscus limonispurus</i>	He 2234	KU559368	KU574828
<i>Stereum complicatum</i>	JS18244	AF506479	AF506479
<i>Stereum hirsutum</i>	Wu 1109–127	LC430906	LC430909
	He 2067	KU559366	KU574826
<i>Stereum ostrea</i>	EL48-97	AF506480	AF506480
<i>Stereum reflexulum</i>	NH11952	AF506481	AF506481
<i>Stereum rugosum</i>	He 2111	KU559367	KU574827
<i>Stereum sanguinolentum</i>	EL11-97	AF506482	AF506482
<i>Stereum subtomentosum</i>	FP-106735	–	AY039309
<i>Xylobolus subpileatus</i>	He 2231	KU881905	KU574825

Bold shows newly obtained sequences. –: sequences not available.

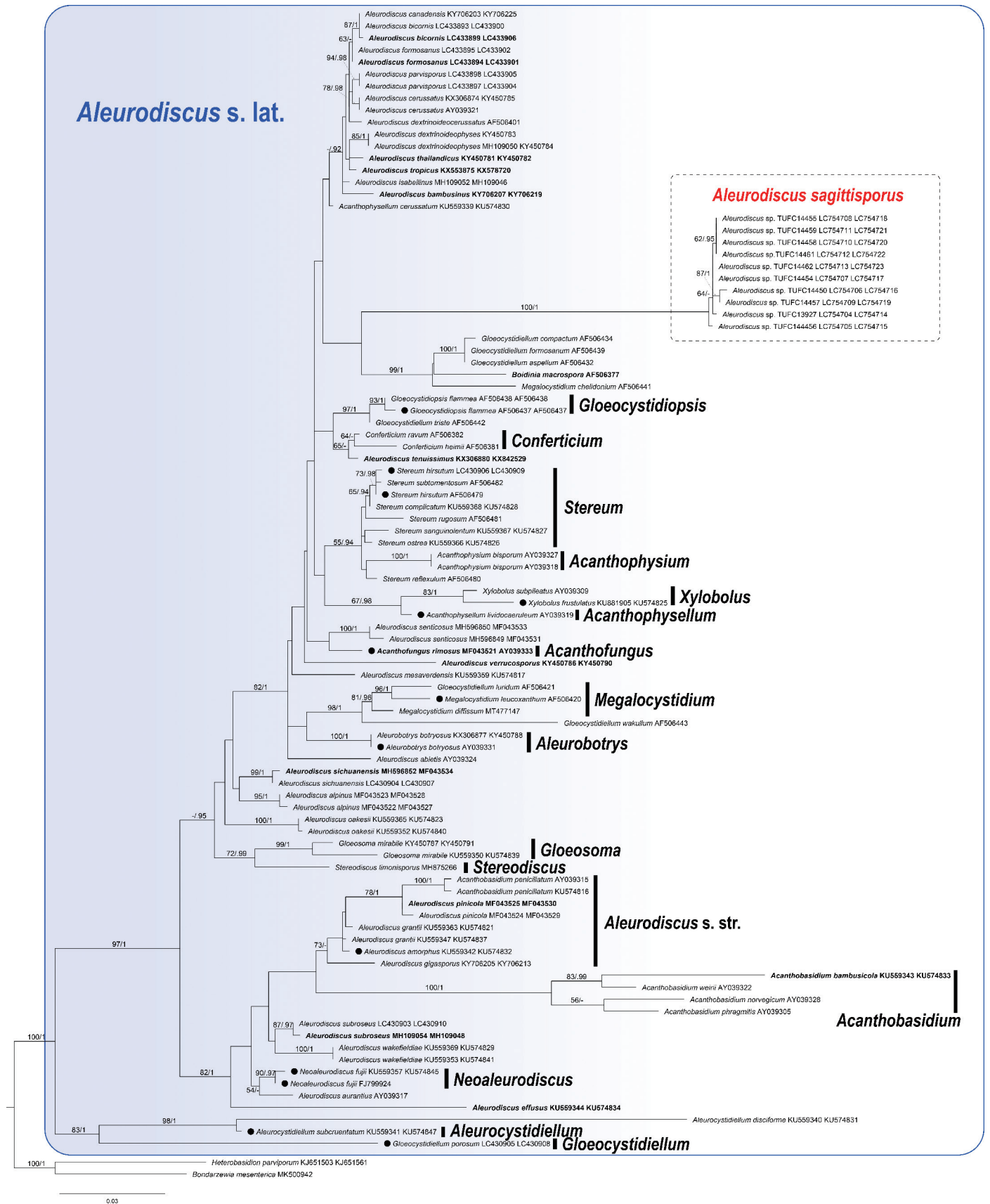


Fig. 1 – Maximum likelihood tree based on the LSU + ITS sequences of species of *Aleurodiscus* (s. lat.) and related genera. Values on branches show the maximum likelihood bootstrap value (≥ 50) and Bayesian inference posterior probability (≥ 0.90). Species names in bold indicate sequences of type specimens, and filled circles indicate sequences of type species in each genus.

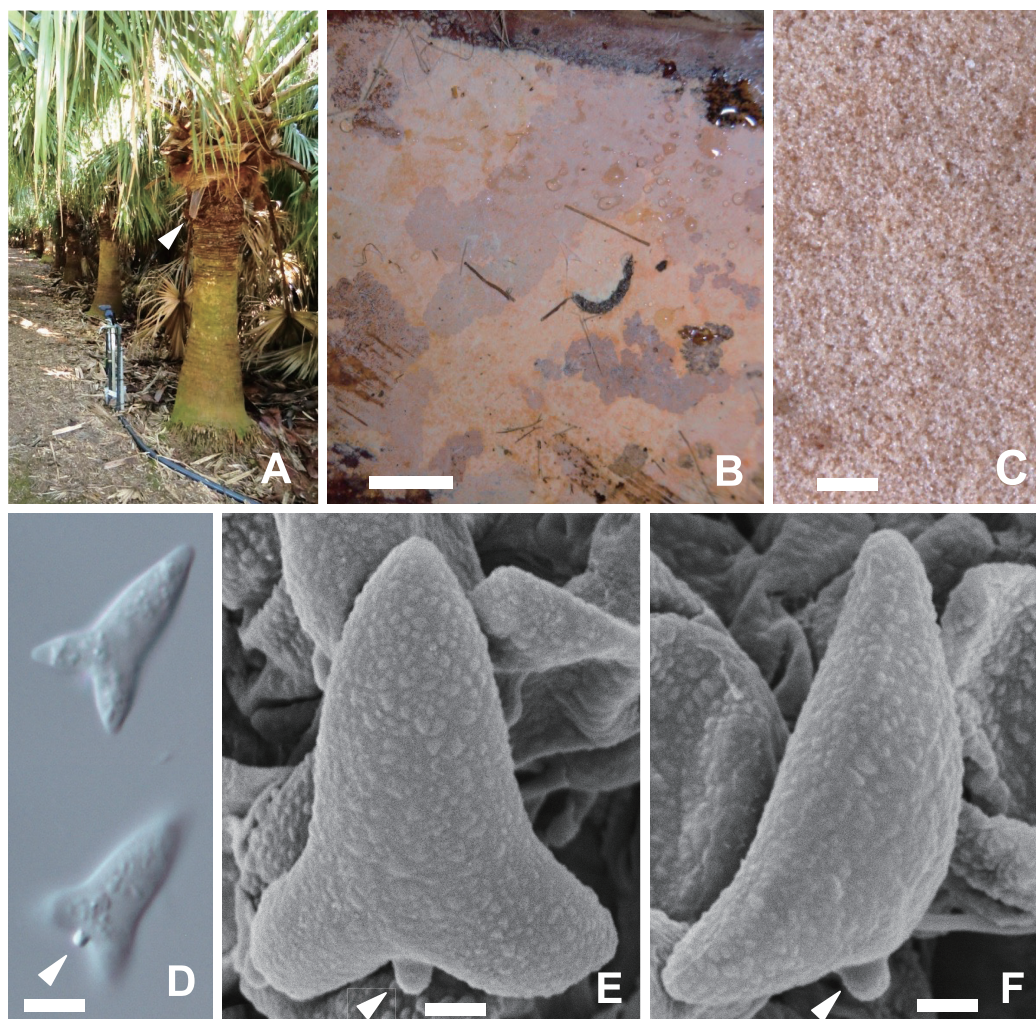


Fig. 2 – *Aleurodiscus sagittisporus* (TUMH 40363, holotype). A: *Livistona chinensis* tree with a dead petiole (arrowhead) hanging from the trunk, where basidioma was found. B: Basidioma. C: Hymenial surface, magnified. D: Frontal view of a basidiospore, focusing on the top surface (upper) and on the back surface showing an apiculus (arrowhead) in 3% KOH. E: SEM image of a basidiospore in frontal view showing the fine warts on the surface and a distinct apiculus (arrowhead). F: SEM image of a basidiospore in lateral view (arrowhead: apiculus). Bars: B 1 cm; C 1 mm; D 5 μ m; E, F 2 μ m.

Other specimens and cultures examined: JAPAN, Tokyo, Hachijo-machi (Hachijo Island), Nakanogo, on dead petiole of *L. chinensis* var. *subglobosa*, 19 Aug 2010, collected by Y. Oba [TUMH 40359 (TUFC 13927)]; on dead petiole of *L. chinensis* var. *subglobosa*, 7 Sep 2011, collected by N. Maekawa and R. Nakano [TUMH 40360, TUMH 40361, and TUMH 40362 (TUFC 14454)]; Hachijo-machi, Mitsune, on dead petiole of *L. chinensis* var. *subglobosa*, collected by N. Maekawa and R. Nakano [TUMH 40371 (TUFC 14462), TUMH 40372, and TUMH 40373]; Hachijo-machi, Okago, on dead petiole of *L. chinensis*, 8 Sep 2011, collected by N. Maekawa and R. Nakano [TUMH 40357 (TUFC 14450), TUMH 40358, TUMH 40368, and TUMH 40374]; Hachijo-machi, Sueyoshi, on dead petiole of *L. chinensis* var. *subglobosa*, 8 Sep 2011, collected by N. Maekawa and R. Nakano [TUMH 40364 (TUFC 14456), TUMH 40365 (TUFC 14457), TUMH 40366 (TUFC 14458), TUMH 40367 (TUFC 14459), TUMH 40369 (TUFC 14461), and TUMH 40370]. TUFC number in parentheses indicates isolate number.

Characteristics in culture: The optimum growth temperature for the polyspore isolates, TUFC 13927, TUFC 14456, and TUFC 14461, were 25–30 °C. These isolates could grow between 10 and 35 °C, but no visible growth was observed at 5 and 40 °C. Growth on MA was 3–7 mm at 25 °C for 24 h in the dark. Mycelial mats after 1

wk subhyaline to white; aerial mycelium cottony, partly woolly; margin distinct, raised, not even, usually with a fan-like extensions; odor not noticeable; reverse side of the mycelial mats white; agar not bleached; no fruiting after 6 wk. Marginal hyphae 1–5 μ m wide, thin-walled, clampless, sparsely branched. Aerial hyphae 1–4 μ m wide, thin-walled, clampless, sparsely branched, sometimes sparsely encrusted. Submerged hyphae 1–8 μ m wide, thin-walled, clampless, sometimes constricted at the septa of broader hyphae, partly encrusted, sometimes gloeoplerous with subhyaline oily contents.

Aleurodiscus sagittisporus is widely distributed on Hachijo Island (Supplementary Fig. S1). Basidiomata were collected only from dead petioles attached to living trees of *L. chinensis* var. *subglobosa*; they were not found on detached petioles. This species was not found on any other palm trees (*Areaceae*), such as *Howea belmoreana* (C. Moore & F. Muell.) Becc., *Hyophorbe lagenicaulis* (L.H. Bailey) H.E. Moore, *Phoenix canariensis* Nabonnand, or *P. roebelenii* O'Brien. In addition, *A. sagittisporus* could not be observed on the fallen trunks or branches of any woody plants near individuals of *L. chinensis* on which its basidiomata occurred. These observations suggest that *L. chinensis* var. *subglobosa* is a specific host for *A. sagittisporus*. According to Index Fungorum (<http://www.indexfungorum.org/names.asp>, 6 Feb 2023), about

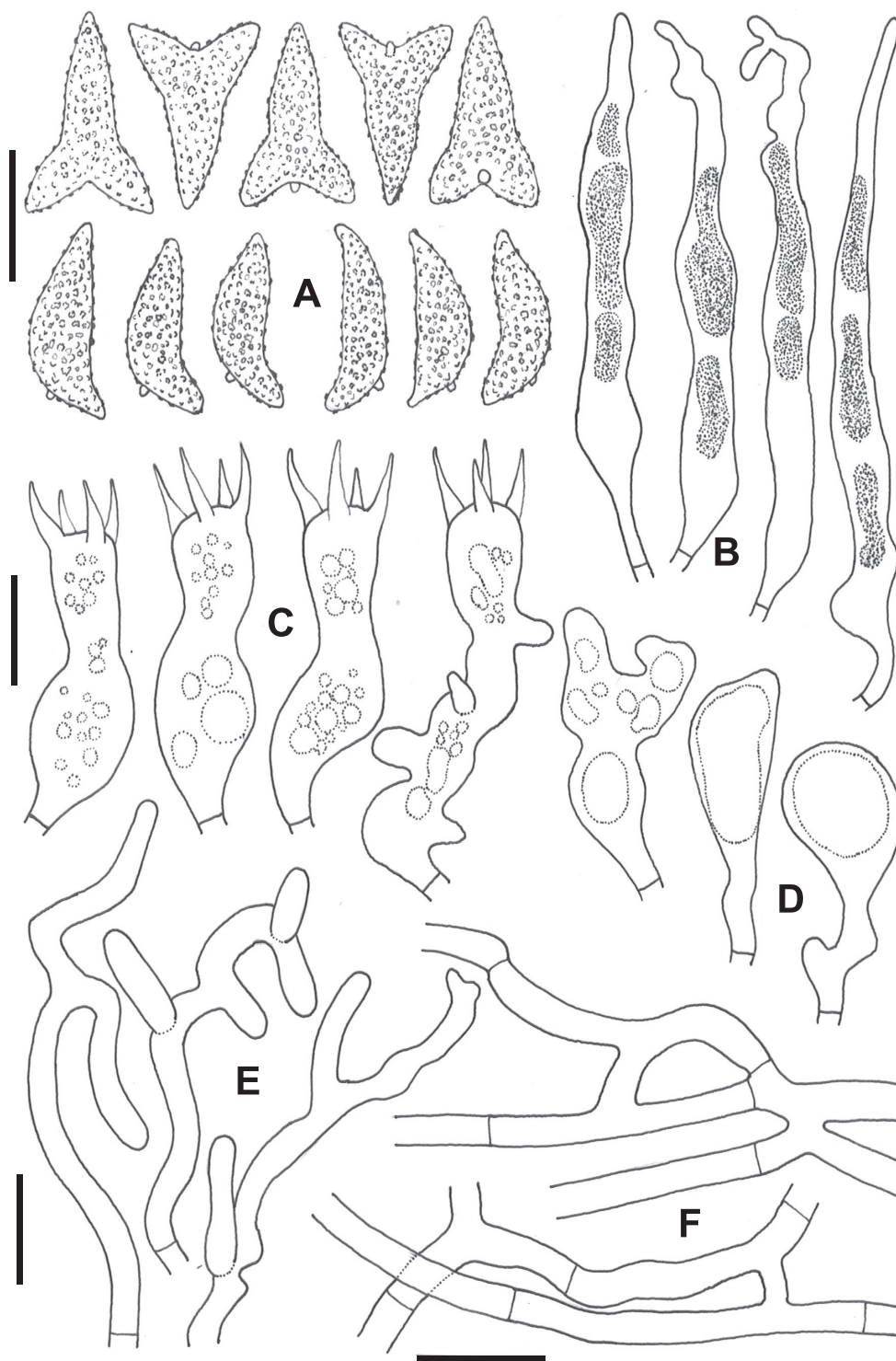


Fig. 3 – Line-drawing of microscopic elements of basidioma of *Aleurodiscus sagittisporus* (TUMH 40357). A: Basidiospores in Melzer's reagent, the upper five in frontal view and the lower six in lateral view. B: Gloeocystidia. C: Basidia. D: Swelling cells produced in the hymenium. E: Paraphysoid hyphae. F: Hyphae. Bars: 10 μ m.

200 species have been described as members of *Aleurodiscus* and related genera, but no species that occurs only on palm trees has been reported (Rogers & Jackson, 1943; Lemke, 1964a, 1964b; Ginns & Lefebvre, 1993; Núñez & Ryvarden, 1997; Gorjón et al., 2013; Dai & He, 2016; Dai, Zhao & He, 2017; Dai, Wu, et al., 2017; Tian et al., 2018; Wu et al., 2019; Rajchenberg et al., 2021; Wu et al., 2022). In Japan, *L. chinensis* var. *subglobosa* is distributed from the Nansei Islands to Kyushu (Yoshida et al., 2000) and is often planted

as a street tree in warm temperate to subtropical areas. We have looked for basidiomata of *A. sagittisporus* on natural and planted *L. chinensis* (var. *subglobosa* and var. *boninensis* Becc.) and other palm trees since 2011 in Kagoshima Prefecture (including Yakushima Island), Kochi Prefecture, Miyazaki Prefecture, Okinawa Prefecture (Okinawa, Ishigaki, and Iriomote Islands), and Tokyo (Hachijo Island and Ogasawara Islands), but so far this fungus has not been found outside Hachijo Island. To determine whether *A. sagittisporus*

rus is endemic to Hachijo Island, further distribution surveys are required, including overseas.

Disclosures

The authors declare no conflicts of interest. All the experiments undertaken in this study comply with the current laws of Japan.

Acknowledgements

We thank Ms. Sachiko Ueta for experimental support. Polyspore isolates examined in this study were provided by FMRC, Tottori University, through the MEXT National BioResource Project. This study was partially supported by Grants-in-Aid from the Institute for Fermentation, Osaka.

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