Mid Term Report

Contribution of mycological data to assess the conservation value of the National Nouabalé-Ndoki Park (NNNP) and its surroundings.

Thanry, 25th August 2023

Abstract of the Project

The 1st Rufford Small Grant number 40270-1 titled : « Contribution of mycological data to assess the conservation value of the National Nouabale-Ndoki Park (NNNP) and its surroundings» aimed at collecting mycological data that will contribute to documenting macrofungal diversity and safeguarding traditional knowledge of this study area. Five activities had been planned for the period from July 2023 to June 2024 including : (1) fieldwork in the Nouabalé-Ndoki National Park and the buffer zone ; (2) data entry in BRAHMS ; (3) identification of the collected specimens in Brazzaville ; (4) production of a list of macrofungi occurring in the Park and surroundings and (5) production of preliminary data that can be used in species conservation assessment for IUCN and KBA. This mid term report is providing information about activities 1 and 2 carried out from June to August 2023 in Bomassa, Makao and Thanry peripheral villages of NNP as well as in Brazzaville.

I. Details on the activities carried out

I.1. Fieldwork in the Nouabalé-Ndoki National Park and the buffer zone

The fieldwork took place in two departments of the Country: Sangha and Likouala from 18 june to August 2023. This activity was carried out from June to August 2023 for the first part on fieldwork in order to contribute to the training of future generation of women interested in Conservation in the Republic of Congo. The woman joining the fieldwork, Ms Jupcie Maëlle Likibi, is an undergraduate student who was looking for opportunities to conduct a fieldwork in conservation related research project in order to produce a thesis for her graduation in September. Thus, the fieldwork focused on collecting data and specimens on occurrence of macrofungi, establishing plots to make an assessment of macrofungi and conducting interviews with local population, mainly hunther-gatherers communities, to collect data on the use of macrofungi by the population.

In the Sangha department, the project was conducted in Bomassa village (2°12' N, 16°11' E; Alt.: 356 m, see map 1) where the Headquarter of the Nouabale-Ndoki National Park (NNNP) and focused in ethnomycological studies with Bangombe community of Hunter-gatherers. In the Park, data I previously collected and those collected by Dr Ndolo and I will be included and analysed.

In the Likouala department, the project was conducted in Makao village (2°35' N, 17°10' E ; Alt. : 371 m) and Thanry village(2°38' N, 17°10' E ; Alt. : 384 m), see map 1 in *Gilbertiodendron dewevrei* monodominant forest and mixed species forest. The work included collecting specimens of macrofungi thoughout the two selected habitat types, recording data on Ectomycorrhizal species in plots in relation to the density of ectomycorrhizal trees and the thickness of the litter and making ethnomycological investigations with the Mbenzele community of Hunter-gatherers.

I.2. Data entry in BRAHMS

This activity still partially conducted as it mainly focused on entering and cleaning data that we previously collected in the Park. This was conducted by a Research Assistant, Mr Christopha Atikani, at the HeadQuarter of the ICPC NGO in Brazzaville in July 2023. It consisted of checking if all specimens of macrofungi collected in the Nouabale-Ndoki National Park has been typed in into BRAHMS with all field notes such as : date, collector and collecting number, type of habitat, latitude and longitude, current identification status of the specimen.

II. Preliminary résultats

II.1 Mapping of sites

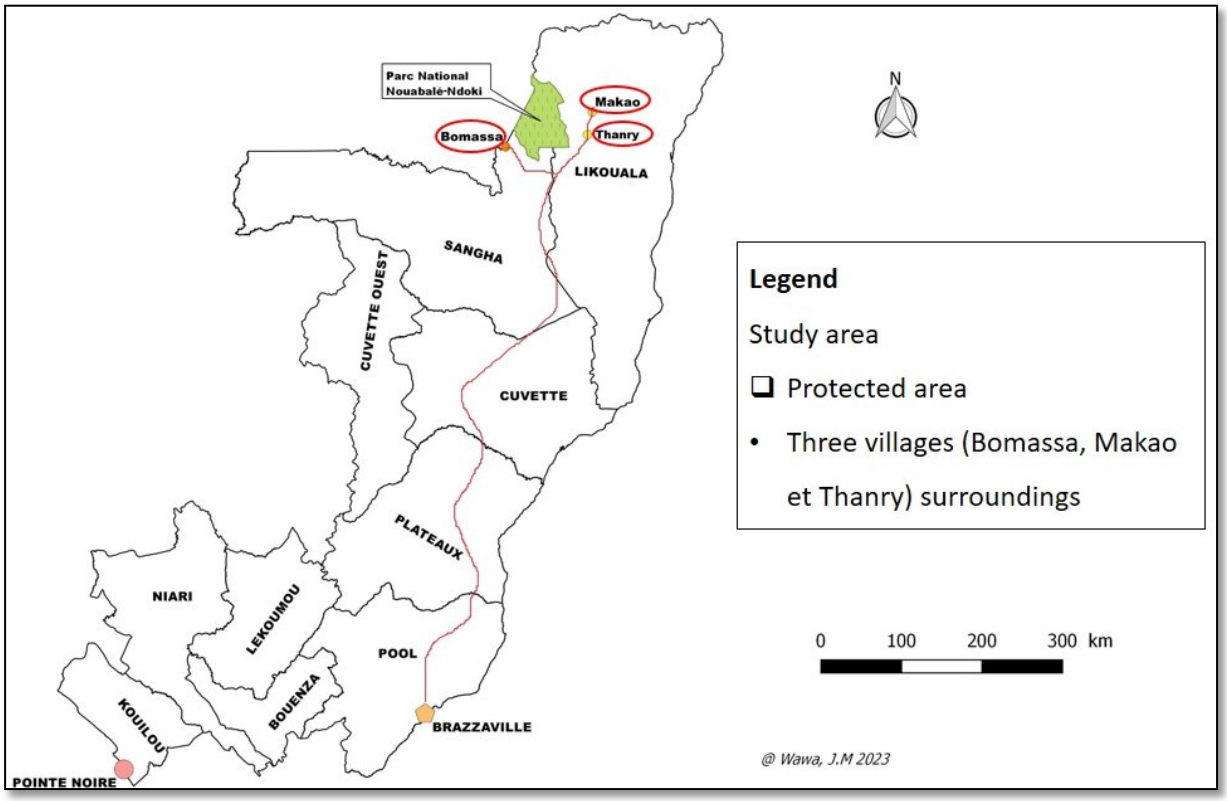


Figure 1 : Presentation of the study area.

II.2 Interview of local population

Interview of the indigenous population in the villages Bomassa, Makao and Thanry was conducted by two team members from 30th June to 6th July 2023 with 57 pickers. The number of people surveyed by village is distributed as follows : 15 in Bomassa, 35 Makao and 7 Thanry. Out of this total of 57 we had 24 men versus 33 women interviewed overall. A total of 8 families, 56 genera and two unknowns were recorded during the survey. The figure 2 shows the team who conducted the project in those villages while the figure 3 illustrates the interview process. Prelimary results show that all ages (youth, adult and elder) are involved in collecting mushrooms for one mainly for commercial purposes. A small quantity of the harvested mushrooms can be used for local consumption, barter and other medical. But it's more the women who are involved in this activity.

Figure 2 : Team of the Rufford Project 40270-1 in north of Congo. From left to right : Likibi Makassa Jupcie Maelle (undergraduate student) and Juvey Wawa (coordonnator project) *24th July 2023*.

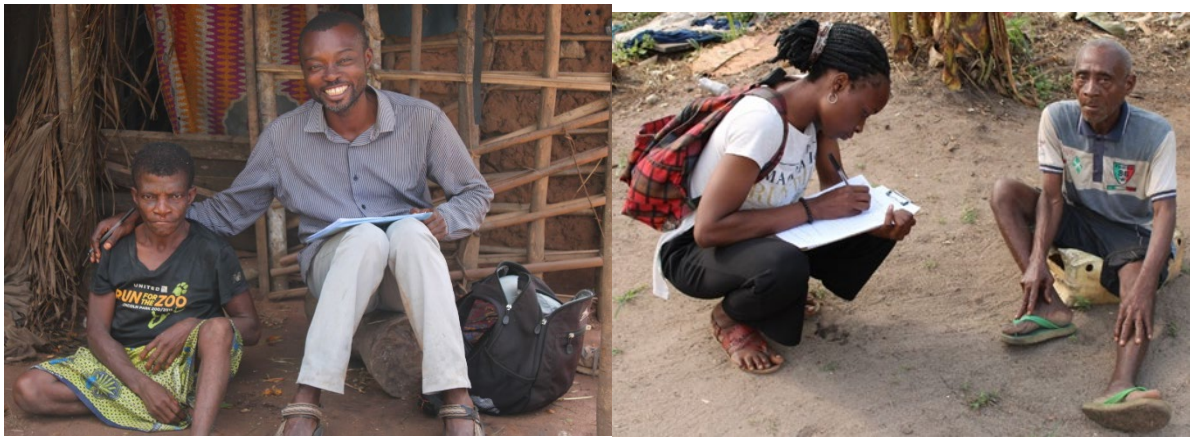


Figure 3 : Team of the Rufford Project conducting interviews in these three villages (Bomassa, Makao and Thanry.

II.3 Macrofungi collection on field

Field observations and harvests of mature sporophores of mushroom species are made in several habitats in the Park and these surrounding villages in order to associate each species with its ecology. Harvests are made in the field in the morning in three plots of 50 m x 50 m installed to Makao-Thanry and during opportunistic walks in the monodominant forests in *Gilbertiodendron dewevrei* and mixed forests and then described in the afternoon once back in the village. These collected and transported specimens were kept or even packed in the leaves of Maratancés separately (one species per package) and then deposited in the basket, which avoided as much as possible, friction and contact between the samples. The harvested material is described morphologically on the fresh before drying in field notebooks. For each species collected, a sheet associating all morphological, anatomical and ecological data is produced. Once back in the village, the samples are also soon placed in the metal sieves and then dried and labeled. The figure below shows the collection of data and specimens by different collectors assisted by two indigenous guides.

Figure 4 : Data collection and specimens

II.4 Drying and preservation of samples in the field

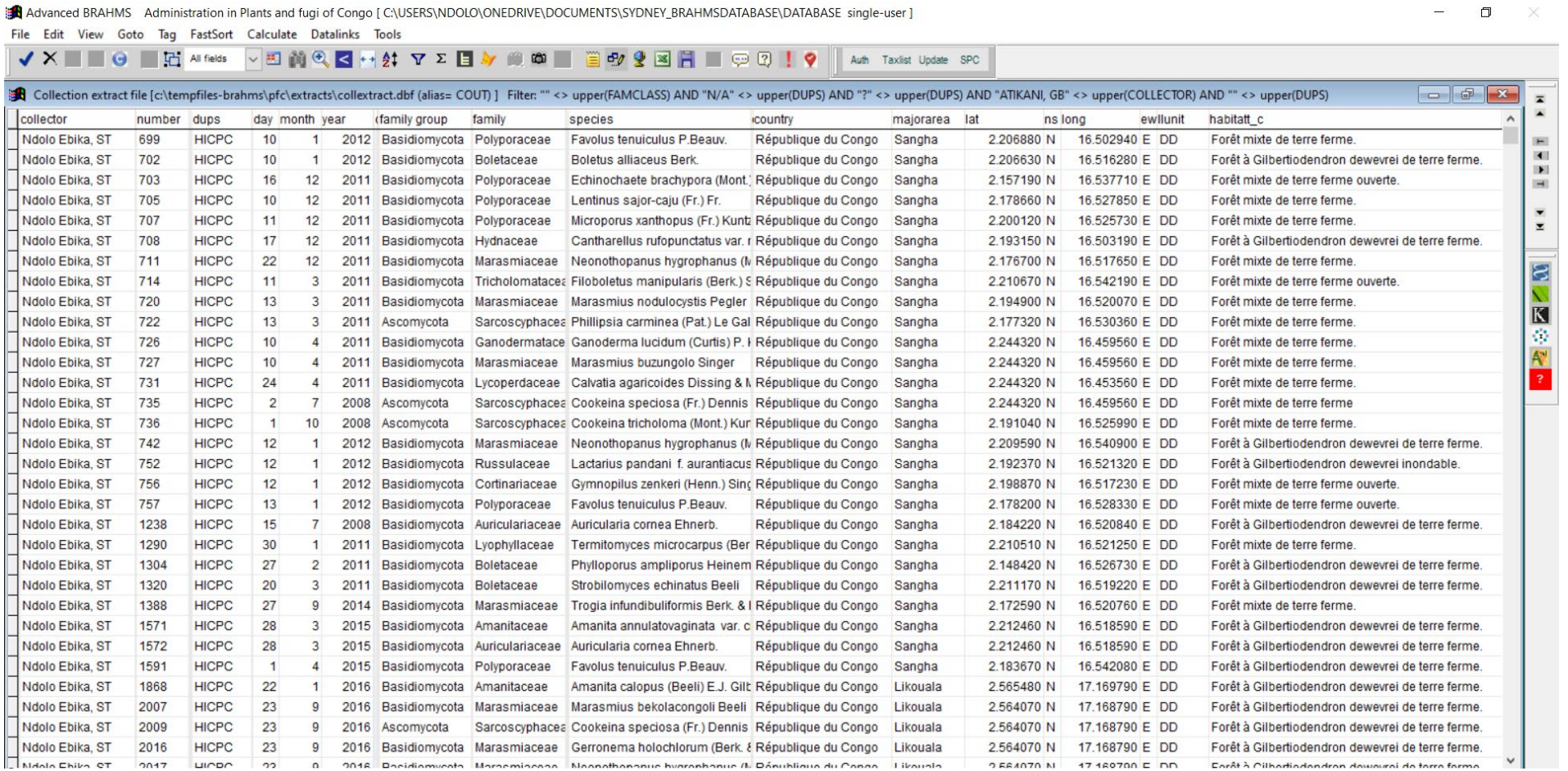
On the one hand, the drying of the collected samples is done the same day after the field by heat. Upon return to the camp, the collected samples are put in metal sieves of different sizes. These sieves are arranged from the smallest to the largest and then placed in a mycological dryer (De Kesel, 2001) which in turn is superimposed on the stove over low heat as shown in the figure below. Regarding the duration of drying of mushrooms, they depend on the amount

of water contained in the sample collected and could vary between 6 to 10 hours or even more (Ndolo Ebika, 2018). Once the samples are dry, they are put in plastic bags indicating the crop number and the name of the collector and then hermetically sealed. After that, they are placed in the containers by adding a few grains of silica gel for preservation. Silicagel absorbs any residual moisture.

Figure 5 : Drying fungal specimens with heat. (A) mounted press with stove on, (B) top view of the press with specimens, (C) dried specimens in Minigrip bags.

II.5 Analysis of previous data in BRAHMS.

Figure 6 below shows a how data are typed in into the BRAHMS software. In total, 777 specimens of macrofungi collected in and around the Park were typed in into BRAHMS. With a total of 28 families represented by : Agaricaceae, Amanitaceae, Auriculariaceae, Boletaceae, Cortinariaceae, Elaphomycetaceae, Ganodermataceae, Geastraceae, Hydnaceae, Lycoperdaceae, Lyophyllaceae, Marasmiaceae, Mycenaceae, Nidulariaceae, Phallaceae, Physalacriaceae, Pleurotaceae, Pluteaceae, Podoscyphaceae, Polyporaceae, Psathyrellaceae, Rhodophyllaceae, Russulaceae, Sarcoscyphaceae, Schizophyllaceae, Sparassidaceae, Strophariaceae, Tricholomataceae. And 61 genera have been identified represented by *: Agaricus, Amanita, Armillaria,Auricularia, Boletus, Calvatia, Cantharellus, Chlorophyllum, Collybia, Cookeina, Coprinus, Cortinarius, Craterellus, Crinipellis, Cyathus, Dictyophora, Echinochaete, Elaphomyces, Favolus, Filoboletus, Ganoderma, Geastrum, Gerronema, Gymnopilus, Hydnum, Lactarius, Lactifluus, Laetiporus, Lentinus, Lepiota, Leptoglossus, Leucocoprinus, Limacella, Lycoperdon, Macrolepiota, Marasmius, Microporellus, Microporus, Mycena, Neonothopanus, Oudemansiella, Phillipsia, Phylloporus, Pleurotus, Pluteus, Podoscypha, Polyporus, Psathyrella, Psilocybe, Pycnoporus, Rhodophyllus, Rhopalocère, Russula, Schizophyllum, Sparassis, Strobilomyces, Termitomyces, Tetrapyrgos, Trametes, Trogia*, and *Volvariella*.



collector	number	dups	day	month	year	family group	family	species	country	majorarea	lat	ns	long	ew	llunit	habitatt_c
Ndolo Ebika, ST	699	HICPC	10	1	2012	Basidiomycota	Polyporaceae	Favolus tenuiculus P.Beauv.	République du Congo	Sangha	2.206880	N	16.502940	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	702	HICPC	10	1	2012	Basidiomycota	Boletaceae	Boletus alliaceus Berk.	République du Congo	Sangha	2.206630	N	16.516280	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	703	HICPC	16	12	2011	Basidiomycota	Polyporaceae	Echinochaete brachypora (Mont.	République du Congo	Sangha	2.157190	N	16.537710	E	DD	Forêt mixte de terre ferme ouverte.
Ndolo Ebika, ST	705	HICPC	10	12	2011	Basidiomycota	Polyporaceae	Lentinus sajor-caju (Fr.) Fr.	République du Congo	Sangha	2.178660	N	16.527850	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	707	HICPC	11	12	2011	Basidiomycota	Polyporaceae	Microporus xanthopus (Fr.) Kuntz	République du Congo	Sangha	2.200120	N	16.525730	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	708	HICPC	17	12	2011	Basidiomycota	Hydnaceae	Cantharellus rufopunctatus var. r	République du Congo	Sangha	2.193150	N	16.503190	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	711	HICPC	22	12	2011	Basidiomycota	Marasmiaceae	Neonothopanus hygrophanus (M	République du Congo	Sangha	2.176700	N	16.517650	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	714	HICPC	11	3	2011	Basidiomycota	Tricholomatacea	Filoboletus manipularis (Berk.) S	République du Congo	Sangha	2.210670	N	16.542190	E	DD	Forêt mixte de terre ferme ouverte.
Ndolo Ebika, ST	720	HICPC	13	3	2011	Basidiomycota	Marasmiaceae	Marasmius nodulocystis Pegler	République du Congo	Sangha	2.194900	N	16.520070	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	722	HICPC	13	3	2011	Ascomycota	Sarcoscyphacea	Phillipsia carminea (Pat.) Le Gal	République du Congo	Sangha	2.177320	N	16.530360	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	726	HICPC	10	4	2011	Basidiomycota	Ganodermatace	Ganoderma lucidum (Curtis) P. K	République du Congo	Sangha	2.244320	N	16.459560	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	727	HICPC	10	4	2011	Basidiomycota	Marasmiaceae	Marasmius buzungolo Singer	République du Congo	Sangha	2.244320	N	16.459560	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	731	HICPC	24	4	2011	Basidiomycota	Lycoperdaceae	Calvatia agaricoides Dissing & M	République du Congo	Sangha	2.244320	N	16.453560	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	735	HICPC	2	7	2008	Ascomycota	Sarcoscyphacea	Cookeina speciosa (Fr.) Dennis	République du Congo	Sangha	2.244320	N	16.459560	E	DD	Forêt mixte de terre ferme
Ndolo Ebika, ST	736	HICPC	1	10	2008	Ascomycota	Sarcoscyphacea	Cookeina tricholoma (Mont.) Kur	République du Congo	Sangha	2.191040	N	16.525990	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	742	HICPC	12	1	2012	Basidiomycota	Marasmiaceae	Neonothopanus hygrophanus (M	République du Congo	Sangha	2.209590	N	16.540900	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	752	HICPC	12	1	2012	Basidiomycota	Russulaceae	Lactarius pandani f. aurantiacus	République du Congo	Sangha	2.192370	N	16.521320	E	DD	Forêt à Gilbertiodendron dewevrei inondable.
Ndolo Ebika, ST	756	HICPC	12	1	2012	Basidiomycota	Cortinariaceae	Gymnopilus zenkeri (Henn.) Sing	République du Congo	Sangha	2.198870	N	16.517230	E	DD	Forêt mixte de terre ferme ouverte.
Ndolo Ebika, ST	757	HICPC	13	1	2012	Basidiomycota	Polyporaceae	Favolus tenuiculus P.Beauv.	République du Congo	Sangha	2.178200	N	16.528330	E	DD	Forêt mixte de terre ferme ouverte.
Ndolo Ebika, ST	1238	HICPC	15	7	2008	Basidiomycota	Auriculariaceae	Auricularia cornea Ehnerb.	République du Congo	Sangha	2.184220	N	16.520840	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1290	HICPC	30	1	2011	Basidiomycota	Lyophyllaceae	Termitomyces microcarpus (Ber	République du Congo	Sangha	2.210510	N	16.521250	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	1304	HICPC	27	2	2011	Basidiomycota	Boletaceae	Phylloporus ampliporus Heinem	République du Congo	Sangha	2.148420	N	16.526730	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1320	HICPC	20	3	2011	Basidiomycota	Boletaceae	Strobilomyces echinatus Beeli	République du Congo	Sangha	2.211170	N	16.519220	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1388	HICPC	27	9	2014	Basidiomycota	Marasmiaceae	Trogia infundibuliformis Berk. & I	République du Congo	Sangha	2.172590	N	16.520760	E	DD	Forêt mixte de terre ferme.
Ndolo Ebika, ST	1571	HICPC	28	3	2015	Basidiomycota	Amanitaceae	Amanita annulatovaginata var. c	République du Congo	Sangha	2.212460	N	16.518590	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1572	HICPC	28	3	2015	Basidiomycota	Auriculariaceae	Auricularia cornea Ehnerb.	République du Congo	Sangha	2.212460	N	16.518590	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1591	HICPC	1	4	2015	Basidiomycota	Polyporaceae	Favolus tenuiculus P.Beauv.	République du Congo	Sangha	2.183670	N	16.542080	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	1868	HICPC	22	1	2016	Basidiomycota	Amanitaceae	Amanita calopus (Beeli) E.J. Gilb	République du Congo	Likouala	2.565480	N	17.169790	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	2007	HICPC	23	9	2016	Basidiomycota	Marasmiaceae	Marasmius bekolacongoli Beeli	République du Congo	Likouala	2.564070	N	17.168790	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	2009	HICPC	23	9	2016	Ascomycota	Sarcoscyphacea	Cookeina speciosa (Fr.) Dennis	République du Congo	Likouala	2.564070	N	17.168790	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.
Ndolo Ebika, ST	2016	HICPC	23	9	2016	Basidiomycota	Marasmiaceae	Gerronema holochlorum (Berk. &	République du Congo	Likouala	2.564070	N	17.168790	E	DD	Forêt à Gilbertiodendron dewevrei de terre ferme.

Figure 6 : Representation of the mycological database recorded in BRAHMS.