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New records and barcode sequence data of wood-inhabiting polypores in Benin with notes on their phylogenetic placements and distribution

B.A. Olou[1*], E. Langer[2], L. Ryvarden[3], F.-S. Krah[4], G.B. Hounwanou[1], M. Piepenbring[5], N.S. Yorou[1]

[1]Research Unit Tropical Mycology and Plants-Soil Fungi Interactions (MyTIPS), Faculty of Agronomy, University of Parakou, BP 123 Parakou, Benin
[2]Department of Ecology, University of Kassel, Heinrich-Plett-Str. 40, Kassel, Germany
[3]Institute of Biology, University of Oslo, P.O. Box 1066, Blindern, N-0316 Oslo, Norway
[4]Faculty of Biological Sciences, Institute for Ecology, Evolution and Diversity, Conservation Biology, Goethe University Frankfurt, Frankfurt am Main, Germany
[5]Department of Mycology, Goethe University Frankfurt am Main, Biologicum, Max-von-Laue-Str. 13, 60438, Frankfurt am Main, Germany

*Corresponding author: borisolou@yahoo.fr

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Abstract: Wood-inhabiting fungi (WIF), such as polypores, are extremely species-rich and play vital roles in the functioning of forest ecosystems as decomposers. Despite the importance of polypores, our knowledge of the diversity and distribution of these fungi is still poor in general and especially for West Africa. To advance our knowledge we here summarise results from field collections between 2017 and 2021 and present (i) a taxonomic overview, (ii) phylogenetic placements and (iii) an illustrated catalogue of wood-inhabiting polypore fungi with colour pictures. During the field sampling campaigns, we collected 647 specimens. Based on morphological characteristics and molecular barcode data, 76 polypore species belonging to six orders, 15 families and 39 genera were identified. Of the 76 species, 30 are new to the West Africa, 69 new to Benin, and two new combinations *Fuscoporia beninensis* and *Megasporia minuta* are proposed. With this summary, we provide new data for further research.

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INTRODUCTION

Wood-inhabiting fungi (WIF) such as polypores are ecologically a very diverse group, ranging from saprotrophic, parasitic, to mycorrhizal (Ryvarden & Johansen 1980, Tedersoo *et al.* 2007). As saprotrophs, they play vital roles in food webs, participate in the recycling of soil carbon and nutrients (Harley 1971), and transform hard-to-digest organic matter (such as lignin and cellulose) into forms usable by other organisms (Stokland *et al.* 2012). In addition to their ecological importance, polypores have practical importance for human beings as food, medicine and resources for mycoremediation (Gilbertson 1980, Zjawiony 2004, Grienke *et al.* 2014). Despite the importance of polypores, their diversity and distribution are often overlooked and neglected in the tropics. As result, many species might disappear without been discovered, recorded and identified (Ujang & Jones 2001, Lindenmayer *et al.* 2013) because of the alarming rate of forest degradation in the tropics and the fact that polypores are partly specialised towards wood from certain plant species (Krah *et al.* 2018). Likewise, we could not obtain any information on the function of the species in the ecosystem and for human beings (Lindenmayer *et al.* 2013). Thus, it is important to document the diversity of polypores in less surveyed areas like Benin.

Benin is a country located in West Africa and characterised by a great diversity of landscapes and ecosystems. It abounds with a floristic diversity of 2 807 known plant species out of 3 000 estimated (Akoegninou *et al.* 2006). Despite the floristic diversity coupled with the dependence of polypores on dead or living trees, only 10 species of polypores have been reported up to 2017. These are *Favolus tenuiculus*, *Ganoderma applanatum*, *Ganoderma lucidum*, *Ganoderma mbrekobenum*, *Lentinus squarrosulus*, *Lentinus tuber-regium*, *Lentinus velutinus*, *Nigroporus stipitatus*, *Pycnoporus sanguineus*, and *Trametes palisotii* (Boa 2004, Ihayere *et al.* 2010, Eyi-Ndong *et al.* 2011, Osemwegie *et al.* 2014, Yorou *et al.* 2014, Boni & Yorou 2015). These reports were based on field observations and no fungarium material is available for taxonomic revision of some of these species such as *G. applanatum* and *G. lucidum* which do not occur in Africa according to recent studies (Cao *et al.* 2012, Wang *et al.* 2012). The first mycological investigations in Benin with a focus on basidiomycetes wood-inhabiting polypores started in 2017. From these surveys, 36 species of polypores were fully identified based on morphological examination (Olou *et al.* 2019a). These species were subsequently listed in the checklist of West African fungi (Piepenbring *et al.* 2020). Since then, further records and new species of polypores were reported for Benin and West Africa (Olou *et al.* 2019b, 2020, 2021, Olou

& Ryvarden 2021). However, as molecular sequence data are lacking, these specimens have never been included in DNA-based studies of polypores. Knowing that fungal identification based on morphology only sometimes yields unreliable results due to the misleading morphological characteristics (Olson & Stenlid 2002, Giraud *et al.* 2008, Hughes *et al.* 2013, Perez *et al.* 2013, Lücking *et al.* 2014); there is a need to re-examine previously reported polypore species from morpho-anatomical and molecular perspective.

DNA marker sequencing, widely known as barcoding (Hibbett 1992, Bridge *et al.* 2005, Nilsson *et al.* 2006, Hibbett *et al.* 2011, Hibbett & Taylor 2013), has become a popular tool for a variety of studies, including species identification and molecular phylogenetic inference (Hebert *et al.* 2003, Hebert & Gregory 2005, Savolainen *et al.* 2005). Different genes or specific DNA regions are used in barcoding application. The ITS region has been widely adopted by the mycological community as the most suitable marker with a high probability of correct identification for species in many groups of fungi (Schoch *et al.* 2012). Although the ITS region is widely accepted, sequence data for this region are available for less than 1 % (Vu *et al.* 2014) of the estimated 3.8 million species of fungi (Nilsson *et al.* 2006, Hawksworth & Lücking 2017, Raja *et al.* 2017). Moreover nearly 70 % of the described species have not yet been sequenced (Rossman & Palm-hernández 2008). Knowing that African species have been scantily used in DNA based studies, there is no doubt that many of the species not yet sequenced are from tropical Africa. This lack of DNA sequences from African specimens is a problem in phylogenetic analyses in a global context. Considering these issues, this study aims to summarise results from field collections in Benin between 2017 and 2021 and present (i) a taxonomic overview, (ii) phylogenetic placements and (iii) an illustrated catalogue of wood-inhabiting polypores with colour photos.

MATERIAL AND METHODS

Specimens

A total of 647 specimens of WIF were collected in eight different forests of Benin namely the Pahou forest, semi-deciduous dense forest of Lama, the woodlands of Toui-kilibo, Ouémé supérieur, Trois Rivières, Okpara, National Park W, and the gallery forest of Bassila from July to September each year starting from 2017 to 2021. All wood-inhabiting polypores with a focus on basidiomycetes were photographed in their natural environment before recording using a Sony camera, model DSC-HX400V. The geographic coordinates of occurrence of each specimen were recorded. Small pieces of fresh basidiocarps were placed in plastic bags half-filled with silica gel for a later DNA extraction. The rest of basidiocarps were air- or oven-dried at 45–50 °C for 1–2 d depending on the consistency of the basidiomata. The dried basidiomata were then preserved in plastic bags for morphological investigation. Specimens are deposited at the mycological herbaria of the University of Parakou (UNIPAR) in Benin, with duplicates at the University of Kassel (KAS) in Germany, and at the Institute of Biology, University of Oslo (O) in Norway.

Wood-inhabiting polypore fungi species identification

Macro-morphological descriptions were based on fresh and dried fungarium specimens. Macro-morphological and microstructures descriptions were based on dried fungarium specimens. Macro-morphological characters are described with the aid of a dissecting microscope Leica EZ4 while microstructures are described using a Leica DM500 compound microscope. For the microstructures, fine sections through the basidiomata were prepared for observation using a razor blade under a dissecting microscope Leica EZ4 and mounted in 5 % aqueous solution of potassium hydroxide (KOH) mixed with 1 % aqueous solution of Phloxine. Melzer's reagent (to test for dextrinoid or amyloid reactions), Cotton Blue (to test for cyanophilic reaction) were used and then examined at a magnification of 1 000× using a Leica DM500 compound microscope. For species identification, we used the identification keys of Ryvarden & Johansen (1980), Gilbertson & Ryvarden (1986, 1987), Bernicchia & Gorjón (2010), Bernicchia & Gorjón (2020).

DNA extraction, amplification, and sequencing

Genomic DNA of all specimens was extracted using mainly the microwave DNA extraction method (Dörnte & Kües 2013). When microwave DNA extraction did not yield good results, the NucleoSpin Plant II DNA extraction kit (Macherey, Nagel, Germany) and the E.Z.N.A.® Fungal DNA Mini kit according to manufacturer's instructions were used. An Epoch machine was used to measure the amount of DNA before amplification. The extracted genomic DNA was amplified targeting the nuclear ribosomal DNA region spanning both of the internal transcribed spacers (ITS) for all species with the primer pair ITS-1F/ITS4 (White *et al.* 1990, Gardes & Bruns 1993). The Polymerase Chain Reaction (PCR) procedure was as follows: initial denaturation at 95 °C for 3 min, followed by 35 cycles at 95 °C for 30 s, 52 °C for 30 s, and 68 °C for 1 min, and a final extension of 68 °C for 3 min. For some genera such as *Megasporoporia* and *Microporus*, additional regions namely the large subunit 28S nrDNA (LSU) and the translation elongation factor (*Tef*) with primer pair LR0R/LR5 (Vilgalys & Hester 1990) and EF1-983F/EF1-1567R (Rehner & Buckley 2008) were amplified. The PCR products were further cleaned with a QIAquick PCR Purification Kit according to the manufacturer's instructions (QIAGEN GmbH, Hilden, Germany) and then sequenced at the company Eurofins Genomics Germany GmbH (https://www.eurofinsgenomics.eu/).

Phylogenetic analysis

Both sequenced DNA strands (forward and reverse) were used to build the consensus sequences using Geneious v. 5.6.7 (Kearse *et al.* 2012). Thereafter, the names given to each species on the basis of morphological examination were assigned to each consensus sequence. All newly generated sequences were aligned with similar sequences retrieved from GenBank. The resulting alignment was used to construct a global phylogenetic tree for wood-dwelling fungi. Later, more in-depth phylogenetic trees were constructed for the two most represented orders, namely *Hymenochaetales* and *Polyporales*. For *Hymenochaetales*, 27 ITS sequences retrieved from GenBank were aligned together with 10 ITS sequences from Benin specimens. For the analysis on *Polyporales*, 93 ITS sequences retrieved from GenBank were aligned together with 49 ITS sequences from Benin specimens. Sequences were aligned with MAFFT v. 7 (Katoh *et al.* 2017). Then, the alignments were manually adjusted with AliView v. 1.28 (Larsson 2014) and exported as Phylip format. The best-fit evolutionary model was estimated for each alignment using

the standard model selection (Kalyaanamoorthy *et al.* 2017) implemented in IQ-TREE v.1.6.12 (Minh *et al.* 2020, http://www.iqtree.org/) with the command line –m TESTONLY. Following this substitution model, the phylogenetic tree inference of Maximum likelihood (ML) and Bayesian Inference (BI) were performed to verify the phylogenetic position of all newly generated sequences. On the dataset of all orders, a Maximum likelihood analysis was performed. The Branch support was evaluated using the Ultrafast Bootstrap (UFBoot**)** (Hoang *et al.* 2018) with 5 000 replicates and approximate likelihood ratio test (SH-aLRT) (Anisimova *et al.* 2011) with 5 000 replicates. The analysis was performed in IQ-tree v. 1.6.12 (Minh *et al.* 2020, http://www.iqtree.org/) with the command line mode. On *Hymenochaetales* and *Polyporales* datasets, the branch supports were evaluated using two approaches, the Ultrafast Bootstrap (UFBoot) (Hoang *et al.* 2018) and posterior probability (PP). The approaches were performed using IQ-TREE v. 1.6.12 (Minh *et al.* 2020, http://www.iqtree.org/) and MrBayes v. 3.2.7 respectively. The ML was run using IQ-TREE v. 1.6.12 with 5 000 replicates. The BI was executed using MrBayes v. 3.2.7 in command line mode (https://github.com/NBISweden/MrBayes) for five million generations until the standard deviation of split frequencies reached 0.01. Chain convergence was determined using Tracer v. 1.7.1 (http://tree.bio.ed.ac.uk/software/tracer/) and the first 25 % (5 000) trees was discarded as burn-in. The remaining trees were used to build the consensus tree using the Phylogenetic Tree Summarization (SumTrees) program within DendroPy v. 4.3.0. (Sukumaran & Holder 2010, https://github.com/jeetsukumaran/DendroPy). The topology of the ML tree is used, and to add the posterior probabilities (PP) of BI on the ML tree, the Phylogenetic Tree Summarization (SumTrees) program within DendroPy v. 4.3.0. (Sukumaran & Holder 2010, https://github.com/jeetsukumaran/DendroPy) was used. Then, the UFBoot values were added to the ML best tree that already has the posterior probabilities using IQ-TREE v.1.6.12 (Trifinopoulos *et al.* 2016). The resulting tree with (UFBoot / PP) is presented below and the support values of UFBoot and PP are indicated on each node when they are > = 50 %. For some genera with questionable phylogenetic position of some species, a targeted phylogenetic analysis on each genus was performed using the ITS-LSU combination for *Megasporoporia* and ITS-LSU-*Tef* for *Microporus*. The sequences used in the analyses with the GenBank accession numbers, voucher, and origin of the specimens are presented in the supplementary Table S1.

Wood-inhabiting polypore fungi species distribution in Benin

The GPS coordinates from the photos of the species taken in the field were extracted using the DNRGPS (https://gisdata.mn.gov/dataset/dnrgps). In addition to the field data, presence records across Africa with their geographic coordinates were downloaded from Global Biodiversity Facilities (GBIF) for each species reported in this study. Moreover, the check-list of fungi of the West-Africa was used to ensure no omission for this region. Duplicate records were deleted and the World Geodesic System 1984 (EPSG 4326) were used to project the geographic coordinates on Africa continent extent under the QGIS v. 3.22.1. We removed erroneous coordinates like coordinates falling in oceans. In order to make the map easier to read, we aggregate occurrences records by genus level.

RESULTS

Diversity of basidiomycetes wood-inhabiting polypores from Benin

In total, 39 genera, 15 families, and six orders representing 76 species of wood-inhabiting polypores are recorded in Benin. The three most diverse genera are *Coriolopsis*, *Perenniporia* and *Trametes* with five species each. *Hymenochaetaceae* and *Polyporaceae* are the most dominant families, with respectively 15 and 46 species each. The other 13 families are represented by one, two or three species.

Importance of newly generated sequences

A total of 152 DNA single direction reads were generated, resulting in 76 consensus sequences namely 59 ITS, 10 LSU, 7 *Tef*. These sequences are mostly the first ever for wood-inhabiting polypores in West Africa. Before this study, sequences of *Microporus concinnus*, *M. incomptus*, and *Phellinus beninensis* were missing in GenBank and are therefore generated here for the first time. The absence of sequences of African wood-inhabiting polypores has always hampered large-scale studies on this group. With these new sequences generated for the West African specimens, further phylogeographic studies integrating sequences from African specimens will be more easily doable.

Phylogenetic placement of Benin wood-inhabiting polypores

Phylogenetic analyses revealed distinct clades corresponding to specific taxonomic orders such as *Agaricales, Gloeophyllales, Hymenochaetales, Polyporales*, and *Russulales*. Sequences belonging to the orders of *Hymenochaetales* and *Polyporales* are the most abundant in our analyses while the other three orders *Agaricales, Gloeophyllales* and *Russulales* are less represented (Supplementary Fig. S1). The phylogenetic tree on *Hymenochaetales* is composed of *Hymenochaetaceae* and newly generated sequenced are positioned accordingly in the corresponding clades with the exception of sequences named *Phellinus beninensis* (Fig. 1). Sequences of *Ph. beninensis* cluster together and fall into the *Fuscoporia* clade with good branch support (70/1). Further phylogenetic analyses of the genus *Fuscoporia* confirmed the correct phylogenetic position of *Ph. beninensis* (Fig. 2). From the phylogenetic tree on *Polyporales*, newly generated sequences cluster together with other similar sequences retrieved from other studies, except the sequences of *Megasporoporia setulosa* and sequences of the genus *Microporus* where species are misplaced (Fig. 3). Sequences of the species identified as *Microporus incomptus* and *M. affinis* grouped together with other sequences named *M. xanthopus* and *M. concinnus*, while sequences named in this study as *Megasporoporia setulosa* did not match with other sequences of the same name available in GenBank (Fig. 3). Phylogenetic analyses combining the ITS and LSU regions for *Megasporoporia* and ITS-LSU-*Tef* for *Microporus* resolved the questionable phylogenetic positions of these different species (Figs 4, 5).

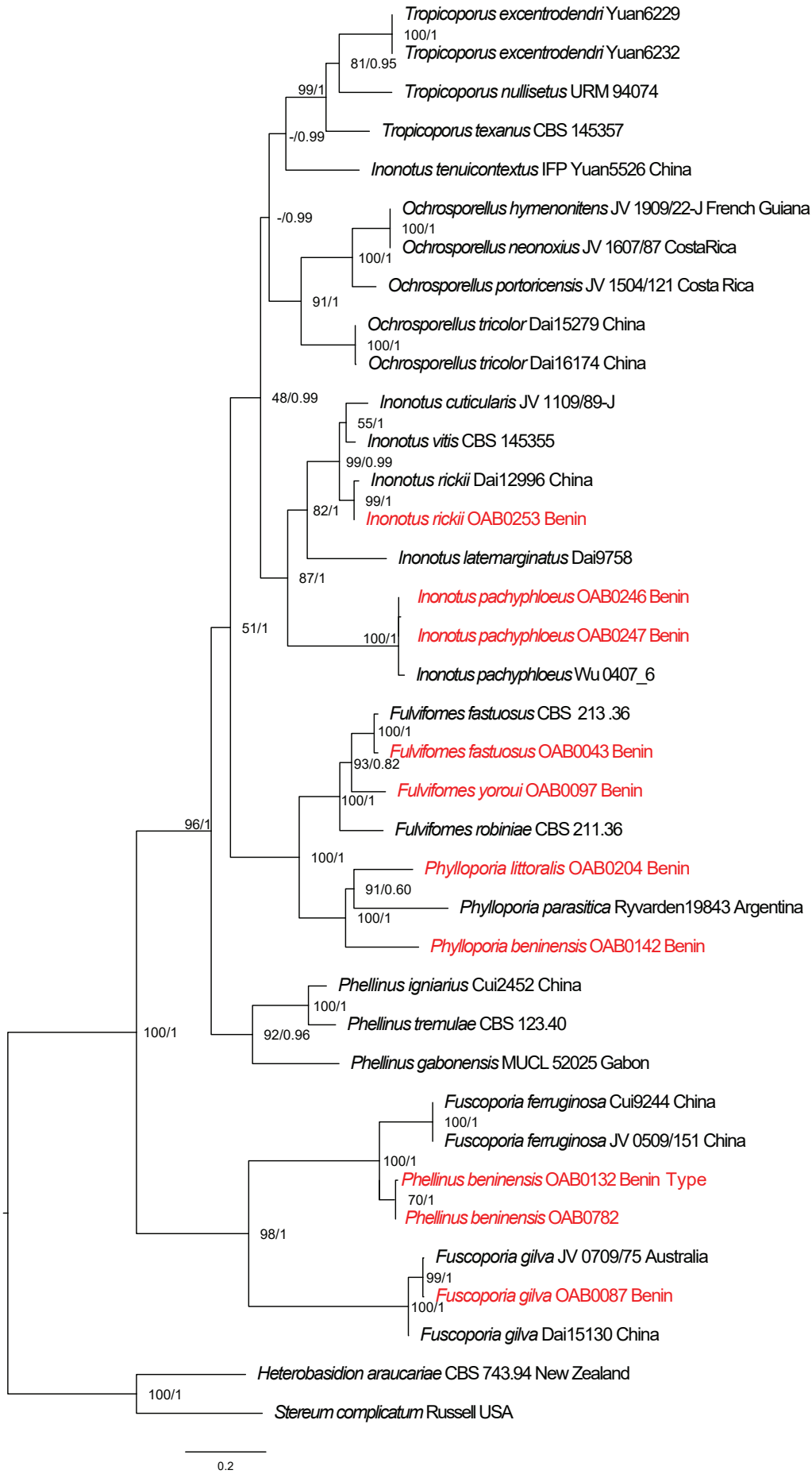

Fig. 1. Maximum likelihood (ML) and Bayesian analysis (BI) analyses of *Hymenochaetales* based on the ITS dataset. Branch support values given as UFBoot / PP. Newly generated and Benin sequences are highlighted in red colour. The sequence names are followed by voucher or strain number and country of origin.

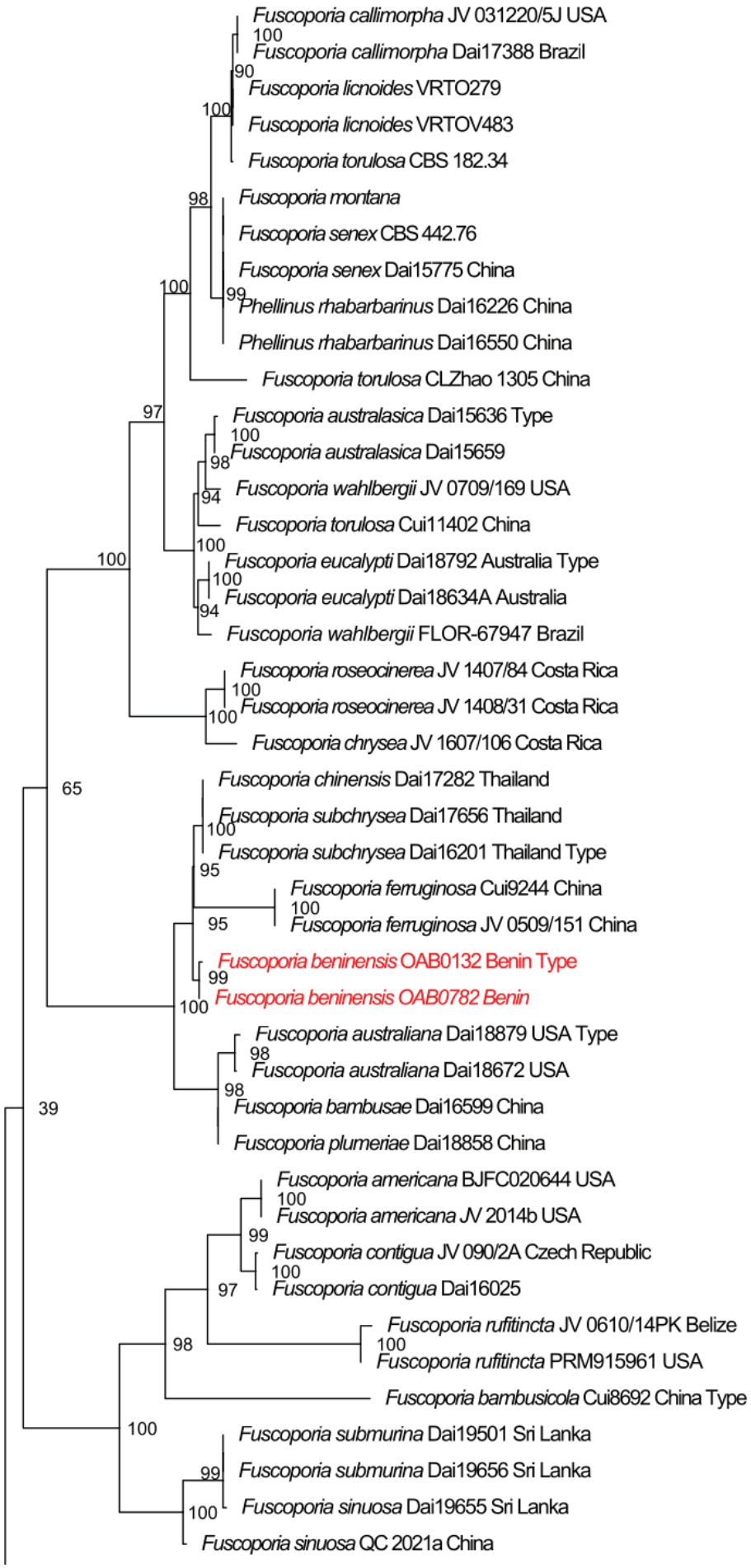

Fig. 2. Maximum likelihood (ML) analysis of the genus *Fuscoporia* with rapid bootstrap values based on the ITS dataset. Newly generated sequences highlighted in red. The sequence names are followed by voucher or strain number and country of origin.

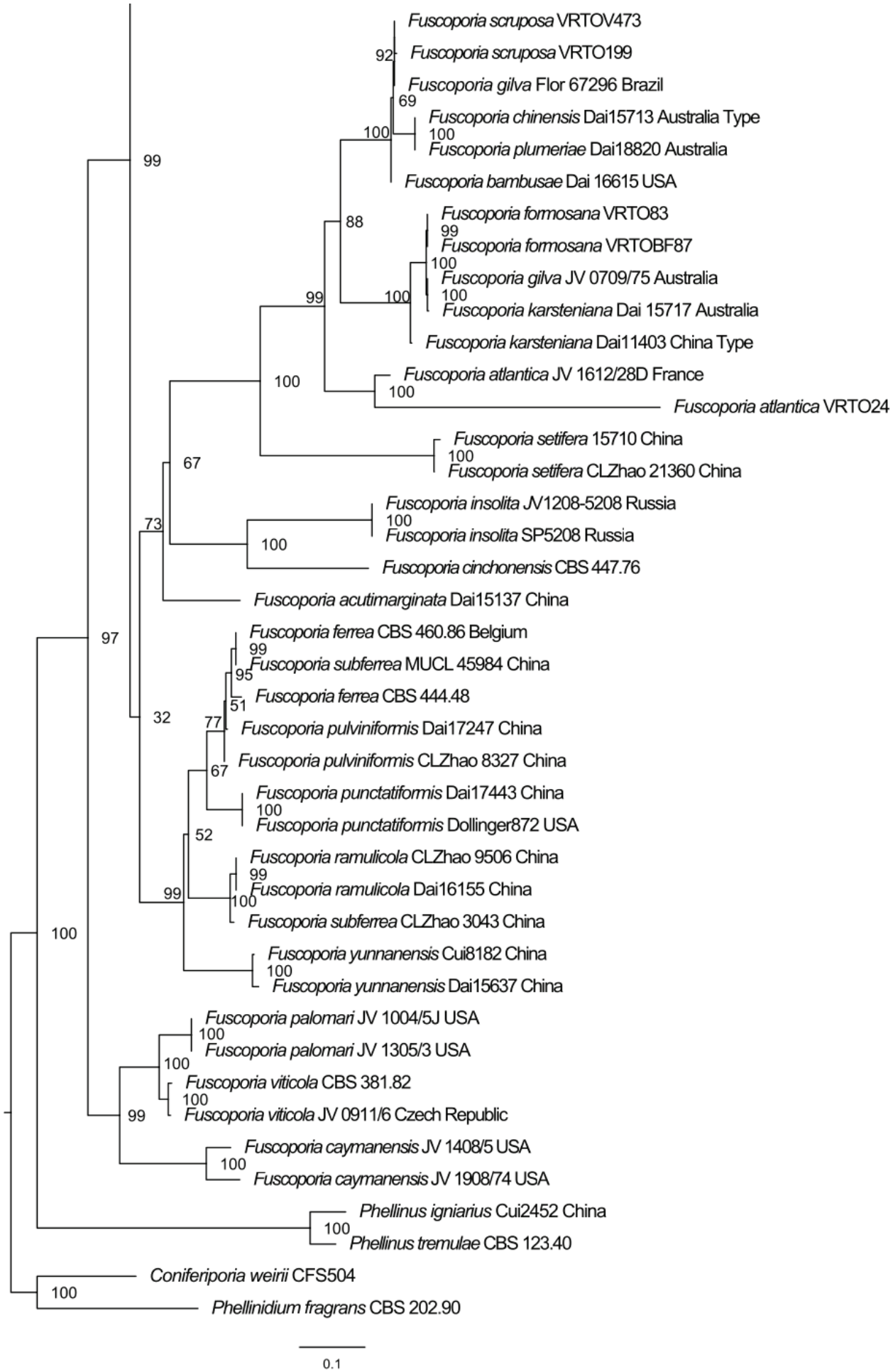

Fig. 2. (Continued).

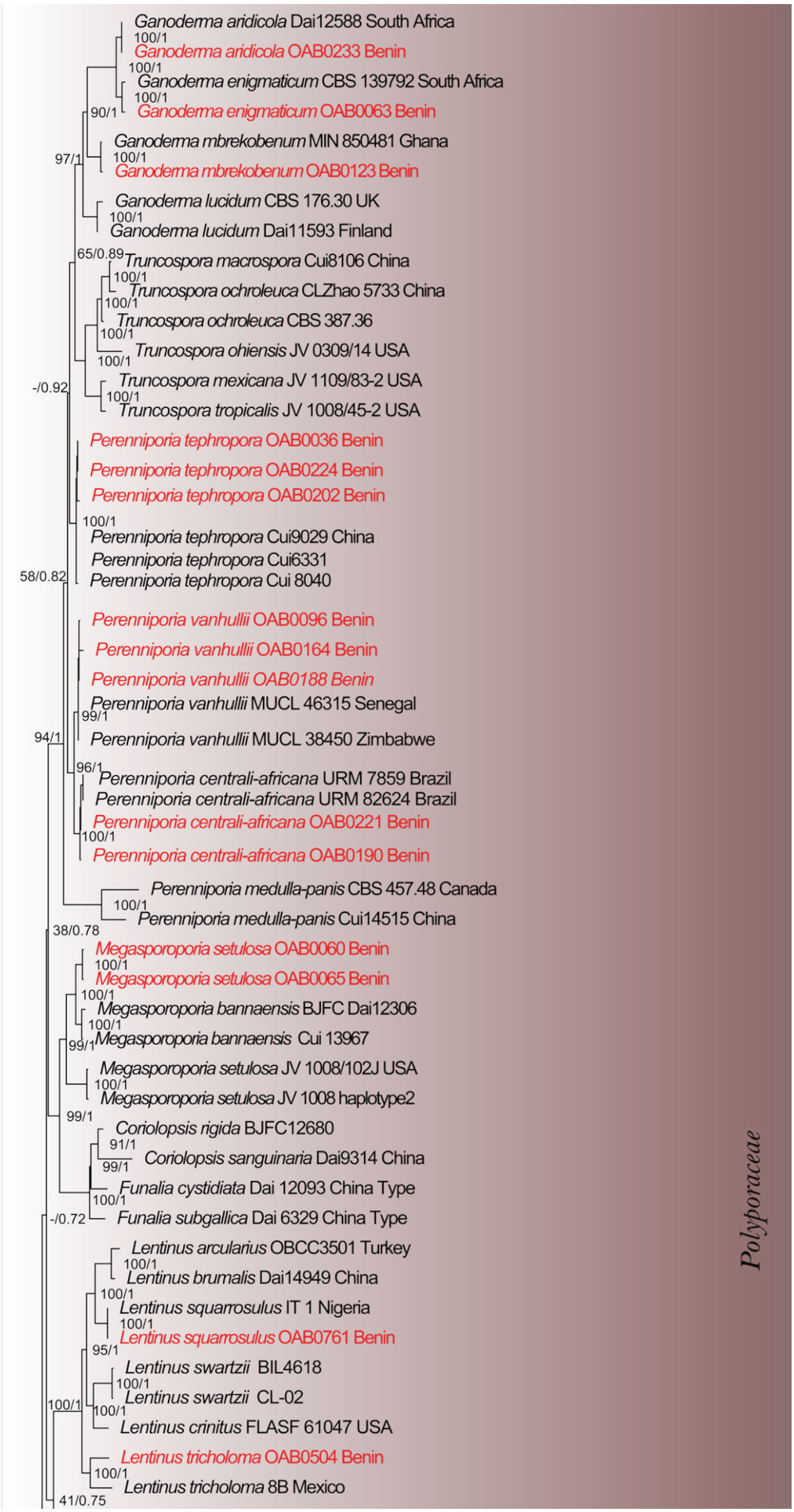

Fig. 3. Maximum likelihood (ML) and Bayesian analysis (BI) analyses of *Polyporales* based on the ITS dataset. Branch support values given as UFBoot / PP. Newly generated and Benin sequences are highlighted in red. The sequence names are followed by voucher or strain number and country of origin.

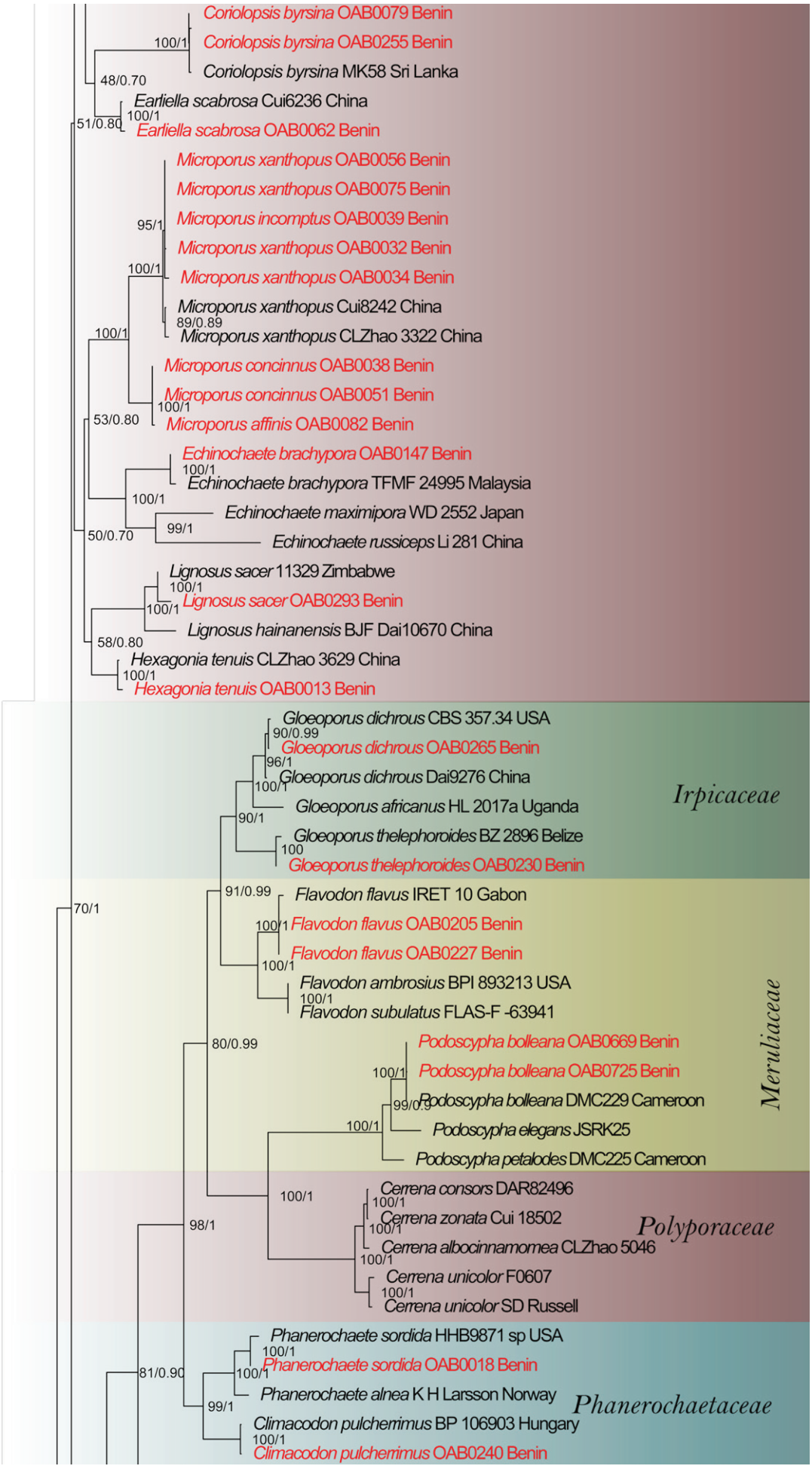

Fig. 3. (Continued).

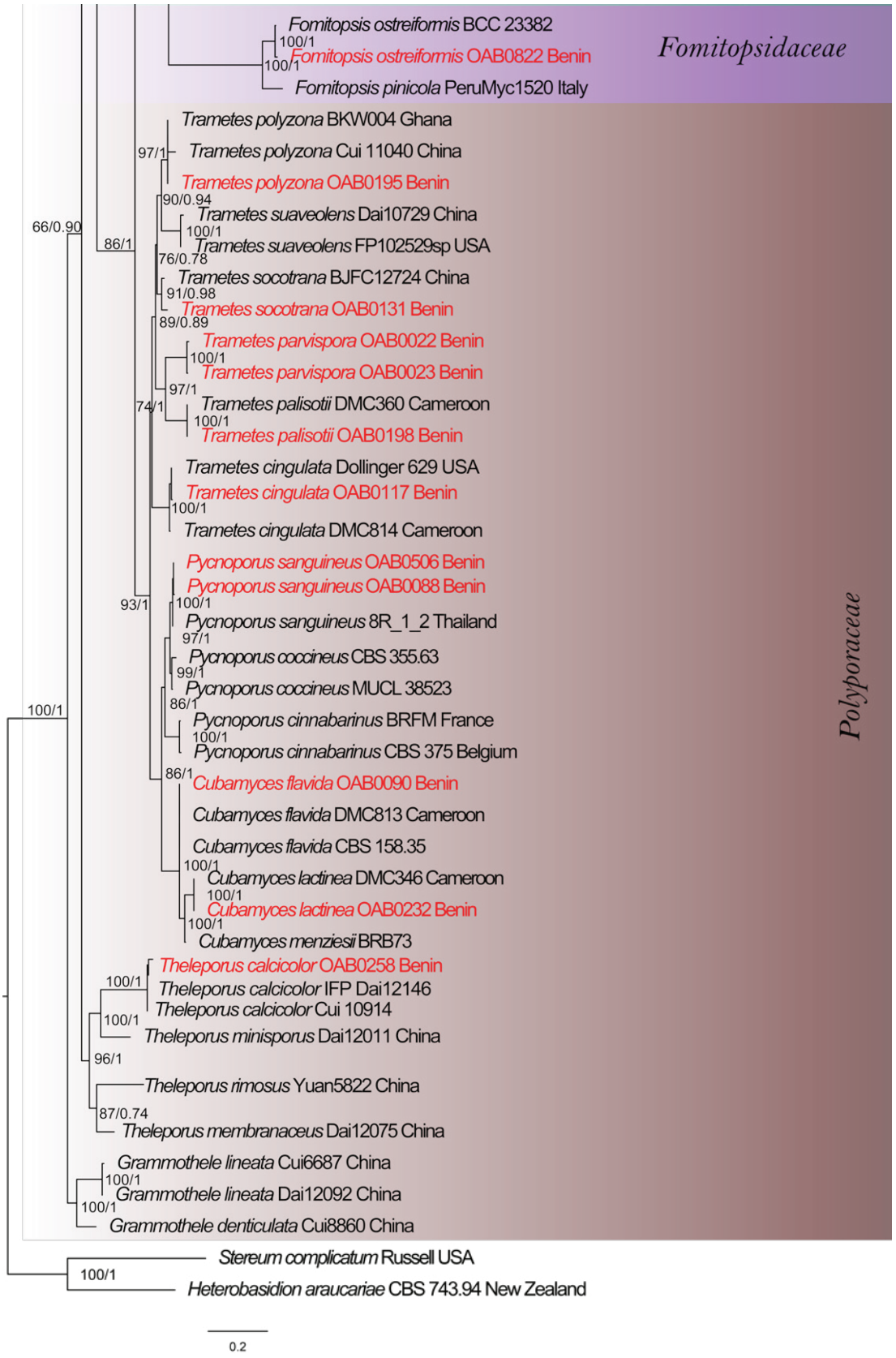

Fig. 3. (Continued).

Annotated and illustrated checklist of wood-inhabiting polypores

An alphabetical list (by genus name) of wood-inhabiting polypores identified in this study is given below. The current name of each species is checked against Index Fungorum and MycoBank. Whenever there is a difference between the two databases, the phylogenetic position of the species in this study or other published studies is used to select the correct current name. Substrate and collection data are provided for each species wherever possible. At this stage, no generic placement can be given to the genus *Coriolopsis* as the type species (*Coriolopsis*

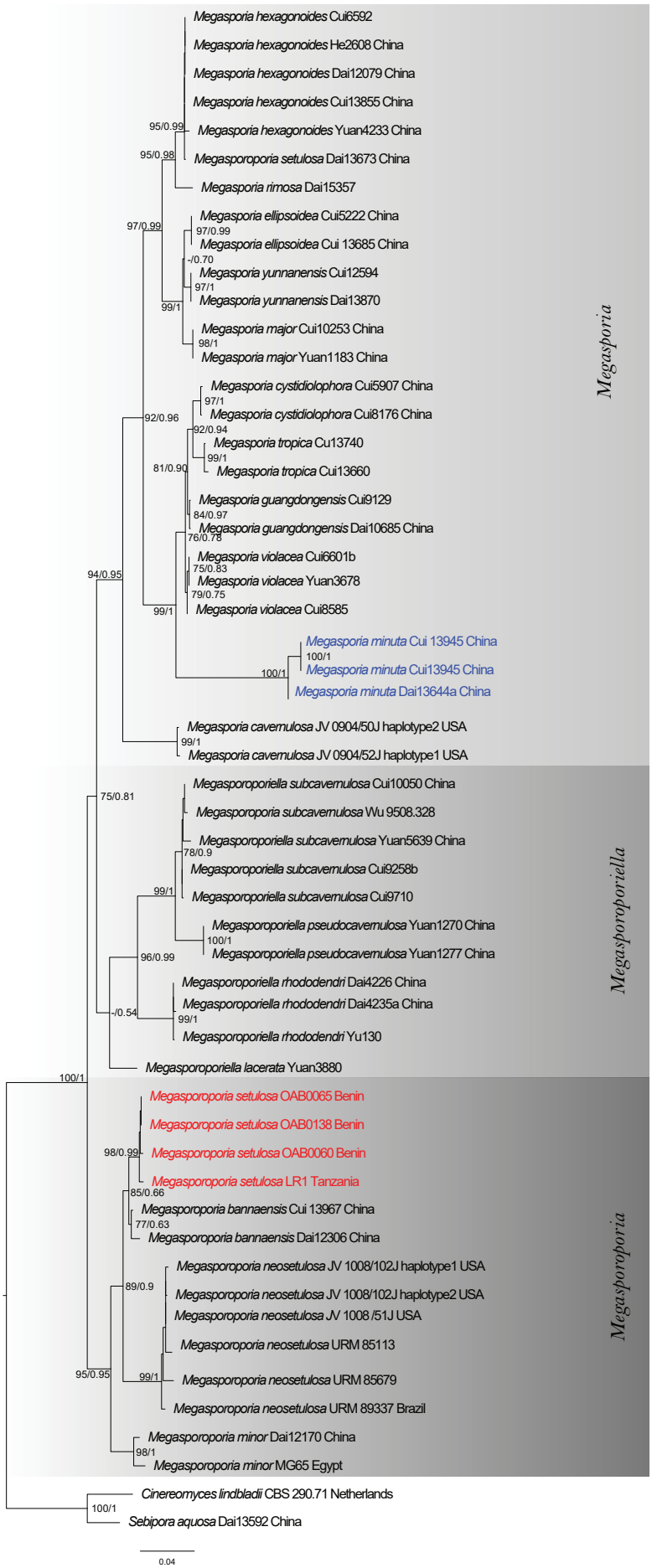

Fig. 4. Maximum likelihood (ML) and Bayesian analysis (BI) analyses of *Megasporoporia sensu lato* based on the combined ITS-LSU dataset. Branch support values given as UFBoot / PP. Newly generated sequences highlighted in red and in blue sequences previously named as *Megasporoporia minuta*. The sequence names are followed by voucher or strain number and country of origin.

Table 1. Newly generated sequences with the GenBank accession numbers, vouchers, and origin of the specimens.

Species name	Voucher	Origin	Accession numbers (ITS)
Amylosporus campbellii	OAB0625	Benin	ON876004
	OAB0644	Benin	ON876005
Climacodon pulcherrimus	OAB0240	Benin	ON876006
Coriolopsis byrsina	OAB0079	Benin	ON876007
	OAB0255	Benin	ON876008
Earliella scabrosa	OAB0062	Benin	ON876009
Echinochaete brachypora	OAB0147	Benin	ON876010
Flavodon flavus	OAB0205	Benin	ON876011
	OAB0227	Benin	ON876012
Fomitopsis ostreiformis	OAB0822	Benin	ON876013
Fulvifomes fastuosus	OAB0043	Benin	ON876014
Fuscoporia beninensis	OAB0132	Benin	ON876015
	OAB0782	Benin	ON876016
Fuscoporia gilva	OAB0087	Benin	ON876017
Ganoderma aridicola	OAB0233	Benin	ON876018
Ganoderma enigmaticum	OAB0063	Benin	ON876019
Ganoderma mbrekobenum	OAB0123	Benin	ON876020
Gloeophyllum striatum	OAB0129	Benin	ON885270
Gloeoporus dichrous	OAB0265	Benin	ON876021
Gloeoporus thelephoroides	OAB0230	Benin	ON876022
Hexagonia tenuis	OAB0013	Benin	ON876023
Inonotus pachyphloeus	OAB0246	Benin	ON876024
	OAB0247	Benin	ON876025
Inonotus rickii	OAB0253	Benin	ON876026
Laxitextum bicolor	OAB0126	Benin	ON876027
Lentinus squarrosulus	OAB0761	Benin	ON876028
Lentinus tricholoma	OAB0504	Benin	ON876029
Lignosus sacer	OAB0293	Benin	ON876030
Megasporoporia setulosa	OAB0060	Benin	ON876031
	OAB0065	Benin	ON876032
Microporus affinis	OAB0082	Benin	ON876033
Microporus concinnus	OAB0038	Benin	ON876034
	OAB0051	Benin	ON876035
Microporus incomptus	OAB0039	Benin	ON876036
Microporus xanthopus	OAB0032	Benin	ON876037
	OAB0034	Benin	ON876038
	OAB0056	Benin	ON876039
	OAB0075	Benin	ON876040
Neonothopanus hygrophanus	OAB0636	Benin	ON876041
	OAB0676	Benin	ON876042
	OAB0855	Benin	ON876043
Perenniporia centrali-africana	OAB0190	Benin	ON876044
	OAB0221	Benin	ON876045
Perenniporia tephropora	OAB0036	Benin	ON876046
	OAB0202	Benin	ON876047
	OAB0224	Benin	ON876048
Perenniporia vanhullii	OAB0096	Benin	ON876049

Table 1. (Continued).

Species name	Voucher	Origin	Accession numbers (ITS)
	OAB0164	Benin	ON876050
	OAB0188	Benin	ON876051
Phanerochaete sordida	OAB0018	Benin	ON876052
Podoscypha bolleana	OAB0669	Benin	ON876053
	OAB0725	Benin	ON876054
Schizophyllum commune	OAB0112	Benin	ON876055
Schizophyllum umbrinum	OAB0507	Benin	ON876056
Theleporus calcicolor	OAB0258	Benin	ON876057
Trametes sanguinea	OAB0506	Benin	ON885559

polyzona) is currently known as *Trametes polyzona*. As this study did not focus on the genus that may house the *Coriolopsis* species, we preferred to keep the name *Coriolopsis* in inverted commas. Species recorded for the first time in Benin, *i.e*. recorded by us through a series of mycological surveys since 2017 are in bold.

Amylosporus campbellii (Berk.) Ryvarden – Fig. 6A.

Substrata: On the soil in semi-deciduous dense forest.

Material examined: OAB0625**,** semi-deciduous dense forest of Pahou/ Ouidah (Benin), 8 Jul. 2021; OAB0644**,** same forest, 8 Jul. 2021.

Distribution: Widespread in subtropics and tropics. In Africa, specimens recorded from Nigeria, Kenya, Tanzania, and Ghana (Ryvarden & Johansen 1980, Piepenbring *et al.* 2020).

Climacodon pulcherrimus (Berk. & M.A. Curtis) Nikol. – Fig. 6B.

Substrata: On decomposing hardwoods.

Material examined: OAB0240, semi-deciduous dense forest of Lama (Benin), 6°57’8’’N, 2°6’12’’E, altitude: 37.8 m a.s.l., 14 Aug. 2018.

Distribution: Mainly Tropical, and known from different tropical regions (Moreno *et al.* 2007). First record in West Africa.

*“**Coriolopsis” byrsina*** (Mont.) Ryvarden – Fig. 6C.

Substrata: Found on dead tree of *Diospyros mespiliformis*, but maybe found on other angiosperms.

Materials examined: OAB0079, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°57’59’’N, 2°08’02’’E, altitude: 51. 3 m a.s.l., 3 Aug. 2017; OAB0255, semi-deciduous dense forest of Lama/ Zogbodomey, 6°57’40’’N, 2°8’2’’E, altitude: 154. 3 m a.s.l., 15 Aug. 2018.

Distribution: Widespread in tropical Africa, and seen throughout East Africa (Ryvarden & Johansen 1980). First record in West Africa.

*“**Coriolopsis” caperata*** (Berk.) Murrill – Fig. 6D.

Substrata: Found on dead tree of different angiosperm trees.

Materials examined: OAB0189, woodland of Trois Rivières in Benin, 10°27’30’’N, 3° 25’11’’E, altitude 386.2 m a.s.l., 27 Aug. 2017; OAB0194, at the same locality, 10°26’53’’N, 3°24’37’’E, altitude 360.9 m a.s.l., 27 Aug. 2017.

Distribution: Widespread in tropical Africa and seen throughout East Africa (Ryvarden & Johansen 1980). First record in West Africa.

*“**Coriolopsis” floccosa*** (Jungh.) Ryvarden

Substrata: On angiosperms of all kinds.

Material examined: OAB0216, savannah-land of the National Park W (Benin), 11°28’25’’N, 3°3’0’’E, altitude: 281.89 m a.s.l., 31 Aug. 2017.

Distribution: Pantropical and common in East Africa in savannah-land and dry forests (Ryvarden & Johansen 1980). First record for the Western African mycobiota.

*“**Coriolopsis” sanguinaria*** (Klotzsch) Teng – Fig. 6E.

Substrata: On dead angiosperms of all kinds.

Material examined: OAB0158, woodland of Ouémé supérieur in Benin, 9°46’9’’N, 2°14’40’’E, altitude 382.5 m a.s.l., 25 Aug. 2017; OAB0197, woodland of Trois Rivières in Benin, 10°28’9’’N, longitude 3°24’40’’E, altitude 364.2 m a.s.l., 28 Aug. 2017; OAB0199**,** woodland of Trois Rivières in Benin, 10°28’8’’N, 3°24’39’’E, altitude 363.4 m a.s.l., 28 Aug. 2017.

Distribution: Paleotropical, widespread in East Africa (Ryvarden & Johansen 1980). First record in West Africa.

*“**Coriolopsis” strumosa*** (Fr.) Ryvarden – Fig. 6F.

Substrata: On dead woods.

Material examined: OAB0081, semi-deciduous Dense forest of Lama in Benin, 6°57’31’’N, 2°7’59’’E, altitude: 56.1 m a.s.l., 3 Aug. 2017.
Distribution: Widespread in the paleotropics from Western Africa to Australia (Ryvarden & Johansen 1980).

Cubamyces flavidus (Lév.) Lücking – Fig. 6G.

Substrata: On dead wood.

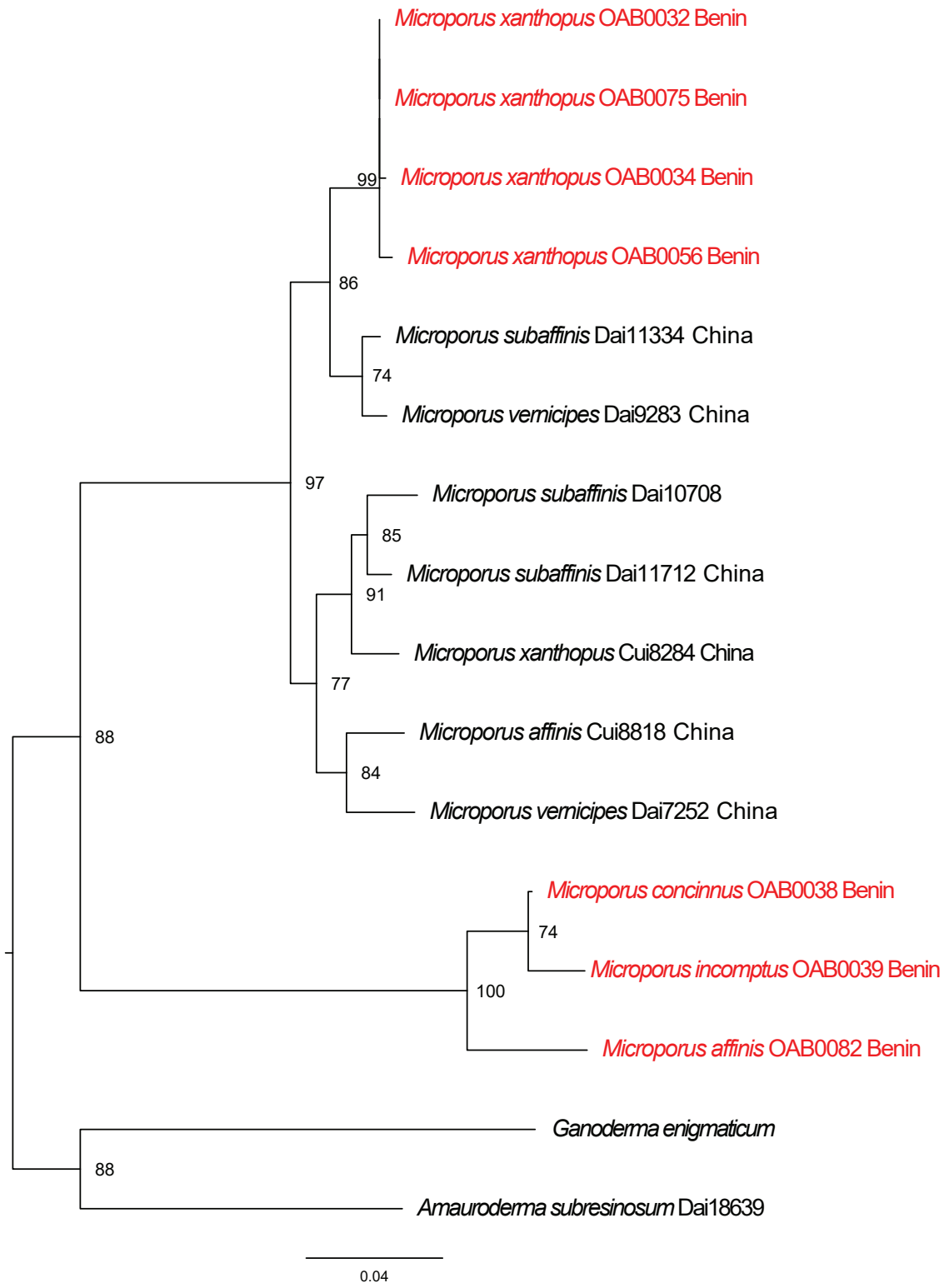

Fig. 5. Maximum likelihood (ML) analysis of the genus *Microporus* with rapid bootstrap values based on the *Tef* dataset. Newly generated sequences highlighted in red. The sequence names are followed by voucher or strain number and country of origin.

Material examined: OAB0047, semi-deciduous dense forest of Lama (Benin), 6°57'58''N, 2°90'55''E, altitude 63.5 m a.s.l., 27 Jul. 2017; OAB0090, woodlands of Kilibo (Benin), 8°32'30"N, 2°41'30"E, altitude 334 m a.s.l., 16 Aug. 2017; OAB0196, Trois Rivières (Benin), 10°28'90''N, 3°24'40''E, altitude 364.6 m a.s.l., 28 Aug. 2017.

Distribution: Tropical species (Zmitrovich *et al.* 2012). First record in West Africa and species reported from Benin (Olou *et al.* 2019a, 2020).

Cubamyces lactineus (Berk.) Lücking – Fig. 6H.

Substrata: On deciduous wood of many kinds.

Materials examined: OAB0207, National Park W (Benin), 11°28'13''N, 3°3'40''E, altitude 289.7 m a.s.l., 31 Aug. 2017; OAB0232, semi-deciduous dense forest of Lama (Benin), 6°56'40''N, 2°6'20''E, altitude 98.3 m a.s.l., 13 Aug. 2018.

Fig. 6. Macromorphology of polypores in Benin. **A.** *Amylosporus campbellii*. **B.** *Climacodon pulcherrimus*. **C.** *Coriolopsis byrsina*. **D.** *Coriolopsis caperata*. **E.** *Coriolopsis sanguinaria*. **F.** *Coriolopsis strumose*. **G.** *Cubamyces flavidus*. **H.** *Cubamyces lactineus*. **I.** *Diplomitoporus hondurensis*. **J.** *Earliella scabrosa*. **K.** *Echinochaete brachypora.* **L.** *Flavodon flavus*. **M.** *Fomitiporia punctata*. **N.** *Fomitopsis ostreiformis*. **O.** *Fulvifomes fastuosus*.

Distribution: Rare in Africa (Ryvarden & Johansen 1980). First record in West Africa.

Diplomitoporus hondurensis (Murrill) Ryvarden – Fig. 6I.

Substrata: On dead hardwood.

Material examined: Benin, Province Borgou, OAB0183, Woodland of Trois Rivières (Benin), 10°26'46''N, 3°25'2''E, altitude: 365.1 m a.s.l., 27 Aug. 2017.

Distribution: Mainly distributed in Americas (Kout & Vlasák 2010). First record in tropical Africa.

Earliella scabrosa (Pers.) Gilb. & Ryvarden – Fig. 6J.

Substrata: On dead deciduous trees.

Materials examined: OAB0062, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°58'47''N, 2°5'30''E, altitude: 58. 4 m a.s.l., 31 Jul. 2017; OAB0067, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°57'70''N, 2°6'30''E, altitude: 56. 4 m a.s.l., 1 Aug. 2017; OAB0119, Woodland of Toui-Kilibo, 8°32'33''N, 2°40'47''E, altitude: 332.8 m a.s.l., 18 Aug. 2017; OAB0169, Woodland of Ouémé Supérieur, 9°46'45''N, 2°12'49''E, altitude: 353.2 m a.s.l., 25 Aug. 2017; OAB0186, Woodland of Trois Rivières, 10°26'47''N, 3°25'30''E, altitude: 367.3 m a.s.l., 27 Aug. 2017; OAB0212, National Parc W, 11°28'17''N, 3°30'20''E, altitude: 285.6 m a.s.l., 31 Aug. 2017.

Distribution: Pantropical distribution and quite common in tropical Africa (Ryvarden & Johansen 1980).

Echinochaete brachypora (Mont.) Ryvarden – Fig. 6K.

Substrata: On dead wood.

Materials examined: OAB0071, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°56'55''N, 2°6'4''E, altitude: 73.3 m a.s.l., 2 Aug. 2017; OAB0147, Woodland of Ouémé supérieur (Benin), 9°45'25''N, 2°18'38''E, altitude: 336.2 m a.s.l., 24 Aug. 2017.

Distribution: Pantropical, in Africa from Uganda, Tanzania, Malawi, Kenya, Burundi (Ryvarden & Johansen 1980). First record in West Africa.

Flavodon flavus (Klotzsch) Ryvarden – Fig. 6L.

Substrata: On fallen and standing dead trunks and branches.

Materials examined: OAB0005, dry dense forest of Pahou/ Ouidah (Benin), altitude. 17.6 m a.s.l., 18 Jul. 2017; OAB0145, Woodland of Ouémé supérieur (Benin), 9°45'24''N, 2°18'37''E, altitude: 336.1 m a.s.l., 24 Aug. 2017; OAB0205, Woodland of Trois Rivières, 10°28'60''N, 3°24'26''E, altitude: 350.5 m a.s.l., 28 Aug. 2017; OAB0227, National Parc W, 11°28'14''N, 3°30'16''E, altitude: 285.6 m a.s.l., 31 Aug. 2017.

Distribution: Throughout tropical Africa (Ryvarden & Johansen 1980).

Fomitiporia aff. punctata (P. Karst.) Murrill – Fig. 6M.

Substrata: On dead branch of living tree of *Isoberlinia doka*.

Material examined: OAB0208, National parc W, 11°28'14''N, 3°30'40''E, altitude: 288.2 m a.s.l., 31 Aug. 2017.

Distribution: The distribution of the species is still unknown even though Ryvarden & Johansen (1980) reported the presence of *Fomitiporia punctata* in East Africa. However, Decock *et al.* (2007) reported that this species has a distribution restricted to the northern or more temperate areas of the Northern Hemisphere. That means, the specimen identified here as *Fomitiporia aff. punctata* might be a different or new species and therefore additional specimens and other collections named *Fomitiporia punctata* in Africa need to be studied in depth morpho-anatomically and molecularly.

Fomitopsis ostreiformis (Berk.) T. Hatt. – Fig. 6N.

Substrata: Found on dead trunk of *Mangifera indica*.

Material examined: OAB0822, Woodland of Ouémé supérieur (Benin), 9°45'40''N, 2°25'46''E, altitude: 342.9 m a.s.l., 19 Jul. 2021.

Distribution: Probably a tropical species. Reported mainly in Asia. In Africa, the specimen was reported from Gabon (Liu *et al.* 2022). This is the first record in West Africa.

Fulvifomes fastuosus (Lév.) Bondartseva & S. Herrera – Fig. 6O.

Substrata: On dead and living tree of *Dialium guineense*, and other unidentified angiosperm trees.

Materials examined: OAB0015, semi-deciduous dense forest of Pahou/ Ouidah (Benin), 6°23'05''N, 2°09'22''E, altitude. 17.6 m a.s.l., 20 Jul. 2017; OAB0043, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°57'07''N, 2°06'03''E, altitude: 56.8 m a.s.l., 27 Jul. 2017; OAB0235, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 13 Aug. 2018; OAB0237, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°56'42''N, 2°5'49''E, altitude: 29.6 m a.s.l., 13 Aug. 2018; OAB0252, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°57'29''N, 2°6'4''E, 15 Aug. 2018; OAB0259, semi-deciduous dense forest of Lama/ Zogbodomey (Benin), 6°58'0''N, 2°8'3''E, altitude: 69.3 m a.s.l., 20 Aug. 2018.

Distribution: Pantropical and quite common throughout tropical Africa (Ryvarden & Johansen 1980).

Fulvifomes indicus (Massee) L.W. Zhou – Fig. 7A.

Substrata: On dead and living angiosperm trees.

Material examined: OAB0210, National Parc W, 11°28'18''N, 3°30'20''E, altitude: 287.5 m a.s.l., 31 Aug. 2017.

Distribution: Reported from Asia and Africa (Ryvarden & Johansen 1980, Zhou 2014). New record in West Africa.

Fulvifomes rimosus (Berk.) Fiasson & Niemelä – Fig. 7B.

Substrata: On dead wood of different kind.

Materials examined: OAB0213, National Park W (Benin), 11°28'18''N, 3°3'30''E, altitude 285.2 m a.s.l., 31 Aug. 2017; OAB0214, at the same locality, 11°28'18''N, 3°3'30''E, altitude 285.2 m a.s.l., 31 Aug. 2017;

OAB0215, at the same locality, 11°28’17’’N, 3°3’10’’E, altitude 284.7 m a.s.l., 31 Aug. 2017.

Distribution: Cosmopolitan species, reported from Europe, Asia, Africa, and Australia (Ryvarden & Johansen 1980). In West Africa, reported from Togo, Sierra Leone (Piepenbring *et al.* 2020) and newly reported here from Benin.

Fulvifomes yoroui Olou & Langer – Fig. 7C.

Substrata: On living tree of *Pseudocedrela kotschyi*.

Material examined: OAB0097, Woodland of Toui-Kilibo in Benin, 8°32’30’’N, 2°40’49’’E, altitude 328.3 m a.s.l., 16 Aug. 2017.

Distribution: New to West African mycobiota and presently only reported from Benin (Olou *et al.* 2019b).

Funalia leonina (Klotzsch) Pat. – Fig. 7D.

Substrata: On dead wood of different kinds.

Material examined: OAB0105, Woodland of Toui-Kilibo in Benin, 8°32’36’’N, 2°41’12’’E, altitude 313.7 m a.s.l., 17 Aug. 2017; OAB0110, woodland of Toui-Kilibo in Benin, 8°32’37’’N, 2°40’13’’E, altitude 329.9 m a.s.l., 18 Aug. 2017; OAB0166, woodland of Ouémé supérieur (Benin), 9°46’50’’N, 2°12’40’’E, altitude 351.1 m a.s.l., 25 Aug. 2017; OAB0181, Trois Rivières (Benin), 10°26’50’’N, 3°25’13’’E, altitude 370.5 m a.s.l., 27 Aug. 2017; OAB0193, Trois Rivières (Benin), 10°26’53’’N, 3°24’37’’E, altitude 348.5 m a.s.l., 27 Aug. 2017.

Distribution: Widespread in tropical Africa from Senegal in west to Ethiopia in north and south to South Africa (Ryvarden & Johansen 1980).

Fuscoporia beninensis (Olou & Ryvarden) Olou, ***comb. nov.*** MycoBank MB 844735. Fig. 7E.
Basionym: *Phellinus beninensis* Olou & Ryvarden, *Syn. Fung.* (Oslo) **44**: 10. 2021.

Substrata: On an unidentified dead angiosperm tree.

Material examined: OAB0132, Woodland of Toui-Kilibo (Benin), 8°37’06’’N, 2°37’44’’E, altitude: 318.89 m a.s.l., 19 Aug. 2017.

Distribution: First record in West Africa and so far, known only from the type locality in Benin (Olou & Ryvarden 2021).

Fuscoporia gilva (Schwein.) T. Wagner & M. Fisch. – Fig. 7F.

Substrata: On several dead angiosperm tree such as *D. guineense*, *Mimusops andongensis*, and other unidentified angiosperm trees.

Materials examined: OAB0045, semi-deciduous dense forest of Lama (Benin), 6°57’07’’N, 2°06’03’’E, altitude: 56.8 m a.s.l., 27 Jul. 2017; OAB0070, at the same locality, 6°56’55’’N, 2°06’04’’E, 2 Aug. 2017; OAB0087, at the same locality, 6°56’58’’N, 2°08’18’’E, altitude: 38.5 m a.s.l., 3 Aug. 2017; OAB0108, Woodland of Toui-Kilibo (Benin), 8°32’36’’N, 2°41’13’’E, altitude: 315 m a.s.l., 17 Aug. 2017; OAB0120, at the same locality, 8°32’35’’N, 2°40’48’’E, altitude: 332.8 m a.s.l., 18 Aug. 2017.

Distribution: Pantropical and quite common in tropical Africa (Ryvarden & Johansen 1980, Wagner & Fischer 2002).

Fuscoporia senex (Nees & Mont.) Ghobad-Nejhad – Fig. 7G.

Substrata: On several dead angiosperm tree such as *D. guineense*, *M. andongensis*, and other unidentified angiosperm trees.

Materials examined: OAB0006, semi-deciduous dense forest of Pahou (Benin), 6°23’30’’N, 2°9’16’’E, altitude: 23.1 m a.s.l., 19 Jul. 2017; OAB0021, dry dense forest of Pahou (Benin), 6°23’30’’N, 2°9’17’’E, altitude: 30.3 m a.s.l., 21 Jul. 2017; OAB0052, semi-deciduous dense forest of Lama (Benin), 6°57’59’’N, 2°9’46’’E, altitude: 56.6 m a.s.l., 28 Jul. 2017; OAB0066, at the same locality, 6°57’70’’N, 2°6’30’’E, altitude: 57.9 m a.s.l., 1 Aug. 2017; OAB0086, at the same locality, 6°56’59’’N, 2°8’16’’E, altitude: 35.3 m a.s.l., 3 Aug. 2017; OAB0106, Woodland of Toui-Kilibo (Benin), 8°32’36’’N, 2°41’12’’E, altitude: 312.89 m a.s.l., 17 Aug. 2017.

Distribution: Pantropical and widespread in Africa (Ryvarden & Johansen 1980, Ghobad-nejhad & Dai 2007). First record in West Africa.

Ganoderma aridicola J.H. Xing & B.K. Cui – Fig. 7H.

Substrata: On dead wood.

Materials examined: OAB0233, semi-deciduous dense forest of Lama (Benin), 13 Aug. 2018; OAB0241, at the same locality, 6°57’50’’N, 2°6’80’’E, altitude: 62 m a.s.l., 14 Aug. 2018; OAB0243, at the same locality, 6°57’40’’N, 2°6’30’’E, altitude: 69.2 m a.s.l., 14 Aug. 2018; OAB0254**,** at the same locality, 6°57’39’’N, 2°6’16’’E, altitude: 58.8 m a.s.l., 15 Aug. 2018.

Distribution: So far known from the type locality, South Africa (Xing *et al.* 2016). First record in West Africa.

Ganoderma enigmaticum M.P.A. Coetzee *et al*. – Fig. 7I.

Substrata: On stumps, trunks and dead trees.

Materials examined: OAB0063, semi-deciduous dense forest of Lama (Benin), 6°58’47’’N, 2°5’20’’E, altitude: 59.1 m a.s.l., 31 Jul. 2017; OAB0094, Woodland of Toui-Kilibo (Benin), 8°32’30’’N, 2°41’30’’E, altitude: 333.4 m a.s.l., 16 Aug. 2017; OAB0095, at the same locality, 8°32’30’’N, 2°41’30’’E, altitude: 333.2 m a.s.l., 16 Aug. 2017; OAB0099, at the same locality, 8°32’37’’N, 2°41’12’’E, altitude: 314.8 m a.s.l., 17 Aug. 2017; OAB0104, at the same locality, 8°32’36’’N, 2°41’13’’E, altitude: 314.39 m a.s.l., 17 Aug. 2017; OAB0109, at the same locality, 8°32’33’’N, 2°40’53’’E, altitude: 316.39 m a.s.l., 17 Aug. 2017; OAB0113, at the same locality, 8°32’37’’N, 2°40’12’’E, altitude: 328.9 m a.s.l., 18 Aug. 2017; OAB0115, at the same locality, 8°32’36’’N, 2°40’48’’E, altitude: 332.5 m a.s.l., 18 Aug. 2017; OAB0124, at the same locality, 8°37’60’’N, 2°38’31’’E, altitude: 310.6 m a.s.l., 19 Aug. 2017; OAB0136, at the same locality, 8°37’60’’N, 2°37’45’’E, altitude: 318.39 m a.s.l., 19 Aug. 2017; OAB0154, Woodland of Ouémé supérieur (Benin), 9°45’16’’N, 2°8’31’’E, altitude: 324.89 m a.s.l., 24 Aug. 2017; OAB0159, at the same locality, 9°46’90’’N, 2°14’40’’E, altitude: 382.3 m a.s.l., 25 Aug. 2017; OAB0170, Trois Rivières (Benin), 10°26’50’’N, 3°25’17’’E, altitude 373.7 m a.s.l., 27 Aug. 2017; OAB0174, at the same locality, 10°26’49’’N, 3°25’18’’E, altitude 372.5 m a.s.l., 27 Aug. 2017; OAB0175, at the same locality, 10°26’50’’N, 3°25’18’’E, altitude 372.4 m a.s.l., 27 Aug. 2017; OAB0219, National Parc W, 11°28’30’’N, 3°3’40’’E, altitude: 287.5 m a.s.l., 31 Aug. 2017.

Fig. 7. Macromorphology of polypores in Benin. **A.** *Fulvifomes indicus*. **B.** *Fulvifomes rimosus*. **C.** *Fulvifomes yoroui*. **D.** *Funalia leonina*. **E.** *Fuscoporia beninensis*. **F.** *Fuscoporia gilva*. **G.** *Fuscoporia senex*. **H.** *Ganoderma aridicola*. **I.** *Ganoderma enigmaticum*. **J.** *Ganoderma lucidum* group. **K.** *Ganoderma mbrekobenum*. **L.** *Gloeophyllum striatum*. **M.** *Gloeoporus dichrous*. **N.** *Gloeoporus thelephoroides*. **O.** *Grammothele lineata.*

Distribution: Typified with South African material (Coetzee *et al.* 2015). First record in West Africa and most abundant *Ganoderma* species in Benin.

Ganoderma aff. lucidum – Fig. 7J.

Substrata: On dead wood.

Materials examined: OAB0011, dry dense forest of Pahou (Benin), 6°23’57’’N, 2°9’90’’E, altitude: 24.7 m a.s.l., 19 Jul. 2017; OAB0016, at the same locality, 6°23’50’’N, 2°9’22’’E, altitude: 19.7 m a.s.l., 20 Jul. 2017; OAB0017, at the same locality, 6°23’50’’N, 2°9’22’’E, altitude: 15.9 m a.s.l., 20 Jul. 2017; OAB0029, at the same locality, 6°23’50’’N, 2°9’21’’E, altitude: 16 m a.s.l., 20 Jul. 2017; OAB0121, Woodland of Toui-Kilibo (Benin), 8°32’34’’N, 2°41’12’’E, altitude: 321.7 m a.s.l., 18 Aug. 2017; OAB0122, at the same locality, 8°32’34’’N, 2°41’13’’E, altitude: 320.5 m a.s.l., 18 Aug. 2017; OAB0133, at the same locality, 8°37’60’’N, 2°37’44’’E, altitude: 343.3 m a.s.l., 19 Aug. 2017; OAB0139, at the same locality, 8°37’60’’N, 2°37’45’’E, altitude: 317.9 m a.s.l., 19 Aug. 2017; OAB0146, Woodland of Ouémé supérieur (Benin), 9°45’25’’N, 2°18’38’’E, altitude: 336.5 m a.s.l., 24 Aug. 2017.

Distribution: Cosmopolitan species but as the interpretation of the name is very variable, the distribution also is quite variable. Thus, the type species is restricted to Europe and part of China (Cao *et al.* 2012). While the distribution of the species reported here is still unknown. So far, recorded throughout Benin.

Ganoderma mbrekobenum E.C. Otto *et al*. – Fig. 7K.

Habitat: On roots and trunks of living or dead trees of several angiosperms.

Materials examined: OAB0083, semi-deciduous dense forest of Lama (Benin), 6°57’32’’N, 2°7’42’’E, altitude: 50.2 m a.s.l., 3 Aug. 2017; OAB0123, Woodland of Toui-Kilibo (Benin), 8°37’60’’N, 2°38’32’’E, altitude: 307.89 m a.s.l., 19 Aug. 2017; OAB0143, Woodland of Ouémé supérieur (Benin), 9°45’28’’N, 2°19’58’’E, altitude: 334.6 m a.s.l., 24 Aug. 2017; OAB0187, Trois Rivières (Benin), 10°27’30’’N, 3°25’11’’E, altitude 384.5 m a.s.l., 27 Aug. 2017; OAB0218, National Parc W, 11°28’30’’N, 3°3’40’’E, altitude: 278.7 m a.s.l., 31 Aug. 2017.

Distribution: Typified with West African material. The type locality is Ghana (Crous *et al.* 2016a, b) and this is a new record for Benin.

Gloeophyllum striatum (Fr.) Murrill – Fig. 7L.

Substrata: On an unidentified dead angiosperm tree.

Materials examined: OAB0129, Woodland of Toui-Kilibo (Benin), 8°37’02’’N, 2°38’05’’E, altitude: 308.2 m a.s.l., 19 Aug. 2017; OAB0843, Woodland of Ouémé supérieur (Benin), 9°46’412’’N, 2°14’41’’E, altitude: 364.8 m a.s.l., 20 Jul. 2021.

Distribution: Pantropical and widespread through Africa (Ryvarden & Johansen 1980). First record in West Africa.

Gloeoporus dichrous (Fr.) Bres. – Fig. 7M.

Substrata: On dead wood.

Materials examined: OAB0265, semi-deciduous dense forest of Lama (Benin), 20 Aug. 2018.

Distribution: Cosmopolitan species (Ryvarden & Johansen 1980). First record in West Africa.

Gloeoporus thelephoroides (Hook.) G. Cunn. – Fig. 7N.

Substrata: On dead wood.

Material examined: OAB0230, semi-deciduous dense forest of Pahou (Benin), 6°22’56’’N, 2°9’12’’E, altitude: 105.9 m a.s.l., 26 Sep. 2017.

Distribution: Pantropic, in Africa widespread from Sierra Leone to Rhodesia and Madagascar (Ryvarden & Johansen 1980).

Grammothele lineata Berk. & M.A. Curtis – Fig. 7O.

Substrata: On deciduous wood of many kinds.

Material examined: OAB0515, semi-deciduous dense forest of Lama (Benin), 20 Aug. 2018.

Distribution: Widespread in Africa (Ryvarden & Johansen 1980), first record in West Africa.

Hexagonia hirta (P. Beauv.) Fr. – Fig. 8A.

Substrata: On hard dead wood.

Materials examined: OAB0026, semi-deciduous dense forest of Pahou (Benin), 6°23’20’’N, 2°9’14’’E, altitude: 23.2 m a.s.l., 19 Jul. 2017; OAB0140, Woodland of Toui-Kilibo (Benin), 8°37’60’’N, 2°37’45’’E, altitude: 322 m a.s.l., 19 Aug. 2017; OAB0182, Trois Rivières (Benin), 10°26’46’’N, 3°25’30’’E, altitude 365.3 m a.s.l., 27 Aug. 2017.

Distribution: Seems to be restricted to Africa (Ryvarden & Johansen 1980). In west Africa reported from Ghana, Sierra Leone and Nigeria (Piepenbring *et al.* 2020). First record in Benin.

Hexagonia hydnoides (Sw.) M. Fidalgo – Fig. 8B.

Substrata: On hard dead wood.

Materials examined: OAB0201, Trois Rivières (Benin), 10°28’90’’N, 3°24’40’’E, altitude 369.8 m a.s.l., 28 Aug. 2017; OAB0275, semi-deciduous dense forest of Lama (Benin), 6°58’48’’N, 2°40’57’’E, altitude 81.9 m a.s.l., 20 Aug. 2018; OAB0602, Okpara forest (Benin), 9°14’41’’N, 2°43’22’’E, altitude 189.5 m a.s.l., 8 Jun. 2021.

Distribution: Quite common in Africa (Ryvarden & Johansen 1980). First record in West Africa.

Hexagonia phellinoides Ryvarden – Fig. 8C.

Substrata: On dead wood.

Materials examined: OAB0203, Trois Rivières (Benin), 10°28’11’’N, 3°24’49’’E, altitude 360.8 m a.s.l., 28 Aug. 2017; OAB0226, National Parc W, 11°28’14’’N, 3°3’16’’E, altitude: 276.8 m a.s.l., 31 Aug. 2017.

Fig. 8. Macromorphology of polypores in Benin. **A.** *Hexagonia hirta*. **B.** *Hexagonia hydnoides*. **C.** *Hexagonia phellinoides*. **D.** *Hexagonia tenuis*. **E.** *Inonotus pachyphloeus*. **F.** *Inonotus rickii*. **G.** *Irpex lacteus*. **H.** *Laxitextum bicolor*. **I.** *Lentinus squarrosulus*. **J.** *Lentinus tricholoma*. **K.** *Lentinus tuberregium*. **L.** *Lignosus sacer*. **M.** *Megasporoporia setulosa*. **N.** *Microporus affinis*. **O.** *Microporus concinnus.*

Distribution: First record in West Africa and known from the type locality Zimbabwe (Ryvarden *et al.* 2022).

Hexagonia tenuis (Hook.) Fr. – Fig. 8D.

Substrata: On deciduous wood of all kinds.

Materials examined: OAB0012, dry dense forest of Pahou (Benin), 6°23'40''N, 2°9'21''E, altitude: 18.6 m a.s.l., 20 Jul. 2017; OAB0054, semi-deciduous dense forest of Lama (Benin), 6°58'50''N, 2°9'45''E, altitude 49.6 m a.s.l., 28 Jul. 2018.

Distribution: Widespread in Africa (Ryvarden & Johansen 1980). In West Africa reported from Mali, Ghana, Burkina faso, Togo, Senegal, Benin and Gambia (Guissou *et al.* 2008, Kane & Courtecuisse 2013, Olou *et al.* 2019a, Piepenbring *et al.* 2020).

Inonotus pachyphloeus (Pat.) T. Wagner & M. Fisch. – Fig. 8E.

Substrata: Recorded on dead and living angiosperms trees.

Materials examined: OAB0246, semi-deciduous dense forest of Lama (Benin), 6°57'30''N, 2°6'80''E, altitude 65.4 m a.s.l., 14 Aug. 2018; OAB0247, at the same locality, 6°57'30''N, 2°6'80''E, altitude 41.1 m a.s.l., 14 Aug. 2018; OAB0260, at the same locality, 6°57'40''N, 2°6'60''E, altitude 119.5 m a.s.l., 15 Aug. 2018.

Distribution: Widespread in Africa (Ryvarden & Johansen 1980). In West Africa, known from Nigeria, Sierra Leone, Burkina Faso and Senegal (Guissou *et al.* 2008, 2015, Kane & Courtecuisse 2013). First record in Benin.

Inonotus rickii (Pat.) D.A. Reid – Fig. 8F.

Substrata: On living tree.

Material examined: OAB0253, semi-deciduous dense forest of Lama (Benin); 15 Aug. 2018.

Distribution: Probably cosmopolitan species. In Africa, records were from Egypt, Guinea, Morocco, and South Africa (Ouabbou *et al.* 2012, Shehata & Abd El-Wahab 2013, Tchoumi *et al.* 2020). First record in West Africa.

Irpex lacteus (Fr.) Fr. – Fig. 8G.

Substrata: On dead wood.

Material examined: OAB0176, Trois Rivières (Benin), 10°26'49''N, 3°25'17''E, altitude 372.2 m a.s.l., 27 Aug. 2017.

Distribution: Cosmopolitan species, in West Africa specimens reported from Benin (Olou *et al.* 2019a) and Ghana.

Laxitextum bicolor (Pers.) Lentz – Fig. 8H.

Substrata: On dead wood.

Material examined: OAB0126, Woodland of Toui-Kilibo (Benin), 8°37'20''N, 2°38'50''E, altitude: 332.2 m a.s.l., 19 Aug. 2017.

Distribution: Maybe cosmopolitan species, specimens reported from Africa (Bernicchia & Gorjón 2010). First record in West Africa.

Lentinus squarrosulus Mont. – Fig. 8I.

Substrata: On dead wood.

Materials examined: OAB0263, semi-deciduous dense forest of Lama (Benin), 6°57'16''N, 2°5'41''E, altitude 67.59 m a.s.l., 14 Aug. 2018; OAB0761, Woodland of Toui-Kilibo (Benin), 8°32'29''N, 2°41'30''E, altitude 323 m a.s.l., 13 Jul. 2021.

Distribution: Paleotropical, and widespread in Africa. In West Africa specimens recorded from Benin, Côte d'Ivoire, Ghana, Mali, Nigeria, Burkina Faso, Togo and Sierra Leone (De Kesel *et al.* 2002, Boa 2004, Guissou *et al.* 2008, Eyi-Ndong *et al.* 2011, Kane & Courtecuisse 2013, Boni & Yorou 2015).

Lentinus tricholoma (Mont.) Zmitr. – Fig. 8J.

Substrata: On dead wood of different kinds.

Material examined: OAB0504, Okpara forest (Benin), 9°15'38''N, 2°43'32''E, altitude 323.6 m a.s.l., 11 Sep. 2019.

Distribution: In Africa, reported from Nigeria (Ryvarden & Johansen 1980) and this is the first record from Benin.

Lentinus tuber-regium (Fr.) Fr. – Fig. 8K.

Substrata: On dead wood.

Material examined: BAA0762, Okpara forest (Benin), 15 Jun. 2021.

Distribution: Paleotropical, distribution similar to *Lentinus squarrosulus*.

Lignosus sacer (Afzel. ex Fr.) Ryvarden – Fig. 8L.

Substrata: On ground.

Material examined: OAB0293, Gallery forest of Bassila (Benin), 11 Aug. 2019.

Distribution: Tropical Africa from Sierra Leone to Kenya and south to South Africa (Ryvarden & Johansen 1980, Piepenbring *et al.* 2020).

Megasporia minuta (Y.C. Dai & X.S. Zhou) Olou, ***comb. nov.*** MycoBank MB 846986.
Basyonym: *Megasporoporia minuta* Y.C. Dai & X.S. Zhou, *Mycol. Prog.* **7**: 254. 2008.

Distribution: So far known from China.

Megasporoporia setulosa (Henn.) Rajchenb. – Fig. 8M.

Substrata: On fallen and standing dead trunks and branches.

Material examined: OAB0060, semi-deciduous dense forest of Lama (Benin), 6°58'47''N, 2°5'20''E, altitude 55.9 m a.s.l., 31 Jul. 2017; OAB0065, at the same locality, 6°58'48''N, 2°5'60''E, altitude 60 m a.s.l.,

31 Jul. 2017; OAB0101, Woodland of Toui-Kilibo (Benin), 8°32’36’’N, 2°41’12’’E, altitude: 315.2 m a.s.l., 17 Aug. 2017; OAB0102, at the same locality, 8°32’37’’N, 2°41’12’’E, altitude: 314.8 m a.s.l., 17 Aug. 2017; OAB0138, at the same locality, 8°37’60’’N, 2°37’45’’E, altitude: 314.2 m a.s.l., 19 Aug. 2017.

Distribution: Very common in East Africa (Ryvarden & Johansen 1980). Reported from Ghana in West Africa (Masuka & Ryvarden 1999).

Microporus affinis (Blume & T. Nees) Kuntze – Fig. 8N.

Substrata: On deciduous dead wood.

Material examined: OAB0082, semi-deciduous dense forest of Lama (Benin), 6°57’31’’N, 2°8’00’’E, altitude 56.1 m a.s.l., 3 Aug. 2017.

Distribution: Common species throughout the tropics in the old world from western Africa to the Pacific area (Ryvarden & Johansen 1980). First record in Benin.

Microporus concinnus P. Beauv. – Fig. 8O.

Substrata: On deciduous dead wood.

Materials examined: OAB0038, semi-deciduous dense forest of Lama (Benin), 6°57’50’’N, 2°10’50’’E, altitude 55.9 m a.s.l., 27 Jul. 2017; OAB0051, at the same locality, 6°57’59’’N, 2°9’47’’E, altitude 55.6 m a.s.l., 28 Jul. 2017; OAB0269, at the same locality, 6°57’60’’N, 2°60’21’’E, altitude 59.1 m a.s.l., 14 Aug. 2018.

Distribution: Tropical species. Specimens reported from Cameroon, Nigeria, Tanzania, Sierra Leone and Zaire (Palisot-Beauvois 1804, Ryvarden & Johansen 1980, Piepenbring *et al.* 2020). First record in Benin.

Microporus incomptus (Afzel. ex Fr.) Kuntze – Fig. 9A.

Substrata: On deciduous dead wood.

Material examined: OAB0039, semi-deciduous dense forest of Lama (Benin), 6°57’50’’N, 2°10’50’’E, altitude 60.6 m a.s.l., 27 Jul. 2017.

Distribution: African species. Specimens reported from Nigeria and Sierra Leone (Piepenbring *et al.* 2020), and this is the first record from Benin.

Microporus xanthopus (Fr.) Kuntze – Fig. 9B.

Substrata: On deciduous dead wood.

Materials examined: OAB0032, semi-deciduous dense forest of Pahou (Benin), 6°23’30’’N, 2°9’31’’E, altitude: 17.4 m a.s.l., 25 Jul. 2017; OAB0034, at the same locality, 6°23’30’’N, 2°9’30’’E, altitude: 12.6 m a.s.l., 25 Jul. 2017; OAB0056, semi-deciduous dense forest of Lama (Benin), 6°58’28’’N, 2°8’41’’E, altitude 41.8 m a.s.l., 31 Jul. 2017; OAB0075, at the same locality, 6°56’55’’N, 2°60’40’’E, altitude 69.7 m a.s.l., 2 Aug. 2017.

Distribution: Tropical species, very common throughout the tropics in the old World, from Western Africa to the Pacific Area (Ryvarden & Johansen 1980, Olou *et al.* 2019a, Piepenbring *et al.* 2020). Quite common in southern Benin.

Mycobonia miquelii (Mont.) Palacio & Westphalen – Fig. 9C.

Substrata: On dead wood of different kinds.

Materials examined: OAB0041, semi-deciduous dense forest of Lama (Benin), 6°57’50’’N, 2°10’5’’E, altitude 60.5 m a.s.l., 27 Jul. 2017; OAB0699, semi-deciduous dense forest of Lama (Benin), 6°57’31’’N, 2°80’00’’E, altitude 55.6 m a.s.l., 10 Jul. 2021.

Distribution: Pantropic, in Africa reported from Republic of Sierra Leone, Uganda, Tanzania, Kenya Ghana, and Nigeria (Ryvarden & Johansen 1980, Piepenbring *et al.* 2020). First record in Benin.

Neonothopanus hygrophanus (Mont.) De Kesel & Degreef – Fig. 9D.

Substrata: On dead wood.

Material examined: OAB0676, semi-deciduous dense forest of Lama (Benin), 6°57’51’’N, 2°10’00’’E, altitude 52 m a.s.l., 10 Jul. 2021.

Distribution: Tropical species, widespread in tropical Africa (Eyi-Ndong *et al.* 2011). In West Africa, specimens reported from Benin, Burkina-Faso, Ghana, Guinea, Nigeria, Sierra Leone, Togo, (Boa 2004, Eyi-Ndong *et al.* 2011, Kamou *et al.* 2015, Piepenbring *et al.* 2020).

Perenniporia beninensis Olou & Ryvarden – Fig. 9E.

Substrata: On deciduous dead wood.

Material examined: OAB0050, semi-deciduous dense forest of Lama (Benin), 6°57’59’’N, 2°9’46’’E, altitude 54.9 m a.s.l., 28 Jul. 2017.

Distribution: So far only known from the type country, Benin (Olou & Ryvarden 2021).

Perenniporia centrali-africana Decock & Mossebo – Fig. 9F.

Substrata: On deciduous dead wood.

Materials examined: OAB0042, semi-deciduous dense forest of Lama (Benin), 6°57’51’’N, 2°10’00’’E, altitude 62.3 m a.s.l., 27 Jul. 2017; OAB0042, at the same locality, 6°56’55’’N, 2°6’40’’E, altitude 54.2 m a.s.l., 2 Aug. 2017; OAB0190, Trois Rivières (Benin), 10°26’59’’N, 3°25’12’’E, altitude 369.1 m a.s.l., 27 Aug. 2017; OAB0220, National Park W (Benin), 11°28’26’’N, 3°30’10’’E, altitude 275.1 m a.s.l., 31 Aug. 2017; OAB0282, semi-deciduous dense forest of Lama (Benin), 6°58’00’’N, 2°8’80’’E, altitude 57.2 m a.s.l., 20 Aug. 2018.

Distribution: Probably a pantropical species. Reported from the type locality, Cameroon (Decock & Mossebo 2001), and also reported from Senegal and Benin in West Africa (Decock & Mossebo 2002, Olou *et al.* 2019a).

Perenniporia miniochroleuca Ryvarden – Fig. 9G.

Substrata: On dead wood.

Fig. 9. Macromorphology of polypores in Benin. **A.** *Microporus incomptus*. **B.** *Microporus xanthopus*. **C.** *Mycobonia miquelii*. **D.** *Neonothopanus hygrophanus*. **E.** *Perenniporia beninensis*. **F.** *Perenniporia centrali-africana*. **G.** *Perenniporia miniochroleuca*. **H.** *Perenniporia tephropora*. **I.** *Perenniporia vanhulleae*. **J.** *Phellinus carteri*. **K.** *Phellinus purpureogilvus*. **L.** *Phylloporia beninensis*. **M.** *Phylloporia littoralis*. **N.** *Piptoporellus baudonii*. **O.** *Podofomes mollis.*

Material examined: OAB0072, semi-deciduous dense forest of Lama (Benin), 6°56'55''N, 2°60'40''E, altitude 72 m a.s.l., 2 Aug. 2017.

Distribution: Specimens have only been seen from Zimbabwe (Ryvarden *et al.* 2022). First record in West Africa.

Perenniporia tephropora (Mont.) Ryvarden – Fig. 9H.

Substrata: On deciduous dead wood.

Materials examined: OAB0008, semi-deciduous dense forest of Pahou (Benin), 6°23'10''N, 2°9'27''E, altitude: 15.3 m a.s.l., 20 Jul. 2017; OAB0036, at the same locality, altitude: 13.5 m a.s.l., 25 Jul. 2017; OAB0202, Trois Rivières (Benin), 10°28'11''N, 3°24'49''E, altitude 364.1 m a.s.l., 28 Aug. 2017; OAB0224, National Park W, 11°28'21''N, 3°3'60''E, altitude 275.89 m a.s.l., 31 Aug. 2017.

Distribution: Pantropical, widespread in East Africa (Ryvarden & Johansen 1980). First record in West Africa.

Perenniporia vanhulleae Decock & Ryvarden – Fig. 9I.

Substrata: Found on dead tree of *Diospyros mespiliformis* but maybe found on other kind of angiosperms.

Materials examined: OAB0096, Woodland of Toui-Kilibo (Benin), 8°32'30''N, 2°41'20''E, altitude: 332.6 m a.s.l., 16 Aug. 2017; OAB0164, Woodland of Ouémé supérieur (Benin), 9°46'48''N, 2°12'59''E, altitude: 349.5 m a.s.l., 25 Aug. 2017; OAB0188, Trois Rivières (Benin), 10°27'30''N, 3°25'11''E, altitude 353.7 m a.s.l., 27 Aug. 2017.

Distribution: Widespread in tropical African countries like Zimbabwe, Namibia, and Senegal (Decock & Ryvarden 2015). First record in Benin.

Phanerochaete sordida (P. Karst.) J. Eriksss. & Ryvarden

Substrata: On dead wood.

Materials examined: OAB0018, dry dense forest of Pahou (Benin), 6°23'50''N, 2°9'21''E, altitude: 15.1 m a.s.l., 20 Jul. 2017; OAB0048, semi-deciduous dense forest of Lama (Benin), 6°57'58''N, 2°9'56''E, altitude 63.4 m a.s.l., 27 Jul. 2017; OAB0160, Woodland of Ouémé supérieur (Benin), 9°46'90''N, 2°14'40''E, altitude: 380.9 m a.s.l., 25 Aug. 2017.

Distribution: Cosmopolitan species (Eriksson *et al.* 1978). First record in West Africa.

Phellinus carteri (Berk. ex Cooke) Ryvarden – Fig. 9J.

Substrata: On dead angiosperms.

Material examined: OAB0217, National Park W (Benin), 11°28'30''N, 3°30'30''E, altitude 277.5 m a.s.l., 31 Aug. 2017.

Distribution: Specimens reported from Ghana in Africa (Ryvarden & Johansen 1980), first record in Benin.

Phellinus purpureogilvus (Petch) Ryvarden – Fig. 9K.

Substrata: On dead wood.

Material examined: OAB0151, Woodland of Ouémé supérieur (Benin), 9°45'16''N, 2°80'25''E, altitude: 327.8 m a.s.l., 24 Aug. 2017.

Distribution: Reported from the type locality in Sri Lanka and Tanzania (Ryvarden & Johansen 1980). First record in West Africa.

Phylloporia beninensis Olou & Langer – Fig. 9L.

Habitat: On dead wood or dead parts of living trees of woody angiosperms, including *Trichilia emetica*.

Materials examined: OAB0107, woodlands of Kilibo (Benin), 8°32'36.39"N, 2°41'12.80"E, altitude 312 m a.s.l., 17 Aug. 2017; OAB0142, woodlands of Ouémé Supérieur, 9°45'29.09"N, 2°19'58.78"E, altitude 334 m a.s.l., 24 Aug. 2017; OAB0511, woodlands of Okpara, 9°15'36"N, 2°43'28"E, altitude 330.1 m a.s.l., 11 Sep. 2019.

Distribution: Currently known from the type locality in Benin (Olou *et al.* 2021).

Phylloporia littoralis Decock & Yombiyeni – Fig. 9M.

Substrata: On living branches, twigs of angiosperm trees.

Material examined: OAB0204, Trois Rivières (Benin), 10°28'50''N, 3°24'33''E, altitude 345.8 m a.s.l., 28 Aug. 2017.

Distribution: Known from the type locality in Gabon (Yombiyeni & Decock 2017) and reported here for the first time outside of the type locality.

Phylloporia spathulata (Hook.) Ryvarden

Substrata: On dead angiosperm trees.

Material examined: OAB0294.

Distribution: In West Africa, reported from Ghana (Piepenbring *et al.* 2020) and Benin.

Piptoporellus baudonii (Pat.) Tibuhwa, Ryvarden & S. Tibell – Fig. 9N.

Substrata: On the ground either from buried roots or from a pseudosclerotium, more rarely on stumps. It attacks many different forest trees and is locally a serious root pathogen in Africa. In Benin, it attacks plant species of the genus *Isoberlinia*.

Materials examined: OAB0603, woodlands of Okpara; OAB0604, at the same locality; OAB0867, Trois Rivières (Benin), 10°27'90''N, 3°24'53''E, altitude 372.3 m a.s.l., 17 Aug. 2021.

Distribution: Widespread in Tropical Africa (Ryvarden & Johansen 1980; Tibuhwa *et al.* 2020). Reported from Burkina-Faso (Guissou *et al.* 2008) and first record in Benin.

Podofomes mollis (Sommerf.) Gorjón – Fig. 9O.

Substrata: On dead part of living trees.

Materials examined: OAB0238, semi-deciduous dense forest of

Lama in Benin, 6°56’41’’N, 2°6’11’’E, altitude: 84.8 m a.s.l., 13 Aug. 2018; OAB0670, same locality, 10 Jul. 2021; OAB0697, same locality, 6°57’50’’N, 2°10’00’’E, altitude: 84.8 m a.s.l., 13 Aug. 2018.

Distribution: First record in West Africa.

Podoscypha bolleana (Mont.) Boidin – Fig. 10A.

Substrata: On dead wood.

Materials examined: OAB0683, semi-deciduous dense forest of Lama (Benin), 6°57’51’’N, 2°10’00’’E, altitude 39.2 m a.s.l., 10 Jul. 2021; OAB0702, at the same locality, 6°57’50’’N, 2°10’10’’E, altitude 39.2 m a.s.l., 10 Jul. 2021; OAB0722, at the same locality, 11 Jul. 2021. OAB0725, at the same locality, 11 Jul. 2021; OAB0885, National Park W (Benin), 11°28’26’’N, 3°3’10’’E, altitude 277.1 m a.s.l., 24 Jul. 2021; OAB0885, at the same locality, 11°28’24’’N, 3°30’10’’E, altitude 275.5 m a.s.l., 24 Jul. 2021.

Distribution: Widespread in tropical regions. In West Africa, reported from Ghana (Piepenbring *et al.* 2020) and first record in Benin.

Pycnoporus sanguineus (L.) Murrill – Fig. 10B.

Substrata: On standing and falling trunks of almost every kind of deciduous wood.

Materials examined: OAB0088, woodlands of Kilibo (Benin), 8°32’30”N, 2°41’30”E, altitude 333.3 m a.s.l., 16 Aug. 2017; OAB0184, Trois Rivières (Benin), 10°26’46’’N, 3°25’30’’E, altitude 365.4 m a.s.l., 27 Aug. 2017; OAB0507, woodlands of Okpara (Benin), 9°15’40”N, 2°43’30”E, altitude 336.6 m a.s.l., 11 Sep. 2019; OAB0512, same locality, 9°15’41”N, 2°43’24”E, altitude 360.9 m a.s.l., 11 Sep. 2019.

Distribution: Pantropical and common in tropical Africa (Ryvarden & Johansen 1980). Widespread in dry areas, and recorded mainly in dry forests and Savannahs in Benin.

Schizophyllum commune Fr. – Fig. 10C.

Substrata: On dead wood.

Material examined: OAB0112, woodlands of Kilibo (Benin), 8°32’37”N, 2°40’13”E, altitude 329.4 m a.s.l., 18 Aug. 2017.

Distribution: Cosmopolitan species and widespread in Africa (Piepenbring *et al.* 2020).

Schizophyllum umbrinum Berk. – Fig. 10D.

Substrata: On dead wood.

Material examined: OAB0507, woodlands of Okpara (Benin), 9°15’39”N, 2°43’47”E, altitude 329.3 m a.s.l., 11 Sep. 2019.

Distribution: Probably a tropical species. First record in West Africa.

Serpula similis (Berk. & Broome) Ginns – Fig. 10E, F.

Substrata: On a dead stump.

Material examined: OAB0266, dry dense forest of Pahou (Benin), 20 Jul. 2018.

Distribution: Reported from Gambia, Ivory coast, and Nigeria (Piepenbring *et al.* 2020) and first record from Benin.

Theleporus calcicolor (Sacc. & P. Syd.) Ryvarden – Fig. 10G.

Substrata: On dead part of living tree of *Drypetes floribunda* (Müll.Arg.) Hutch.

Material examined: OAB0258, semi-deciduous dense forest of Lama (Benin), 6°57’38’’N, 2°6’60’’E, altitude 67.2 m a.s.l., 15 Aug. 2018.

Distribution: Reported from Sri Lanka, Malaya, and Tanzania (Ryvarden 1979, Ryvarden & Johansen 1980). First record in West Africa.

Tomophagus colossus (Fr.) Murrill – Fig. 10H.

Substrata: On a completely degraded angiosperm stump.

Material examined: OAB0774, woodlands of Kilibo (Benin), 8°32’28”N, 2°41’40”E, altitude 338.6 m a.s.l., 13 Jul. 2021.

Distribution: Pantropical. Known from several Western and Central African countries (Ryvarden & Johansen 1980). First record in Benin.

Trametes cingulata Berk. – Fig. 10I.

Substrata: On deciduous wood.

Materials examined: OAB0093, woodlands of Kilibo (Benin), 8°32’31”N, 2°41’30”E, altitude 333.1 m a.s.l., 16 Aug. 2017; OAB0114, at the same locality, 8°32’36”N, 2°40’48”E, altitude 330.7 m a.s.l., 18 Aug. 2017; OAB0117, at the same locality, 8°32’35”N, 2°40’48”E, altitude 332.8 m a.s.l., 18 Aug. 2017; OAB0135, at the same locality, 8°37’60”N, 2°37’44”E, altitude 325.1 m a.s.l., 19 Aug. 2017; OAB0155, woodlands of Ouémé Supérieur, 9°46’90”N, 2°14’40”E, altitude 386.1 m a.s.l., 25 Aug. 2017; OAB0161, at the same locality, 9°46’90”N, 2°14’39”E, altitude 380.5 m a.s.l., 25 Aug. 2017; OAB0171, Trois Rivières (Benin), 10°26’50’’N, 3°25’17’’E, altitude 372.6 m a.s.l., 27 Aug. 2017; OAB0173, at the same locality, 10°26’50’’N, 3°25’18’’E, altitude 372.3 m a.s.l., 27 Aug. 2017; OAB0178, at the same locality, 10°26’51’’N, 3°25’13’’E, altitude 373.3 m a.s.l., 27 Aug. 2017; OAB0231, dry dense forest of Pahou (Benin), 6°22’59”N, 2°9’70”E, altitude 100.5 m a.s.l., 26 Sep. 2017.

Distribution: Widespread in Africa and Asia (Berkeley 1854, Ryvarden & Johansen 1980). Reported from Ghana, Nigeria (Piepenbring *et al.* 2020) and Benin. It is the most abundant *Trametes* species in Benin.

Trametes palisotii (Fr.) Imazeki – Fig. 10J, K.

Substrata: On deciduous wood of all kinds.

Materials examined: OAB0118, woodlands of Kilibo (Benin), 8°32’33”N, 2°40’47”E, altitude 332.7 m a.s.l., 18 Aug. 2017; OAB0153, woodlands of Ouémé Supérieur, 9°45’16”N, 2°8’31”E, altitude 326.1 m a.s.l., 24 Aug. 2017; OAB0198, Trois Rivières (Benin), 10°28’80’’N, 3°24’40’’E, altitude 364.1 m a.s.l., 28 Aug. 2017.

Fig. 10. Macromorphology of polypores in Benin. **A.** *Podoscypha bolleana*. **B.** *Pycnoporus sanguineus*. **C.** *Schizophyllum commune*. **D.** *Schizophyllum umbrinum*. **E.** *Serpula similis*. **F.** Hymenophore of *S. similis*. **G.** *Theleporus calcicolor*. **H.** *Tomophagus colossus*. **I.** *Trametes cingulata*. **J.** *Trametes palisotii*. **K.** Hymenophore of *T. palisotii*. **L.** *Trametes parvispora*. **M.** *Trametes polyzona*. **N.** *Trametes socotrana*. **O.** *Tyromyces contractus*.

Distribution: Pantropical and very common in areas with seasonal drought. Specimens reported from Ethiopia to Malawi (Imazeki 1952, Ryvarden & Johansen 1980). Widespread in tropical Africa.

Trametes parvispora Olou, Yorou & Langer – Fig. 10L.

Substrata: On dead part of living angiosperm tree *D. guineense*.

Materials examined: OAB0022, dry dense forest of Pahou/ Ouidah (Benin), 6°23'2.97"N, 2°9'15.90"E, altitude: 33.1 m a.s.l., 21 Jul. 2017; OAB0023 at the same locality, 6°23'3.07"N, 2°9'16.32"E, altitude 18.4 m a.s.l., 21 Jul. 2017; OAB0267, same locality, 6°23'2.49"N, 2°9'16.27"E, altitude 33.1 m a.s.l., 20 Jul. 2018; OAB0268, at the same locality, 26 Aug. 2018.

Distribution: Apart from the type locality, Benin (Olou *et al.* 2020), the species has recently been reported from Nigeria.

Trametes polyzona (Pers.) Justo – Fig. 10M.

Substrata: On deciduous wood of many kinds.

Materials examined: OAB0092, woodlands of Kilibo (Benin), 8°32'31"N, 2°41'30"E, altitude 332.5 m a.s.l., 16 Aug. 2017; OAB0128, at the same locality, 8°37'20"N, 2°38'50"E, altitude 307.4 m a.s.l., 19 Aug. 2017; OAB0165, woodlands of Ouémé Supérieur, 9°46'49"N, 2°12'49"E, altitude 348.6 m a.s.l., 25 Aug. 2017; OAB0191, Trois Rivières (Benin), 10°26'53"N, 3°24'38"E, altitude 372.6 m a.s.l., 27 Aug. 2017; OAB0195, at the same locality, 10°26'53"N, 3°24'37"E, altitude 346.9 m a.s.l., 27 Aug. 2017.

Distribution: Pantropical, in Africa reported from almost all countries south of Sahara (Ryvarden & Johansen 1980, Justo & Hibbett 2011).

Trametes socotrana Cooke – Fig. 10N.

Substrata: On dead wood.

Materials examined: OAB0131, woodlands of Kilibo (Benin), 8°37'60"N, 2°37'44"E, altitude 326.2 m a.s.l., 19 Aug. 2017; OAB0165, woodlands of Ouémé Supérieur, 9°46'49"N, 2°12'58"E, altitude 350.3 m a.s.l., 25 Aug. 2017.

Distribution: Seen in different parts of Africa from Kenya, Tanzania, Burundi, Malawi and Ghana (Ryvarden & Johansen 1980, Piepenbring *et al.* 2020). First record in Benin.

Tyromyces contractus Olou & Ryvarden – Fig. 10O.

Substrata: On dead wood.

Material examined: OAB0073**,** semi-deciduous dense forest of Lama (Benin), 29 Jul. 2017.

Distribution: Known so far from the type locality, Benin (Olou & Ryvarden 2021).

Distribution of identified species in Africa

Figure 11 shows the distribution of the species collected and identified in this study. The widest distributed genus is *Schizophyllum*, represented in this study mainly by *Schizophyllum commune*. The genus *Microporus* clearly shows a tropical distribution and is distributed from Senegal to Madagascar. Benin, which was the subject of our study, and the Congo seem to be the best covered. Several other countries are still unexplored or occurrence data are not publicly available. Future mycological survey series will be extended to these countries where currently we have very little data on wood-inhabiting fungi. When zooming in on Benin where we collected the specimens, several species and genera of polypores have a wide distribution from south to north of Benin. However, some genera and species show a geographical pattern. For example, species of the genus *Microporus* were only found in southern Benin, while species of the genera *Gloeophyllum* and *Piptoporellus* were only found in central and northern Benin (dry area of Benin). Within the same genus it is also quite common to observe that although the genus has a wide distribution from the South to the North, some species have narrow distribution and for the moment never recorded in the South. An example is the genus *Trametes* where species are distributed throughout the country. However, some species like *P. sanguineus*, *T. polyzona*, and *T. socotrana* occur mainly in the North of Benin.

DISCUSSION

Phylogenetic position of wood-inhabiting polypores in Benin

All investigated specimens were first identified by morpho-anatomical characteristics. Further, we generated DNA sequences for wood-inhabiting polypores collected in tropical Benin (West Africa) and used them for phylogenetic analyses in order to confirm the morphological identification.

All newly generated sequences fall correctly into the corresponding clades with the exception of the sequences named *Megasporoporia setulosa, Microporus concinnus, M. incomptus*, *M. affinis* and *M. xanthopus*. For the genus *Microporus*, we performed further phylogenetic analyses involving the ITS, LSU and *Tef*. The results of these analyses clearly show that *M. affinis*, *M. cocinnus*, *M. incomptus* and *M. xanthopus* are four different species (Fig. 5 and Supplementary Fig. S2). Of all the *M. xanthopus* sequences available on GenBank, only the sequence obtained from a specimen from Nigeria (accession number KT273357) groups with our sequences from Benin (Supplementary Fig. S2). All other *M. xanthopus* sequences available on GenBank are different from the Benin and Nigeria ones. The type locality of *M. xanthopus* is Nigeria, West Africa (MycoBank), so it makes sense that Benin and Nigeria sequences group together and are conspecific. Other specimens outside of West Africa bearing this name need to be carefully examined both phylogenetically and morphologically. Therefore, a thorough taxonomic study of the Chinese specimens currently known as *M. xanthopus* will be crucial to shed light not only on the correct identity of these specimens but also to increase our knowledge of the global distribution of *M. xanthopus*. Phylogenetic analyses of *Microporus* based on the ITS and the combination ITS-LSU-*Tef* gave a poor and unresolved tree while a phylogenetic analysis based on *Tef* gave a better tree (Fig. 3, Supplementary Fig. S2 *vs* Fig. 5). This shows that even though the ITS region is recognised as a universal and suitable region for correct identification (Schoch *et al.* 2012), this region alone is not sufficient for some genera

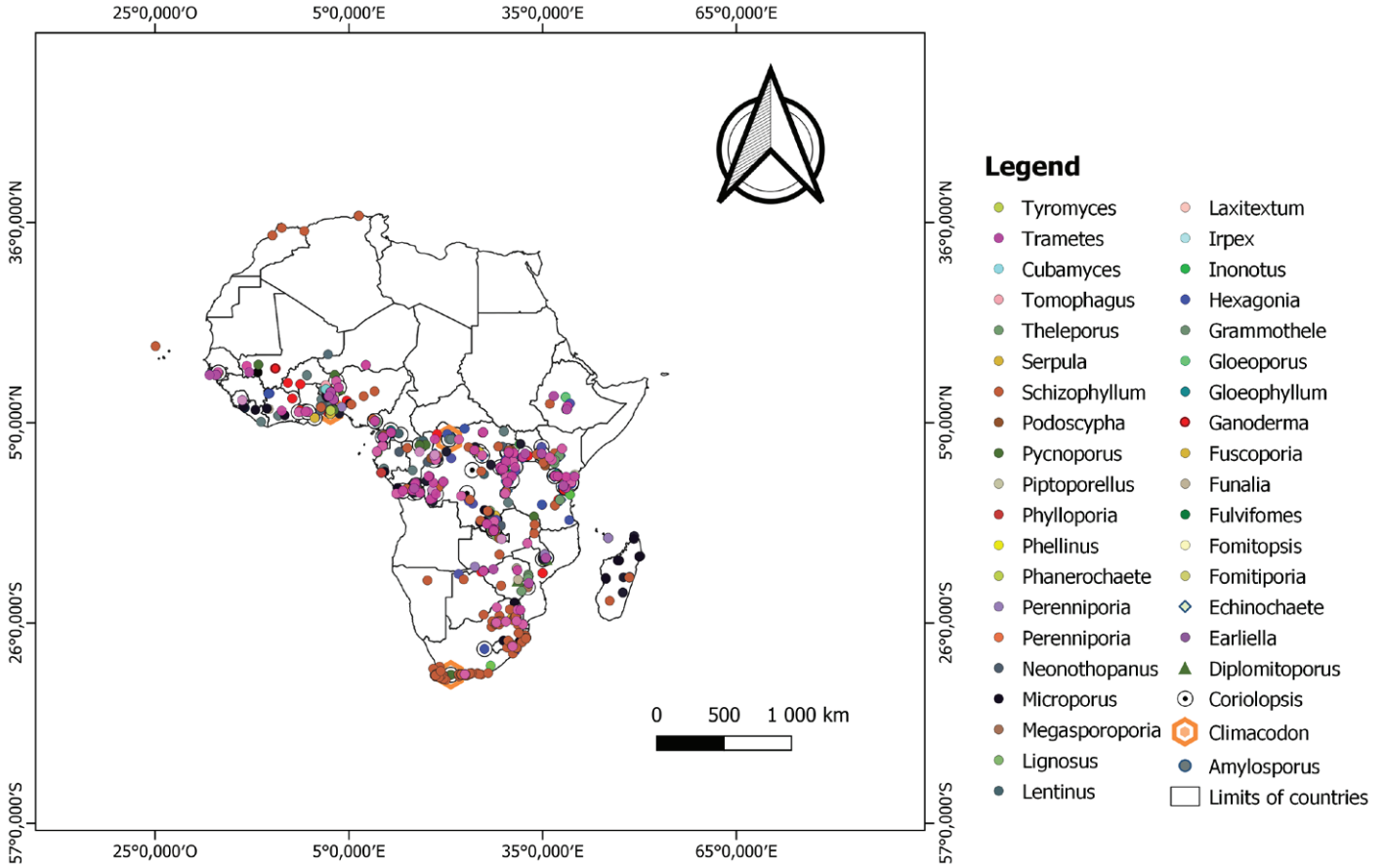

Fig. 11. Distribution of polypore genera in Africa. Each coloured circle represents a genus.

and cryptic species (Badotti *et al.* 2017, Lücking *et al.* 2020) and therefore studies combining different DNA regions are needed and important for accurate identification. *Microporus affinis* has several varieties (MycoBank). From our analysis, several sequences identified as *M. affinis* do not group with others of the same name. Besides, the *M. affinis* sequence from Benin forms a distinct lineage in our analysis. Unfortunately, no spores were found from our specimen despite several attempts. We therefore preferred to keep the name *M. affinis* for the Benin specimen and further studies on this species will be carried out as soon as additional specimens of this species become available. *Megasporoporia setulosa* was originally described from Tanzania, Africa. Our phylogenetic analyses based on the ITS-LSU loci of *Megasporoporia* and related genera showed the same results like the one from ITS and the specimens from Benin and the one collected by Ryvarden in 1973 from the type locality (Tanzania) group together and form a distinct group far away from sequences from GenBank annotated as *M. setulosa* from China, Brazil and the USA (Figs 3, 4). The sequence named *M. setulosa* from China falls in *Megasporia* clade and grouped together with a sequence of *Megasporia hexagonoides*. This shows that this sequence was misidentified. Nevertheless, the other sequences named *M. setulosa* from the USA and Brazil are not actually *setulosa* but rather a recently described new species, *M. neosetulosa* (Lira *et al.* 2021). This confirms that the sequences from our Benin and Tanzania specimens newly generated in this study are the true *M. setulosa*.

New combinations in the genera *Fuscoporia* and *Megasporia*

Our phylogenetic analysis of the genus *Fuscoporia* places the sequences of the species identified as *Ph. beninensis* in the *Fuscoporia* clade. *Fuscoporia* as well as several other genera such as *Fomitiporiella*, *Fulvifomes*, *Phylloporia*, *etc*. have been segregated from *Phellinus sensu lato* (Wagner & Fischer 2001, 2002). These small genera share very similar morpho-anatomical characteristics that complicate their differentiation based on morphology alone. As a result, introducing a new species into one of the small genera based on morphology is very challenging to all polyporologists. Despite above-mentioned consideration, *Ph. beninensis* was introduced as a new species based on morphological characteristics of a specimen from Benin (Olou & Ryvarden 2021). Here, the sequences of the same species fall in *Fuscoporia*, underlining the importance of combining molecular and morphological data to accurately assign species to genera. Thus, a new combination *Fuscoporia beninensis* is proposed (see checklist).

Although this study did not focus on the genus *Megasporia*, our phylogenetic analysis on the genus *Megasporoporia* and related genera such as *Megasporia*, and *Megasporoporiella* showed that the sequences of *Megasporoporia minuta* cluster together and fall into the clade *Megasporia*. *Megasporia* is segregated from *Megasporoporia sensu lato* and characterised by the acyanophilous, non-dextrinoid hyphae, which are also unbranched to sparingly branched, usually lack hyphal pegs and dendrohyphidia, with a neotropical distribution. However, *Megasporoporia* is characterised by strongly dextrinoid, cyanophilous hyphae, which are also unbranched to sparingly

branched, lack dendrohyphidia, with the presence of hyphal pegs in most of species, with tropical and subtropical distributions (Yuan *et al.* 2017). *Megasporoporia minuta* is characterised by an annual to biennial habit, resupinate basidiocarp with a distinct sterile margin, and small, cylindrical to oblong-ellipsoid spores. Unlike most species of *Megasporoporia*, *M. minuta* has small pores, oblong-ellipsoid basidiospores, and lacks hyphal pegs and dendrohyphidia (Zhou & Dai 2008). These characteristics fit well the genus *Megasporia*. *Megasporoporia minuta* was described based on morphological examination only. Given that the genus *Megasporia* is segregated from *Megasporoporia sensu lato*, it can therefore be concluded that in the absence of the molecular data, *M. minuta* has been misassigned, and that in the presence of the molecular data the correct genus for this species is *Megasporia*. Therefore, we propose here a new combination *Megasporia minuta*.

Diversity and distribution of wood-inhabiting polypores in Benin

In this study we provide for the first time an illustrated catalogue of wood-inhabiting polypores with colour photos and molecular data as well as species distributions in Africa. A total of 76 species of wood-inhabiting polypores belonging to six orders, 15 families and 39 genera are reported for Benin based on own collections from 2017 to 2021. Of the 76 species, 30 are new to West Africa and 69 are recorded for the first time for Benin.

Of the 10 species reported from Benin before 2017, only five were recollected and identified in this study. The other five species, namely *F. tenuiculus*, *G. applanatum*, *G. lucidum*, *L. velutinus*, and *N. stipitatus*, were not identified during our mycological surveys. Future fieldwork and taxonomic investigation will show whether these species occur in Benin. Several specimens belonging to genera like *Coltricia*, *Favolus*, *Ganoderma*, *Lentinus*, *etc*. are still awaiting proper identification.

The diversity of wood-inhabiting polypores reported here is very low compared to other regions where the diversity is well explored (Lindblad 2001, Cui & Dai 2007, Robledo & Rajchenberg 2007, Dai *et al.* 2011, Dai 2012, Niemelä 2013, Ryvarden & Melo 2014, Kunttu *et al.* 2015, Jang *et al.* 2016, Ginns 2017, Bernicchia & Gorjón 2020, Gafforov *et al.* 2020). This low diversity in Benin is partly because this study only focused on basidiomycetes and did not take into account corticoid and ascomycetous wood-inhabiting fungi such *Xylariales*. In addition, the low sampling effort (only eight partially surveyed forests out of a total of 48 forests existing in Benin), and the relatively short survey period compared to diversity studies in other regions are responsible for the low diversity recorded in Benin. For example, Gafforov *et al*. (2020) reported 153 species of wood inhabiting fungi based on records from 1950 to 2020. Dai (2012) reported 704 species of polypores in China after 20 years of mycological surveys. Therefore, this checklist on polypores in Benin should be considered as provisional. Considering Benin's floristic diversity of 2 807 species (Akoegninou *et al.* 2006), and the fact that a high diversity of plant species leads to a high diversity of associated fungal species (Hawksworth 1991, Hawksworth & Lücking 2017) and the scanty knowledge of the mycodiversity in this area (Piepenbring *et al.* 2020), we are sure that more species of wood-inhabiting polypores can be discovered in Benin in the future.

Most of wood-inhabiting polypores reported in this study are saprotrophs and as such they are key players in wood decomposition, maintenance and functioning of forest ecosystems (Harley 1971, Wei & Dai 2004, Purahong *et al.* 2018). By decomposing dead plant materials, they increase carbon sequestration below ground in forest ecosystems and thereby reducing greenhouse gas (GHG) emissions. In addition to this, they hold effective mechanisms of lignocellulose-decomposing enzymes useful to attack toxic and non-toxic pollutants (Adaskaveg *et al.* 1990, Coetzee *et al.* 2015, **Kües 2015)**. Future studies to evaluate the ability of degradation of plastic waste of new species typified with Benin material will be a new and innovative research application idea to take advantage of the enzymes produced by fungi and decomposers. Apart from saprotrophic species, other species inhabiting living wood such as *Ganoderma*, *Phylloporia*, *Fulvifomes*, *Inonotus*, and *Phellinus* are reported. Some species of these genera can cause enormous damage and important economic losses to forest ecosystems (Ganglo & Maître 2003).

Some wood-inhabiting polypores are edible and/or medicinal mushrooms. Although in Benin the edibility and medicinal effects of polypores are not well known to the public, some species such as *Lentinus squarrosulus* and *Lentinus tuber-regium* are used for food (De Kesel *et al.* 2002, Boni & Yorou 2015, Fadeyi *et al.* 2017). Apart from these species, we have other species like *Echinochateae brachypora* which is not known by the Beninese public but reported as edible in other areas in Africa (Eyi-Ndong *et al.* 2011). Unlike plants, the use of mushrooms in traditional medicine is still unknown, yet they are very effective in the treatment of certain diseases in many regions of the world. Among the species used are species of the genus *Trametes* and species of the complex *Ganoderma lucidum* which are used in the treatment of cancer, diabetes, and AIDS (El-Mekkawy *et al.* 1998, Akbar & Yam 2011). Species of the *G. lucidum* complex are regarded as the most valuable medicinal mushrooms and used to treat various diseases (Paterson 2006, Grienke *et al.* 2014, Zhu *et al.* 2016). As these species are reported in Benin, further ethnomycological, chemotaxonomic, mycochemical, and pharmacological studies will be important to benefit from these species and achieve the Sustainable Development Goals by directly contributing to human health and well-being (SDG3), decent work and economic growth (SDG8). Indirectly this will also contribute to poverty and hunger eradication (SDG1 and 2) through cash income that will be generated from the cultivation of mushrooms like *Ganoderma* spp.

Hiherto, *Hymenochaetales* and *Polyporales* are the two orders with the highest diversity in Benin. These two orders have also been reported as the most dominant in other studies dealing with the diversity of wood-inhabiting fungi (Dai 2012, Gafforov *et al.* 2020). This could be justified by the fact that the distribution of species of these two orders would be largely determined by their degree of specificity for host species and broad environmental conditions. Of the 76 species reported here, three species, namely *F. ostreiformis*, *G. striatum*, *P. baudonii* are brown rot fungi. Both species are recorded in the central and northern Benin (drier area of Benin). Previous studies have revealed the effect of climate on the type of rot (Gilbertson 1981, Hibbett & Donoghue 2001). The distribution of some species would require host and habitat preference and thus a particular environmental condition (Gilbert *et al.* 2008). This could explain why species of some genera like *Microporus*, *Gloeophyllum*, *Piptoporellus* are only present in one area or habitat. Thus, to maintain the diversity of basidiomycetes wood-inhabiting polypore fungi, special attention should be given to

the protection of their habitats. The distribution map provided here is therefore a baseline for good management and decision making on wood-inhabiting fungi.

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Fig. S1. Maximum likelihood tree with rapid bootstrap values. The species names are followed by voucher or strain number and country of origin. Species names in red are from Benin.

Fig. S2. Maximum likelihood (ML) analysis of the genus *Microporus* with rapid bootstrap values based on the combined ITS-LSU-*Tef* dataset. Newly generated sequences highlighted in red. The sequence names are followed by voucher or strain number and country of origin.

Table S1. Taxon names and GenBank accession numbers of some sequences used in this study.

Fig. S1

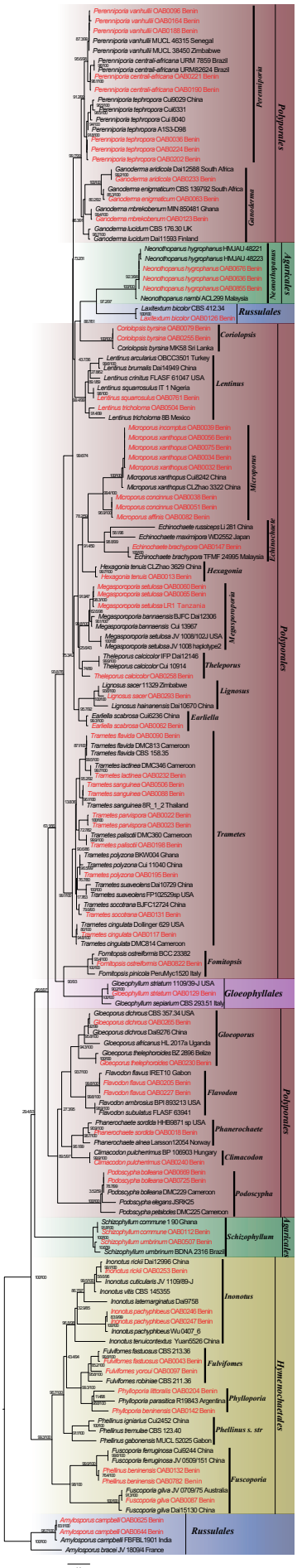

Fig. S1. Maximum likelihood tree with rapid bootstrap values. The species names are followed by voucher or strain number and country of origin. Species names in red are from Benin.

Fig. S2

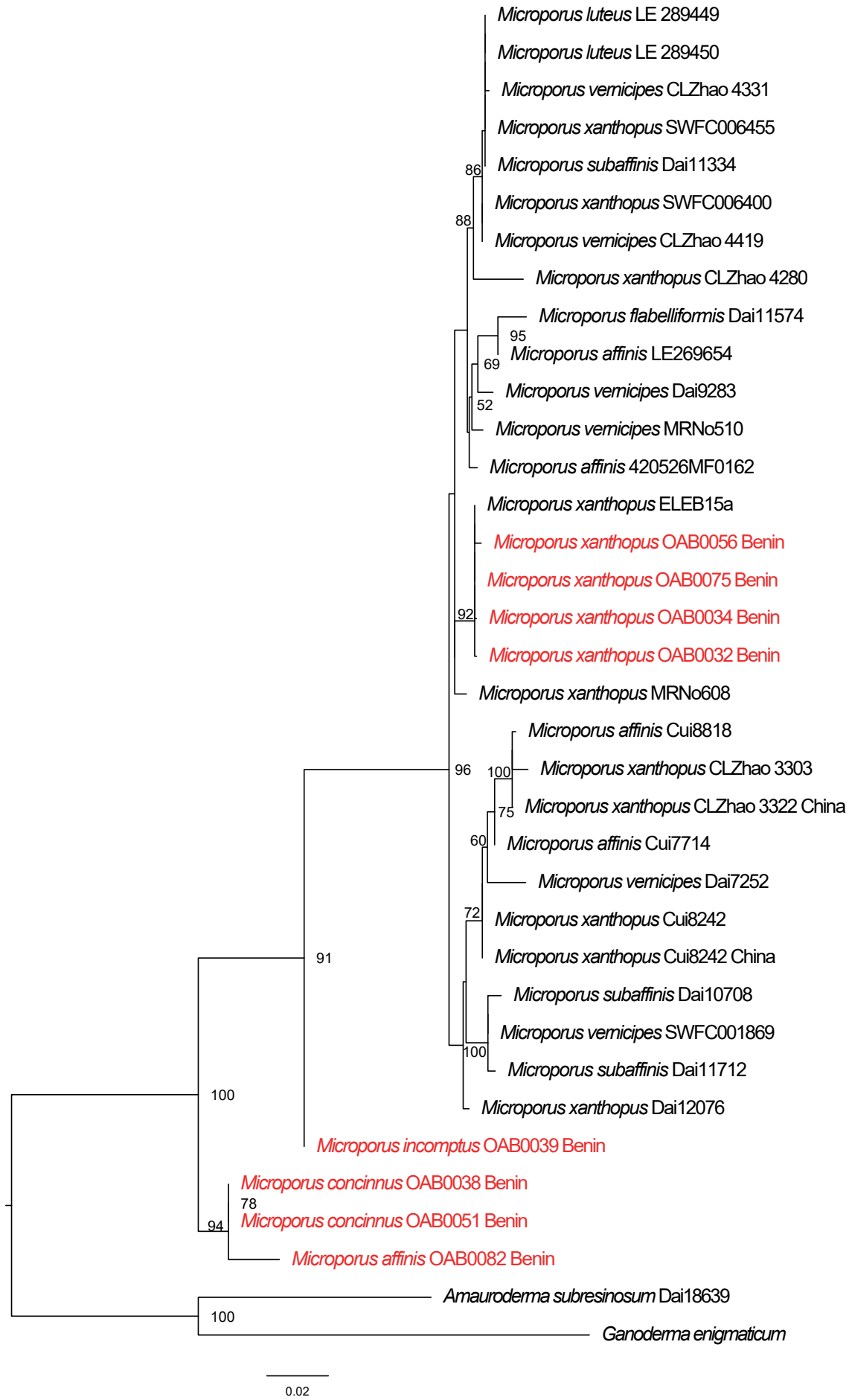

Fig. S2. Maximum likelihood (ML) analysis of the genus *Microporus* with rapid bootstrap values based on the combined ITS-LSU-*Tef* dataset. Newly generated sequences highlighted in red. The sequence names are followed by voucher or strain number and country of origin.

Table S1

Table S1. Taxon names and GenBank details accession numbers of some sequences used in this study.

Species	Voucher or strain	Origin	Accession number (ITS)
Amylosporus bracei	JV 1809 /4	France	MN888695
Amauroderma subresinosum	Dai18639	_	MK119826
Ganoderma enigmaticum	CBS 139792	South Africa	NR_132918
Amylosporus campbellii	FBFBL1901	India	MN753977
	OAB0625	Benin	ON876004
	OAB0644	Benin	ON876005
Cerrena_consors	DAR82496	_	KP204874
Cerrena unicolor	F0607	_	JX908741
	SD_Russell	USA	OP470484
Cerrena albocinnamomea	CLZhao 5046	China	MK268866
Cinereomyces lindbladii	CBS 290.71	Netherlands	MH860129
Climacodon pulcherrimus	OAB0240	Benin	ON876006
	BP:106903	Hungary	MG097865
Coriolopsis byrsina	UOC KAUNP MK58	Sri Lanka	KR907880
	OAB0079	Benin	ON876007
	OAB0255	Benin	ON876008
Earliella scabrosa	Cui 6236	_	KC867366
	OAB0062	Benin	ON876009
Echinochaete brachypora	TFM:F-24995	Malaysia	AB462320
	OAB0147	Benin	ON876010
Echinochaete maximipora	WD2552	Japan	AB462312
Echinochaete russiceps	Li 281	China	KX900073
Flavodon ambrosius	BPI 893213	USA	NR_154000
Flavodon flavus	IRET10	Gabon	KY449351
	OAB0205	Benin	ON876011
	OAB0227	Benin	ON876012
Flavodon subulatus	FLAS-F-63941	_	MN994276
Fomitopsis ostreiformis	OAB0822	Benin	ON876013
	BCC23382	_	FJ372684
Fomitopsis pinicola	PeruMyc1520	Italy	MG820763
Fulvifomes fastuosus	CBS 213.36	_	AY558615
	OAB0043	Benin	ON876014
Fulvifomes robiniae	CBS 211.36	_	AY558646
Fulvifomes yoroui	OAB0097	Benin	MN017126
Fuscoporia beninensis	OAB0132	Benin	ON876015
	OAB0782	Benin	ON876016
Fuscoporia ferruginosa	Cui 9244	China	MN816706
	JV 0509/151	China	MN816707
Fuscoporia gilva	Dai 15130	_	KX961109
	JV 0709/75	Australia	MN816720
	OAB0087	Benin	ON876017
Ganoderma aridicola	Dai 12588	South Africa	NR_152914
	OAB0233	Benin	ON876018
Ganoderma enigmaticum	CBS 139792	South Africa	NR_132918

Table S1. (Continued).

Species	Voucher or strain	Origin	Accession number (ITS)
	OAB0063	Benin	ON876019
Ganoderma lucidum	CBS 176.30	UK	AF094511
	Dai11593	Finland	JQ781852
Ganoderma mbrekobenum	MIN 850481	Ghana	NR_147647
	OAB0123	Benin	ON876020
Gloeophyllum sepiarium	CBS 293.51	Italy	MH856865
Gloeophyllum striatum	1109/39-J	USA	KC345721
	OAB0129	Benin	ON885270
Gloeoporus africanus	HL-2017a	Uganda	MG572764
Gloeoporus dichrous	CBS 357.34	USA	MH855565
	Dai 9276	China	KU360398
	OAB0265	Benin	ON876021
Gloeoporus thelephoroides	BZ-2896	Belize	MG572757
	OAB0230	Benin	ON876022
Hexagonia tenuis	CLZhao 3629	China	MK268959
	OAB0013	Benin	ON876023
Inonotus cuticularis	JV 1109/89-J	_	KF446595
Inonotus latemarginatus	Dai9758	_	KP030784
Inonotus pachyphloeus	OAB0246	Benin	ON876024
	OAB0247	Benin	ON876025
	Wu 0407_6	_	KP030785
Inonotus rickii	Dai 12996	China	KC479128
	OAB0253	Benin	ON876026
Inonotus tenuicontextus	IFP Yuan 5526	_	NR_119969
Inonotus vitis	CBS 145355	_	NR_168218
Laxitextum bicolor	CBS 412.34	_	MH855587
	OAB0126	Benin	ON876027
Lentinus arcularius	OBCC3501	Turkey	KY628652
Lentinus brumalis	Dai 14949	China	KX851612
Lentinus crinitus	FLASF 61047	USA	MH211712
Lentinus squarrosulus	IT 1	Nigeria	LC648783
	OAB0761	Benin	ON876028
Lentinus tricholoma	isolate 8B	Mexico	MW605227
	OAB0504	Benin	ON876029
Lignosus hainanensis	Dai 10670	China	R_154112
Lignosus sacer	isolate 11329	Zimbabwe	GU001674
	OAB0293	Benin	ON876030
Megasporia cystidiolophora	Cui5907	China	JQ314371
	Cui8176	China	JQ314370
Megasporia ellipsoidea	Cui5222	China	JQ314367
	Cui 13685	China	KY449433
Megasporia guangdongensis	Cui9129	_	JQ780397
	Dai10685	China	JQ314372
Megasporia hexagonoides	Cui6592	_	JQ780402
	Dai12079	China	JQ314369
	He2608	China	JQ314368

Table S1. (Continued).

Species	Voucher or strain	Origin	Accession number (ITS)
Megasporia major	Cui10253	China	JQ314366
	Yuan1183	China	JQ314365
Megasporia rimosa	Dai15357	_	KY449436
Megasporia tropica	Cu13740	_	KY449438
	Cui13660	_	KY449437
Megasporia violacea	Cui6601b	_	JQ780395
	Cui8585	_	JQ314375
Megasporia yunnanensis	Cui12594	_	KY449441
	Dai13870	_	KY449443
Megasporia minuta	Dai13644a	China	KX900654
	Cui13945	China	MW989397
	Cui 13945	China	OK642178
Megasporoporia bannaensis	Dai12306	_	NR_120300
	Cui 13967	China	MG847212
Megasporoporia cavernulosa	JV0904_50J_haplotype2	USA	JF894106
	JV0904_52J_haplotype1	USA	JF894107
Megasporoporia minor	Dai12170	China	JQ314363
	MG65	Egypt	KX428469
Megasporoporiella pseudocavernulosa	Yuan1270	China	JQ314360
	Yuan1277	China	JQ314359
Megasporoporiella rhododendri	Dai4226	China	JQ314356
	Dai4235a	China	JQ314355
	Yu130	China	JQ780388
Megasporoporiella subcavernulosa	Cui9258b	_	JQ780377
	Cui9710	_	JQ780375
	Cui10050	China	JQ314357
	Yuan5639	China	JQ314358
Sebipora aquosa	Dai13592	China	KU376422
Megasporoporia setulosa	Dai13673	China	KX900655
	JV1008_102J	USA	JF894110
	JV1008_51J	USA	JF894109
	JV1008_102J_haplotype2	USA	JF894111
	OAB0060	Benin	ON876031
	OAB0065	Benin	ON876032
Megasporoporia neosetulosa	URM85113	Brazil	KX584460
	URM85679	Brazil	KX584459
	URM89337	Brazil	MW989398
Microporus affinis	420526MF0162	_	MH142008
	Cui7714	_	JX569739
	Cui 8818	China	KX880614
	LE269654	_	KC503507
	OAB0082	Benin	ON876033
Microporus concinnus	OAB0038	Benin	ON876034
	OAB0051	Benin	ON876035
Microporus flabelliformis	Dai11574	_	JX569740

Table S1. (Continued).

Species	Voucher or strain	Origin	Accession number (ITS)
Microporus incomptus	OAB0039	Benin	ON876036
Microporus luteus	LE289449	_	KC503503
	LE289450	_	KC503504
Microporus subaffinis	Dai10708	China	KX880617
	Dai11334	China	KX880615
	Dai11712	China	KX880616
Microporus vernicipes	CLZhao 4331	China	MK343601
	CLZhao 4419	China	MK343603
	Dai 7252	China	KX880619
	Dai9283	China	KX880618
	MRNo510	Thailand	LC176772
	SWFC001869	China	MK811315
Microporus xanthopus	CLZhao 3322	China	MK269135
	CLZhao 3303	China	MK269134
	CLZhao 4280	China	MT159985
	Cui8242	_	JX290074
	OAB0032	Benin	ON876037
	OAB0034	Benin	ON876038
	OAB0056	Benin	ON876039
	OAB0075	Benin	ON876040
	Dai12076	China	KX880620
	ELEB15a	Nigeria	KT273357
	MRNo608	Thailand	LC176778
	SWFC006400	China	MK894048
	SWFC006455	China	MK894049
Neonothopanus hygrophanus	HMJAU 48221	_	MK931357
	HMJAU 48223	_	MW298685
	OAB0636	Benin	ON876041
	OAB0676	Benin	ON876042
	OAB0855	Benin	ON876043
Neonothopanus nambi	ACL299	Malaysia	KJ206989
Perenniporia centrali-africana	URM 7859	Brazil	MH330690
	URM82624	Brazil	KX584433
	OAB0190	Benin	ON876044
	OAB0221	Benin	ON876045
Perenniporia tephropora	A1S3-D98	_	KJ780755
	Cui6331	_	HQ848473
	Cui 8040	China	JN048763
	Cui9029	China	HQ876601
	OAB0036	Benin	ON876046
	OAB0202	Benin	ON876047
	OAB0224	Benin	ON876048
Perenniporia vanhullii	MUCL 38450	Zimbabwe	NR_137962
	MUCL 46315	Senegal	KP217810

Table S1. (Continued).

Species	Voucher or strain	Origin	Accession number (ITS)
	OAB0096	Benin	ON876049
	OAB0164	Benin	ON876050
	OAB0188	Benin	ON876051
Phanerochaete alnea	K. H. Larsson 12054	Norway	KX538924
Phanerochaete sordida	HHB-9871-sp	USA	AY219385
	OAB0018	Benin	ON876052
Phellinus gabonensis	MUCL 52025	Gabon	NR_137055
Phellinus igniarius	Cui 2452	China	JQ828876
Phellinus tremulae	CBS 123.40	_	AY558650
Phylloporia beninensis	OAB0142	Benin	MW244094
Phylloporia littoralis	*OAB0204*	Benin	MW244095
Phylloporia parasitica	Ryvarden 19843	Argentina	KU198361
Podoscypha bolleana	*DMC229*	Cameroon	JQ675324
	OAB0669	Benin	ON876053
	OAB0725	Benin	ON876054
Podoscypha elegans	*JSRK25*	_	MK116583
Podoscypha petalodes	*DMC225*	Cameroon	JQ675329
Schizophyllum commune	OAB0112	Benin	ON876055
	1-90	Ghana	AF249373
Schizophyllum umbrinum	BDNA2316	Brazil	KR261612
	OAB0507	Benin	ON876056
Theleporus calcicolor	IFP:Dai 12146	_	JN411118
	OAB0258	_	ON876057
	Cui 10914	China	KU376423
Trametes cingulata	DMC814	Cameroon	KC589133
	Dollinger 629	USA	KY264043
	OAB0117	Benin	MK736972
Trametes flavida	OAB0090	Benin	MK736967
	CBS 158.35	_	MH855616
	DMC813	Cameroon	KC589130
Trametes lactinea	OAB0232	Benin	MK736983
	DMC346	Cameroon	KC589126
Trametes palisotii	OAB0198	Benin	MK736982
	DMC360	Cameroon	KC589139
Trametes parvispora	OAB0022	Benin	MK736989
	OAB0023	Benin	MK736990
Trametes polyzona	BKW004	Ghana	JN164978
	Cui 11040	China	KX880647
	OAB0195	Benin	MK736986
Trametes sanguinea	OAB0088	Benin	MK736969
	OAB0506	Benin	ON885559
	isolate 8R_1_2	Thailand	FJ372672
Trametes socotrana	BJFC12724	China	KC848313
	OAB0131	Benin	MK736987
Trametes suaveolens	Dai 10729	China	JN048770
	FP102529sp	USA	JN164966